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Degree of Doctor of Philosophy

The Impacts of Social Networks in Regional Environmental Regimes on Regime Outcomes and Interactions

The Case of the Carpathian Convention

Marta VETIER

May 2020

Budapest

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Marta VETIER

THE CENTRAL EUROPEAN UNIVERSITY

ABSTRACT OF DISSERTATION submitted by:

Marta VETIER for the degree of Doctor of Philosophy and entitled: The Impacts of Social Networks in Regional Environmental Regimes on Regime Outcomes and Interactions, The Case of the Carpathian Convention.

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Although there is general agreement that environmental regimes (the formal and informal rules, norms, principles and procedures that influence the behaviour of states and other actors) contribute to mitigating human-induced environmental problems, many open questions remain concerning what makes one regime succeed and another fail. This question is even more pressing for regional regimes for which very little is known about their effectiveness and interactions.

The overarching aim of this dissertation is to understand if and how a regional environmental regime can contribute to global environmental governance by examining the Carpathian Convention over its first 15 years. Combining quantitative social network analysis methods (affiliation-based bipartite network, survey-based social network, citation-based ego-network analysis) with qualitative analysis of participant observation and semi-structured interviews provides the basis for analysing of the structure and functioning of the Carpathian Convention's networks. The dissertation develops propositions for how the structural and functional characteristics of regime actors' social network can be linked to the outcomes of the regime, and what roles regional regimes can play in regime interactions.

At the theoretical level, this dissertation concludes that the network driving forces of homophily and triadic closure may lead to the swift emergence of a core-periphery network in regional regimes due to the smaller number and more homogenous group of actors that characterises regional regimes. It also claims that the network structural effects of activities carried out by regime actors can have both positive and negative implications for regime outcomes. Finally, it suggests four mechanisms through which regime interactions affect regime outputs and outcomes: desk-top, yo-yo, hands-in-hands and stowaway. These theoretical propositions suggest pathways for future research.

At the empirical level the dissertation shows how the Carpathian Convention's actors' network evolved into a core-periphery network, with a small number of highly connected organizations and several loosely attached peripheral actors. It points to ambiguities in leadership and highlights activities core actors implement to strengthen social cohesion. With regards to regime interactions, the research finds that the Carpathian Convention connects to 39 other regimes and organizations, albeit through different mechanisms.

The dissertation concludes that regional regimes, based on their unique characteristics can act as a stepping stone in the global environmental governance system and can enhance environmental change.

Keywords: regime outcomes, regime interactions, regional environmental regimes, Carpathian Convention

Acknowledgements

Writing a PhD is quite similar to running an ultramarathon. I ran uphill and downhill stretches, I fought with unexpected changes in the weather, I hit my foot in potholes on the route and even ventured onto gravel and dirt roads. Sometimes I ran enthusiastically and energetically in the sunshine, sometimes I dragged myself along in cold rain and wind, and there were days when I had to run with a bleeding blister. But I made it to the final finish line.

I am thankful to all people who stood along the roadside of this lonely run: my husband Dániel Barcza and my kids Benedek and Kornél, my supervisor Alexios Antypas and my committee members Jörg Balsiger, Michael Labelle, Sara Svensson and Balázs Vedres, my friends and colleagues, and CEU's staff and faculty members.

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Preface

As a child, I used to spend my weekends and holidays at the feet of the Hungarian Carpathians, in the picturesque Danube-bend. We camped on the banks of the Danube River, built sandcastles on the beach of the river and tried to swim upstream, or simply enjoyed how the current swept us downstream. In the evenings we hiked in the Börzsöny and Visegrádi Mountains, up to the peaks of Hegyestető and Prédikálószék and looked down at the magnificent view of the Danube River turning south.

As a teenager and young adult, I used to go for week-long trekking journeys in the Carpathians: climbing peaks in Romania, Slovakia and Poland. Sleeping in mountain huts, tents and once even in a snow cave. I was always mesmerised by the beauty and diversity of the natural and cultural heritage of the region. It became a habit of my friends and me to explore new parts of the mountain range year after year.

As an adult, I still have a passion for the Carpathians; I still consider it part of my heritage. But as an adult, I also saw the changes in the mountains, and many of the changes I felt were not for the good of the region. Villages became nearly deserted, and tourist centres grew in rural landscapes, highways segmented habitats, traditional hay meadows were abandoned, previously inaccessible forests were harvested.

As a researcher, when deciding on the focus of my PhD, I wanted to have a topic that I care about. I hope that the findings of this research contribute to putting the Carpathian region on a path to sustainability.

1 Introduction

1.1 Problem Framework: Environmental Regime (In)effectiveness

Global scientific assessments of the status of the earth's environment project alarming future scenarios and call for urgent and systemic action. In 2018 the Intergovernmental Panel on Climate Change (IPCC) published a Special Report on Global Warming of 1.5C (IPCC 2018), the Report projects a grim global future of the rise in global temperature exceeds 1.5C. It also concludes, that "[p]athways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems (high confidence)"(IPCC 2018, 17). In practical terms, this means that human society has time merely until 2030 to act to avoid severe changes in the earth's climate.

In 2019 the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) published its Global Assessment Report (IPBES 2019). This report focuses on the status of global biodiversity and ecosystem services. It comes to similarly pessimistic conclusions as to the IPCC's climate report: "Nature and its vital contributions to people, which together embody biodiversity and ecosystem functions and services, are deteriorating worldwide." (IPBES 2019, 2). IPBES also points to the need for "transformative changes" that are necessary for our economic, social, political and technological spheres to halt the loss of biodiversity and degradation of ecosystem services.

These two recent global scientific reports shed light on the alarming status of the earth's environment, and the urgency needed to avoid a global environmental crisis. States have made attempts since the early 1970s to address global and regional environmental issues jointly. They have signed several hundreds of multilateral environmental agreements (MEA): from bilateral agreements between two countries, through regional environmental agreements of countries in a specific geographic area, to global agreements inviting all countries of the world to cooperate. States have also established other formal and informal principles, norms, procedures and programmes that aim to reduce our impact on the environment. Environmental regimes[1] cover a

[1] Environmental regimes are understood as the formal and informal rules, norms, principles and procedures that influence the behaviour of states and other actors in order to solve environmental problems (Krasner 1982; Levy, Young, and Zürn 1995). Environmental agreements (including treaties, conventions, protocols) are one form of specifying the formal rules, norms, principles and procedures.

wide range of topics, including atmosphere and climate, freshwater resources, hazardous substances (waste, chemicals, industrial accidents), marine living resources and marine environment (global and regional), biodiversity and nature conservation and nuclear safety.

Although there is general agreement that environmental regimes matter, not all have led to the same level of success (Breitmeier, Underdal, and Young 2011). There are a few regimes with environmental agreements at their centre that have been praised by researchers and decision-makers as meeting their objectives (Raubenheimer and McIlgorm 2017; Escobar-Pemberthy, Ivanova, and Bueno 2018), for example, the international treaty for protecting the ozone layer[2], the Antarctic Treaty and its protocols[3], and the Convention to Protect the River Rhein[4]. On the other side of the balance lie many regimes that never delivered the goals that were set by decision-makers, for example, the climate regime[5], the agreement to combat desertification[6], and some (but not all) regional fisheries management regimes (Young 2011). Along the continuum of 'successful' to 'failed' regimes lie many others that delivered partial goals. Researchers have been trying to understand for a long time what leads to the success and failure of regimes, and thus how to design or redesign MEAs and their system so that more regimes can become successful in leading to desired changes in the environment.

Regional environmental agreements, signed by geographically adjacent countries, make up two-thirds of all MEAs (Balsiger and Prys 2016), and yet little is known about their effectiveness and their roles in global environmental governance[7]. Claims have been made that regional regimes may benefit from the familiarity of actors with each other, the actors' shared histories and problems, and can thus become a stepping stone between global regimes and national implementation (Conca 2012). However, there is a dearth of studies on regional environmental agreements and regimes, and many open questions remain if and how the regional level can contribute to global environmental governance.

[2] Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal 1987.

[3] Antarctic Treaty System, Washington D.C. 1961.

[4] Convention on the Protection of the Rhine, Berne 1999

[5] United Nations Framework Convention on Climate Change, Rio de Janeiro 1992.

[6] United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, Paris 1994.

[7] Environmental governance includes activities of non-state actors (for example non-governmental organizations, business actors, local level administrations) further to states in delivering environmental changes.

1.2 Problem Manifestation: Socio-Environmental Challenges in the Carpathian Mountains

The Carpathian Mountains are the largest, longest and most fragmented mountain chain of Europe (UNEP 2007). The mountain range has a length of 1450 km running from the Danube near Bratislava, Slovakia through an arc touching the Czech Republic, Hungary and Ukraine, all the way to the Iron Gate in Romania and even stretching into Serbia, see Figure 1-1. The width of the mountain system varies between 12 km and 500 km. The Carpathians are not an uninterrupted chain of mountains, but a group of several geologically distinctive mountains. The highest peak of the Carpathian Mountains is in Slovakia: the Gerlachovsky Peak reaches to 2655 meters above sea level.

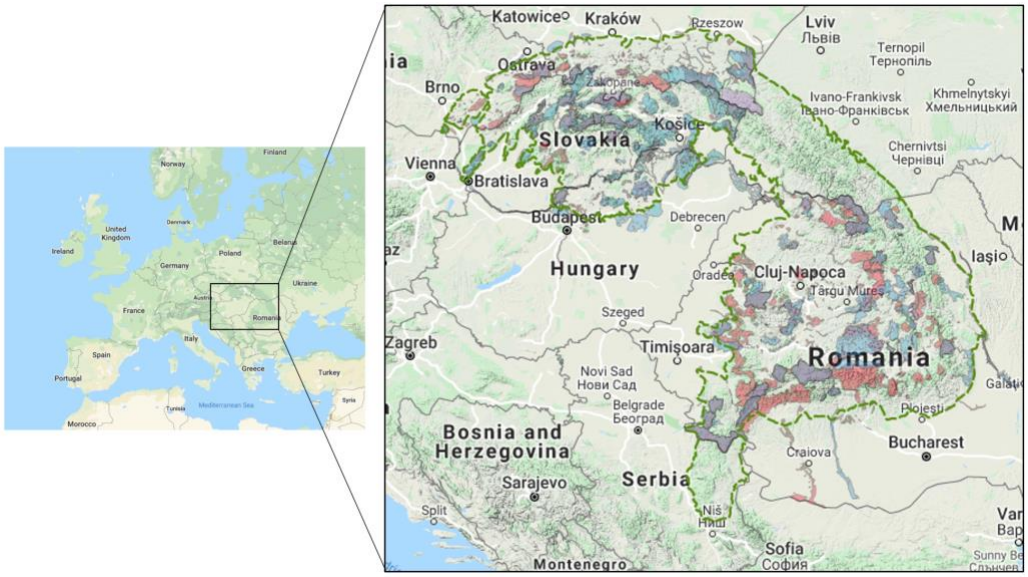

Figure 1-1: Carpathian Mountains (WWF 2019, Google Maps 2019)

The Carpathian Mountains are a biodiversity hotspot at European level (Bálint et al. 2011). Around 60 000 species, excluding microorganisms, can be found in the Carpathians (UNEP 2007), including an almost complete megafauna with viable populations of large carnivores (brown bear, grey wolf and lynx) and large herbivores (European bison, chamois); as well as over one-third of all European plant species (Webster, Holt, and Avis 2001; Witkowski, Król, and Solarz 2003). Half of the Carpathians are covered in forests, including Europe's largest unfragmented old-growth forest area in the Southern Carpathians (EEA 2002; REC and EURAC 2007; UNEP 2007) and 300 000 hectares of forests with negligible human impact that display natural forest dynamics (Webster, Holt, and Avis 2001). The Carpathian arch acts as an ecological

corridor between Europe's northern taiga forests and southern Mediterranean and western areas (Webster, Holt, and Avis 2001; Bösze and Meyer 2014; UNEP 2007).

Next to natural ecosystems, traditional landscapes are another essential element of the Carpathian landscapes. The Carpathian Mountains have been inhabited for centuries; currently, they are estimated to give a home to 16-18 million people (UNEP 2007). Pastures and mosaic farmlands cover 21% of the Carpathians (EEA 2010), which were formed by long traditions of mountain agriculture and sheep farming and extensive practices, and hold tremendous value for nature (Webster, Holt, and Avis 2001). Interestingly, nearly half of the Carpathian species depend on human activity to survive (Webster, Holt, and Avis 2001).

However, during the last 20 years, a combination of multiple environmental, social and economic pressures have resulted in changes in land use in many parts of the Carpathians with dangerous adverse effects on biodiversity and ecosystem services (EEA 2010; REC and EURAC 2007; Björnsen Gurung et al. 2009). The NGO Word Wide Fund for Nature (WWF) has identified the Carpathians as one of the 200 terrestrial ecoregions that are critically endangered by human activities (Olson and Dinerstein 2002); scientists have suggested listing 868 plant and animal taxa and 145 plant alliances as endangered species and habitats of the Carpathians (Kadlečík 2014; Barančok et al. 2014). Main threats currently to Carpathian landscapes include illegal hunting, habitat fragmentation and destruction, pollution and contamination from historical industrial activities, agricultural intensification and land abandonment, illegal and unsustainable forest management practices, expansion of settlements, spread of invasive and alien species and climate change (Webster, Holt, and Avis 2001; Witkowski, Król, and Solarz 2003; Bösze and Meyer 2014; EEA 2010; UNEP 2007; Favilli et al. 2014; WWF 2014; Kadlečík 2014).

In 2003 the seven Carpathian countries, the Czech Republic, Hungary, Poland, Romania, Serbia, Slovakia and Ukraine signed a treaty (the Framework Convention on the Protection and Sustainable Development of the Carpathians) to foster the development of policies and enable cooperation among parties "for the protection and sustainable development of the Carpathians with a view to inter alia improving quality of life, strengthening local economies and communities, and conservation of natural values and cultural heritage" (Carpathian Convention, Article 2). Although the Carpathian Convention has been operational for 17 years, little is known about its effectiveness and its contributions to maintaining the valuable social-ecological systems of the Carpathian Mountains.

1.3 Research Aim and Objectives

The overall question that inspired my research is understanding if and how a regional environmental regime can contribute to global environmental governance by focusing on the experiences of the establishment and first 15 years of the Carpathian Convention. Within this frame, the aim of my exploratory research is to develop propositions for how the characteristics of regime actors' social network can be linked to the outcomes of the regime, and what roles regional regimes can play in regime interactions. I approach this overarching aim through the analytical lenses of quantitative and qualitative social network analysis.

I meet the aim of the research through four objectives:

Objective 1: Develop an integrated conceptual framework for applying social network analysis measures, concepts, principles and theories in regime studies. Since my research rests upon three disciplines (regime effectiveness, regime interaction and network science), I aim to develop a conceptual framework that brings these fields together. I will build upon scientific publications that use network analysis for studying regime effectiveness and interaction and environmental management and develop an integrated framework. The framework will be integrated in the sense that it will re-conceptualise network measures, concepts, principles and theories for both regime effectiveness and regime interaction analysis. I will use this conceptual framework to analyse my data.

Objective 2: Analyse the structural and functional qualities of the social network of a regime's actors and their impact on regime outcomes. Using mixed methods (network analysis combined with qualitative data analysis), I aim to understand both the network structural and functional qualities of the case study's social network. In my dissertation from multiple data sources, I will construct several social networks and will overlay the findings of the network analysis with actors' perceptions of their interactions and my observations. The focus of the analysis will be on the effects of the network's qualities on regime outcomes.

Objective 3: Analyse the structural and functional qualities of a regime interaction network and their impacts on regime effectiveness. Similarly, I will use mixed methods to analyse interactions between the case and other regimes and the effect of regime interactions on effectiveness. I aim to create a network of the regimes, institutions and organisations that the Carpathian Convention refers to or interacts with. I will use qualitative data sources (interviews, documents and observations) to gain an in-depth

understanding of how the connections are implemented in practice. Furthermore, I will analyse perceptions of actors on how regime interactions impact on their regime.

Objective 4. Apply and assess the benefits and limitations of using various network science methods in regime studies. I will use three different network representations in my dissertation: the meeting-affiliation based social network of actors, the survey-based social network of actors and the citation-based ego-network of regimes. As part of this research exercise, I also aim to test the applicability and appropriateness of these different network representations for regime studies.

1.4 Structure of the Dissertation

I present the structure of my dissertation in Figure 1-2. This Introduction is followed by the Literature Review (Chapter 2), which covers the main bodies of literature related to international regime effectiveness, regime interactions, regional environmental governance and social network analysis.

My **Conceptual Framework (Chapter 3)** explains how network theories, principles and measures were re-conceptualised for regime effectiveness and regime interaction analysis. The framework first explains the relevance of networks for regime effectiveness and regime interaction. It then develops a framework for using principles of network evolution and network structural theories in regime studies. Finally, it provides an overview of the meanings of social network measures I use in this dissertation.

Chapter 4 describes the **methodological approach and the research design** of the dissertation. It does not explain in detail my data collection and analysis methods since that is done in each empirical chapter. The Methodology chapter focuses on the general approach I took in this research: case study research and applying mixed methods. It also includes an overview of the concrete methods and the case.

Chapters 5-7 present the results of the empirical analysis. The **Actors' Meeting Affiliation Network (Chapter 5)** contains an analysis of the meeting affiliation network of the Carpathian Convention's social actors. Based on meeting registration data, I created and analysed a set of networks that show which actors took part jointly in meetings of the Convention. I used these networks to understand the structural properties and evolution of the social network. At the end of the chapter, I provide analytical reflections on the benefits and disadvantages of using meeting affiliation network analysis for regime studies.

In the **Internal Network of Actors** chapter **(Chapter 6)**, I build upon social network surveys, interviews and participant observation data to understand the structural and functional qualities of the network of the key actors within the Carpathian Convention. In the chapter, I analyse from a regime effectiveness point of view the social network of the actors, the actors' perceptions of the network and the functions of the network. At the end of the chapter, similar to the previous one, I reflect on using mixed methods for regime effectiveness analysis.

The third empirical chapter **(Chapter 7)** focuses on **the network of regimes**. In this chapter, I analyse the citation-based ego-network of the Carpathian Convention. I describe the structure of the network and then provide an in-depth analysis of four connections in the network. The third set of findings in this chapter describes the impacts of regime interaction on the effectiveness of the Carpathian Convention.

Chapter 8 contains **the discussion,** which brings together the findings of the empirical chapters. It draws upon key pieces of literature in the fields of regime effectiveness, regime interaction, regional regimes and presents the theoretical, methodological and empirical contributions that I make through this dissertation to these fields. It also points to future research pathways.

Finally, I make **conclusions and recommendations in Chapter 9**. This chapter looks at the broad picture and returns to the overarching research question. It presents my ideas, opinions and recommendations on how to make global environmental governance more effective.

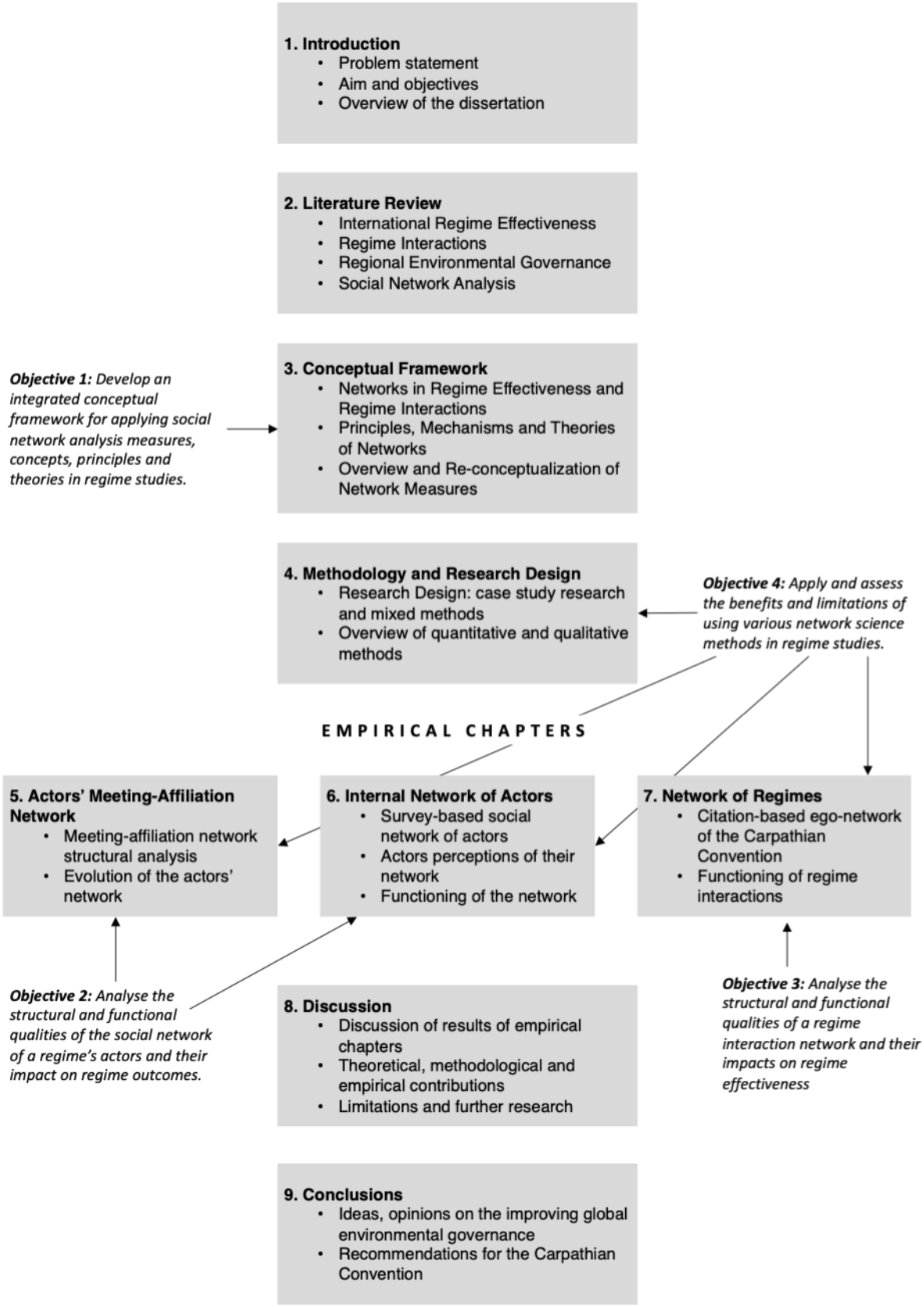

Figure 1-2: Overview of the dissertation's structure.

2 Literature Review

2.1 Introduction and Overview

Since the late 19th century state and non-state actors have been attempting to cooperate on tackling environmental problems. Based on years of empirical studies, scientists have identified several distinct approaches that actors use for this purpose. Parallel to the *international regime* concept describing state-centred approaches (which will be elaborated in detail in the following pages), researchers identified the important role of non-state actors, which lead to the emergence of *governance* (and its many perspectives: polycentric, network, adaptive, co-, collaborative, see Section 2.2.2). Environmental governance acknowledges that the actions of non-state actors are also important for the shared environmental goal. Studies also pointed out the impacts of *transnational norms and ideas* that are generated by cooperation and materialize also in domestic politics (Balsiger and VanDeveer 2012). Furthermore, leaving state actors aside, *private governance and partnerships* can also be seen as part of these joint attempts to solve environmental problems (Hahn and Pinkse 2014). While acknowledging this large variety of approaches to solving transboundary environmental problems, this literature review focuses on regimes, their rules, actors and interactions.

Regimes are "sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations" (Krasner 1982, 186), the given area being *environment*, in the case of *environmental regimes*. It is no longer a question that environmental regimes are playing a role in mitigating and avoiding human-induced detrimental environmental processes (Breitmeier, Underdal, and Young 2011). The overall puzzling question is rather what makes some regimes more successful than others (Young 2011; Bodin 2017). As discussed in Chapter 1, environmental regimes lie along the "successful" to "failed" continuum, and researchers strive to understand what enables regimes to meet their objectives.

This literature review covers four domains of knowledge: regime effectiveness, regime interaction, regional environmental regimes and social network analysis in policy studies. It provides an analytical overview of current publications in these fields and points out open questions and missing connections.

I structure the literature review as follows:

- Section 2: **environmental regime effectiveness** is a field of knowledge that focuses on if and how international-level regimes bring about changes in the environment. The review focuses on how regime effectiveness is understood and what the main open questions are. The section also reviews disciplines focusing on social actors' interactions in governance settings: adaptive governance and collaborative governance.
- Section 3: the field of **environmental regime interactions** studies the structure and outcomes of the interplay between regimes. This section explains the different interactions, and the multiple perspectives in which interactions are studied and described: causal pathways of interaction, the structure of interaction and quality of interaction.
- Section 4: **regional environmental governance** focuses on environmental agreements and regimes between geographically neighbouring states. The review includes main arguments for and against regional-level action from the perspectives of regime effectiveness and regime interactions, and the main open questions that scientists identified.
- Section 5: **social network analysis** is a discipline focusing on analysing social actors' interactions from humans through animals and organisations to countries and institutions. This section reviews the main trends in social network analysis and also how social network analysis is being used in fields related to environmental regimes such as international relations, policy studies and environmental management studies.

These four bodies of literature are the main pillars of my dissertation. In my research, I aim to bridge these disciplines, as discussed in more detail in the Conceptual Framework (Chapter 3) and the Discussion (Chapter 8).

2.2 Regime Effectiveness

This section of the literature review explains how regime effectiveness is conceptualised and what the key research trends are in this field. It is about the effectiveness of an individual regime, and not about interactions between regimes, which also affects regime effectiveness (Young 2011). Regime interactions are discussed in the next section of the literature review. In the current section, first, the three conceptual components of regime effectiveness (output, outcome and impact) will be discussed, followed by a more detailed elaboration of how changes in actors' behaviour affect

regime effectiveness and how these changes can be defined and studied.

2.2.1 Three Aspects of Regime Effectiveness

Scholars have been aiming to establish a causal link between regimes and changes in the environment since studies began. By now, there is broad scientific consensus that regimes matter (Breitmeier, Underdal, and Young 2011; Breitmeier, Young, and Zürn 2006; Miles et al. 2001). The questions of how and to what level regimes lead to positive environmental changes is still being studied. Studies focusing on *causality dimension* of effectiveness aim to show how a regime can make a difference to the environmental problem, whereas studies focusing on the *adequacy dimension* analyse how far the problem is from being solved (see for example (Haas, Keohane, and Levy 2001; Mitchell 2003)); and of course these two broad approaches are also combined (Stokke 2012; Underdal 2002).

However, establishing a direct causal connection between a specific regime and actual changes in the environment has proven to be quite challenging (Jordan et al. 2015) due to the complexity of social and environmental systems (Bodin 2017) and the unavailability of data (Seelarbokus 2014). The causal pathway of regime effectiveness has been theoretically established as (1) legislative outputs leading to (2) behavioural outcomes, causing (3) environmental impacts (Young 2011; Underdal 2002), see Figure 2-1.

Figure 2-1: The causal pathway of regime effectiveness.

1. Outputs of a regime (also called regulatory effectiveness of the regime (Stokke 2012)) are described as the tangible products of the process: legal documents and policy decisions (e.g. conventions, regulations, protocols, action plans), other documents (e.g. lists, reports, scientific analyses), infrastructure created because of the international regime and joint projects ran by its stakeholders. It is these outputs that determine the actions taken by stakeholders (see next point).
2. Regime outcomes (also called behavioural effectiveness (Stokke 2012)) are

defined as the changes in human behaviour brought by the regime (Underdal 2002). For example, development of consensual knowledge, changes in power relationship and emergence of joint management functions (Young 2011; Stokke 2012; Breitmeier, Underdal, and Young 2011).

3. The impacts of environmental regimes are defined as the regime's intended and unintended effects on the environment. For some researchers (Helm and Sprinz 2000), this is seen as the ultimate proof of success (or failure) of the regime.

The three aspects of regime effectiveness (outputs, outcomes and impacts) form an interlinked causal pathway, see Figure 2-1. The outcome level of regime effectiveness, to a certain extent, is a "black box" along the causality pathway (Figure 2-2): regime effectiveness scholars agree that it has a vital role to play, at the same time they struggle to understand what happens inside the box, and how it determines regime effectiveness (Young 2011; Breitmeier, Underdal, and Young 2011). What is very clear, though, is that interactions of social actors play a vital role in determining outcomes (Ostrom 1990), as discussed in more detail in Chapter 3 of this dissertation.

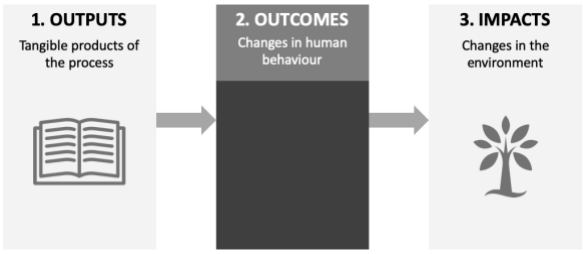

Figure 2-2: Regime outcomes as the "black box".

2.2.2 Social Interactions and Adaptive Regimes

While scholars of regime effectiveness acknowledge the importance of human behaviour and behaviour changes, the regime effectiveness literature claims that many open questions remain in this realm of knowledge (Breitmeier, Underdal, and Young 2011; Young 2011). Social interactions are identified as one potential determinant of regime outcomes. Focusing on interactions between different social actors (e.g. people, organizations, institutions) is seen as one tool to overcome common hurdles of environmental governance and management, such as mismatch between the geographic scale of environmental problems and governance structures (see also discussion under Section 2.4), data uncertainties and unavailability, dynamically changing social and environmental characteristics (Ostrom 2010; Bodin 2017; Folke et al. 2005; 2007). However, regime effectiveness literature does not establish a direct causal link but calls for more research in this field.

On the other hand, there are schools of knowledge that specifically focus on the roles of human interactions and social networks in solving environmental problems and have advanced findings of what determines and influences successes and failures of governance system from a social interaction perspective. Collaborative governance and adaptive co-management (and the combination of the two)[8] are research fields that aim to understand, through case studies of sub-national governance initiatives, when and how actors' interactions are effective and for what kind of environmental problems is collaborative or adaptive governance suitable.

Adaptive co-management and collaborative governance both have social interactions (social learning, processes based on inclusion and equity, and active connections among actors) at their core: "a range of interactions between actors, networks, organizations, and institutions emerging in pursuit of a desired state for social-ecological systems" (Chaffin, Gosnell, and Cosens 2014, no page number). The theoretical link between collaborative and adaptive governance and regime effectiveness has been already established (Dietz, Ostrom, and Stern 2003; Folke et al. 2005; Breitmeier, Underdal, and Young 2011; Emerson, Nabatchi, and Balogh 2011; Baird, Plummer, and Bodin 2016), but would deserve more attention (Bodin 2017; Young 2011).

The findings of adaptive co-management and collaborative governance studies are that a well-functioning social network of the actors is vital to the outputs and impacts of the governance system, especially for problems riddled with uncertainty, data unavailability, and changing circumstances (Ansell and Gash 2007). Beyond interactions, adaptive co-management highlights the importance of learning and collaboration (Crona and Bodin 2011). Learning is vital for the co-management system to remain adaptive to social and environmental changes. Collaboration, further to providing legitimacy of actions and decision, is also a potential source of diversity of perspectives and knowledge, which can contribute to increased learning and improved management decisions (Armitage et al. 2009). Along with a similar perspective, collaborative governance focuses on the depth of interaction between actors, arguing to move from cooperation, through coordination, to collaboration[9] in order to enhance effectiveness (Emerson, Nabatchi, and Balogh 2011).

[8] There is no clear-cut line between adaptive and collaborative governance; the two often cross-reference each other.

[9] *Cooperation*: Actors retain their own goals and aim not to interfere with each other's goals. *Coordination*: Actions of actors are defined to achieve a common goal. *Collaboration*: Actors move beyond their usual boundaries and collectively create agree on aims and concrete actions that could not have been created by the individual actors

2.3 Regime Interactions

The field of regime interactions is a reasonably young discipline emerging from international institutional interplay studies, and claiming to be still working on defining its concepts and analytical frameworks (see for example (Biermann et al. 2009; Gehring and Oberthür 2009; Lima et al. 2017).

Box 2-1: Definitions of institution, regime and interaction.

> *Institutions*, according to Keohane's often cited definition, are "persistent and connected sets of rules (formal and informal) that prescribe behavioural roles, constrain activity, and shape expectations" (Keohane 1988, 383).
>
> In contrast, *regimes* in the same piece are defined as "specific institutions involving states and/or transnational actors, which apply to particular issues in international relations" (Keohane 1988, 384), thus, in fact, are seen as a subset of institutions. For my research, I use Kraser's (1982) definition of regimes. He defines regimes as "sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations" (Krasner 1982, 186).
>
> Institutional and regime interaction is defined as a relationship between two institutions and regimes (respectively), in which one institution/regime affects the development, contents, operation, performance or consequence of another institution/regime (Gehring and Oberthür 2009; Stokke 2001).

Scholars studying interactions between regimes take multiple perspectives and follow different research agendas. Whereas some focus on establishing the causal links of how regimes can influence one another, others analyse the structures of interactions, and yet other researchers focus on the quality and evolution of interactions. The next paragraphs review these three different perspectives of regime interaction.

2.3.1 Causal Mechanisms of Interactions

Scientists first argue that in regime interactions, there needs to be a source regime and a target regime, a causation effect; and that the interaction is, in fact, unidirectional (Gehring and Oberthür 2009). Similar to regime effectiveness, researchers focusing on the causal mechanisms of regime interactions follow the output, outcome, impact cascade. Based on this conceptualization of individual regime's effectiveness, Gehring and Oberthür (2009) define four causal mechanisms of regime interaction depending on the level of effectiveness: (1-2) cognitive and commitment interactions happen at the output levels, (3) behavioural interaction is at the outcome level; and (4) impact-level interaction (as its name suggests) happens at the impact level of the regimes, see Figure 2-3.

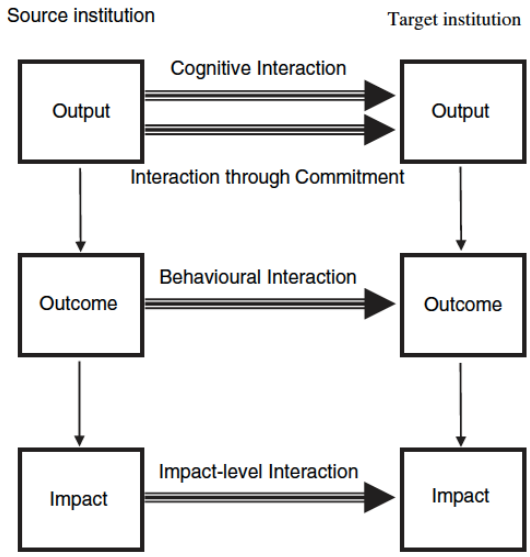

Figure 2-3: Four causal mechanisms of regime interaction (Gehring and Oberthür 2009, 131).

However, recently, the uni-directionality and the strict separation of source and target have been later questioned, and regime interactions are now seen as an evolving system (Jordan et al. 2015), as discussed later in this section.

2.3.2 Structure of Interactions

Regime interaction studies also describe the architecture of interactions. *Architecture* in the discipline is understood as the structural qualities of connections between regimes. The regime interactions literature differentiates several types of regime architecture structures, such as embedded (an institution being surrounded, or embedded in a broader institutional framework), nested (hierarchical relationship), overlapping and parallel (two or more institutions covering the same problem area with or without formal ties) (Young 1996; Abbott and Snidal 2009; Zelli et al. 2010), and polycentric regime interactions (multiple strong institutions with weak links between them) (Ostrom 1990). Regime complexes are a recently defined subset of interactions, see Box 2-2. At the overarching level, regime interaction studies often talk about the international environmental agreements' landscape becoming "dense", "fragmented", "complex" and about regime "clusters" (see, for example (Kim 2013; Guerra et al. 2015; Zelli and Van Asselt 2013; Lima et al. 2017; Oberthür and Gehring 2006; Moltke 2005).

Box 2-2: Regime complexes.

A specific type of regime interaction (and a reasonably recent "buzz or boom", (Orsini, Morin, and Young 2013)) is that of overlapping and non-hierarchical regimes: or regime complex. The term regime complex was devised by Raustiala and Victor to describe a phenomenon of "a collective of partially overlapping and non-hierarchical regimes" (Raustiala and Victor 2004, 277). Thus, according to its original definition, regime complexes form a subset, and a distinct type of regime interaction: the interactions are between regimes (and not institutions), and the

interactions are overlapping and non-hierarchical. A later definition, aiming to reduce ambiguities of the original one, defines regimes complexes as "network[s] of three or more international regimes that relate to a common subject matter; exhibit overlapping membership; and generate substantive, normative, or operative interactions recognized as potentially problematic whether or not they are managed effectively" (Orsini, Morin, and Young 2013, 29). What makes this definition markedly different from the earlier one, is that it insists that interactions between regimes of the complex can lead to conflicts. However, even in this definition, regime complexes are a specific type of regime interaction.

Most articles on regime architecture do not define clear criteria and thresholds that, for example, establish a critical threshold for a concrete regime system to qualify as nested, parallel, polycentric, dense, fragmented, or clustered. A large number of articles speak about these phenomena only anecdotally (Kim 2013) or describe them though perceived or observed symptoms such as: "growing practice of liaison diplomacy that is taking place among the secretariats" (Orsini, Morin, and Young 2013, 28). Despite the fact, that nearly all the terms that regime interaction scientists use to describe regime architecture have a network science meaning, connections between regime architecture and network science are only emerging (Kim 2013; 2019; Pattberg and Widerberg 2015), see also Section 2.5.2.

2.3.3 Quality and Evolution of Interactions

Researchers use a wide variety of terms to describe the quality of interaction between regimes, for example conflicting, synergistic and neutral (Gehring and Oberthür 2009); compatible and diverging (Rosendal 2001) (Rosendal 2001); horizontal and vertical (Morin et al. 2017); utilitarian, normative and ideational (Stokke 2001); cooperative and conflicting fragmentation (Biermann et al. 2009) and core-, complementary-, and supplementary synergies (Lima et al. 2017).

Beyond the multiple facets of the quality of regime interaction, researchers also conceptualise the evolution of interactions: the impact of interaction on regime systems. Jordan et al. (2015) conceptualise four pathways for two or more interacting regimes: coexistence, fusion, competition and replacement.

2.4 Regional Environmental Governance

The previous sections of this literature review have shown how regime effectiveness and regime interactions are essential in understanding why some environmental agreements succeed and others fail. Regional environmental agreements, as argued by some by some scientists, could have a unique role in both regime effectiveness and interactions: regional agreements are claimed to benefit from the smaller number (Barrett 2005) and the familiarity of actors (Haas 2016; Conca 2012) and to act as a

stepping stone between local and global environmental regimes (Conca 2012; Selin 2012). This section of the literature review analyses literature in the field of regional environmental agreements.

2.4.1 Overview of Regional Environmental Governance

From an environmental governance perspective, the regional level has been defined as the "spaces [containing all or parts of at least two adjacent states] in which some environmental problems can be addressed and in which a host of regionally framed environmental cooperation arrangements exist already" (Balsiger and Prys 2016, 244). Regional environmental governance initiatives include *regional regimes*, which are bilateral or multilateral agreements signed by geographically connected states targeting a shared environmental phenomenon (Balsiger and VanDeveer 2012). Furthermore, *regional organizations* are also considered to be instruments for regional environmental governance (Delreux 2015), such as the International Commission for the Protection of the River Danube (ICPDR), the Mekong River Commission (MRC) and the Association of Southeast Asian Nations (ASEAN) and the European Union's macroregional strategies (Stead 2014; Kern and Söderström 2018; Balsiger 2016).

Although regional environmental agreements outnumber their global counterparts, this field of governance is understudied (Balsiger and Prys 2016). Research trends created a paradoxical situation in which "much is known about some favoured regimes, but little or nothing about many others" (Andersson 2013, 312). Regional regimes tend to fall into the less studied "many other" category, even though under one of the most significant current regimes, the evolving global climate governance system, more emphasis is placed on bottom-up initiatives, including regional agreements (Jordan et al. 2015).

2.4.2 Role of Regional Regimes

Studies suggest that regional regimes may have characteristics and roles from regime effectiveness and interactions perspectives, however many gaps remain in this field of knowledge.

Regional Regime Effectiveness. Studies claim that regional regimes could be more effective than global initiatives for many environmental problems. Regional regimes (1) can match ecosystem boundaries with boundaries of the administrative system, and (2) can benefit from characteristics of "local" governance initiatives: similarity of the

environmental problem, fewer actors and their familiarity with each other and thus the opportunity to tailor concrete and innovative measures to a smaller group of stakeholders (Conca 2012; Dearing et al. 2014; Balsiger and VanDeveer 2012; Barrett 2005). The next two paragraphs explain both of these claims in more detail.

Scientists have long recognised that ecological and socio-political boundaries rarely overlap; and administrative, social and political boundaries have no ecological function (Stead 2014; Dallimer and Strange 2015). It has been shown that the spatial extent of institutions and regimes need to fit the biophysical and temporal characteristics of the problem they are meant to address in order to be effective, termed spatial fit (Young 2002; Treml et al. 2015). One approach to make governance systems fit better to some environmental problems is to move to the regional level (Bodin et al. 2016). As discussed previously, according to adaptive governance theories, the actors should be able to "adapt" their governance approaches to the changes in the environmental and social system in which they operate (Barrett 2005). A precondition to being able to carry out this type of adaptation is to align the boundaries of the institution or regime with the boundaries of the problem they are meant to address so that that appropriate information can be sought, and appropriate responses can be given. In some instances, this means moving to the regional level.

Regional regimes are claimed to be more effective because of the smaller number (Barrett 2005) and closer network of actors, who are thus able to maintain "face-to-face monitoring mechanisms [which are] rich in information, low in transaction costs, and high in culturally embedded authority" (Conca 2012, 129), and which are more challenging to create and sustain at the global level (Conca 2012). On the other hand, some studies criticise regional regimes on other aspects of regime effectiveness. For example, Sovacool and Van de Graaf (2018) analysing the global climate governance system's sub-global elements conclude that sub-global elements fail to meet criteria of effective institutions. Jordan et al. (2015) also point out that we need to understand better if the new forms of climate governance are performing well. Gruby (2017), focusing on Micronesia's regional climate regime, criticises the hopes set towards regional agreements. She concludes that regional regimes can become a tool to increase resources, recognition, legitimacy, agency and autonomy; instead of environmental objectives. However, there are not enough empirical studies on regional initiatives' social networks to allow theoretical level agreement on the "local" versus "global" debate (Conca 2012; Balsiger and VanDeveer 2012; Balsiger and Prys 2016).

Regime Interactions. A debated question of regional environmental governance[10] literature relates to regional regimes' position between other environmental institutions: is it a "building block" or a "stumbling block" (Balsiger and Debarbieux 2011; Gruby 2017) in global environmental regime architecture? Regional agreements are embedded in the multi-dimensional patchwork of all other governance arrangements: environmental governance is nowadays distributed among many fora that interact with each other (Bodin 2017; Jordan et al. 2015). Research has shown that regional agreements can emerge when global level governance processes fail or becomes deadlocked (Conca 2012). For example, when there are compliance and implementation problems at the global level, when states and other actors become disappointed with the outcomes of negotiations (lowest common denominator), or when there is a lack of institutional interaction between global regimes (Delreux 2015). Regional governance arrangements, which are between global and national scales, can find concrete solutions to concrete environmental problems. This might include finding synergies between regimes and avoiding conflicts between global agreements. However, scientists so far have not yet agreed what the role of regional agreements is: is it advancing or hindering global environmental governance.

2.5 Social Network Analysis

The previous sections of this literature review showed how interactions between the social actors of regimes and between regimes underpin the effectiveness of regimes. This section of the literature review turns to the discipline of social network analysis (SNA). First, this section provides an introduction to social network analysis and then reviews how SNA methods and theories are used in governance studies (international relations, policy studies, environmental management). Social network concepts, theories, and methods are discussed in the other chapters of this dissertation.

2.5.1 Overview of Social Network Analysis

Social network analysis is a quantitative method to uncover and analyse the characteristics of the network formed by connections between actors (Wasserman and Faust 1994). Social network theories - developed in most cases through interdisciplinary empirical research - describe the recurring phenomena in social actors' interactions and

[10] The role of regional agreements and regional regimes is not only debated in the environmental field, but also in other areas of international cooperation, such as trade and economy. (Senti 2014; Dür 2007)

the effects of these phenomena on processes such as knowledge systems, power relationships, future interactions. Social network analysis can take many forms. Although most commonly it is used to analyse social relationships and interactions between individuals; social network analysis can also analyse social relationships between other kinds of entities, including organisations, countries etc. (J. Scott 2012).

Since the early 2000s SNA methods and theories are becoming more frequently used in the disciplines of international relations, policy studies and environmental management and governance studies, including some concrete calls from researchers to integrate the advances of SNA into their fields (Hafner-Burton, Kahler, and Montgomery 2009; Maoz 2012). However, there are also claims that one should be careful in using information gained through social network analysis as the panacea that can solve all governance problems (M. Scott 2014). Starting from the international and moving towards the sub-national level, the next section reviews how SNA has been used in international relations, policy studies and environmental management.

2.5.2 Applications of SNA

2.5.2.1 International Relations

Around 2010 there were multiple calls to the International Relations (IR) research community to use network science methods and theories in their discipline fields (Hafner-Burton, Kahler, and Montgomery 2009; Maoz 2012; 2011). The researchers argued that both IR and network analysis are about *relations*. Thus, network analysis is perfectly suitable to understand relationship structures between states and other international actors better. These calls were taken up by many IR scholars, who began exploring the possibilities and opportunities of combining the two disciplines. Peace and conflict studies and research on trade relationships were the fields that most readily took up this call.[11]

Peace and conflict researchers analyse why states enter (or end) conflict and peace, and what factors matter for maintaining peace between states. Scholars of peace and conflict studies have been using network methods and theories frequently in their research: in 2016 the *Journal of Peace Research* published a special issue that was dedicated to network analysis in international peace and conflict. The editors claim that

[11] Of course, other topics are also being analyzed through network methods in the IR literature; however, not in such significant numbers as the above two topics.

recent developments in this research field are going beyond describing and mapping linkages and are aiming now to "measure and model complex interdependencies" (Dorussen, Gartzke, and Westerwinter 2016, 284). They identify three different uses of network studies: theoretical, measurement tool and inferential tool.

Trade relationships and trade networks are also analysed through network methods by IR scholars - and vice versa, trade and investment networks are analysed by network scientists (Lombaerde et al. 2018). Descriptive studies of the topology of trade networks emerged first not from IR (or economics) scholars, but physicists. Serrano and Boguna (2003) described the network characteristics of the whole world trade web, and Saban et al. (2010) approximated the global trade web through bilateral investment treaties. However, these studies focused only on the topography (structural characteristics) of the trade network, without aiming to link their findings to IR theories. The two disciplines (network science and IR) were brought together by IR scholars who no longer only looked at the structure of the trade network, but also at the drivers of its evolution. Maoz (2012) described that the network principles of preferential attachment and homophily manifest in international trade networks, and Haim (2016) explored how indirect alliances determine trade. Similar to peace-conflict scholars, IR trade scientists also integrate network analysis in their research for descriptive, predictive and theoretical reasons: contributing to the literature on IR, trade and network sciences.

2.5.2.2 Environmental Governance Topics

Based on the focus of their topics, the articles addressing environmental problems through network science analysis form a couple of thematic groups:

- **Empirical case study based studies**: There is a growing number of publications based on empirically driven case studies covering various topics, actors and interactions, including fisheries (Hollway and Koskinen 2016; Oostdijk et al. 2019; Tuda and Machumu 2019), nuclear energy cooperation (Jewell, Vetier, and Garcia-Cabrera 2019), natural resource governance (Ahmadi et al. 2019; Yamaki 2017; 2015; Angst and Hirschi 2017), water governance (Stein, Ernstson, and Barron 2011; Lienert, Schnetzer, and Ingold 2013), climate change governance (Böhmelt, Koubi, and Bernauer 2014; Baird, Plummer, and Bodin 2016) and international environmental institutions (Morin et al. 2017; Crooks et al. 2014).
- **Research on the qualities and roles of actors' network**: Mapping the networks of actors has been an approach frequently highlighted by researchers as a method to better understand the roles of actors in a given governance system

(Bodin and Prell 2011; Stein, Ernstson, and Barron 2011). Substantial work has been done at the sub-national level that looks into how social ties between actors influence the outcomes of a governance system (for an overview, see (Berardo et al. 2018). Some studies in this body of literature even claim that for enforcement and compliance the underlying network of the actors is more important than the existence of formal institutions (Bodin and Crona 2009) or ecological knowledge (Ungar and Strand 2012).

- **Studies focusing on environmental regime interactions**: There are studies that analyse interactions between environmental regimes. Kim (2013) analysed the network of 747 MEAs (conventions, protocols, agreements, amendments, treaties, etc.) as a citation network. Wilderberg (2016), Boulet et al. (2016), Carattini et al. (2019) similarly aim to analyse the network structure of MEAs: these three papers conceptualise the system as a bipartite network of MEAs and states, with membership or ratification of an MEA creating the link between the nodes. Böhmelt and Spilker (2016) and Ward (2006) focus on regime interactions at the regime design stage and use states co-membership as the tie connecting two treaties, hypothesising that if there is a stronger co-membership tie between two treaties, then they will be more similar to each other.
- **Broader theoretical and conceptual frameworks**: Some articles aim to synthesise findings of empirical case studies into broader theoretical and conceptual frameworks. For example, Bodin et al. (2006), Barnes et al. (2017) and Eilstrup-Sangiovanni (2018) discuss theoretically the criteria for "ideal" network structures (also claiming that one structure will not fit all types of networks).

While social network analysis is becoming more integrated into international relations and research on environmental governance; there are still fields that could benefit from the structural approach that network science methods could contribute (Pattberg and Widerberg 2015). For example, Kanie et al. (2013) in their extensive article review lessons for improved environmental governance from 15 governance institutions (ranging from private initiatives to global MEAs), conclude that "no single actor exercises influence independent of other actors" (Kanie et al. 2013, 27). However, in typifying the different networks of influence and interaction they do not use any network methods to justify and explain terminologies such as "expansive network", "expanding multilevel network", "technocratic network". Similarly, Guerra et al. (2015) claim to map the institutional architecture of global climate change. However, they do not conceptualise it as a network, even though the description of their data begs for

such an approach.

This review supports the conclusions of Bodin that "a substantial part of current research on collaborative networks in environmental governance is […] conducted on smaller scaler scales. This suggests that more research efforts should be directed toward the regional and global scales" (Bodin 2017, 7).

2.6 Gaps between the Four Domains of Knowledge

The four domains of knowledge that were discussed in the previous pages (regime effectiveness, regime interactions, regional environmental governance and social network analysis) are the pillars of my dissertation. As Figure 2-4 illustrates, the four domains form an interlinked system around environmental regimes' performance.

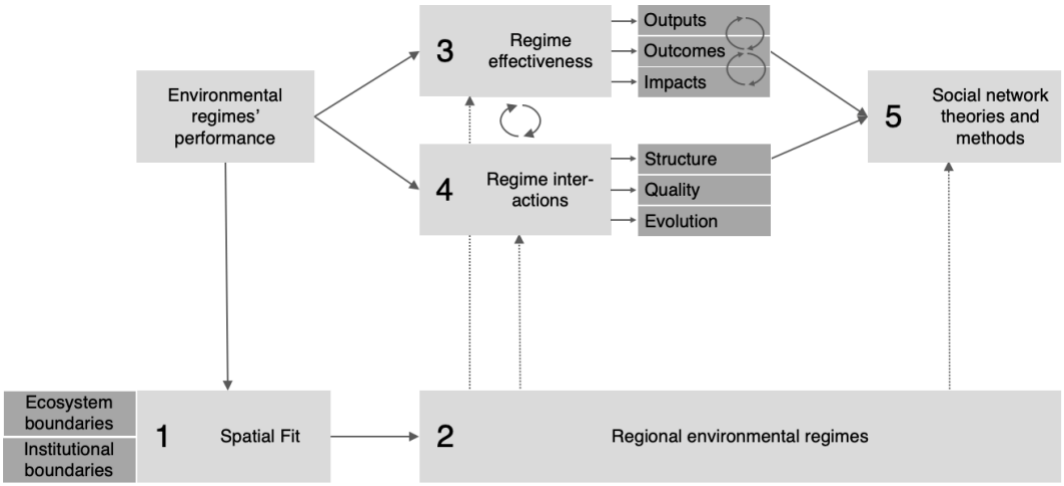

Figure 2-4: The interlinked system of the four domains influencing environmental regimes' performance.

In order to understand why an environmental regime is thriving or failing (or where it is along this continuum), we need to look at multiple features of regimes:

1. Spatial fit and regional environmental regimes: We need to understand if the regime's geographic scope is aligned with the ecological boundaries of the environmental problem it is aiming to address. From an ecological perspective, if the human-defined institutional boundaries and ecosystem boundaries are not aligned (i.e. there is no spatial fit), then the regime's potentials cannot be fully utilized.
2. Regional regimes are a particular type of environmental regime created by geographically neighbouring states for a common environmental problem they face. Such problems can be purely of regional importance (e.g. river basin management regime, transboundary air pollution) or can be a distinct regional

approach to a global environmental problem (e.g. European Emission Trading Scheme under the global climate regime, regional initiatives under the Ramsar Convention).

3. Regime effectiveness: We need to understand the effectiveness of the regime itself: its policy outputs, behavioural outcomes and environmental impacts. In an adaptive system, these three aspects of effectiveness form an interlinked system, mutually influencing each other in order to respond to the observed (intended or unintended) social and environmental changes. The qualities of interactions between social actors (people, groups, organizations) underpin the adaptive cycle of the regime since humans and changes in their behaviour are the central element of the causal pathway (from policy outputs to environmental impact, and from changes in the environment to adapted policy output).
4. Regime interactions: We need to understand how the regime interacts with other regimes (structure and quality of interactions) and how this interaction influences the evolution of the regime. Regime interactions are essential to understand also from the perspective of regime effectiveness since the two are interlinked.
5. Social network theories and methods: All these domains of knowledge could be substantially advanced if social network theories and analytical methods were incorporated into their research.

My dissertation is interdisciplinary research (see Research Design in Chapter 4) that uses these domains of knowledge as its pillars. Through original empirical work with a regional regime, it advances some of the missing connections between these domains, and thus contributes to theoretical and methodological advancement of knowledge (see also Aims and Objectives in Chapter 1).

Outcomes of regimes are highly dependent on social interactions between actors. Social network theories explain how phenomena like trust, shared knowledge base, power structures, management structures are influenced by the structure of the social networks between the actors, and the actors' position within these networks. Building upon two new datasets on the case study of the Carpathian Convention, and employing social network theories that explain how actors' social network determines their actions and interactions to analyse the case, my dissertation will provide a basis for developing propositions on how regime actors' networks characteristics may influence the outcomes of regimes.

Concepts used to describe the structure of regime interactions have well-defined

network science equivalents (dense, fragmented, hierarchical or polycentric network, a cluster of nodes, etc.). However, the connection between the two domains of knowledge is not regularly made: what are the characteristics and impacts of regime interactions' network structure, qualities and functioning on regime effectiveness. Furthermore, it is not fully understood how ties between regimes function, what are the mechanisms and directions of interactions. In my research I build on a new dataset (the regime interaction network of the Carpathian Convention). My exploratory analysis on the one hand provides a network structural analysis of this regime interaction network; on the other hand, develops empirically based propositions on interaction mechanism.

Regional regimes are considered by some researchers as a critical element of global environmental governance - even though very little is known about their functioning and effectiveness. Claims relating to social actors' interaction under regional regimes, and regional regimes' interactions with national and global regimes will be scrutinized through social network theories methods in my dissertation by focusing on one regional environmental agreement the Carpathian Convention; thus, providing new analytical insights into regional regimes' role in global environmental governance. The dissertation by analysing new and original data will also shed light on the processes, actors, rules and norms of the Carpathian Convention.

2.7 Summary

This literature review provided an analytical insight into four domains of knowledge: regime effectiveness, regime interactions, regional environmental governance and social network analysis. The evolution of these domains, as described in the previous sections, can be summarized as:

Regime effectiveness literature has established the causal pathway that leads from a regime's policy outputs, through changes induced in human behaviour to environmental impacts. However, the domain of regime effectiveness has been grappling with regime outcomes, even though it is seen as the intermediary along the output-to-impact causal mechanism pathway. On the other hand, other bodies of literature, such as adaptive governance and collaborative governance, have in-depth insights into human interactions in environmental governance.

Regime interactions literature runs along many threads to describe and categorize interactions between regimes. The main themes within this body of literature are causal mechanisms of interactions, structure (termed architecture) of interactions, and quality

and evolution of interactions. The domain mostly uses qualitative descriptors to categorize interactions, even those of structural nature.

Regional environmental regimes are both old and new phenomena under environmental governance. More lately, they are seen as an important building block of the polycentric global climate governance system. However, at the same time, researchers claim that little is known about their effectiveness and interactions with other regimes. Some bodies of the literature suggest that regional level governance is better suited to address environmental problems; whereas other bodies question their effectiveness.

Application of **social network analysis** (theories and methods) in the fields of international relations, policy studies and environmental management are gaining traction since the early 2000s. The use and integration of SNA methods and theories are well established in some topics of international relations and sub-national environmental management settings. In the fields of regional environmental regimes and environmental regime interactions, social network theories and methods are not yet utilized to their full extent.

3 Conceptual Framework

3.1 Overview

While states are quite successful at solving some trans-boundary environmental problems, they are failing tremendously at others. As elaborated in the Literature Review (Chapter 2), the effectiveness of environmental regimes and regimes interactions are understood as two crucial determinants of where states end up on the successful-to-failing continuum. Research on social networks (J. Scott 2012; G. L. Robins 2015) and the application of a social relational approach to environmental management (Bodin et al. 2011) have shown that the characteristics of the network of social actors explain observed actions and interactions. This chapter describes the conceptual framework of my dissertation and explains how social network analysis and network theories can lead to a deeper understanding of the factors that contribute to the regimes outcomes and regime interactions (see Figure 3-1).

After this overview, this chapter starts by explaining the implications of social network structural and functional characteristics for regime outcomes (Section 3.2) and regime interactions (Section 3.3): how the structural characteristics of interactions between social actors of a regime can influence changes in their behaviour (regime outcomes), and how the structural and functional characteristics of regime networks can determine their interactions. Section 3.4 of the chapter introduces social network theories that, on the one hand, explain the evolution of networks (theories of networks), and on the other hand, explain how the network's characteristics (network, node and link-level) influence the possibilities of interactions between and actions of the actors (network theories). Finally, the last section (Section 3.5) gives an introduction to and provides a re-conceptualization of social network measures, that can be used for analysing regime effectiveness and regime interaction. Social network measures are introduced at three levels: (3.5.1) whole network, (3.5.2) each node's (social actor or regime) position within the network, relative to the other nodes and (0) the nature and qualities of connections between the nodes.

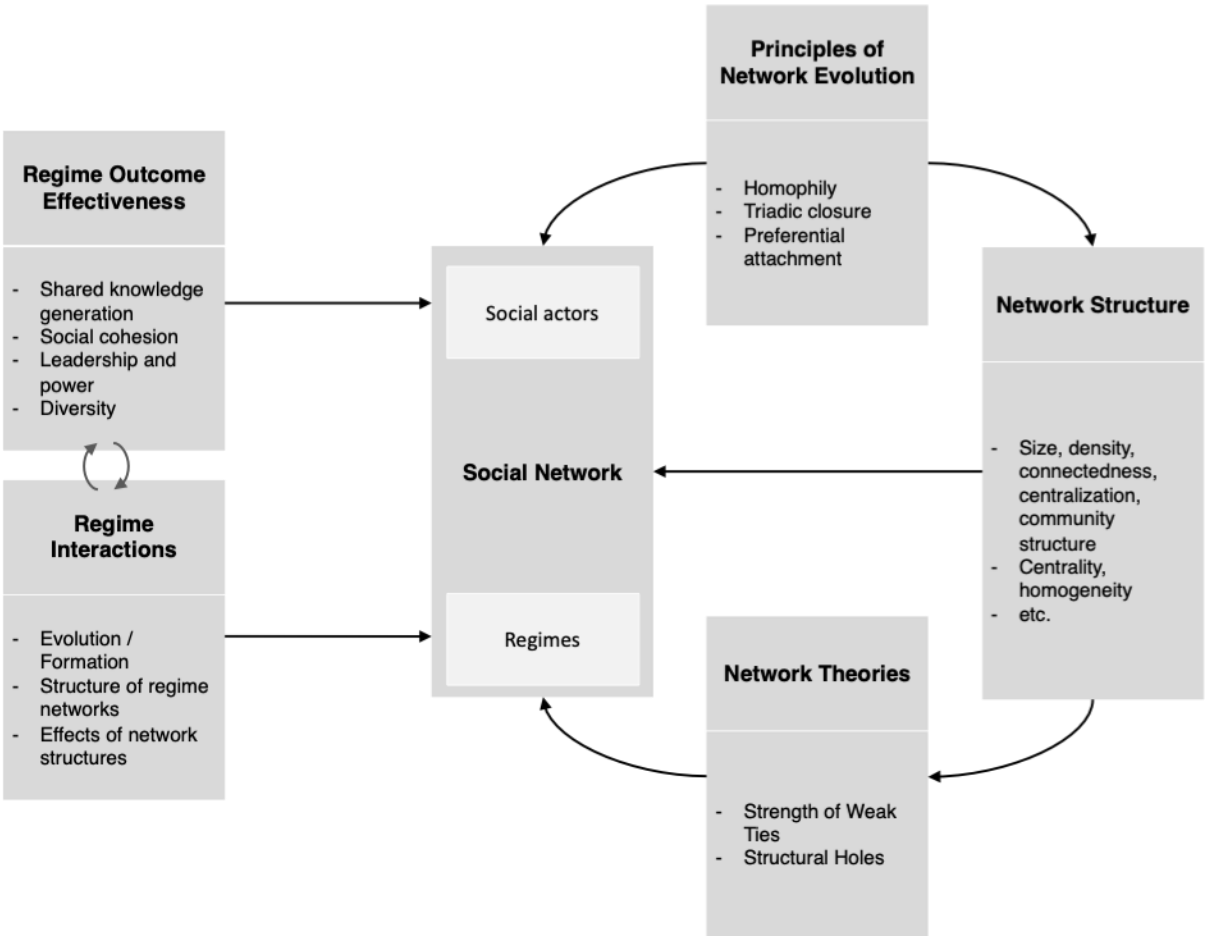

Figure 3-1: Overview of the dissertation's conceptual framework.

3.2 Networks in Regime Effectiveness

Regime effectiveness in general, as discussed in the Literature Review (Chapter 2), is understood at three levels: the regime's outputs, outcomes (changes in human behaviour), and its environmental impacts. In my dissertation, I focus on regime outcomes, more specifically the influence that actors' social network's structural and functional characteristics have on four (of many more) underlying conditions of regime outcomes, as discussed on the next pages.

Environmental regime studies and related disciplines of environmental governance and management have identified aspects of human interactions that have a causal effect on outcomes. Multiple studies in the fields of ecosystem-based management, adaptive co-management, adaptive and collaborative governance (Armitage et al. 2009; Emerson, Nabatchi, and Balogh 2011; Bodin, Sandström, and Crona 2017; Folke et al. 2005) point to the importance of (1) shared knowledge generation and social learning; (2) social cohesion for mutual trust, understanding and joint management systems; (3) the role of

leaders and power relations and (4) diversity of engaged stakeholders and sectors. I will use these four underlying conditions to analyse regime outcomes. The next paragraphs explain the conceptual linkages between regime outcomes and these four underlying conditions. The connection to network principles and theories will be discussed in Section 3.4 of this chapter.

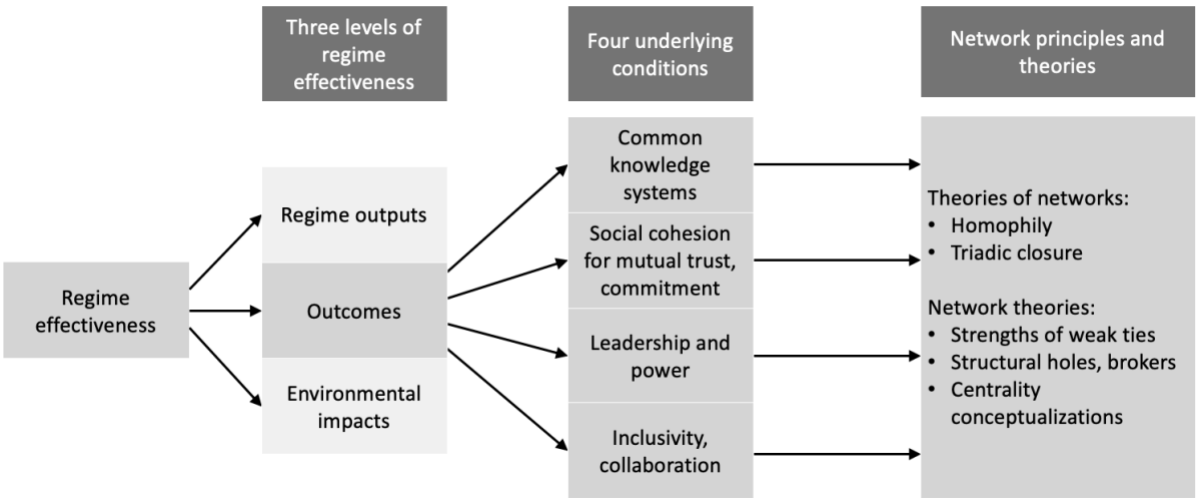

Figure 3-2: Overview of regime effectiveness and social network principles and theories.

Shared knowledge generation and social learning among actors are seen as a precondition for a regime to be able to adapt to changing environmental and social contexts (Folke et al. 2005; Armitage et al. 2009). The actors of the network should, on the one hand, be able to *generate knowledge*; on the other hand, be able to *share knowledge*. New information is necessary to maintain the adaptive capacities of the regime, and social learning feeds into social cohesion of the actors, it ensures that the new knowledge is internalized by the actors[12]. The structure of the social network of actors has effects both on the diffusion of information and knowledge (Crona and Bodin 2011), and (2) access to new information (Granovetter 1973). As Section 3.4 explains, both knowledge sharing and accessing can be related to typical network structures, albeit different structures.

Social cohesion: The development of mutual trust, mutual understanding, shared commitment, joint management, all of which are seen as contributing to outcome effectiveness (Ansell and Gash 2007) are very much dependent on the social cohesion of the actors. Cohesion can also have positive effects on collective action (Bodin, Sandström, and Crona 2017; Crona and Bodin 2011). However, too much subgroup

[12] More information does not necessarily mean more effective regime.

cohesion can create a feeling of "us and them" (Hornsey and Hogg 2000) and can also hinder creative thinking (Vedres 2017). Social cohesion has distinct network imprints, and network principles have been identified that drive the emergence of cohesion, theories have been described that explain the benefits and disadvantages of network cohesion, as explained in Section 3.4 of this dissertation.

Leadership and power structures: leadership, i.e. influencing and facilitating other actors to accomplish shared objectives (Yukl 2002), is an essential contributor to success of social networks in delivering environmental impacts (Crona, Gelcich, and Bodin 2017; Emerson, Nabatchi, and Balogh 2011; Bodin, Sandström, and Crona 2017). Network analysis can identify actors in potential leadership positions from a network structural point of view having ties to a large number of other actors, having direct connections to most actors of the network, acting as a bridge or broker[13] between different parts of the network. Studies beyond network structural positions can analyse if these actors are, in fact, acting and accepted as leaders.

Inclusivity: crossing boundaries between countries, sectors and organization types (1) provides legitimacy of actions and decision, and (2) is a potential source of new perspectives and knowledge, which can contribute to increased learning and improved management decisions (Armitage et al. 2009), see also discussion above. Having ties between different kinds of actors does not automatically mean that integration is happening, but it is unlikely to have integration if there is no interaction between sectors. A diverse regime network can also facilitate policy integration, enable spatial fitting of the regime to the geographical extents of the problem it is meant to address. Unfortunately, social networks tend to evolve against inclusivity, as characterised by homophily and triadic closure principles of network formation (see Section 3.4).

In this dissertation, inclusivity will be analysed at three levels:

- Inclusive networks are vital from a geographical point of view. Environmental problems often cross national and other human-defined political and administrative boundaries. According to institutional fit theories (Young 2002;

[13] Brokers are actors that provide bridges between parts of the network and are thus can control the flow external information and resources to the network. The broker's position can be beneficial for the broker since they can control the flow of the resources and might also be perceived as the source of the ideas they are channelling to the network and thus enjoy an elevated status. However, brokers might misuse their role to gain power and control the flow of resources. Social network analysis can help to identify actors in broker roles but cannot answer if they are playing a supportive or disruptive role. Similar to leadership, other methods need to be employed to understand the qualities of the actor in the bridging position.

Treml et al. 2015), the boundaries of the governance system need to be aligned with the extent of the environmental problem they are meant to solve. If there is a mismatch between the boundaries of the environmental issue at hand and the geographical scope of the governance arrangement, then regulatory outputs will be less impactful.

- Our current approach to public administration is divided by sectors (countries usually have ministries, authorities and agencies divided for example water, energy, nature conservation, forestry, agriculture, transport, tourism etc.). Goals, objectives and activities of a single sector can have impacts on the environment; and environmental goals can only be achieved if the sectors interact. Environmental policy integration is a well-known concept to describe the process of weaving environmental perspectives into other sectoral policies.
- Top-down government lead approaches to solving complex regional environmental problems have its limitations (Ansell and Gash 2007). The more recent approach to governing complex environmental problems is based upon interactions between organizations and individuals from different societal sectors: non-governmental actors, academic sector, local governments, international organizations, protected area administrations working alongside governmental actors (Ostrom 2010; Bodin 2017; Folke et al. 2005; 2007).

To summarize, in my dissertation I operationalize regime effectiveness as the structure and functioning of regime actors' network for shared knowledge generation, social cohesion, leadership and power structures, and inclusivity (geographical scope of operations, sector of the organizations, types of organizations).

3.3 Regime Interactions and Network Analysis

One feature foundational to regime interactions is to have a connection between regimes' actors that should interact, simply because if there are no connections between regime actors, there are no possibilities for interactions. Thus, establishing ties between actors (individuals, organizations, institutions) is a precondition for having any kind of interaction. There can be many different types of connections between regimes. The global biodiversity regimes created an institution, the Liaison Group of Biodiversity-related Conventions to oversee cooperation of five MEAs. Other regime connections are formalized through joint declarations or memoranda of understanding. Parties and other organizations can establish informal regime cooperation by being members or observers of both (or all) regimes (Widerberg 2016; Böhmelt and Spilker 2016; H. Ward

2006). Finally, textual references (Kim 2013) which either remain on paper and merely acknowledge a wish to remain synergistic, or are later transformed into formal connections can also be seen as ties between regimes.

As discussed in the literature review (Chapter 2), the scientific field of institutional interactions is relatively recent and is currently occupied with understanding the macro-structure of interactions (Kim 2019), the effects of interactions on regime effectiveness (Young 2011), and approaches to manage interactions (van Asselt 2014). Network science offers the tools to visualize and analyse all kinds of networks, including networks of regimes, institutions, organizations. Through the representation and analysis of regime interactions as networks, a deeper understanding can be gained of regime interactions. Theories of networks (explaining the processes that determine network formation) and network theories (explaining the effects of network structures have on its actors) can:

- Explain the formation of the macro-structure of regime interactions;
- Describe and conceptualize the structures of regime interactions;
- Explain the effects of the network structure on regime interaction; and
- Explain the connections between regime interaction and regime effectiveness

The following paragraphs explain the conceptual framework of my dissertation regarding network science and regime interactions.

Formation and evolution: It is crucial to understand how structures of interactions between regimes form and evolve, what effects the evolving structure has on regime interactions; not only to know if global environmental governance institutions are become more fragmented, complex or polycentric (Kim 2019). Theories of networks explain how networks emerge and evolve (see Section 3.4), what are the principles and rules that determine the formation of networks.

Structure of interactions: The study of institutional interactions is about *interactions* and so is social network analysis (Hafner-Burton, Kahler, and Montgomery 2009), thus the two fields of knowledge can be bridged, as it has been suggested and done by a few scientists (see Kim 2019 for a thorough overview, and see Section 2.5 of this dissertation). Network science has the tools and methods to describe the macro-structures of regime interactions with mathematical graph measures, which the institutional interactions literature only defines qualitatively. The terms used by institutional architecture scholars (such as fragmented, complex, polycentric, dense) have concrete network meanings; network structures can be associated with them.

Regime interaction networks are often conceptualized as regime-to-regime citation networks or state-to-regime membership bipartite networks (see overview in Chapter 2, Section 2.5.2.2). In such conceptualizations, network analysis of regime interactions is able to identify structures and connections that can enable or constrain interaction between regimes, it is not able to tell if such interaction is happening, and how this is taking place (see methodology chapter for further elaboration).[14]

Effects of network structure: The effects of network structure for individual actors of the network are often studied. Network theories are not regularly applied in the field of regime interactions, although they could explain certain phenomena and inform management of institutional interactions. For example, network analysis can identify those regimes, institutions or organizations (depending on the level of analysis) that are in a bridging position; and can highlight actors that are more central than others (have more connections, lie along the paths connecting other actors, are the closest to others). Even if network analysis does not tell us if and how these regimes are using their particular position, it can point out such actors.

Furthermore, network analysis can identify and theories of network evolution can explain which networks are more resilient or susceptible to node deletion (both random and targeted) (Ghoshal, Chi, and Barabási 2013; Guillaume, Latapy, and Magnien 2005). This, in regime interactions, would mean identifying vulnerabilities of macro-structures; especially in networks that are formed by organizations that could shut down, change priorities and thus exit the interaction network.

3.4 Principles, Mechanisms and Theories Relating to Social Networks

As discussed in the previous section, regime effectiveness and regime interactions are determined (among others) by the networks that form, evolve and exist between their actors (depending on the analytical lenses: individuals, regimes, institutions, organizations etc.). Social network analysis offers several measures to describe the qualities of the networks between social actors; and there are theories that explain how and why networks form, evolve and function, and what impact network structures and

[14] Another approach to defining regime interaction networks could be based on actual interactions (for example, information exchange between secretariats, participation in other regimes' meetings, joint projects). In such case the network would be of course able to tell if interaction is happening.

position have on the actor itself. This section briefly explains several network principles and theories and explains their relevance to regime effectiveness and interaction. First, it discusses theories of networks, which explain the formation and evolution of networks. Then it provides an insight into principles and theories that explain how the network structure enables and constrains the actors' future interactions and actions.

3.4.1 Principles and Mechanisms of Network Formation and Evolution

Homophily Principle: Social network scientists observed that social actors tend to form positive ties (pro-social connections, such as friendship, advising, spending time together, sharing information) with actors who are similar to them. This results in the emergence of homogenous networks (McPherson, Smith-Lovin, and Cook 2001).

- Relevance to regime outcomes: The homophile character of social networks goes against inclusivity of regimes. Inclusivity requires a network that is diverse and can thus access resources and people beyond its usual circle. The principle of homophily explains the challenges of establishing regimes that involve interactions that cross boundaries between countries (trans-boundary interactions), sectors (cross-sectoral) and between different types of organizations (governance). On the other hand, homophily might explain the claim made by regional environmental governance scholars, that region level agreements can be easier to establish than global ones, since at the regional level actors from neighbouring states tend to be more similar to each other (geographic location, historical past etc.) (Conca 2012).
- Relevance to regime interactions: Similarly, the homophily principle suggests that regime interactions are more likely to be formed between regimes that are similar to each other in one way or another (topic, geographic area, policy mechanisms). This is, however, an open question in current scientific literature, since not enough studies have been conducted on regime networks to be able to say if regime networks exhibit the principle of homophily definitely.

Principle of Triadic Closure: many social networks show tendencies towards triadic closure (J. A. Davis 1970), or in common terms "the friends of my friends are also my friends", see Figure 3-3. This leads to the formation of dense social networks and cliques and sub-groups within the network. Burt (2004) claims that dense closed networks in which all actors are connected to nearly all other actors are beneficial to its members because they help the development of trust, cooperation and mutual support. On the other hand, dense and closed networks can also become stagnant since ideas

and resources circulate only inside the network. The reason is, that such dense and isolated groups tend to develop group identities and norms that hinder them in accessing new ideas, information, resources and actors from outside of their group (unless these external factors reinforce their existing identities and norms). Granovetter's (1973) strength of weak ties theory (see discussion later) differentiates between bonding and bridging ties. Bonding ties are those that create closely-knit groups, that usually carry high levels of trust, but give limited access to external information (see above).

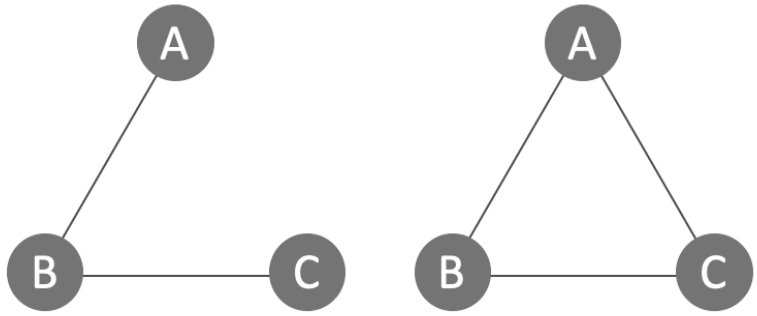

Figure 3-3: Three nodes in an open (left panel) and in a closed (right panel) triad.

Notes to figure: The left panel shows three nodes with no connection between nodes A and C. The right panel shows the same three nodes with triadic closure.

- Relevance to regime outcomes: Having a closed and dense network of actors of a regime can have both positive and negative impacts on outcomes. Such networks tend to lead to the development of social cohesion, trust, mutual understanding, shared knowledge (which are seen a positive driver of effectiveness), on the other hand, hinder access to new resources (which can act against effectiveness, especially regarding regime adaptiveness). From a network perspective, a combination of bonding and bridging ties is necessary. If some actors in the network are also members of other subgroups (i.e. act as bridges over structural holes), then these individuals can play a crucial role in providing new information to the network; however, they can also decide to block the flow information or filter resources (Burt 2005).
- Relevance to regime interactions: Triadic closure suggests that regime networks will also tend to form dense clusters, with the implications outlined above.

3.4.2 Network Theories on the Effects of Network Structures for Nodes of the Network

Strength of Weak Ties Theory: Granovetter (1973) when describing the effects of closure (and the lack of it) for actors makes a differentiation between "strong" and "weak" ties between actors. Granovetter claims that while strong ties exhibit triadic closure characteristics (bonding ties), weak ties provide connectivity to other subgroups of the social network (bridging ties). He claims that weak ties can be of vital importance to actors since bonding ties give limited access to external resources beyond the actors' own homogenous network.

- Relevance to regime outcomes: to be effective, regime actors need to balance between weak and strong ties. Knowledge sharing and social cohesion require bonding ties between actors, whereas knowledge generation and inclusivity cannot function without bridging ties that connect actors to other actors outside their immediate bonding connections.
- Relevance to regime interactions: Similarly: bonding ties can lead to cooperation or collaboration among regimes, whereas weak ties between regimes are necessary to access new information and resources.

Structural Holes Theory and the Concept of Network Brokerage: Burt (1992) suggested the structural holes theory to explain the particular "broker" position that those actors occupy that provide the bridge between two weakly connected parts of the network. Brokerage position of an actor shows that it is acting as a "bridge" above a structural hole, or saying it with other words, as a "broker" between two or more otherwise unconnected or only weakly connected parts of the network. Burt (2005) also claims that the position of an individual that connects sub-networks is beneficial both for the individual and the sub-network. The "broker" can bring in new resources (information, contacts etc.) to the sub-network. Their bridging position is beneficial for the broker since they can control the flow of the resources and might also be perceived as the source of the ideas they are channelling to the network and thus enjoy an elevated status.

- Relevance to regime outcomes: Actors bridging structural holes between subgroups have a unique position within the network because they can bring in external information and resources to the network. Such a position could be beneficial for leaders. In regime studies, brokers could be organizations active in two loosely connected regimes (for example NGOs following both natural

resource governance regimes and transport infrastructure policies), and SNA can identify actors that occupy broker-type positions. For regime effectiveness studies, it's important to know which actors are bridging structural holes since such a network position can be vital for the effectiveness of the whole regime.

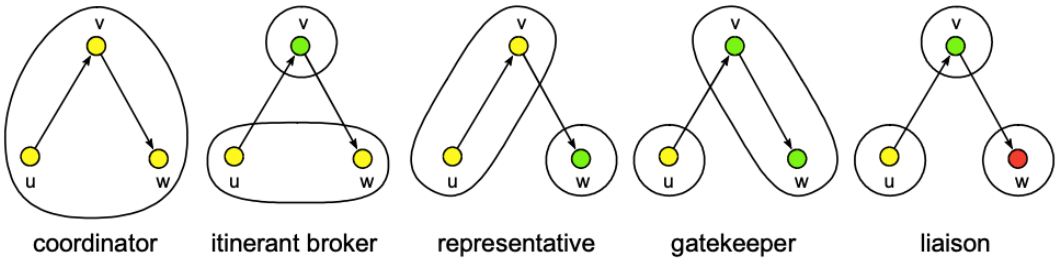

Figure 3-4: Illustration of brokerage roles of an actor

Notes to Figure 3-4: Source: (Nooy, Mrvar, and Batagelj 2011, 136). Node "v" is in the brokerage role in all panels, and the colours represent group membership. The coordinator panel illustrates node-v mediating between group members of their own group. The Itinerant broker panel shows node-v as an external actor to the group mediating between group members. The representative panel shows how node-v can regulate the flow of information or goods from their own group. The gatekeeper panel illustrates how node-v can regulate the flow of information or goods to their own group. Finally, the liaison panel shows node-v as a broker mediating between members of different groups and belonging to neither of those groups.

Network Robustness Principle and Random Node Deletion: different network structures have a different level of resilience to random node deletion (equivalent of a social actor quitting the regime system for any reason): while scale-free networks preserve their typical network structure and function even after deletion of several nodes, random networks are more susceptible to random node deletion (Guillaume, Latapy, and Magnien 2005).

- Relevance to regime outcomes and interactions: This means that specific network structures have an inherent risk substantial network change: if an organization closes down or quits the regime, then the whole network would substantially change.

3.5 Overview and Re-Conceptualization of Social Network Measures

Networks, consisting of a set of social actors and relationship(s) between these actors, are called *social networks*. Social networks, in general, have some qualities that non-social networks do not have: (1) nodes of a social network are social actors that create or eliminate ties with other actors in line with their own motivations and strategies; and

(2) relational ties (connections) are formed through socially directed actions, and thus ties have a past and presumably a future, and possibly many layers (e.g. friendship, information, line-management) (G. L. Robins 2015). On the other hand, non-social networks have only nodes and edges, albeit a wide range of them, for example, electricity grids, the network of the internet, protein-protein interactions, the neural network of our brain, recipes and their ingredients, etc. Both social and non-social networks can be represented as a mathematical graph consisting of *nodes* and *edges or links*[15] representing the connections between them.

Social networks in the field of environmental regime effectiveness and regime interactions, depending on the concrete case and research question can, be of many kinds. Social actors can be people, groups, organizations, countries, institutions, regimes, and elements of the network can be fora where social actors can interact, such as meetings, projects, conferences, publications, treaty texts. Links can be formal or informal connections (e.g. information exchange, phone calls, e-mails between two individuals or groups and even contracts or memoranda of cooperation between two organizations) (e.g.: (Jewell, Vetier, and Garcia-Cabrera 2019; Tuda and Machumu 2019; Ahmadi et al. 2019)), ties emerging through co-participation or shared membership in meetings, projects, publications, institutions (e.g. (Hollway and Koskinen 2016; Böhmelt, Koubi, and Bernauer 2014)), and links can even be conceptualized from citations in the case of regime-to-regime connection (e.g. Kim 2013). Despite this nearly infinite variety of social networks for regime analysis, there is a finite set of widely used social network measures that are used to describe and analyse networks. The next paragraphs explain the basic network measures and (re)conceptualize them for regime effectiveness and regime interaction research.

3.5.1 Network-level Measures

Social network measures at the network-level aim to analyse the whole network. These measures describe the type and the size of the network: how many nodes are in the network and if there is any special rule that guides the establishment of links between nodes. For example, there are ego-networks (see Chapter 7) that only include ties from one selected node to its alters and ties between the alters; there are bipartite networks (see Chapter 5) that have two sets of nodes and ties can be formed only between nodes

[15] Edges are the more commonly used term in non-social network sciences, whereas social network analysis more often uses the term links.

of different types, see Figure 3-5. As the figure shows, these distinct network characteristics give very different chances for actors to interact.

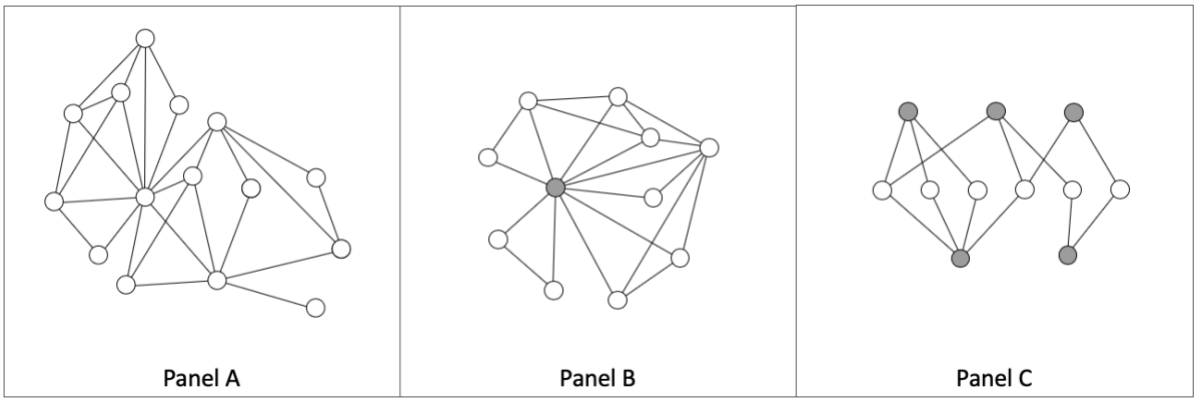

Figure 3-5: Illustration of uni-partite (Panel A), ego- (Panel B) and bi-partite (Panel C) networks.

Notes to figure: Panel A depicts a full uni-partite network consisting of nodes of one class and links between these nodes. Panel B depicts an ego-network: the ego is coloured grey and its alters are white, note that the network boundaries are defined by the alters of ego. Panel C depicts a bipartite network with two classes of nodes, in which links can only be formed between nodes of the different classes.

The number of nodes (social actors) in the network gives the size of the network, and density shows to what degree nodes are connected to each other compared to the theoretically possibly fully connected network. The diameter of a network shows how many intermediaries are between the two most distantly connected social actors. Looking at the structure of the network, as a first step, we need to establish if the nodes form a single component, or are fragmented into two or more clusters, or if there is any single actor that forms an isolate without any connection to any other actor. Network science has tools to identify typical network structures, such as hierarchical, core-periphery, scale-free, see Figure 3-6.

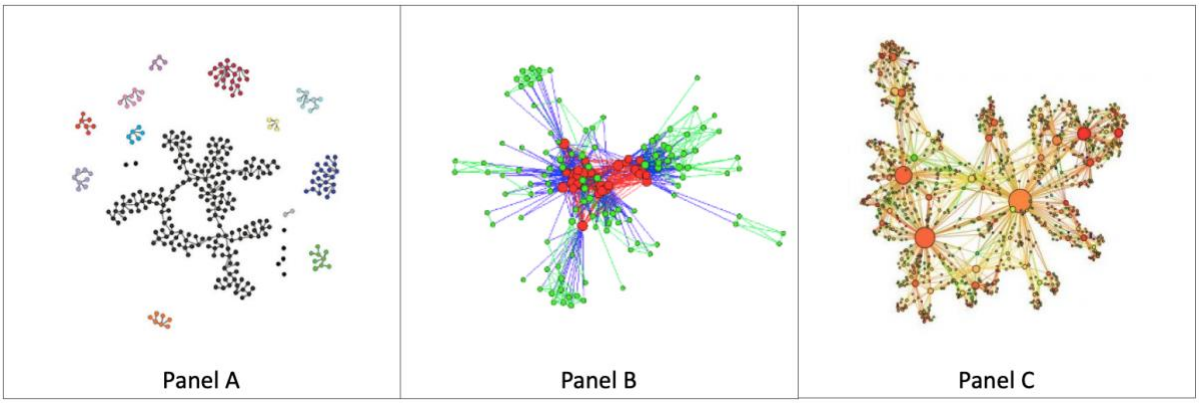

Figure 3-6: Illustration of fragmented, core-periphery and scale-free networks.

Notes to figure: Panel A (Kwon 2019) depicts a fragmented network consisting of a larger component (in black), several smaller components (in colour) and six isolates (in black). Panel B (Avin et al. 2014) depicts a hierarchical core-periphery network: red nodes form the core, and green nodes the periphery. Panel C (Bianconi and Rahmede 2015) depicts a scale-free network with a couple of hubs.

Network structure can also be understood at a smaller scale: sub-groups or cliques within the network are groups of nodes that are more strongly connected to each other than to other nodes of the network. Centralization is a network-level measure that measures variation in centrality across nodes within a network. It indicates to what level centrality scores are centred around a couple of nodes compared to the other actors; thus, it can be a reflection of (in)equality of power and access to resources. Table 3-1 below gives a detailed overview of the network-level social network measures and their re-conceptualization for regime studies.

Table 3-1: Overview of network-level social network measures and their meaning for regime studies.

SNA measures and concepts	SNA Definition	Meaning for regime studies	References
Type of network: whole network, ego-network, uni-partite, bipartite	*Whole network* includes a set of nodes and links between them; whereas *ego-network* includes only the ego node and its alters, and ego-alter and alter-alter links. *Uni-partite network* has one type of nodes, whereas *bipartite network* has two types of nodes and links are only between nodes of different types.	Depending on the research question, the network and its social actors have to be defined, and network boundaries have to be drawn (see methodology chapter).	(G. L. Robins 2015)
Size	Number of nodes in the network.	Number of social actors in the network.	(Eilstrup-Sangiovanni 2018)
Diameter	The largest distance (longest shortest path) in the network.	The distance between the two most distant social actors, largest number of intermediaries needed to connect them.	(Barabási 2016)
Connectedness, clusters, isolate	A network is connected if all pairs of actors in the network are connected. A network is disconnected if there are at least one pair of actors that are not connected. A cluster (also called component) is a subnetwork, whose actors are connected to each other, but not to actors of other clusters. An isolate is a node that does not share any links with any other nodes in the network.	Shows if actors are all connected to each other or if the network is broken into two or more clusters that do not connect to each other.	(Barabási 2016; Prell 2011)
Density	The ratio between the total number of connections and the total possible connections between actors which are actually present.	Shows what share of actors actually has a connection compared to the theoretical maximum number of connections.	(Eilstrup-Sangiovanni 2018; Huppé, Creech, and Knoblauch 2012; Prell, Reed, and Hubacek 2011)

SNA measures and concepts	SNA Definition	Meaning for regime studies	References
Centralization	The sum of the actual (degree or closeness) centrality values of the nodes divided by the maximum possible such sum.	Shows how (un)evenly the centralities are distributed among the actors, to what extent is centrality concentrated around a single actor, which can be a reflection of the (in)equality of power and influence (Eilstrup-Sangiovanni 2018). Using density and centralization together can give an indication of the level of cohesion in the network (Prell 2011).	(Prell 2011; Huppé, Creech, and Knoblauch 2012; Eilstrup-Sangiovanni 2018)
Community structure: subgroups, cliques	Nodes that are more strongly connected to each other than to other nodes in the network.	Identifies triads (clique) and larger groups (sub-groups, clusters) of actors that all have positive ties to each other.	(Wasserman and Faust 1994)

3.5.2 Node-level Measures

Social network analysis can capture node-level characteristics. These revolve around nodes' position within the network relative to other nodes and nodes' attributes. Centrality measures[16] include different conceptualizations of what it means for a node to be "central" within a network. Degree centrality conceptualizes those nodes more central that have a higher number of links. In regime networks, this can relate to, for example the actors' levels of activity (participation in events) and popularity of the actor (number of partners, advisors it has). Closeness centrality identifies the independent actors: those actors have the highest closeness centrality that are closest to all other nodes in the network. Betweenness centrality indicates potential control by showing which actors lie on the largest number of shortest paths connecting every pair of nodes.

There are network measures to identify nodes that hold key positions, in terms of being "bridges" between otherwise unconnected or loosely connected parts of the network. Constraint and effective size (of the network) indicate to what degree an actor has ties only within its close circle.

Homogeneity, heterogeneity and alter dispersion are descriptive statistical measures that give an indication of the composition of the actors' based on their attributes. While homogeneity and heterogeneity compare actors to each other, alter dispersion

[16] Further to the three centrality measures discussed in the text, network science literature conceptualizes several other types of centrality measures: Eigenvector centrality, beta centrality.

compares alters' attributes to the ego in an ego-network.

Table 3-2: Overview of node-level social network measures and their meaning for regime studies.

SNA measures and concepts	SNA Definition	Meaning for regime studies	References
Degree centrality (Degree, weighted degree)	Number of links of the node. In case of a weighted network: the sum of the weights of the links of the node.	Degree centrality focuses on the activity and popularity of the actor: it is a count of the number of direct ties an actor has, or in case ties have strength, the weighted degree gives the sum on the tie strengths.	(Prell 2011; G. L. Robins 2015)
Closeness centrality	The reciprocal of the sum of paths lengths to all other nodes.	Closeness centrality identifies independence of actors. It shows which actors are closer to all other actors and are thus able to reach out to others.	(Prell 2011)
Betweenness centrality	A measure of how frequently a node is on the shortest paths (geodesics) connecting nodes	Betweenness centrality indicates potential control. It identifies actors that lie on the paths connecting other actors.	(Prell 2011; Eilstrup-Sangiovanni 2018; Huppé, Creech, and Knoblauch 2012; G. L. Robins 2015)
Homogeneity, heterogeneity, alter dispersion	Homophily measures to what degree nodes are similar (or dissimilar) to a particular node and alter distribution compares alters to each other.	(Dis)similarity of the actors to each other or to a specific actor, based on actors' attributes and not network position.	(Krackhardt and Stern 1988)
Constraint	Constraint is an index that measures to what extent an actor's network has structural holes. A high constraint is an indication of a large number of structural holes in the node's network.	Holding a broker position, that is bridging structural holes between two loosely connected parts of the network, as described in Burt's Strength of Weak Ties theory, can be beneficial for both the actor and the network.	(Burt 1992)
Effective size	Effective size indicates the number of non-redundant contacts in an actor's ego-network.	Effective size measures to what degree an actor is connecting to other actors that are all connected to each other, and thus probably have access to the same kind of resources.	(Burt 1992; 2004)

3.5.3 Link-level Measures

Social network analysis can be used to analyse the level of links of a network. Firstly, how many links there are, whether they are directed or undirected and weighted or unweighted. In a social network, links can be representations of positive or negative ties between actors (e.g. supporting each other or competing against each other). Between two actors, there can be many layers of social interactions, which can be conceptualized into a multi-layer network, as different kinds of links between the same sets of actors.

Further to network science measures, it is crucial to understand the "nature" of the links (Huppé, Creech, and Knoblauch 2012). For example: what travels through the link, how the link between two regimes is executed in practice. This can be studied not through network science measures, but by other qualitative methods.

Table 3-3: Overview of link-level social network measures and their meaning for regime studies.

SNA measures and concepts	SNA Definition	Meaning for regime studies	References
Number of links	Total number of links in the network	Total number ties between actors.	
Directionality (directed / undirected)	Links in a network can be directed from a source node to a target node, or undirected.	Depending on the conceptualization of the research question, some networks consist of only directed (one-directional or reciprocal) or undirected.	(Prell 2011)
Weight (weighted / unweighted), also called strength	Links can have weights or can be unweighted.	In some cases, links between social actors can be weighted, either through quantitative measurements (e.g. frequency of phone calls) or through qualitative tools (e.g. actors' perceived level of cooperation)	(Prell 2011)
Positive and negative ties	Ties can have a positive (pro-social), negative (anti-social) and neutral characteristics.	Positive ties between actors (e.g. advice, sharing resources) strengthen social connections, whereas negative ties (e.g. competition) can erode social connections and trust.	(Everett and Borgatti 2014; Leskovec, Huttenlocher, and Kleinberg 2010)
Multilayer (also called multi-relational, multiplex, multi-variate) links	More than one type of connection between nodes of the same network.	Links between two social actors can have many dimensions, e.g. information flow, competing for resources, co-participation to meetings.	(Kivelä et al. 2014; Jewell, Vetier, and Garcia-Cabrera 2019; Prell 2011; G. L. Robins 2015)

SNA measures and concepts	SNA Definition	Meaning for regime studies	References
Nature of links		Questions relating to the nature and functioning of the links, such as: "what travels through the links?" are important to understand the functioning of the social network; however, such questions cannot be answered through network methods, but require other methods such as interviews, surveys, observation.	(Huppé, Creech, and Knoblauch 2012)

3.5.4 Network Measures Outside the Scope of this Dissertation

Beyond the descriptive social network analysis measures outlined in the previous sections, there are numerous further network analytical measures. Here I give an insight into the two large groups of approaches, without going into details of the methods and explain why I decided *not* to use them in my study.

- Statistical modelling approaches (for example latent space models and random graph models, such as the p_1 model, Markov random graphs, Bernoulli graphs) are principled statistical approaches that allow researchers to test theoretical reasons (such as homophily, reciprocity, transitivity – depending on the assumption of dependence in the respective model) for why ties in the studied network exist (G. Robins et al. 2007), and thus enable network pattern recognition (G. Robins 2014). Random graph modelling studies are carried out on medium to large social networks (Snijders 2011), and only recently did scientists start to discuss how ERG models for "small" networks (less than 30 nodes) can be applied (Yon and de la Haye 2019).
- Various methods have been developed for addressing data gaps, since it understood that social network analysis requires nearly full datasets (J. Scott 2012) as the analysis of the structure of the network is especially sensitive to missing data (Kossinets 2006). Methods to address missing data include two main approaches: likelihood-based estimation (G. Robins, Pattison, and Woolcock 2004) and imputation methods (Huisman 2014). However, as explained later in the methodology and analytical chapters (chapters 4-7), the dataset used for my research is sufficiently complete, that it was not necessary to use methods for addressing data gaps.

3.6 Summary

Regime effectiveness and regime interactions are determined by the network structure that evolved between their actors: ties between actors of regimes and regimes themselves can be conceptualized as social networks. These networks can be analysed with social network analysis measures, and social network theories can explain both why these networks evolve in specific ways, and also how the characteristics of the network determine possible future actions and interactions of actors. Ultimately, the insights gained through bridging these disciplines can allow us to know more about why some regimes succeed and others fail to solve environmental problems.

However, network science is not a panacea for all research problems. Structural characteristics of networks have been found to be a condition for specific actions to happen; however, importantly, actors are not aware of their mathematical network positions. Furthermore, actors in social networks are *social* beings (people, groups, organizations, regimes) whose behaviour is influenced by many other factors beyond network position: personality, budget, geographical location, etc. Thus, actors of a network might not be acting as one would expect based on their network position - which of course contributes to regime effectiveness and interactions. Network science cannot capture many of these social features: for example, how actors perceive their network positions, "what flows through" the links (Kim 2019, 18). For a fuller understanding, these features of the actors and their social networks need to be analysed through qualitative methods (Oancea, Petour, and Atkinson 2017; Raeymaeckers 2016; Yousefi-Nooraie et al. 2018). In the next chapter of my dissertation, I describe how I dealt with mixed methods in my research and how I used a case study of one specific regime to advance scientific knowledge.

4 Methodology and Research Design

4.1 Introduction

In my research from data collection to analysis, I used multiple methods: qualitative and quantitative methods to complement each other. This chapter explains my general approach to research design and gives a general overview of the different methods I used but does not explain the methods' specificities. I give the details in each empirical chapter since the details vary substantially between the chapters.

The methodology chapter comprises the following sections: first, it discusses case study based research methodologies, justifies the case selection and gives an overview of the case study. The second section introduces my approach to mixed methods research design and gives a general overview of the three methods used in the research: interviews, participant observation and social network analysis. The methods, as applied in each chapter, are discussed extensively in each empirical chapter, since there are differences in how the methods were used, especially the network analysis methods. Finally, the chapter reflects upon limitations of my research design.

4.2 Case Study Research Design

My research design is single case study research. I understand case study research, in line with other scientists, as a research process that investigates a single example or unit (George et al. 2005) through a single or multiple observations (Gerring 2006) and provides a holistic, in-depth analysis of a phenomenon or properties of the example involving multiple data sources (Yin 2009). In my dissertation, I analyse a single case in detail, through multiple observations and with mixed methods.

This dissertation, as explained in the previous chapters, focuses on regional environmental regimes, which gives the boundaries of the population, from which I selected my case. The single case that I analyse in my dissertation is one of these regimes: the Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention) is a regional regime signed by seven geographically connected countries focusing on "the protection and sustainable development of the Carpathians" (Article 2). There are several justifications for the selection of this case:

- **Less-studied regime:** Of course, there are several other regional environmental regimes, and some of these are better researched, such as the Alpine Convention. However, there was a recent call from Anderssen (2016) to focus regime analysis on less-researched regimes, as he has put it: "much is known about some favoured regimes, but little or nothing about many others" (Andresen 2016, 312). My research clearly answers this call by focusing on a regime that so far, has received less attention.
- **Mountain convention:** Parallel to this, the Carpathian Convention is a mountain convention. Mountains have been highlighted recently in global processes (such as IPCC and IPBES) as areas that deserve more attention than what they have received (Payne et al. 2017). From a contribution's point of view, my research answers this call. There is also another aspect of mountains: mountains are areas with fairly complex social and environmental issues. Thus, questions relating to trans-boundary connections, integration, cross-sectoral interactions (which are critical elements of my research) can be studied, see next point.
- **Holistic and integrated approach:** My research aims to examine the formation of connections between actors of different countries, sectors and organization types. During case selection, this meant looking for regimes that address problems of complex social-environmental systems and have a holistic and integrated approach to solutions. The Carpathian Convention covers multiple topics (see next section) and aims for public participation, trans-boundary cooperation, integrated planning and management, programmatic approach and ecosystem approach (Carpathian Convention Article 2), all of which necessitate interactions.
- **Timeframe:** Sabatier (1986) argues that for studies focusing on how policies serve as a basis for learning, a 10-15 years' timeframe is needed. At the time of data collections (2015-2017), the Carpathian Convention was 12 to 14 years past its signing. This amount of history of the regime enabled me both to trace back actors and meetings of the initial years and to study the evolution of regime.
- **Practical justifications of case selection:** English is the working language of the Carpathian Convention, which allowed me to gain full access to all documents, reports and meetings; and to carry out interviews with all engaged actors. This would not have been possible for other regimes whose working language I do not comprehend, or only partially comprehend. Geographic proximity was also a case selection criterion. I was able to travel to several meetings of the Convention and meet and interview people in person, which formed essential

pillars of my data collection.

From a research design perspective, the case of the Carpathian Convention is both an exploratory case (Yin 2009). My research relies on an in-depth study of the history, description and interpretation of the evolution of the Carpathian Convention, which can then serve as a basis for developing propositions, hypotheses and later theory. As discussed later in the empirical chapter (5-7) and the discussion (chapter 8), the research presented in this dissertation could be seen as a precursor to a larger study involving more environmental regimes.

4.2.1 Background Information on the Carpathian Convention

The empirical chapters (Chapters 5-7) assume a certain level of familiarity with the topics, structure, processes and rules of the Carpathian Convention. The following paragraphs provide this background knowledge to readers.

4.2.1.1 Objectives and Topics

The Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention) was signed by six Carpathian countries (the Czech Republic, Hungary, Romania, Serbia, Slovakia and Ukraine) on 22 May 2003, and by Poland on 25 November 2003. Following the fourth ratification, the Convention entered into force on 1 April 2006. The origins of the Carpathian Convention are discussed and analysed in detail in chapter 5, section 5.3.1.

The Carpathian Convention's general objective (as spelt out in Article 2) is to foster the development of policies and enable cooperation among parties "for the protection and sustainable development of the Carpathians with a view to inter alia improving quality of life, strengthening local economies and communities, and conservation of natural values and cultural heritage" (Carpathian Convention 2003b, Article 2). Its focal topics are spelt out in Articles 3 to 13:

- An integrated approach to land resources management,
- Conservation and sustainable use of biological and landscape diversity,
- Spatial planning,
- Sustainable and integrated water/river basin management,
- Sustainable agriculture and forestry,
- Sustainable transport and infrastructure,
- Sustainable tourism,
- Industry and energy,

- Cultural heritage and traditional knowledge,
- Environmental assessment/information system, monitoring and early warning,
- Climate Change and
- Awareness-raising, education and public participation.

The Convention has been supplemented with four protocols detailing specific action in the fields of biological and landscape diversity, forest management, tourism, transport and agriculture and rural development, see Table 4-1.

Table 4-1: Overview of the protocols of the Carpathian Convention.

Title of Protocol	Year of adoption	List of parties signed	List of parties ratified	Year of entry into force
Protocol on Conservation and Sustainable Use of Biological and Landscape Diversity	2008	All seven parties	All seven parties	2010
Protocol on Sustainable Forest Management	2011	All seven parties	CZ, HU, RO, SK, RS, UA	2013
Protocol on Sustainable Tourism	2011	CZ, HU, PL, RO, SK, RS	All seven parties	2013
Protocol on Sustainable Transport	2014	CZ, PL, RO, SK, RS, UA	CZ, PL, RO, SK, RS, UA	2019
Protocol on Sustainable Agriculture and Rural Development	2019	CZ, HU, PL, RO	SK	Not yet in force

4.2.1.2 Official Meetings under the Carpathian Convention

The Carpathian Convention has three different official meetings: sessions of the Conference of the Parties (COPs), meetings of the Carpathian Convention's Implementation Committee (CCIC) and working group meetings (WG). Article 14 of the Convention establishes the Conference of the Parties as the main decision-making body of the Convention, which meets every three years and is chaired in a rotational manner by the parties. As of writing this dissertation five meetings of the Conference of the Parties have taken place: COP1 in 2006 in Kyiv (Ukraine), COP2 in 2008 in Bucharest (Romania), COP3 in 2011 in Bratislava (Slovakia), COP4 in 2014 in Mikulov (Czech Republic) and COP5 in 2017 in Lillafüred (Hungary).

The Implementation Committee was established in Decision COP1/3 of the First COP as the subsidiary body of the Carpathian Convention (Carpathian Convention 2006), and its specific terms of reference were adopted at the Second COP. The role of the CCIC is to oversee actions of parties and observers in relation to the Convention and to steer the

Convention by organizing the work of working groups, developing new protocols and ensuring mutual consistency of all activities carried out under the Convention (Carpathian Convention 2008). The CCIC is serviced by the Secretariat and meets at least once a year.

Working groups coordinate activities of parties and observers under specific sectors. Working groups are established through COP decisions. Currently, there are eight working groups under the Carpathian Convention.

1. Working Group on Conservation and Sustainable Use of Biological and Landscape Diversity (COP1/4)
2. Working Group on Cultural Heritage and Traditional Knowledge (COP1/6)
3. Working Group on Sustainable Agriculture and Rural Development (COP1/7, para 3)
4. Working Group on Sustainable Forest Management (established jointly with the agriculture working group by the COP1/7 decision, but operates separately from agriculture and rural development)
5. Working Group on Sustainable Transport (established originally as WG on sustainable industry, energy, transport and infrastructure by COP1/9 decision, but operated as WG on Sustainable Transport and Infrastructure in 2013, and operates as WG on Sustainable Transport since 2018)
6. Working Group on Sustainable Tourism (COP1/10, para 2)
7. Working Group on Spatial Planning (COP1/11, para 4)
8. Working Group on Adaptation to Climate Change (COP3/15)

The working groups operate under the Carpathian Convention Implementation Committee. Each working group defines its own terms of references at its first meeting. The working groups do not meet according to a pre-established schedule but take place upon request of parties. These meetings are usually attended by sectoral experts delegated by parties and observers.

Numerous informal meetings are also listed as events relating to the Carpathian Convention. These informal meetings, such as workshops, project meetings, conferences are not official meetings of the Convention, however parties and observers are encouraged to participate.

4.2.1.3 Rules of the Carpathian Convention

There are three foundational norms that are established by the Convention, and as discussed later in the dissertation, play an important role in its development.

Decision-making by consensus: The Convention and its Rules of Procedures (Carpathian Convention 2003a, Rule 34) declare that all decisions under the Convention on all subject matters need to be made by consensus. This means that all seven parties have to support all the decisions (including the adoption of protocols, working plans) of the Convention.

Participation of observers and conduct of business: quite prominently, Article 2 of the Convention spells out that the Convention should promote public participation and stakeholder involvement. More specific details are given in the Rules of Procedure (Rules 24 and 35): all sessions of the Conference of the Parties and meetings of the subsidiary bodies (CCIC and WG) are held in public. The option for observers to participate in meetings is established by the Convention (Article 14). The Rules of Procedure further detail that during meetings, observers can present information or reports that are relevant to the topic of the meetings. Furthermore, the Secretariat is required to maintain an up-to-date list of observers and notify them of upcoming meetings at least one month before the meeting.

English: The Rules of Procedure (Rule 36) define English as the official language of the Convention, not only for its meetings but also for all official documents of the meetings.

4.2.1.4 Key Actors of the Carpathian Convention

Secretariat of the Carpathian Convention is based at UNEP Vienna office[17]. The Secretary General of the Carpathian Convention is Mr. Harald Egerer.

Parties of the Carpathian Convention are represented by:

- The first point of contact are parties' national focal points. National focal points sit at the countries' ministry for environment (or similar).
- For sectoral discussions parties often delegate experts from other ministries, such as tourism, transport. The ministry of foreign affairs might also send delegates to high level meetings of the Convention.

[17] UNEP Vienna is an outposted office of UNEP's Regional Office for Europe. It is specialized on mountain ecosystems, on environmental programme delivery in South East Europe and hosts the Carpathian Convention's Secretariat.

- National agencies and authorities of the parties (for example the Slovak State Nature Conservancy, Romanian Mountain Area Agency, the Romanian National Authority for Tourism) also often participating in meetings.

Local and regional administrative bodies and their networks:

- The Carpathian Euroregion is an international association (NGO) funded in 1993. It comprises 19 administrative units of five countries from Poland, Ukraine, Slovakia, Hungary and since 2000 also from Romania.
- The Union of Cities and Towns of Slovakia is a platform for local governments.

Protected area administrations and their networks:

- CNPA is a network for protected area administrations. Its mission is to coordinate joint projects designed to: improve cooperation between the seven Carpathian countries; facilitate exchanges between the Carpathian protected areas; raise awareness of the fragile ecosystems in the massif, and work to realise practical measures, such as the creation of an ecological network to ensure the survival of endangered species.
- The Association of the Carpathian Protected Areas (ACANAP) was founded in 1991 after the initiative of the former director of the Tatra National Park in Slovakia (Niewiadomski 2010). It was a voluntary network of Carpathian national parks and protected areas from Slovakia, Ukraine, Hungary and Romania. ACANAP's main focus was initially on network development and scientific cooperation between the protected areas. Later it started to orient to more practical issues including the management of protected areas. ACANAP organized several conferences and published reports on Carpathian protected areas and related conservation efforts and research needs. However, their activities remained limited due to lack of funding (Niewiadomski 2010).
- The Alpine Network of Protected Areas is an umbrella NGO for protected areas in the Alps.

Key academic and research organizations and their networks:

- EURAC Research is an Italy-based research organization set up by the Italian Ministry of Environment and providing regular scientific input to the Alpine Convention. EURAC has been involved in the Carpathian regime process from the very beginning, after being recommended to Carpathian actors by their Alpine counterparts. One of the staff members working at UNEP's Vienna office is seconded from EURAC.

- Science for the Carpathians (S4C), emerged in 2008 as an informal voluntary research network of scientists working on Carpathian issues. S4C is dominated by natural scientists: geographers, hydrologists, GIS experts and forest biologists. Its objectives are to develop and implement a research framework for the Carpathians, to promote research collaborations (for example peer-reviewed papers and synthesis articles) across disciplines and national boundaries, and to foster dialogue between research, policy and practice. The Secretariat of the Carpathian Convention and S4C signed a Memorandum of Understanding recognizing the scientific advising role of S4C.

Key NGOs and their networks:

- WWF is an international NGO, focusing on biodiversity conservation. WWF Central and Eastern Europe (WWF-CEE, formerly called WWF Danube-Carpathian Regional Office) is its office focusing on the Carpathian Region. With its headquarters in Austria, WWF-CEE has offices in the following Carpathian countries: Hungary, Romania, Serbia, Slovakia, Poland and Ukraine.
- Ecological Tourism in Europe (ETE) supports the development of sustainable tourism in Europe. It is based in Germany and works in close cooperation with the NGO CEEweb for Biodiversity in the Carpathian region.
- Green Dossier is an NGO registered in Ukraine.
- The Bile Karpaty (White Carpathians) Educational and Information Centre is a Czech NGO focusing on environmental education and sustainable tourism in Moravia (Czech Republic).
- Ekopsychologia Association is a Polish NGO running projects in the Polish Carpathian region.
- DAPHNE is an NGO based in Slovakia, focusing on applied research and environmental education. Previously they were one of the leading organizations of the Carpathian Ecoregion Initiative (CERI).
- CERI was launched in 1999 by WWF. It was a network of around 50 organizations, local NGOs and research institutions, from six Carpathian countries (Serbia only joined the network at a later point). CERI had a multi-layered organisational structure: there were 17 thematic working groups on topics such as biodiversity, climate change and large carnivores; and led by a focal expert. Additionally, there was also a country-based layer, with focal points for each country. In 2005 CERI became independent from WWF and was established as an independent legal entity.
- CEEweb for Biodiversity is an international umbrella NGO working on the

conservation of biodiversity, tourism and rural development in the Central and Eastern European region.

4.3 Overview of Methods

This section only gives a general overview of each method that I used in my research. I explain the details of data collection and analysis in the empirical chapters (Chapters 5-7).

4.3.1 Mixed Methods

Mixed methods research means combining qualitative and quantitative approaches to validate findings or gain a deeper understanding of a problem. Traditionally in mixed methods research, qualitative and quantitative elements remain separately distinguishable and are used for triangulation purposes, to test the validity of the research through analysing the same problem with data from multiple sources (Carter et al. 2014). More recent methodological publications consider the level of "mixing" along a continuum (Bazeley 2012) and the purpose of mixed methods to have a richer understanding of the research question (Yousefi-Nooraie et al. 2018).

In social network analysis, there is an explicit call for applying mixed methods, whereby the qualitative social network analysis is used in combination with other quantitative research methods, such as interviews and participant observation (Crossley 2010; Yousefi-Nooraie et al. 2018). The argument for using mixed methods in network analysis is that "research questions about the structure of social relations require quantitative (sociometric) methods, whereas research questions about the processes that produce networks, the perception and meaning of networks, or change over time, require qualitative methods." (Edwards 2010, 21). In line with these recent calls, in my research, I used mixed methods to gain a more detailed and more in-depth understanding of my research question: to analyse both the structural and the functional characteristics of actors' social network.

In practice I combined methods along the following research path. I began my research with exploratory network analysis using project-affiliation data readily available on the internet, as presented at multiple conferences (Vetier 2015, 2016). The findings of this exploratory phase were used to select organizations for first rounds of interviews. Later in the research, through participant observation I identified organizations to include in the network survey and to interview. As explained before, all organizations of the survey

were interviews. The additional interviewees were identified through participant observation and snowballing. Thus, for my data collection the three methods (network analysis, interviews and participant observation) were all connected and guiding me.

During data analysis I carried out the quantitative network analysis and qualitative data analysis parallel. However, after the network analysis findings started to emerge, I ran a second round of qualitative data analysis focusing on actors, organizations, agreements that were highlighted by the network analysis. So again, the methods were truly mixed during analysis.

4.4 Qualitative Methods: Interviews and Participant Observation

4.4.1 Data collection

I carried out **participant observation** at 11 events: sessions of the Conference of the Parties, meetings of the Carpathian Convention Implementation Committee, working group meetings, and meetings of organizations related to the Carpathian Convention (Carpathian Network of Protected Areas, Science for the Carpathians) see Table 6-1 for a full list of events. I used participant observation to collect data on the dynamics of discussions and interactions between participants, and in the initial phases of the research to identify key themes, topics of the research and future interviewees. My field notes, in line with Richards (2005) included accounts of the setting of the meeting, the type and characteristics of interactions, the verbal and non-verbal communication. I recorded the keynote speeches at conferences.

In total, I **interviewed** 63 people. I identified interviewees through desktop research and participant observation. I further refined the initial list of interviewees through snowball sampling. My aim was to interview current and previous actors of the Carpathian Convention and people who have had intensive contact with the Carpathian Convention through, for example, projects, reports, partnership agreements, etc. Additionally, I also included a few experts in my list, whose work focuses on the Carpathian region albeit not specifically on the Convention. Interviewees came from all seven Carpathian countries, EU bodies, international organizations, NGOs, research institutes in the Carpathians and outside of the Carpathian countries but active in the region. The interviewees cover several sectors and organization types. As discussed in Chapters 5-7, some of these interviews were used in understanding the Convention's actors' relationships and the regime's outcomes; while others were used to gain an insight into regime interactions.

I conducted approximately two-thirds of the interviews in person: I carried out 27 individual face-to-face interviews and spoke to 12 people in two-person group interviews. I did 24 interviews using videoconferencing facilities. There was one individual, who responded to my questions in writing, and one individual (a national focal point) who did not agree to be interviewed.

My interviews were semi-structured interviews, more at the looser end of the spectrum. After briefly introducing myself and my research, I asked open-ended questions. For current or previous actors of the Carpathian Convention, my questions addressed the past, present and future of the Carpathian Convention. For actors outside of the Carpathian Convention (e.g. experts, partner conventions, institutions and organizations) I tailored the questions to the specific expertise of the individual or cooperation history of the two bodies. In both cases, the open-ended questions prompted personal recollections of the regime's functioning and evolution in the Carpathians to avoid political statements and ready-made general answers (see Annex 1 for the interview questions).

I recorded the interviews after receiving consent from the interviewees, and also took field notes of the interview setting, tone, body language. Later, I fully transcribed the interviews.

4.4.2 Data analysis

I analysed my qualitative data (participant observation field notes, interview transcripts and field notes) through constructivist grounded theory. This method is a combination of grounded theories inductive approach and constructivist's abductive approach (Timmermans and Tavory 2012). According to Charmaz: "The constructivist version [of grounded theory] fosters asking probing questions about the data and scrutinizing the researcher and the research process. Unlike other versions of grounded theory, the constructivist version also locates the research process and product in historical, social, and situational conditions." (Charmaz 2017, 34). My choice for this qualitative data analysis method was influenced by my research design. For my research, it was necessary to include how actors' perceptions of their network and their activities influence each other and to have tools to study temporality.

In practice, my analytical process was based on the following methodological strategies: (1) in-vivo coding of data without using pre-defined codes, (2) grouping in-vivo codes under emerging concepts and topics, (3) memo-writing. I carried out qualitative data

analysis and quantitative (network) data analysis iteratively: overlaying and questioning the findings of one field with the other. This approach to analysis and theory construction is in line with constructivist grounded theory, which calls for moving back and forth between our data, our interpretations of the data and possible theoretical explanations (Charmaz 2017).

4.5 Quantitative Method: Social Network Analysis

I **collected relational data** for social network analysis through three means; I give details of each data collection method in the empirical chapter that builds on the data. I base chapter 5 on archival records of meeting registration, Chapter 6 on organizational-level relational surveys completed by individuals, and Chapter 7 on citations in and partnership agreements between regimes.

Meeting affiliation based network analysis: Co-participation, co-membership and other types of affiliation networks are often used in network analysis to indicate a "hidden" social structure (Wasserman and Faust 1994). These affiliation networks are relational from two perspectives: events serve as a platform for social ties to emerge, and co-participation can indicate a relation between two actors.

Survey-based network analysis: Questionnaires for the collection of relational data are routinely used in political science research. Surveys usually record data on the presence, type, and intensity of a relationship between the respondent and other actors in the network (M. D. Ward, Stovel, and Sacks 2011). It is claimed, that collecting social network data through surveys is an appropriate method when nodes of the network are organizations (M. D. Ward, Stovel, and Sacks 2011), such as in my research. Survey-based data collection shares the usual challenges of all kinds of surveys, as discussed in, for example, Bryman (2008).

Citation-based network analysis is a method that is widespread in network science (J. Scott 2012). In international regimes, citation-based network analysis is also a recognized method, for example, Kim (2013), Ahlström and Cornell (2018) and Perez and Stegmann (2018) construct institutional network based on citations in legal texts. Citation networks are time-bound directed networks: agreements can contain references to other, pre-existing agreements by mentioning those in their preambles (Kim 2013). This is seen as a way for parties to show which other agreements they consider relevant to the agreement by its contributions to solving the problem at stake or by providing an example of norms (Kiss and Shelton 2007).

Social network analysis: I coded all three types of network data into node lists (list of nodes with attributional data) and edge lists (table of node-to-node connections) and then imported the node and edge lists into Gephi (Bastian et al. 2009) and ORA (Carley 2017) software packages for analysis. I used Gephi to visualize the networks and carry out exploratory data analysis. I relied on ORA for network transformations and numerical analysis. I describe the details of the network measures and their re-conceptualization in Chapter 3, and specifically for each type of network in the empirical chapters (Chapters 5-7).

4.6 Limitations and Reflections

4.6.1 Validity and Generalizability

As explained previously, this research is built upon an exploratory case: the in-depth study of the single case of this research is meant to serve as a basis for developing new theory and testing existing theory. However, as Grandy (2010) claims, the exploratory case is primarily about delivering new and rich analysis about the case along the theories to be tested or hypotheses to be developed and not about generalizing. Along these lines, the findings of this dissertation will add more details to existing theories and form the basis for developing propositions.

4.6.2 Limitations

Each empirical chapter contains a detailed elaboration of limitations arising from the specific method applied and how I deal with it during my analysis. This section provides only a general overview of the limitations that occurred.

- Missing data is a common problem in research. In social network analysis, it is necessary to have a close-to-full dataset for analysis (J. Scott 2012), although it is also recognized that often social network data is incomplete (Kossinets 2006). Although I was aiming for complete network data in my research, as described in Chapter 5-7, each dataset contains some data gaps. During my interviews, I had only one respondent who, even after offering full anonymity, rejected to be interviewed. After finishing data collection, I decided that that dataset can be considered close-to-full. Only obvious errors in the data were corrected, and no further methods were deployed to deal with missing data.
- Unit(s) of analysis. In my research (see Chapters 5 and 6), I encountered two

types of cases, when an entity appeared under multiple names, forms, locations. Some organizations that changed their name during the analytical time scope of the research, such as ministries; and some organization have a presence in more than one country, sometimes registered as separate legal entities, but operating under the same work programme, such as the World Wide Fund for Nature (WWF). In these cases, I grouped the entities into single units. In Chapter 7, I faced the opposite of this problem: the units in my original data were, in fact, vaguely defined umbrellas for several pieces of legislation. I carried out substantial background research to "unpack" these umbrella units.

- Organizational research. Inter-organizational network studies' common struggle is how to get individual perspectives to represent the network between organizations (Kumar, Stern, and Anderson 1993). As described in Chapter 6, I applied recognized strategies to overcome this limitation: interviewing more than one person from the organization, supplementing interview and survey data with participant observation.

External generalizability (validity) is a recurring question in case-based research design. As explained previously, my research is an exploratory case study selected from the general population of regional environmental regimes. However, even for this population the findings are not necessarily generalizable but point to propositions to be tested and research paths to be explored.

4.6.3 Personal Reflections

In qualitative research, the researcher often has an influence on the research outcomes (Richards 2005). The following paragraphs reflect on how I could have influenced my research:

- My gender and age could have impacted the interviews, though I did not feel that it was outspoken in any of the interviews. I took steps to establish rapport at the beginning of the interviews.
- My nationality could have also impacted the research. I am Hungarian, and Hungary is one party of the Convention. Although I did not have the impression that interviewees withhold information and avert politically sensitive topics, my nationality could have meant that some perceptions were not shared with me.
- I speak Hungarian but not the other national languages of the parties. In my research, I stayed at the international level and did not collect data on national-level processes. During my data collection, I relied only on English documents

and did not include any national documents that were not translated to English, not even Hungarian ones. I interviewed Hungarian people in Hungarian, and with others in English, which is the official language of the Carpathian Convention. I felt that for some of my interviewees' English language was causing a communication barrier, and they could probably share more information if I interviewed them in their mother tongue (see Chapters 6 and 9). This observation became data in my research.

- At the beginning of data collection, I was a novice researcher in qualitative research. Although I piloted and tested my interviews before entering the field, the interviews I carried out towards the end of my data collection were probably better, in the sense that I was less stressed, more relaxed; and had a better understanding of the topics and relevant issues.
- I am a person who internally embraces institutionalism and has an emotional connection to the Carpathians. Thus, I was maybe less critical during data collection (especially in taking field notes during participant observation) and analysis than another person would have been who does not have these personal internal ties.

5 Formation and Evolution of the Actors' Network

5.1 Introduction

Environmental regimes are formalized agreements between states (Krasner 1982), aiming to solve environmental problems. However, regimes cannot change the environment directly. The causal pathway of environmental regimes has three elements. Policy *output*s are the tangible things that are created because of the regime (for example legal documents, projects, conferences), see Box 5-1 for concrete examples for the Carpathian Convention. These outputs, ideally, lead to behaviour changes of actors, which are conceptualized as the *outcomes* of the regime. And finally, changes in actors' behaviour can have actual environmental *impacts* (see also Figure 2-1).

Box 5-1: Examples of outputs, outcomes and impacts of the Carpathian Convention.

Outputs of the Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention) are, for example, the Convention itself, its five protocols detailing action in specific fields of biodiversity, forest management, tourism, transport, agriculture and rural development, the action plans of the protocols, work programmes of thematic working groups, the adopted criteria and indicators for selection of virgin forests in the Carpathians, and the lists of endangered species, habitats, old-growth forests. Outputs also include the numerous projects conferences and workshops for knowledge and skill sharing that have been carried out under the Carpathian Convention (see Section 6.3) The recently created tourism centres are also outputs of the Convention. *Outcomes* are changes in behaviour, for example, new perspectives on forest management, new approaches to managing tourism, changing attitudes towards large carnivores. *Impacts* of the Carpathian Convention are, for example, avoided habitat fragmentation, preserved old-growth forests, improvements in the population status of large carnivores.

Changes in human behaviour (regime outcomes) are the central element of the regime effectiveness causal chain. Regimes can only lead to environmental impacts by bringing about changes in human behaviour. Regime effectiveness and collaborative and adaptive governance literature identify several conditions that are necessary for outcome-level change to happen: the establishment of a common knowledge system, social cohesion among the actors for the development of mutual trust, the presence of leadership and power, and inclusivity, diversity and collaboration of actors. As I explained in significantly more detail in Chapter 3, these social phenomena are determined, enabled and constrained by the characteristics of the underlying network that connect the actors. The structure of the actors' social network and actors' position within the network can become an enabling or limiting condition for individual and joint actions and interactions between actors.

Regional environmental regimes hold a particular position in the discussion on regime effectiveness. Regional regimes are defined as those regimes that are formed by geographically connected countries. Claims have been made that the establishment of regional regimes can be advanced by the familiarity of actors with each other and with

the problem that they plan to address (Conca 2012). However, little is known if and how this claimed "familiarity" is operationalized in real cases, and if and how "familiarity" transforms as the regime evolves, and what impacts this might have on the effectiveness of the regional environmental regime.

This chapter builds upon interviews and the Carpathian Convention's meeting affiliation network to analyse the evolution of the Convention's network and its effects on the regime's effectiveness. I carried out in-depth interviews with actors who were present during the negotiations, signing and first years of the Convention, and actors who are currently engaged in the Convention's official processes and projects. For the actors' meeting affiliation network, the organizations participating at meetings of the Convention and their official meetings (sessions of the Conference of the Parties, working group meetings, meetings of the Carpathian Convention Implementation Committee) were conceptualised as the two sets of nodes of the network. Registration to an event was conceptualized as the tie between the two sets of nodes (see detailed elaboration in Section 5.2.2.1).

This chapter has two objectives:

1) To analyse the changes in the social network of the Carpathian Convention's actors, by (1) analysing the evolution of the structure and composition of the social network of the actors, and (2) identifying organizations occupying critical positions within the network, and analysing changes in their network position.
2) To critically analyse the usefulness and limitations of applying a meeting-affiliation based approach to regime effectiveness analysis.

This chapter contributes to Objectives 2 and 4 of this dissertation (see Section 1.3), by providing an insight into the evolution of the characteristics of actors' social and elaborating how the changes in the network characteristics may influence the outcomes of the regional environmental regime.

The Chapter is structured as follows: first, it explains in detail the methods that were used to collect and analyse the data (Section 5.2), then applies the analytical methods to the case study of the Carpathian Convention (Section 5.3). Section 5.4 gives my reflections on the benefits and limitations of using bipartite meeting affiliation network analysis for regime analysis. Finally, there is a summary that provides an overview of the findings (Section 5.5).

5.2 Methodology

The current section should be read together with the Conceptual Framework (Chapter 3) and Methodology and Research Design (Chapter 4) chapters of this dissertation, which give, respectively, an insight into the definitions and reconceptualization of the network measures and explain the epistemological and methodological foundations of the research. This section reviews in detail how data collection and analysis was carried out for the meeting affiliation network of the Carpathian Convention. It also explains in more detail specific network measures that had to be re-conceptualized for a bipartite network.

5.2.1 Bipartite Social Networks

Social network analysis is a quantitative method to uncover and analyse the connections between social actors (A. Davis, Gardner, and Gardner 1941; Wasserman and Faust 1994). It can take many forms. A recent publication (Jewell, Vetier, and Garcia-Cabrera 2019), for example, looked at how countries cooperate on nuclear energy and what this means for energy security discussions. Trade, peace and conflict networks are also commonly analysed as social networks between countries (Dorussen, Gartzke, and Westerwinter 2016; Haim 2016). In the field of environmental management, it is common to analyse organizational interactions in relation to a shared natural resource (e.g. fisheries, watersheds) (Bodin and Prell 2011), see Literature Review (Section 2.5.2) for an overview of the use of social network analysis.

A particular type of social network uses data not on interactions between the same types of nodes, such as the examples listed above, but creates a network from shared interests, joint memberships, shared attendance, shared projects, etc. This kind of social network or affiliation network is also called a bipartite network. Bipartite networks are networks consisting of two different classes of nodes, and links are only formed between nodes in different classes and never between nodes in the same class (A. Davis, Gardner, and Gardner 1941; J. Scott 2012; Wasserman and Faust 1994). Social sciences and social network analysis have long been dealing with bipartite networks, especially affiliation networks (actors participating in clubs, events, meetings). The foundational theory being that individuals need to be able to meet each other to form a social tie, and that specific characteristics of affiliation networks (e.g. co-occurrence) can indicate a hidden social structure (Wasserman and Faust 1994).

Affiliation networks are relational in at least two ways.

1. Meeting affiliation networks can show how events create ties among actors assuming that in order for a tie to form between two actors, they should have the opportunity to meet in person (Wasserman and Faust 1994).
2. Other theoretical approaches see shared event participation not as a precondition for the formation for social ties, but as the way to uncover an otherwise hidden network structure. For example, the participation of one actor might depend on the presence of another actor (Wasserman and Faust 1994).

It has to be noted that the analysis of a meeting affiliation network does not tell us what actually happened at the event, club, or meeting. It can uncover the structure of the social network, but not what is travelling through the network, nor the quality of the meeting or the quality of the interactions. For example, such network analysis will not indicate if the participating actors were constructively fuelling the processes, or on the contrary, if they were acting against the will of the majority and destructively blocking everything. As discussed more extensively in the next chapter, other qualitative methods can fill in this gap.

For regional or global environmental regimes, especially those that have been operational for several decades or involve numerous countries, usually, it is neither feasible nor possible to collect relational data through questionnaires or interviews.[18] Thus, other data collection and analysis methods are needed for global and regional regimes. Social network analysis relying on archival bipartite network data, such as co-voting records, meeting participation, project affiliation, or working group membership. This is a way to work around the network data collection problem and analyse the structure of such governance networks. This was also the choice that I made for my research. The following sections explain in detail my data collection and analysis steps.

5.2.2 Data Collection

5.2.2.1 Creating the Affiliation Network

I asked the Secretariat of the Carpathian Convention for meeting participation data of meetings under the Carpathian Convention. The dataset that the Secretariat sent me consisted of a set of files (xls, pdf, doc) that listed to various levels, precision and detail

[18] Distance and time constraints and the unavailability of actors do not allow to reach all actors and ask them to reflect upon their connections. Even asking them to complete an online social network survey that covers the full network can be problematic for several reasons, such as the time needed to review the list of all actors and the effects of human psychology that we tend to recall more readily our recent encounters (Cowan 2008).

(see Limitations) the individuals who have registered for meetings of the Convention. I obtained registration lists for 47 official meetings between 2006 and 2017, including Conferences of the Parties (COPs), meetings of the Carpathian Convention Implementation Committee (CCIC), working group meetings (WG) and Bureau meetings[19]. The files contained the details of the meeting (title, date), the personal data of individuals[20] (name, position, and contact details in some cases), their organizational affiliation (as they have specified themselves during the registration) and in some cases the roles of the individuals towards the Convention (party, UN, observer).

From this meeting affiliation dataset, I created a bipartite network. One set of nodes are the meetings (M-nodes), and the other set of nodes are the organizations (O-nodes) that have registered individual delegates for the meetings. The weights of the connecting link between the meeting nodes and the organizational nodes are defined by the number of delegates an organization has registered. So, for example, if a party has sent four individuals from its ministry of environment, and two from its ministry of tourism to a conference of the parties, then the link between the environment ministry and the COPx would carry a weight of 4, and the link between the tourism ministry and the COPx would have a weight of 2.

Umbrella nodes were created for two cases: ministries and international NGOs. Firstly, when there is a change in the government, countries in the region tend to rename ministries and move topics between ministries. In order to avoid inflating the number of nodes (i.e. introducing a new node for each newly renamed ministry), I merged them under umbrella nodes, as shown in Table 5-1. Secondly, international NGOs that have presence in more than one Carpathian country were merged into one single entity, for example, WWF Danube-Carpathian Programme has offices in Vienna, Budapest, Bucharest and Lviv, the Carpathian Euroregion has national offices in all Carpathian Countries, Heifer International has presence in Austria and Ukraine, these were coded as, respectively WWF, Carpathian Euroregion and Heifer International.

[19] I have not included in my analysis meeting registration of other kinds of meetings, such as conferences, seminars and workshops.

[20] I have been requested by the Secretariat to keep individuals anonymous, which I have duly followed.

Table 5-1: Overview of umbrella nodes used for ministries.

Umbrella node	Topics included under the umbrella	Concrete examples
Environment	Environment, forestry, mining, climate change, sustainable development, water	Romanian Ministry of Environment and Climate Change, Romanian Ministry of Environment, Waters and Forests, Romanian Ministry of Environment
Agriculture (if separate from environment)	Agriculture, rural development	Ministry of Agriculture SK, Ministry of Agriculture and Rural Development SK
Tourism	Tourism, culture, national heritage	Polish Ministry of Sport and Tourism, Polish Ministry of Cultural and National Heritage, Polish Ministry of Culture
Transport	Transport, infrastructure development	Polish Ministry of Constructions, Polish Ministry of Transport, Construction and Maritime Economy, Polish Ministry of Infrastructure, Polish Ministry of Infrastructure and Development
Trade	Trade, development, economy	Romanian Ministry of Development, Public Works and Housing, Romanian Ministry of Economy, Trade and Relations with Business Environment, Romanian Ministry of Economy, Trade and Tourism, Romanian Ministry of Development and Public Administration
Education	Education, research	Romanian Ministry of Education and Research, Romanian Ministry of Education, Research, Youth and Sports
Parliament	Parliament, Senate	Polish Parliament, Polish Senate, Chancellery of the Sejm

Organizational characteristics (node attributes) relevant to the research question were recorded for the organizations. These are (1) the geographic scope of the organization's activities, (2) its thematic sector and (3) the type of the organization.

The geographic attributes of the organizations were not defined by the location of the organization, but the geographic scope of their activities. Geographic attributes were used as an indication of trans-boundary interactions, which by definition is foundational to regional regimes: (1) organizations acting in a single country were coded with the name of the country, (2) institutions of the European Union were coded as EU, and (3) organizations working in multiple countries were coded as "international".

The sectoral attributes of the organizations were based on the topics of the Carpathian Convention. This meant coding organizations along a total of 12+2 sectors in order to test for cross-sectoral interactions: (1) agriculture and rural development, (2) biological and landscape diversity, (3) climate change, (4) cultural heritage, (5) education and

awareness-raising, (6) environmental assessment and monitoring, (7) forests, (8) industry and energy, (9) spatial planning and development, (10) tourism, (11) transport and infrastructure, (12) water and river-basin management. Further two categories were added: (13) "general", which was used for those organizations that cover more than one topic of the Carpathian Convention; and (14) "other", which was used for those organizations that only cover topic(s) outside the scope of the Carpathian Convention.

For their organization type, organizations were coded into one of the following nine categories: (1) governmental bodies, such as ministries and national agencies, (2) local and regional governmental bodies, (3) national park and other protected area administrations, (4) local, national and international non-governmental organizations, (5) inter-governmental organizations, (6) UN agencies and bodies, (7) public and private academic and research organizations, (8) for-profit private sector actors, such as businesses and industries, including consultant companies and media outlets and (9) independent observers, consultants.

5.2.2.2 Limitations

As with nearly all kinds of data, the dataset I received from the Secretariat of the Carpathian Convention also contains some inconsistencies. Firstly, data were missing for 13 meetings, as shown in Table 5-2. Most missing meetings took place between the first and second conferences of the parties, which meant that it was not possible to analyse this time segment of the governance process. At the overall level, considering that I have data for 47 official meetings which represent 78.3% of all meetings, this limitation does not appear to be threatening the reliability of the findings.

Table 5-2: List of meetings for which I did not receive data (Source: Secretariat of the Carpathian Convention website).

Title of the meeting	Date of the meeting
First preparatory meeting to the First Conference of the parties	16 December 2005
Second preparatory meeting to the First Conference of the parties	11-12 September 2006
First meeting of the Working Group on Sustainable Transport	22-23 March 2007
First Meeting of the Working Group on Conservation and Sustainable Use of Biological and Landscape Diversity	25-27 March 2007
First Meeting of the Working Group on Sustainable Tourism	2-4 April 2007
First meeting of the Working Group on Sustainable Agriculture, Rural Development and Forestry	9-10 July 2007

Title of the meeting	Date of the meeting
Second meeting of the Working Group on Sustainable Agriculture, Rural Development and Forestry	9-10 July 2007
First Meeting of the Working Group on Cultural Heritage and Traditional Knowledge	27-28 August 2007
Second Meeting of the Working Group on Conservation and Sustainable Use of Biological and Landscape Diversity	19-20 November 2007
Second Meeting of the Working Group on Sustainable Industry, Energy, Transport and Infrastructure	11-12 December 2007
Carpathian Convention Implementation Committee Meeting	2-4 April 2008
Fourth meeting of the Working Group on Sustainable Forest Management	4-6 September 2013
Third Meeting of the Carpathian Convention Working Group on Adaptation to Climate Change	12-13 March 2014

Secondly, there were some meetings that did not indicate the presence of any delegates from the Secretariat, which is highly unlikely to be true. This inconsistency was manually corrected by adding a link with an edge weight of one between the meeting and the Secretariat. In total 8 links have been added manually to correct for this registration error in the original dataset for the following meetings: Implementation Committee meeting (2016), Working Group on Climate Change (2016), Fourth Conference of the Parties (2014), Working Group on Forests (June 2016), Working Group on Tourism (2008), Working Group on Transport (2012, February 2013, June 2013).

Thirdly, as discussed previously, the dataset is based on meeting registration, and not participation. Thus, it cannot be excluded that some people who registered were not present at the meeting. In fact, in one case where I participated as an observer, I witnessed registered participants not attending the meeting. It was not possible to correct for this limitation before the analysis; however, it has to be acknowledged that meeting affiliation network analysis *participation* data would be a better resource to rely on than meeting *registration* data (see Discussion section).

Fourthly, there were some individuals who, according to their registration, represent more than one organization. While coding the data, I noticed that they registered for some meetings under one and for other meetings under the name of their other organization. I have coded in my dataset the organization that the individual has named for the specific meeting, in case they named two organizations, then I only coded for the first one they listed.

Finally, after anonymising the individual level upon request of the Secretariat, the dataset only shows if there were registrations from the same organizations, the dataset is not coded to the level of individuals, but to the level of organizations. This means that the general limitations of inter-organizational network analysis apply (see for example (Provan, Fish, and Sydow 2007; Bergenholtz and Waldstrøm 2011)). Most importantly, the analysis cannot consider if there were the same two individuals who attended meetings together, whereas groups cannot directly relate to each other, only indirectly through individuals. The qualitative data analysis of interviews and participant observation that is discussed in the next chapter can fill in this analytical gap.

5.2.3 Data Analysis

5.2.3.1 Network Transformations

My analysis included three different representations of the organizational meeting affiliation network.

1. Aggregate network: all meetings and all organizations of the dataset combined into one bipartite network without considering the timing of the meetings.

2. Set of projections:[21] From the bipartite network, I created two different uni-partite network projections. The organization projection places a link between any two O-nodes that have registered to the same meeting. In my analysis, I applied a link weight threshold value of three, which means that in the organization projection, only those organizations are connected to each other that have registered to at least three meetings together. Applying such a threshold is a commonly used practice when researching social phenomena that require the development of strong ties between actors, such as trust, mutual understanding and shared knowledge (Borgatti and Halgin 2014).

The meeting projection has a link between those meetings that had at least one shared organization. Since the Secretariat is participating in every meeting of the Convention, its node was deleted before transforming the network. Otherwise, the analysis of the meeting projection network would have been impossible, as the projection would have resulted in a fully connected network.

[21] For these projections the bipartite network's links were binarized before the transformation, thus the projections do not consider how many delegates were registered from the same organization, only if there was anybody.

3. Sub-networks were defined by time-segments between conferences of the parties to allow the analysis of changes in the actors' network. Since the presidency of the Carpathian Convention shifts in a rotational manner at every COP, the time segments for the analysis were defined by presidencies. Segment 1 includes all meetings from COP2 to just before COP3,[22] Segment 2 starts with COP3 and ends just before COP4, and Segment 3 starts with COP4 and ends just before COP5.

5.2.3.2 Network Measures

Network measures, theories and their re-conceptualization for regime effectiveness are discussed in detail in the Conceptual Framework chapter. This section only looks at the specifics related to bipartite meeting affiliation network analysis.

The **size of the network** gives the numbers of both types of nodes: the organizational-nodes and the meeting-nodes, which tells us how many meetings took place and in total how many organizations registered to at least one meeting, and what the share is of nodes with different attributes.

Degree (degree centrality) of organization nodes is the number of meetings an organization has registered to. This is an indication of the organization's level of engagement in the governance process. Assuming that sending delegates to a meeting correlates with organizations' level of involvement,[23] the degree of organizations gives an indication of organizations' readiness to invest time and resources in the governance process. Comparing different organizations to each other by their degree centrality highlights those organizations that are more ready to (or can afford to) invest time and resources into the regime: a higher degree centrality indicates stronger commitment.[24]

Degree of meeting nodes expresses a slightly different characteristic: it shows the number of organizations registered at the event. When taking into consideration the weights of the links between meetings and organizations (**weighted degree** in network terms), which is defined by the number of delegates registered to the meeting; we can understand not only how many organizations were registered to the event, but how many individuals in total these organizations have sent.

[22] Since I had data for only two meetings between COP1 and COP2, I decided not to create a sub-network for this time segment, see Limitations section.

[23] Sending delegates is an expensive investment from human and financial resources perspectives, and it is an expression of interest in the process

[24] The current research did not control the data for the size and resources of organizations, which might impact their ability to participate in events.

Connectedness of the network is a measure that identifies if the nodes form one single connected network, or if the network is fragmented into two or more components. In terms of the governance network, this measure can highlight if there was any meeting that was attended by a separate group of organizations that have not registered to any other meeting.

The **weight of the links** in the organization projection tells us how many shared meetings each pair of actors registered to, or organizations' co-affiliation in other terms. From this perspective, link weight between pairs of nodes can identify those organizations that tend to attend meetings together and those that only rarely meet. Since usually, one single meeting is not enough to form trust between people and organizations (Borgatti and Halgin 2014), the link weight can be an indication of the likely stronger ties between organizations.

Meetings, in the current representation of the governance network, act as platforms for organizations to interact. Parallel to identifying organizations that are in a network position that makes them able to connect other organizations to each other as described in the previous paragraphs, analysing the network position of the meetings can show which events provided a platform for organizations to meet that otherwise would not have met. The meeting projection is created by projecting the aggregate network so that only meeting nodes are preserved, and links are placed between meeting that had at least one organization in common. The **weight of the links** in the meeting projection indicates the number of shared organizations. A low link weight between two meetings indicates that only a few organizations were in common, i.e. those two meetings were attended by nearly a distinct group of organizations. On the other hand, a high edge weight indicates that many organizations attended the same two meetings.

For all other network measures, please refer to Section 3.5 and Table 3-1, Table 3-2 and Table 3-3 of the Conceptual Framework chapter.

5.3 Findings

5.3.1 Origins of the Carpathian Convention

Regional regimes are claimed to benefit from the smaller number (Barrett 2005) and familiarity of actors (Haas 2016, Conca 2012), which can contribute to their

effectiveness. This first section reviews the processes that contributed to the signing of the Carpathian Convention.

5.3.1.1 Networks

In the 1990s, there were several trans-boundary networks in Carpathian countries, which lead to connections between people and organizations spanning national borders, different types of organizations and sectors. My interviews and scientific literature (Niewiadomski 2004, Fall 2007, Niewiadomski 2010, Gabarell 2014, Taggart-Hogge and Schoon 2016) highlighted five networks that significantly contributed to the establishment of the Carpathian Convention[25]: the Association of the Carpathian Protected Areas (ACANAP) that connected protected areas' administrative bodies, the Carpathian Euroregion that connected local and regional governments, the Carpathian Ecoregion Initiative (CERI) that united NGOs and scientists, the Northern Alliance for Sustainability (ANPED) that linked Carpathian NGOs with NGOs working in the northern hemisphere, and the East Carpathian Biosphere Reserve (ECBR) which was a tri-lateral protected site under UNESCO's Man and Biosphere Programme (for a more detailed description of these organizations, see Section 4.2.1.4 and Table 5-3).

These networks (see Table 5-3) were operating in several, if not all, Carpathian countries and were aiming to create networks to enable knowledge exchange and capacity building. They were platforms for individuals to get to know each other, and they also nurtured the culture of cross-border and cross-disciplinary cooperation. For example, under CERI, actors developed joint scientific reports, under ACANAP and the ECBR they had shared approaches to developing protected area management plans. These organizations also provided capacity building on methodological issues (ACANAP, CERI), project management skills (CERI, Carpathian Euroregion) or intergovernmental processes (ANPED, CERI). It is very likely that these trans-boundary networks formed the basis of what Conca (2012) calls "familiarity" of actors in regional regimes.

[25] Obviously, many more non-governmental organizations and transboundary networks were emerging and active in the Carpathian region during the 1990s and early 2000s, for an overview see (Zimmer and Priller 2004).

Table 5-3: Overview of network organizations.

Name	Year of founding and current form of existence	Sector(s) involved in the network	Countries involved	Mission
Association of the Carpathian Protected Areas (ACANAP)	1991, its current subsidiary is the Carpathian Network of Protected Areas, (CNPA)	Protected areas	Slovakia, Ukraine, Hungary and Romania	"The goal of this organisation was to bring together administrations of national parks, reserves and other protected areas to develop on principles of common interest of nature protection of Carpathian Mountains" (Niewiadomski 2010, 18)
Carpathian Ecoregion Initiative (CERI)	1999, currently inactive	NGOs and scientists	Czech Republic, Hungary, Poland, Romania, Slovakia and Ukraine; Serbia joining only at a later stage	"The Carpathian Ecoregion Initiative, 'CERI' is an international network of NGOs and research institutes from seven Carpathian countries […] dedicated to the protection of this internationally important nature area. The Initiative was created in 1999 to take a complex, multidisciplinary ecoregional approach to conservation of the Carpathian mountain range […] ." (UNECE 2004)
Carpathian Euroregion	1993 - still existing	Local and regional administrative units	Poland, Ukraine, Slovakia, Hungary and since 2000 also Romania	"The mission of the Carpathian Euroregion is to improve the quality of life, to preserve the peace, to form good relationships between the people in the border area, to reduce the dividing function of the border and to ensure the permeability of the border" (Benč, et al. 2015, 17)
Northern Alliance for Sustainability (ANPED)	1991, merged into the European Environmental Bureau in 2014	Carpathian and non-Carpathian NGOs	Countries of the northern hemisphere, including Carpathian countries	"[ANPED's] mission [is] to empower Northern civil society through capacity development, exchanges and sharing of knowledge. […] Our goal is to promote fair and equitable sustainable development for all with respect for the limits of our common ecological and social capital." (Northern Alliance for Sustainability 2011)
East Carpathian Biosphere Reserve	1992-, still existing	Certain protected areas	Poland, Slovakia and Ukraine	"The East Carpathians Biosphere Reserve is a transboundary mountain reserve located in Central Europe that encompasses areas of significant value for biodiversity conservation." (UNESCO 2016)

5.3.1.2 Shared Motivations

Another element of Conca's hypothesis (2012) is that actors of regional regimes have shared problems and shared motivations. In the case of the Carpathian Convention's actors, these motivations varied as demonstrated in Box 5-2, but all actors saw the creation of a multilateral environmental agreement (MEA) for the Carpathian Mountains as the path to fulfilling their own objectives. As Frits Schlingemann, who was the

director of UNEP's Regional Office for Europe at that time, put it: "people saw their own possibilities and their own advantages [in setting up the Carpathian Convention]". Parties were motivated to set up a multilateral agreement for the Carpathians because they hoped it would help them to implement EU legislation, to safeguard their shared heritage, to solve shared problems and to make it easier to access funds for joint projects. NGOs were also pushing for the setting up of the intergovernmental process because they also saw it as a tool to protect the Carpathians and to allow them to receive project funds. UNEP also had its own motivations to get engaged in the Carpathian process, beyond their usual role as facilitator: this was their chance to translate the Alpine model to mountain governance and to develop a convention that takes a holistic approach to sustainable development. Although the actors had different motivations to push for or join the process that led to the birth of the Carpathian Convention, they all saw this intergovernmental process as a path that contributes to their own objectives.

Box 5-2: Actors' motivations for setting up the Carpathian Convention.

Implementing EU legislation: In the mid-1990s EU accession negotiations formally started between the five Carpathian countries and the European Union. First Hungary and Poland started its negotiations in 1994, and soon after Romania, Slovakia and the Czech Republic in 1995[26]. The start of the EU accession also galvanised the emergence of the Carpathian Convention. For countries in negotiations with the EU, the emerging Carpathian Convention process was seen as a tool to assist in the adoption of EU legislation. However, the start of the accession process pushed also the non-accession countries towards the Carpathian Convention, albeit for a different reason. In my interviews, it has been highlighted, specifically for Ukraine, that it wanted to have some kind of arrangement with its "new" neighbours. The "new-EU", and the Carpathian Convention seemed an excellent tool for this - which is, in fact, one of the achievements of the Convention, as discussed in Chapter 7.

Protecting their common heritage and solving shared problems: The Carpathian countries share the ecosystems of the Carpathian Mountains and preserving their unique cultural, and natural heritage was seen as one reason to start developing the Carpathian Convention. Both NGOs and parties have recalled that the desire to save the common heritage has been pushing them towards the establishment of the Convention, as illustrated in the two quotes below:

> *[The Carpathian Convention] was seen partly as an instrument to implement the EU legislation, but also as something to preserve the unique heritage that exists in the Carpathians for various regions: the Iron Curtain, the underdevelopment, the political boundaries, and also the weaker economic pressures on the environment. I think there was the bottom-up drive to maintain the unique character of the Carpathians. (Interview with Jan Dusik, currently Director of UNEP's Regional Office for Europe, who was working for the International Relations Directorate of the Ministry of Environment of the Czech Republic during the late 1990s and early 2000s)*
>
> *One of the reasons to form the Carpathian Convention was to say: 'Okay, we are an insider club of seven countries which know exactly what we want. And we want two things, we want to protect what we have, and we want to sustainably develop it.' (Interview with Michael Meyer, head of NGO Ecological Tourism in Europe (ETE))*

The Carpathian countries were facing similar problems, and some of these problems seemed more natural to solve with combining their forces. So, beyond "maintaining the unique character of the Carpathians", there was another motivation of parties to develop a joint multilateral agreement for the Carpathian Mountains to "solve regional problems" as a ministerial focal person for the Convention (national focal point) has put it in my interview. We can thus see that the Carpathian Convention was perceived on the one hand as a tool to preserve the Carpathian Mountain's social and ecological heritage, and on the other hand as a tool that can help parties to overcome their shared regional problems.

[26] EU accession negotiations started with Serbia in 2009 and are still ongoing. Ukraine signed the its Association Agreement with the European Union in 2013, which gives the framework for cooperation between the two entities.

Shared projects and access to funding: Solving problems, on the other hand, demands action and investment from actors. The Carpathian Convention seemed to promise these as well by allowing actors to better access funds for joint projects. When I asked about the original drivers behind the Convention, one national focal point summarized the case as follows:

> *I think rather the countries wanted to solve the regional problems and thought that this instrument would help them to do it and to access money for projects. To have money for projects was something behind it. The idea was that if we combine our forces, it would be much easier [to access funds] and also, of course, it would be better for nature protection. (Interview with a national focal point)*

The motivating factor of shared projects and easier access to funds was shared by many people, especially from NGOs and government bodies. The underlying assumption was that at EU level when competing for funding the fact that several countries submit a joint project can have a competitive advantage, especially if the project is fitting into a broader strategic framework agreed by the countries. It is important to note, as we will see in later chapters, that this is the case even today. For many actors, the relevance of the Carpathian Convention is still about having projects and access to funding (discussed in Chapter 6).

Creating the perfect sustainable development convention: UNEP got engaged with the Carpathian Convention during its very early phases when they were invited by Ukraine in 2001 to facilitate the negotiations between countries. UNEP had its own interest also in getting involved in the process being the global centre of environmental diplomacy and intensively preparing for the International Year of the Mountain. On the one hand, it was an opportunity for them to distribute the Alpine Convention's model to mountain governance, especially in the years around the International Year of Mountains. On the other hand, it was a chance to develop and put into practice a convention that is not only environmental but takes a holistic approach to sustainable development.

In fact, UNEP's engagement in the Carpathian process turned out to be so strong, that it was seen as the driver behind the whole idea by several of my interviewees. Frits Schlingemann who was at that time (1996-2009) Director of UNEP's Regional Office for Europe, acknowledged the important role he personally played in the establishment of the Carpathian Convention: "I created it […] you asked me, how this initiative started, well we started it from my office" (personal interview).

5.3.1.3 The process

The fall of the Iron Curtain created a momentum that fuelled the growth of non-governmental trans-boundary networks and turned the countries towards each other and towards the west. At the same time, the International Year of Mountains focused international attention on mountain issues. A pivotal moment was definitely the Bucharest Summit organized by Romania and WWF, where the Carpathian Ecoregion's report on the Status of the Carpathians was presented, and where heads of states agreed that they want to start an intergovernmental process. Ukraine then took the initiative forward since it was agreed that the to-be MEA would be signed in Kyiv, and also because it had strong motivation to have multiple ties to its neighbours that were joining the EU. Ukraine invited UNEP to facilitate the process, and UNEP, seeing that there is interest in the Carpathians for a mountain related MEA, agreed to facilitate the process, especially since it was the International Year of Mountains. The Alpine Convention was a perfect role model for the Carpathians and the Alpine countries were ready to come on board and assist policy translation very early in the process. According to my interview with Marco Onida (former Secretary General of the Alpine Convention), some Alpine countries participated with an open heart, whereas others wanted to ensure they get their foot in the door and access future opportunities that an intergovernmental agreement might offer (such a access to project funds, opportunities

for consultancy work). In the end, in two years' time, the negotiations of the Carpathian Convention were concluded, and the new governance tool was signed by the seven Carpathian countries in 2003.

5.3.2 Evolution of the Network

After reviewing the origins of the Carpathian Convention, this section looks into how the network of actors evolved between the first and fifth sessions of the Conference of the Parties.

5.3.2.1 Overview of the Three Sub-Networks

This section analyses the evolution of the Carpathian Convention's social network through three time segments. I segmented the meeting affiliation network into four sub-networks defined by time periods between sessions of the Conferences of the Parties (COPs)[27]. The three sub-networks are Segment 1: COP2 (June 2008) to CCIC of January 2011; Segment 2: COP3 (May 2011) to Tourism Working Group meeting in May 2014, and finally Segment 3: COP4 (September 2014) to CCIC in November 2016.[28]

There is a significant difference between the number of meeting nodes in each sub-network. Whereas during Segment 1 and Segment 3, respectively, 12 and 11 meetings took place; there were nearly double of this amount (21 meetings) between COPs 3 and 4 (Segment 2). While the number of organizations registering to at least one meeting exhibits a smaller fluctuation (118, 150 and 144 respectively for the three segments).

[27] I used COPs as the starting point of each sub-network because that is the moment when the presidency of the Carpathian Convention changes. The incoming presidency country already hosts the COP and chairs the Convention in the next years until the next COP. During its presidency period, and after agreement with the other parties, a country can push its own agenda under the Carpathian Convention, usually in line with the presidency holder's other national priorities. For example, as discussed in more detail in the next chapter, the Czech presidency was pushing for resolving the conflict between transport development and large carnivores, and Hungary decided to take steps on education for sustainable development.

[28] For the time period between COP1 and COP2 I only received data for the conference of the parties and one other working group, so this time period was left out of the analysis.

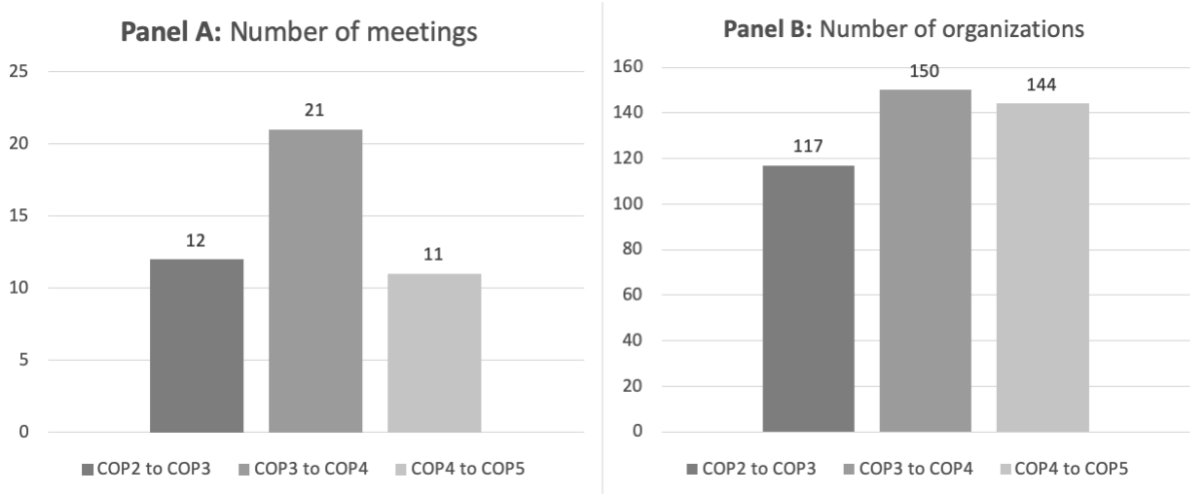

Figure 5-1: Number of meetings (Panel A) and organizations (Panel B) in the three segments.

All three networks consist of a single connected component, even after the deletion of the Secretariat of the Carpathian Convention. Thus, even in these time segments, there was no meeting that was attended by an isolated group of organizations.

The links of the meeting projections show which meetings were the strongest network-building events: connecting the largest number of organizations. During Segment 2 (COP 3 to COP 4) there were 27 pairs of meetings where (besides the Secretariat) only one other organization was shared. This number is much lower for the other two time periods: 1 and 4 meetings (see Table 5-4). We know that between COP 3 and COP 4 there were 20 meetings, whereas there was only half of this number in the other two time segments. Knowing that the "additional" meetings in this segment are not annual CCIC meetings, but working group meetings, this tells that the working group meetings are attended by somewhat isolated groups of organizations. This is also underlined by the fact that after the deletion of the general meetings (COPs, CCICs and Bureaus) the density of the network declines.

Table 5-4: Overview of meeting projections.

	Segment 1 **COP 2 to 3**	**Segment 2** **COP 3 to 4**	**Segment 3** **COP 4 to 5**
Network density	1	0.98	0.945
Lowest link weight	1 (1 occasion)	1 (27 occasions)	1 (4 occasions)
Highest link weight	18	22	22
Most organizations shared between	COP and CCICs	Climate WG and COP Different CCICs Different Transport WGs	COP and CCIC Different CCICs COP and Tourism WG

The organization projection shows which organizations registered jointly to meetings (co-affiliation). Density of the organization projections varies between 0.37 for Segment 2, 0.55 for Segment 1 and 0.57 for Segment 3 (see Table 5-5). This means that in the timespan between COPs 3 and 4 when most of the meetings took place, only 37% of organizations had the chance to meet; compared to over 50% for the other two time periods.

Table 5-5: Density of organization projections.

	Segment 1 COP 2 to 3	**Segment 2 COP 3 to 4**	**Segment 3 COP 4 to 5**
All links	0.56	0.37	0.57 (denser)
Links with a weight of three or more	0.61 (denser)	0.41 (denser)	0.38

Keeping only those links that have a weight of three or above, the density of the networks changes, see Table 5-5. As we can see in Segments 1 and 2, the density of the network that only includes actors that co-registered at least three times (link weight 3+) is higher than that of the original one. This indicates that there is likely a group of organizations that have attended a larger number of meetings together and thus are likely to have gotten to know each other. In Segment 3, however, the opposite is happening: the density of the modified network is smaller. This indicates that there are two or more communities among the organizations that tend to attend different types of meetings together.

Centrality measures identify nodes in critical positions. Closeness centrality identifies the connectors of the network, or from another perspective, the independent actors that can reach the largest number of other actors without intermediaries. Betweenness centrality looks at how many times a path connecting any two nodes in the network crosses the node in question. This reflects a network position of the node that can enable it to connect (or block connections between) nodes or parts of the network. The top 10 organizations with the highest closeness and betweenness centrality scores are shown in Table 5-6. Cells with a grey background show those organizations that had one of the top 10 betweenness and closeness centrality scores in the respective Segments.

Table 5-6: Changes in central organizations in the three segments.

	Betweenness			Closeness		
Name of organizations	**Segment 1**	**Segment 2**	**Segment 3**	**Segment 1**	**Segment 2**	**Segment 3**
Carpathian Euroregion NGO						
CZ Environmental Ministry						
EcoResource NGO						
ETE NGO						
EURAC at SSC						
Green Dossier NGO						
HU Environmental Ministry						
Hungarian Academy of Sciences						
PL Environmental Ministry						
RO Environmental Ministry						
RS Environmental Ministry						
Secretariat of the Carpathian Convention						
SK Environmental Ministry						
SK Transport Ministry						
Slovak State Nature Conservancy						
UA Environmental Ministry						
WWF						

As we can see, there are a couple of organizations that had a central network position[29] in all of the three time-segments: environmental ministries of Hungary, Poland and Romania, the Secretariat of the Carpathian Convention and WWF. Other organizations show emerging (Carpathian Euroregion, Slovakian transport ministry), declining (environmental ministry of the Czech Republic, Green Dossier, Slovakian environmental ministry) or fluctuating (Slovak State Nature Conservancy, Ukrainian environmental ministry) characteristics.

Geographic diversity: Figure 5-2 shows counts of organizations from different territories. As discussed in the previous section, at the aggregate level, most organizations are coming from the international level. This holds true for the second and third time segment, however not for the first time period, when during the Romanian Presidency of the Carpathian Convention the Romanian organizations (26 organizations) outnumbered international ones (23 organizations). It also has to be noted, that while in the first time segment the share of organizations from different parties was quite uneven, during the third time segment this became somewhat evenly distributed, except for Serbian organizations which are still falling behind the other countries.

[29] The network position only highlights organizations that are best placed in the network to become leaders; however, it does not tell us if they are using their network position for leadership, and if so, how they are doing this.

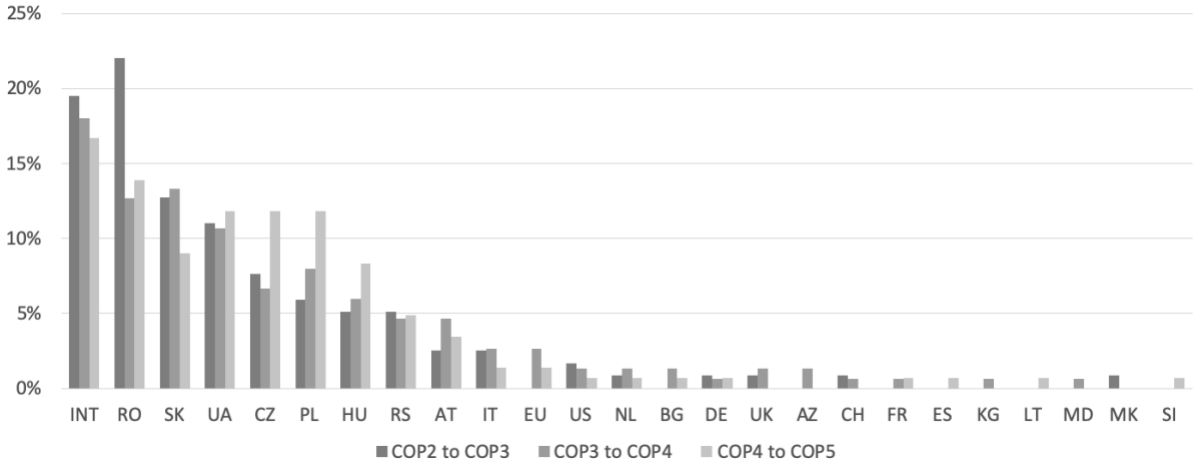

Figure 5-2: Distribution of countries represented by organizations.

Notes to figure: Countries are represented by their two-letter ISO codes and are listed in the order of a total number of organizations. The total number of organizations in the respective segment is taken as 100%.

Sectoral diversity: Organizations acting in more than one topic of the Carpathian Convention (coded as "general") are strongly dominating all of the three time-segments, these groups made up 35-44% of organizations (see Figure 5-3 and Figure 5-4). The share of organizations focusing on a specific sector (such as biodiversity, tourism, forestry, education) increase and decrease slightly in the three sub-networks, in line with the kinds of working groups that were organised. We can observe that the share of education-focused organizations significantly dropped after the first time segment, while biodiversity and tourism organizations' share increased.

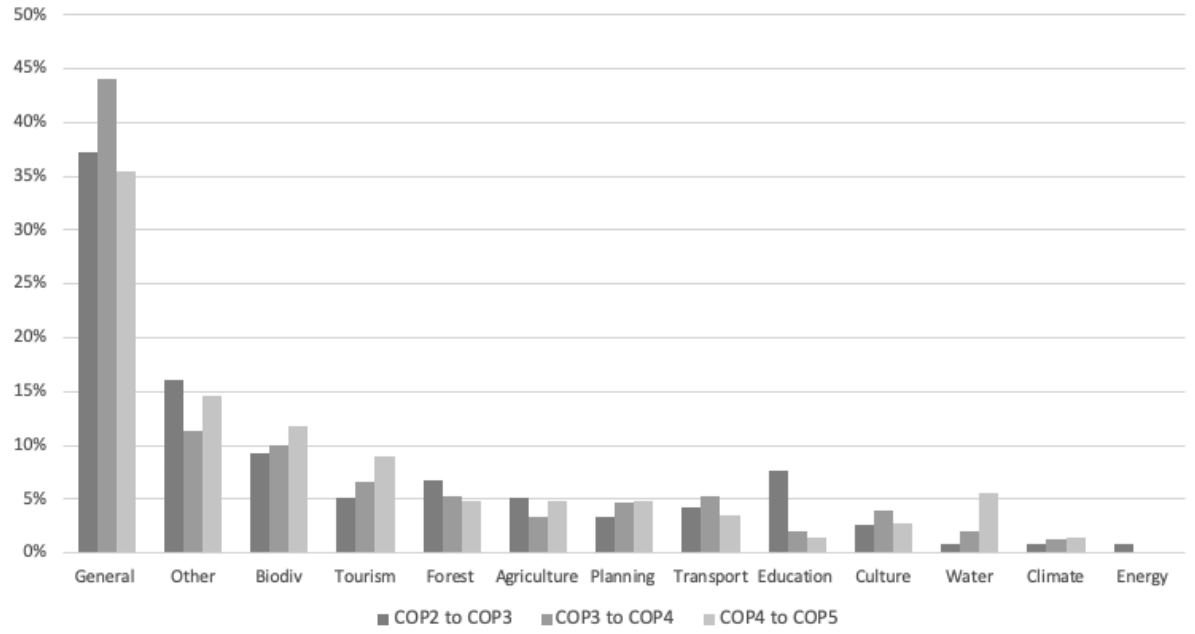

Figure 5-3: Distribution of sectors represented by the organizations.

Notes to figure: The panel clusters organizations by sectors in each time-segment. The total number of organizations in the respective segment was taken as 100%.

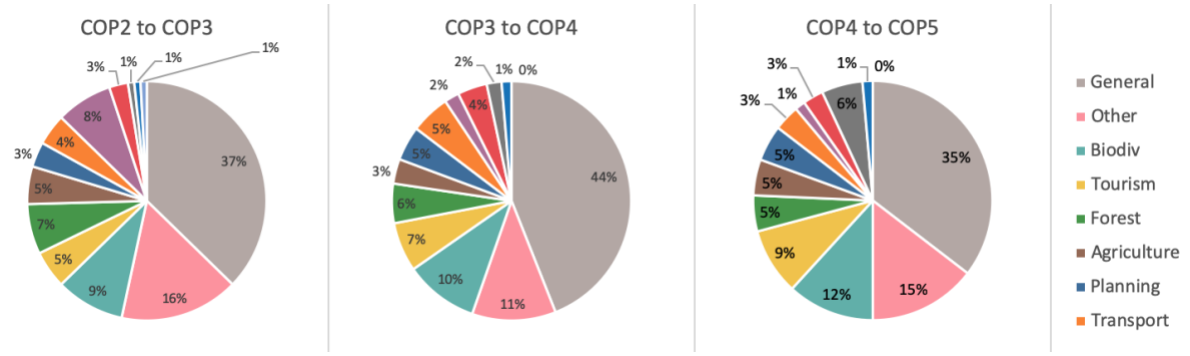

Figure 5-4: Share of sectors represented by organizations.

Notes to figure: The panel compares share of organizations from different sectors in the three segments. The total number of organizations in the respective segment was taken as 100%.

Types of organizations: All eight types of organizations were represented during each of the three time-periods, though their shares have changed somewhat. The governmental and the NGO sector took the largest shares in all three time-segments, followed by academic institutions. As we can see in Figure 5-5 and Figure 5-6, during the second time segment the share of NGOs and academic institutions was nearly the same (23% and 20% respectively), whereas in the other time segments nearly twice as many organizations came from the NGO sector than the academic sector. Taking governmental bodies, NGOs and academic organizations together, these three types of organizations made up more than 75% of participants in all three segments. Businesses, local governments and protected area administrations were represented by a significantly smaller number of organizations (less than 10% of registrations). The relative share of UN delegates decreased in each time segment (6%, 5% and 3% respectively).

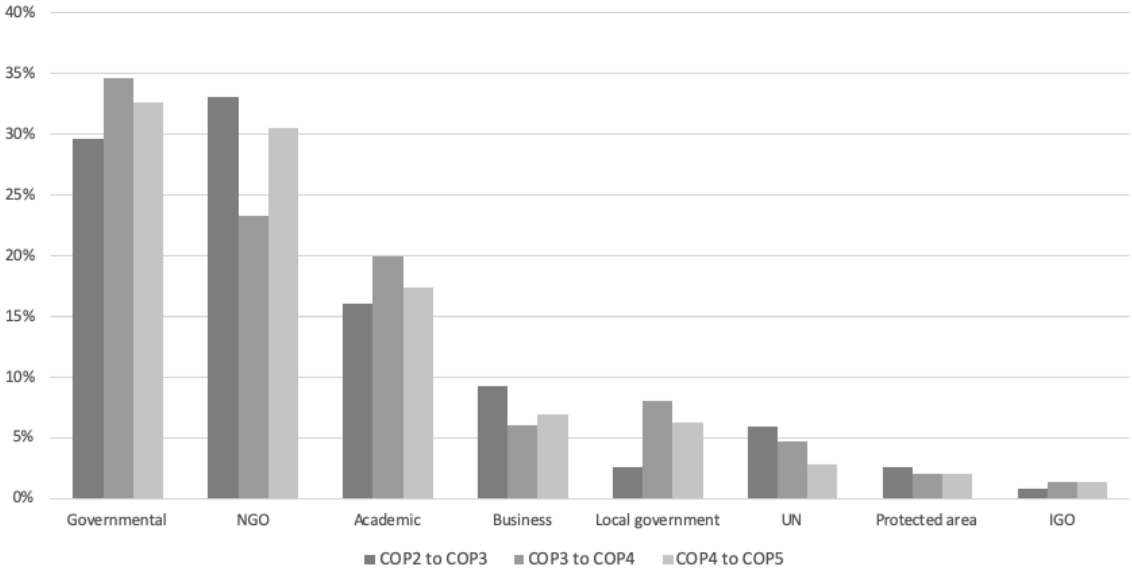

Figure 5-5: Distribution of types of organizations in the three time segments.

Notes to figure: The panel clusters types organizations in each time-segment. The total number of organizations in the respective segment was taken as 100%.

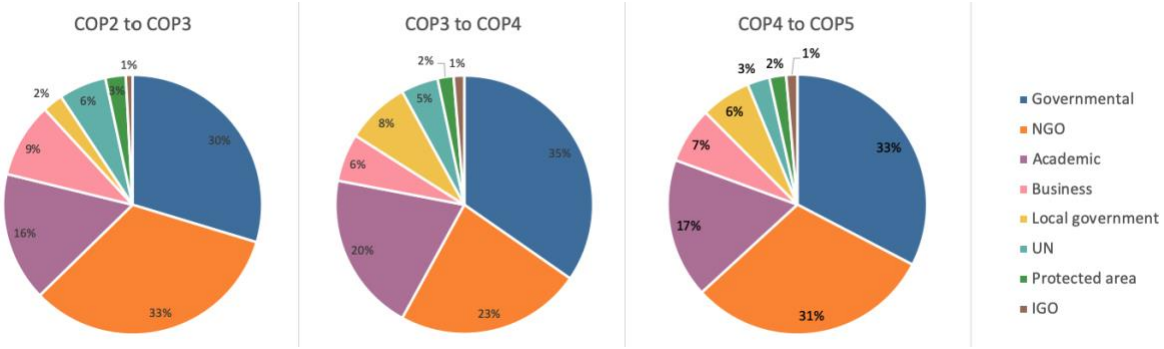

Figure 5-6: Share of different types of organizations in the three time segments.

Notes to figure: The panel compares share of different types of organizations in the three segments. The total number of organizations in the respective segment was taken as 100%.

5.3.2.2 Structure and Key Positions

The network of the Carpathian Convention's actors exhibits a gradual evolution. The differences in the numbers of meetings and organizations reflect changes in the work plan and resources of the parties and secretariat. During the second segment between COP 3 and COP 4, the Slovakian presidency hosted a larger number of meetings and thus attracted a larger number of organizations than the other two presidencies in the analysis. Parallel to this, we see slight fluctuations in the share of organizations from different sectors and types. On the other hand, the organizations with the highest closeness centrality and betweenness centrality do not change substantially: the Secretariat, the parties' environmental ministries, the Slovak State Nature Conservancy, WWF, Green Dossier and the Carpathian Euroregion are among the top 10 in practically all sub-networks.

The main difference that the network analysis highlighted concerns the structure of the network, which changed considerably in the observed three time periods. In the first time period the network had a clear core-periphery structure (Panel A of Figure 5-7), which changed into an atypical structure for the second segment, and then evolved into a structure with two communities and couple bridging organizations (Secretariat, WWF and environmental ministries of Czech Republic, Hungary, Romania, Serbia and Ukraine), see Panel B of Figure 5-7.

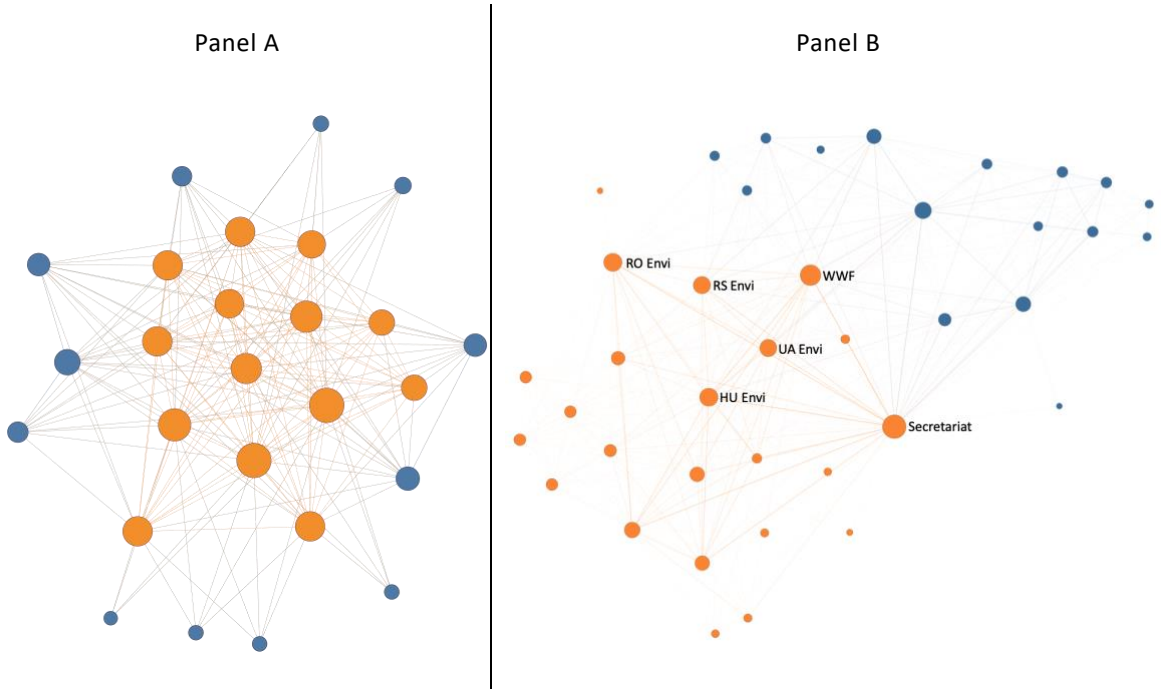

Figure 5-7: Network structure of Segment 1 (Panel A) and Segment 3 (Panel B).

Notes to figure: The left panel depicts the core-periphery network structure of the organization projection of the first time segment. Core nodes are coloured green, and periphery nodes are coloured pink, nodes are sized according to their degree. The right panel depicts the two communities of the third time segment. Communities were generated with the Louvain modularity detection methodology (Blondel et al. 2008a). Nodes are sized according to their degree.

What the network analysis indicates is that the Carpathian Convention's actors' social network started to evolve from a more general "all-hands-on-the-deck" approach, possibly originating in the "familiarity" of actors with each other, to a more specialized topic-based working group system. However, if this trend continues, then it can affect the regime outcomes, since theoretically there can be a risk of the network breaking into several components. Having observed the actors over five years this risk can be considered minimal. The observed changes in the structure are more likely to be due to specialized work taking place in working groups which necessitates specialist participation.

5.3.3 Aggregate Network

The third section of this empirical chapter combines all meeting affiliation network data into a single network and discusses the characteristics of this aggregate network focusing on the four pillars of regime effectiveness: shared knowledge generation, social cohesion, leadership and power and inclusivity.

5.3.3.1 Overview of the Network

The dataset, as described in the data collection section, included meeting registration data for 47 meetings (number of M-nodes). In total, there were 346 organizations (number of O-nodes) that sent at least one delegate to at least one meeting. On average, calculating from the average link weight, organizations send 1.5 delegates to each meeting; ranging between 11-12 for a presidency holder country at a COP, to 850 instances of single delegates registering to a meeting. By far the COPs have received the most participants (weighted degree) ranging between 134 for COP1 and 188 for COP4. The smallest meetings were specific working group meetings and Bureau meetings, see Table 5-7.

Table 5-7: Degree and weighted degree of top 10 and bottom 10 M-nodes.

Name of event	Year of event	Number of organizations (degree)	Number of delegates (Weighted Degree)
COP 4	2014	100	188
COP 5	2017	95	163
COP 1	2006	84	134
COP 2	2008	79	144
COP 3	2011	75	154
WG on Tourism	2008	40	46
WG on Climate Change	2012	33	44
Implementation Committee meeting	2015	29	34
Implementation Committee meeting	2010	28	38
WG on Climate Change	2014	26	32
WG on Biodiversity and WG on Spatial Planning	2014	26	32
Implementation Committee meeting	2016	26	33
…	…	…	…
WG on Biodiversity	2010	13	19
WG on Biodiversity	2012	13	20
WG Cultural Heritage and Traditional Knowledge	2013	12	14
WG Cultural Heritage and Traditional Knowledge	2014	12	14
WG on Climate Change	2016	12	14
WG on Sustainable Forest Management	2013	12	16
WG on Biodiversity	2010	12	17
WG on Biodiversity	2009	11	17
WG Cultural Heritage and Traditional Knowledge	2013	10	14
Bureau meeting	2009	8	13

The aggregate meeting affiliation network forms a single connected component. This means that there is no meeting that has been attended by an isolated group of organizations that have not registered to any other meeting, see Figure 5-8.

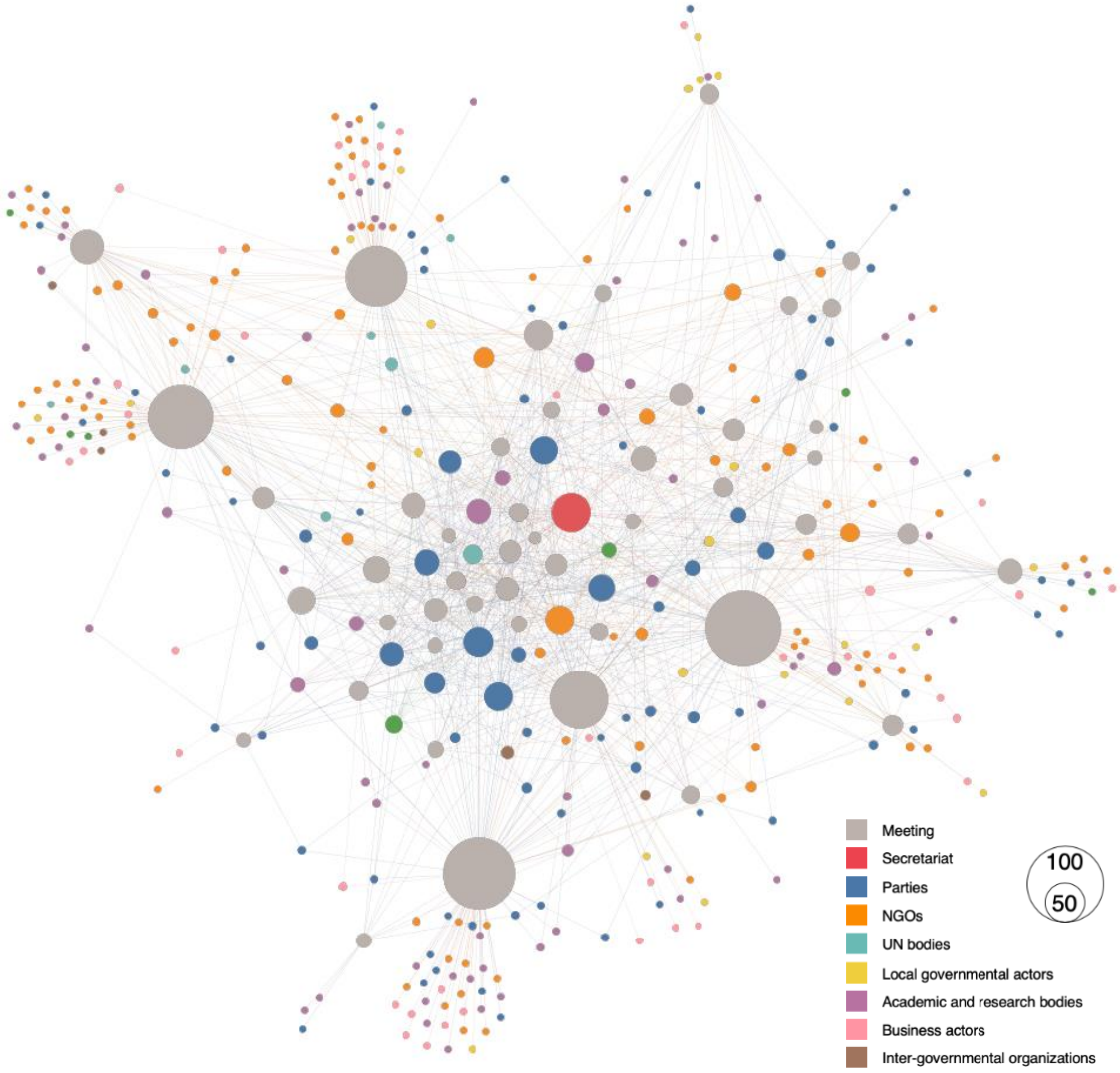

Figure 5-8: Aggregate meeting affiliation network of the Carpathian Convention (COP 1 to COP 5).

Notes to figure: The size of the nodes correlates to their degree. Meetings are coloured grey; organization nodes are coloured according to the organizations' societal sector. Layout created by Gephi's Force Atlas 2 Algorithm.

Figure 5-8 shows that the network-weaving events were not the conferences of the parties, but CCIC and working group meetings - which are placed by the Force Atlas 2 algorithm (Jacomy et al. 2014) to the centre of the figure.[30] This observation is supported by the analysis of the meeting projection: most commonly meetings share two, three or four organizations further to the Secretariat (146, 136, 118 instances, respectively). The largest overlap in attending organizations is between different COPs,[31] and COPs and CCIC meetings. The least overlapping events (lowest link weight between

[30] Force Atlas 2 is a force-directed layout algorithm. Force Atlas 2 turns structural properties of the network into a visual map (Jacomy et al. 2014).

[31] The conferences of the parties are by far the largest events, with an average of 156.6 participants.

pairs of nodes) are the different working group meetings, which in several cases share only the Secretariat.

The network of the organization (organization projection of the meeting affiliation network keeping only those organizations that have co-attended at least three meetings) has a core-periphery network structure.[32] The core of the network has 19 nodes: the Secretariat of the Carpathian Convention, environmental ministries of all the seven parties, Poland's ministry responsible for tourism, Slovakia's ministry responsible for transport, Ukraine's Ministry of Foreign Affairs, the Slovak State Nature Conservancy, the Secretariat of the Alpine Convention[33], UNEP's Regional Office for Europe, EURAC Research, the Carpathian Euroregion, and NGOs Ecological Tourism in Europe, Green Dossier and WWF. These nodes form a fully connected cluster, see Figure 5-9.

Periphery nodes were identified by having a clustering coefficient of 1, meaning that all of their partners are also connected to each other; and betweenness centrality of 0, meaning that no shortest paths run through them. There are 35 organizations on the periphery of the network, including governmental bodies, national and international NGOs, academic institutions, businesses and local governmental actors. These organizations only connect to nodes in the core of the network.

[32] A core-periphery meeting consisting of a "core" formed by nodes densely connected to each other, and a "periphery" in which the nodes connect to nodes in the core and not to each other in the periphery (Csermely et al. 2013)

[33] Convention on the Protection of the Alps (Salzburg, 1991)

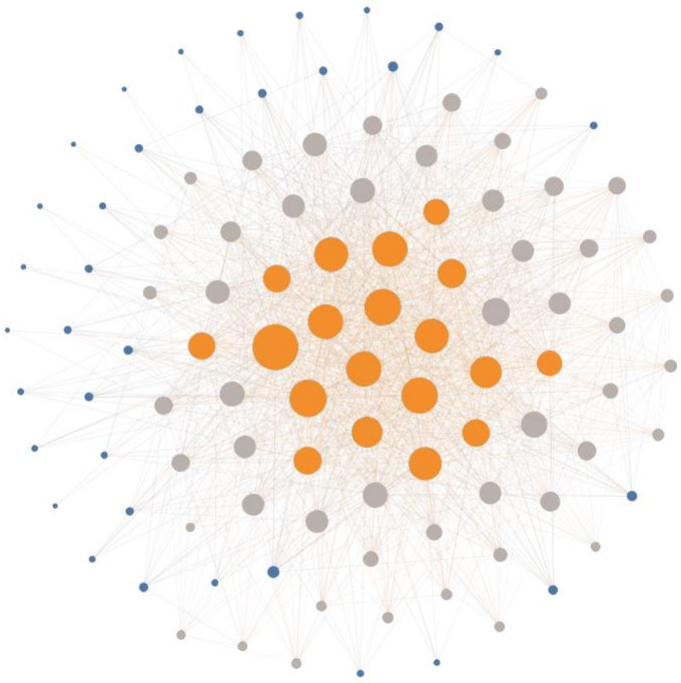

Figure 5-9: Core-periphery structure of the organization projection network.

Notes to figure: orange nodes are the core, and blue nodes are the periphery. Nodes are sized according to their degree; the layout is produced by Gephi's Fruchterman Reingold algorithm (Fruchterman and Reingold 1991).

5.3.3.2 Shared Knowledge Generation

Shared knowledge generation is seen as one contributor to effective outcomes of regimes. Shared knowledge generation from a social network perspective has two sides one is *shared knowledge,* and the other is *knowledge generation.* These two sides elucidate different network characteristics. Shared knowledge is about being able to share, and thus necessitates a dense, connected, not fragmented network structure, similar to social cohesion (as discussed in the next section).

Knowledge generation (especially for adaptation, which is the main reason for knowledge generation to be part of regime effectiveness) requires a network structure that has bridges between social actors accessing different kinds of information. As described in the previous section, the organization-projection of the aggregate affiliation network has a core-periphery structure consisting of a densely connected core and periphery nodes that only connect to the core but not to each other (see Figure 5-9). It was also discussed, based on the meeting-projection, that the network-weaving events were COPs, CCIC meetings and certain (but not all) working group meetings. Some working group meetings happened in near isolation, with the

Secretariat being the only node connecting them[34]: forestry, transport, climate change and tourism working groups were followed only by experts of the relevant topic, and not by the generalist focal points forming the core of the network.

Lu, Singh, and Sun (2017) suggest that a core-periphery network structure can hinder knowledge sharing, especially for actors occupying periphery positions, who are in a disadvantageous situation. Actors positioned on the periphery only connect to core nodes. However, core actors are more likely to respond to questions coming from other core actors than periphery actors. Thus periphery actors are left without answers, even though, according to Granovetter's Strength of Weak Ties theory (Granovetter 1973), it very well could be these nodes that hold new information (and other resources) that the core actors cannot access.

5.3.3.3 Social Cohesion

Social cohesion is defined as a feature of an actors' network contributing positively to regime effectiveness, which (as discussed in the Conceptual Framework chapter) has very direct network imprints. Social cohesion necessitates a closed and dense network.

In a meeting affiliation network, meetings are conceptualized as the venues where actors can form ties. The meeting projection shows that the "bonding" events were meetings of the implementation committee (CCIC) and certain, but not all working group meetings. The organization projection (keeping only those organizations that had the chance to meet at least three times) has 104 nodes and a density of 0.30, indicating a relatively loose social network. Link weights, in the organization projection, express the number of times the two organizations have met at meetings, or in other words, co-affiliation. We know that the more opportunities to meet indicate a stronger chance of establishing a relationship (albeit this dataset and analysis do not have details about the quality of the relationship). Link weights in the organization projection range between 34 and 3[35]. The node pairs with the highest edge weights (20 or above) include the Secretariat, the parties' environmental ministries, WWF, EURAC at the Secretariat, the Slovak State Nature Conservancy and Green Dossier. These network measures support the findings of the previous paragraphs that there is a densely connected core. Nodes

[34] The most "isolated" working group meeting based on the nodes' degree, and weighted degree, was the climate change working group in 2016. The other less network-weaving events were the cultural heritage working group in 2014, the transport working group in February 2013, the Tourism working group in 2016, the transport working group in 2012, the SARD working group in 2016, the cultural heritage working group in May 2013, and the two forest working group meetings in 2013 (June and September).

[35] Links with an edge weight below 3 were deleted, resulting in the deletion of 242 nodes, see methodology.

that are all connecting to each other and are thus likely to have strong social cohesion.

5.3.3.4 Leadership and Power Structures

Network analysis is able to highlight nodes that are placed in network positions that would be beneficial for leaders: such being connected to most actors (degree centrality), being close to other actors (closeness centrality), being on the paths connecting actors to each other (betweenness centrality).

- Degree centrality shows the most active organizations. These were the Secretariat, the environmental ministries of the parties (albeit at different levels of engagement, their degrees range between 21 and 34), WWF, the Slovak State Nature Conservancy, EURAC staff seconded to the Secretariat, EURAC researchers from Italy, Green Dossier, UNEP's Regional Office for Europe, the Carpathian Euroregion and Piatra Craiului National Park Administration[36]. These organisations registered to at least 33% of the meetings. On the other side, there are 190 nodes in the network with a degree of 1: these are those organizations attended one single event under the Carpathian Convention, most commonly one session of the Conference of the Parties. At the network-level of the organization projection, degree centralization is 0.087, which on the 0 to 1 range of centralization is rather low.
- Closeness centrality is related to the independence of organizations by showing their ability to reach other actors in the network without intermediaries. The organizations positioned closest to all other organisations in the network are the Secretariat, WWF, environmental ministries of the parties except for Slovakia and Ukraine, EURAC researchers from Italy, Green Dossier and the Slovak State Nature Conservancy. At the network-level of the organization-projection, closeness centralization is 0.245, which shows a somewhat higher concentration of ties than degree centrality.
- Betweenness centrality indicates potential control: The Secretariat's normalized betweenness centrality is by far the highest, which means that it lies on the largest number of shortest paths between other nodes. The next ones in a connecting structural position are the environmental ministry of Hungary, Czech Republic and Poland, WWF and EURAC Research Italy. Betweenness

[36] The Piatra Craiului Mountains are a mountain range in the Southern Carpathians in Romania. The National Park was funded in 1990.

centralization of the organization-projection is 0.026, a rather low value.

Measures relating to structural holes (Burt 1992) are also an indication of network structural positions beneficial for leadership. Taking measures of brokerage, effective size and efficiency into consideration, beyond the already listed organizations, the Carpathian Euroregion and the Polish NGO Ecopsychology Association occupy positions that are beneficial for leadership.

Based on these network measures, it is possible to identify a couple of organizations that occupy network structural positions beneficial to leadership. The Secretariat, the environmental ministries of the Czech Republic, Hungary, Poland, Romania, Serbia and Ukraine (but not of Slovakia), the Slovak State Nature Conservancy, WWF, Green Dossier and the Carpathian Euroregion can be considered being the in positions reflecting potential leadership roles throughout the evolution of the governance network.

The Carpathian regime currently centres around the Carpathian Convention. While one would expect the Secretariat and the parties' main ministries to be in a leadership position of a multilateral agreement, that is a legal document between states, the lack of the Slovakian environmental ministry and the presence of its State Nature Conservancy, and the role of NGOs (WWF, Green Dossier, Carpathian Euroregion) are less typical. Parties and the Secretariat are less likely to leave the regime; however, the Slovak State Nature Conservancy and especially NGOs could without any legal obstacles quit the processes under the Carpathian Convention. Although their deletion from the network would not cause it to break into for example two fragments[37], it would definitely be felt by the actors (see Chapter 6).

5.3.3.5 Inclusivity

Inclusivity of the social network of actors is the fourth component that previous research has identified as contributing to regime outcomes. It advances the adaptive capacities of the regime by allowing diverse information to be incorporated into the regime. However, principles of homophily and triadic closure, which are typically determining the formation and evolution of social networks, work against diversity. Diversity can be analysed through descriptive statistical means. As discussed previously, the dataset was coded along three axes: geographic scope of activities, sector and type of organization.

[37] Even after the deletion of 8 other connecting nodes the network did not significantly change its structure.

The geographic scope of activities: Organizations registering to the meetings of the Carpathian Convention are active in 25 countries, the EU and organizations with an international scope. As Figure 5-10 shows, most organizations have an international focus (53 organizations), closely followed by organizations working on Romanian issues (51 organizations). Organizations from the other parties and from Austria are next (ranging between 16 and 40 organizations). The remaining 45 organizations are distributed among 18 countries and the EU. What this shows is that there is international diversity at the meetings of the Carpathian Convention, albeit dominated understandably by organizations from the parties.

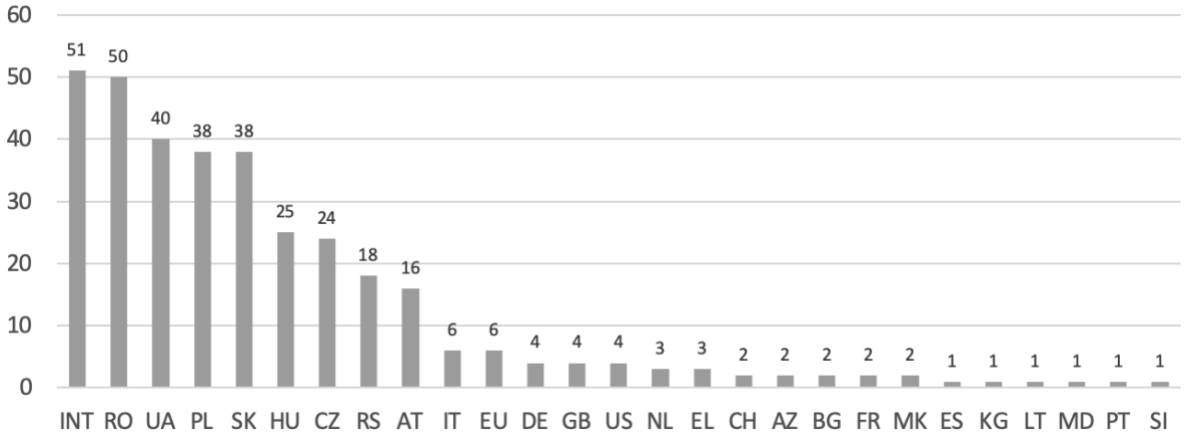

Figure 5-10: Number of organizations from each country, the EU and organizations with an international scope.

Notes to figure: the countries are listed by their 2 letter ISO codes. INT stands for organizations with an international scope.

Sectors: Organizations are dominated by those that follow more than one topic of the Carpathian Convention, and are thus coded as "general" (125 organizations), followed by 65 organizations that work on issues outside the scope of the Carpathian Convention[38]. The organizations with a single theme are biodiversity (32), tourism (23), forest (16), regional development and landscape planning (15), transport (15), water (14), agriculture (13), education (12) and cultural heritage (10). While water quality and river basin management is not a focal area of the Carpathian Convention, still there are 14 organizations with such focus that have registered to at least one meeting.[39] On the other hand, at COP5 the Carpathian Convention adopted a new article in relation to climate adaptation, whereas only four climate-specialist organizations have taken part

[38] For example: organization focusing on business development, or the British Council.

[39] For example: Aquaprofit Ltd (project partner of BioREGIO), International Commission for the Protection of the Danube River (ICPDR), the Middle Tisza Water Authority of Hungary, Global Water Partnership in CEE.

in the meetings.[40]

When taking into account the number of delegates registered to meetings (sum of weighted degrees of nodes) from the different thematic sectors, the balance changes slightly (see Figure 5-11). The largest number of delegates are coming from organizations working on more than one topic of the Carpathian Convention (coded as "general", 966 delegates in total); however, the second largest group are biodiversity-focused (250) followed by organizations working on topics outside the scope of the Convention ("other", 187 delegates).

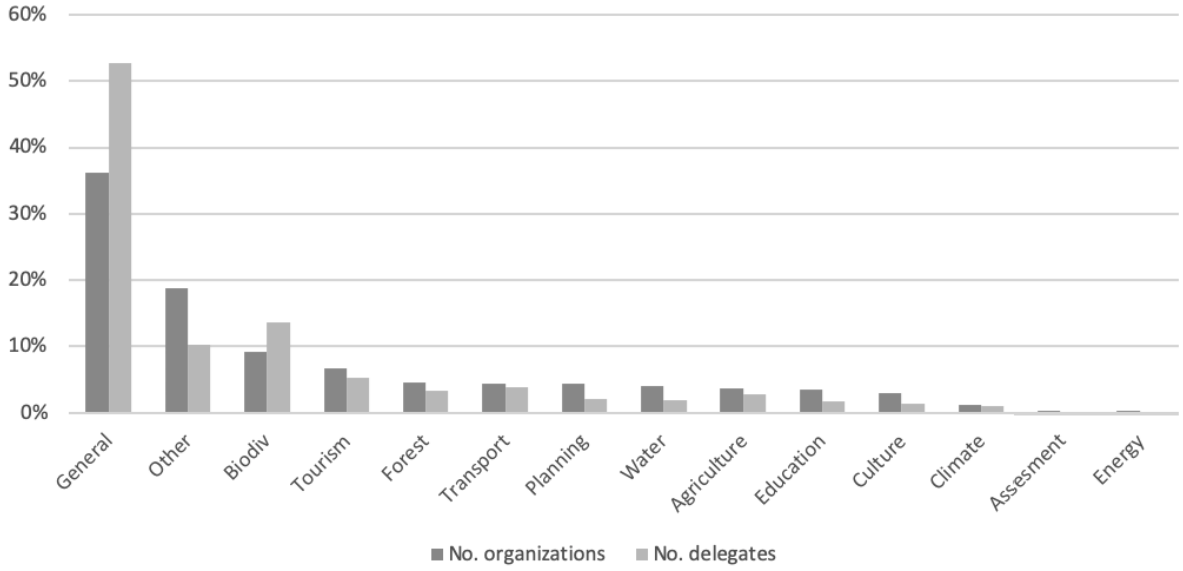

Figure 5-11: Share of organizations and delegates from different thematic sectoral groups as the percentage of the total number of organizations and the total number of delegates in the network.

Types of organizations: Organizations from the NGO sector (sum of the degree of nodes: 108) outnumber organizations from the governmental sector (85). The academic sector with 71 organizations comes third, followed by businesses, local governmental bodies, UN bodies, protected area administrations and inter-governmental organizations. Taking into consideration the number of delegates registered to meetings (sum of weighted degrees of nodes), the order changes: Governmental bodies (778), NGOs (455), academic (255) and UN (168), see Figure 5-12.

[40] The four organizations are: Szent Istvan University, Zentralanstalt für Meteorologie und Geodynamik, Climate Change and Ozone Centre and RAC-RO (Climate Action Network Romania).

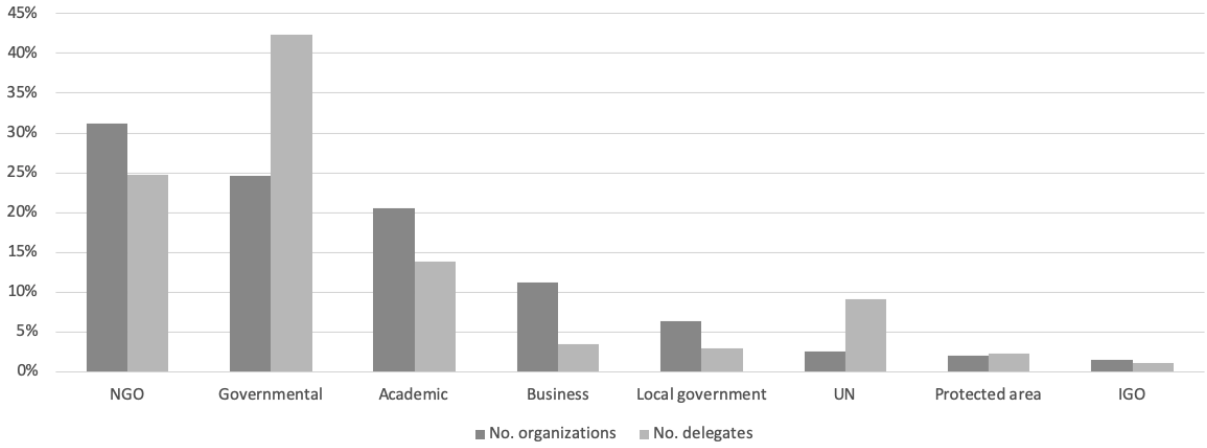

Figure 5-12: Share of organizations and delegates from different societal sectoral groups as the percentage of the total number of organizations and the total number of delegates in the network.

5.4 Reflections on Using Meeting Affiliation Network for Regime Effectiveness

This section focuses only on the meeting-affiliation based social network analysis for regime effectiveness. It highlights its benefits, weaknesses and suggested channels of use.

5.4.1 Benefits of affiliation network analysis

Network analysis of meeting affiliation data can tell us more about the meetings and organizations than descriptive statistical methods. Statistical analysis could identify node count, degree, weighted degree and homogeneity. But other measures, such as closeness and betweenness centrality, density; and the meeting-to-meeting and organization-to-organization projection can only be calculated if the dataset is considered as a graph consisting of nodes and links.

A very strong benefit of using meeting affiliation data to approximate the formation of social networks under a governance system relates to data collection. Since it is highly common for governance institutions to keep meeting participation lists, this data is readily available; though the EU's recent regulation on data protection (GDPR) might make it more difficult to access such information in the future. However, there are also alternatives to meeting affiliation that can be used either to complement meeting affiliation data or to substitute for it if it is not available, such as project partnerships, voting records or even for larger governance systems signatories to convention(s), protocols, etc.

Secondly, meeting affiliation data, if kept on record, can cover large timespans. In order to analyse changes in the network over time, it is necessary to have historical as well as "current" data. With other social network data collection methods (interviews, observation, survey) it is problematic to collect historical data. Meeting affiliation records, on the other hand, can approximate past networks and can thus allow the analysis of changes in the governance network over time.

Using meeting affiliation data makes it possible to compare different regimes. By using the same data collection and analysis methods (i.e. developing a blueprint for such analysis) the different regimes become comparable. The comparison allows for other kinds of insights than deep(er) analysis of a single regime if it is segmented into subnetworks, for example along time periods, geographical locations, topics of events etc. as defined appropriate for the research context.

As we have seen in the previous sections, meeting affiliation data can show the general structure of the regime's network, and its characteristics (size, density, connectedness) and the types of actors engaged. More importantly by uncovering the network structure that connects actors and meetings, such analysis can also highlight the connecting nodes (actors or events), which can be important in understanding why a regime might be failing (e.g. if the connecting actor is blocking flows or is running low on capacities) and where it might be vulnerable (e.g. if the connecting actor leaves the regime's network). If meeting affiliation data is available for a larger timespan, social network analysis can also show the evolution of the regime network over time; including all the previously described characteristics.

Meeting affiliation networks easily allow analysing changes of the regime network over time, since the meetings usually happen sequentially and thus provide opportunities to create time segment based sub-networks. In larger networks, it could also be theoretically justified to segment the network into other kinds of sub-network, for example along geographical locations of the meetings, the topics of the meetings, the types of the meetings. The sub-networks need to be defined from the dataset and the characteristics of the governance system.

5.4.2 Limitations of affiliation network analysis

As with all kinds of data collection and analysis methods, social network analysis of meeting affiliation data is not a silver bullet but has its own limitations. Most importantly, as highlighted several times in this chapter, such analysis cannot tell us

what actually happened at the meeting, which organizations met, and established connections and which actors went into strong unresolvable arguments and distanced themselves from each other. It also cannot tell us what (if anything) travels through the network: common visions, shared goals, information about the environment, project ideas; or destructive gossip, illiberal ideas, corruption. Further methods need to be deployed to understand these qualitative aspects of the social network (for example analysing meeting documents, observing meetings, recoding interviews with meeting participants), as it will be demonstrated in the subsequent chapter.

In case the analysis is based on organization-level data, the analysis cannot consider if the same two individuals were present at two events or if the organization was represented by different individuals. Connections between organizations depend on individuals of organizations since two organizations cannot connect, only their delegates can. With a dataset that is to the level of individuals (and not organizations), this problem can be averted. If organizational affiliation of the individuals is known and preserved as an attribute of the individual, or as a third class of nodes (tripartite network analysis) then further analysis can be carried out.

Meeting affiliation data, in a causally direct way, cannot tell us if the regime had environmental impacts: if it was effective in leading to intended positive changes in the environment. It uncovers the social network of actors that we know from other research (see for example, (Bodin, Sandström, and Crona 2017), is necessary for the formation of trust and long-term cooperative relationships. However, the direct cause-and-effect connection between the characteristics of the social network of actors and the improving status of the environment cannot be drawn.

5.5 Summary

Regime effectiveness studies and social network theories have pointed out that the underlying social connections between actors can determine regime outcomes. Thus, the effectiveness of a governance arrangement in delivering environmental impacts rests among others, on the structural characteristics of the network of the actors of the governance system. This chapter used qualitative data and affiliation network analysis to analyse the formation, evolution and structure of the social network formed by organizations registering to meetings of the Carpathian Convention.

Social network analysis has been using affiliation data (co-participation in clubs, events, meetings, projects, etc.) to uncover the hidden fabric of social interactions. Meeting

participation data is usually available in formalised governance systems in the form of registration forms, lists of participants or meeting minutes. This provides an easily accessible way to analyse the evolution and status of regime networks: assuming that meetings provide the platform for actors to meet and interact.

In this chapter, I used semi-structured interviews and meeting affiliation data of the Carpathian Convention. My analysis shows that before the signing of the Carpathian Convention there were several trans-boundary and cross-sectoral networks in the regions that enabled actors to become familiar with each other and also lead to a shared understanding of the issues of the Carpathian Mountains. After signing of the Convention in 2003, the Carpathian Convention's actors' social network initially had a core-periphery network structure, which evolved into a network of sector-based communities. The analysis also showed that the network's core actors remained largely the same; and that only a few organizations are in structurally important central and bridging roles, namely the Secretariat, parties' environmental ministries and some NGOs.

I suggest that the methodology described in this chapter can be successfully used in analysing the network structure of large and long-standing regimes since this method enables researchers to look back into time and provides a tool that allows conducting comparative studies. Since this methodology cannot give an insight into what actually happened at the event, it is suggested to complement it with other qualitative methods, as it will be demonstrated in the next chapter of this dissertation.

6 The Internal Network of Actors

6.1 Introduction

Meeting affiliation networks (as discussed in Chapter 5) can map out the structure of the actors' social network, but do not show what actually travels through the network, how actors perceive the network and what effects the ties may have. Meeting affiliation networks can identify connecting and central actors, but not leaders; can tell us who had the chance to meet at an event, but not if they really met or if their interaction ended in cooperation or confrontation; can shed light on the history of the network, but not on how actors perceive their shared future. The underlying network structure between actors enables and constrains actions of actors and interaction between actors. However, beyond the network structure there are other features of actors that determine if they will interact or act: (1) actors are not aware of their network structural position within the whole network, they only know their immediate contacts; (2) actors' personal and social characteristics (e.g. language skills) may also influence their readiness to engage or tendency to disengage; (3) external features such as financial resources, spatial distances, access to the events of the network can also enable or limit actions and interactions; and finally, the (4) culture and norms of the actors can also determine actions and interactions.

The aim of this chapter is to analyse how actors of a regime perceive their own network, and what happens in their network - and ultimately, what implications these have for the outcomes of the regime. It is based on network surveys, interviews with key actors and on my observations of their meetings. Survey-based social network analysis can show the structure of the network as aggregated from each actor's perspective. Interviews with actors of the network can give details of the contents of the links (i.e. "what travels through the network") and how the actors perceive the evolution of their network from past to future. Overlaying the analysis of the survey-based social network of the actors with interviews, asking about their current joint activities and cooperation, can give a detailed insight into the functioning of the network currently.

This chapter contributes to Objectives 2 and 4 of this dissertation (see Section 1.3), by providing an analysis of the functioning of the regime actors' social network, and its influence on the effectiveness of outcomes of regional environmental regimes. It also provides reflections on the advantages and disadvantages of the methods for regime

studies.

This chapter is structured similar to the previous analytical chapter. First (Section 6.2), it describes the methods of data collection and analysis and reconceptualizes them for the specific research question. The Findings section (6.3) applies the methodologies to the case study of the Carpathian Convention. In Section 6.4 I describe the advantages and limitations of using this methodology for the analysis of the effectiveness of regional environmental regimes. And finally (Section 6.5) I give a summary of the chapter.

6.2 Methodology

I used different types of data collection and analysis methods to understand the details of the internal network of the Carpathian Convention. The three data collection methods (semi-structured interviews, social network surveys and participant observation), and the two data analysis methods (social network analysis and qualitative data analysis) were used to complement each other, and offer a more holistic insight as recommended by literature on mixed methods in social network analysis (Ahrens 2018; Crossley 2010; Yousefi-Nooraie et al. 2018). This section first describes the details of data collection and then discusses data analysis.

6.2.1 Data Collection

My data collection included three strands of data: observing several meetings of the Carpathian Convention and its related bodies as a participant, semi-structured interviews with actors of the regime network and social network surveys completed at the organizational level by the actors.

I carried out **participant observation** at 11 events, see Table 6-1. It was used as a method to collect data on the dynamics of discussions and interactions between participants. Participant observation also played a role in identifying individuals to be included in the network survey and interviews.

Table 6-1: Overview of meetings where I carried out participant observation.

Name of Event	Organizing body	Description	Time
Forum Carpaticum	Science for the Carpathians	Bi-annual scientific conference of Science for the Carpathians	September 2014
Fourth Conference of the Parties	Carpathian Convention	Conference of the parties to the Carpathian Convention	October 2014
Carpathian Network of Protected Areas Steering Committee meeting	Carpathian Network of Protected Areas	Meeting of the committee that guides the work of the Carpathian Network of Protected Areas	October 2014

Name of Event	Organizing body	Description	Time
Sixth meeting of the Carpathian Convention's Implementation Committee	Carpathian Convention	The annual meeting of the Convention's Implementation Committee	November 2015
Forum Carpaticum	Science for the Carpathians	Bi-annual scientific conference of Science for the Carpathians	September 2016
Conference on Large Carnivores Protection in the Carpathians	Czech Nature Conservation Agency	Conference to kick-start a process for a joint management plan for large carnivores in the Carpathians	October 2016
Meeting of the Working Group Conservation and Sustainable Use of Biological and Landscape Diversity	Carpathian Convention	The Convention's working group meeting on biodiversity topics	October 2016
Seventh meeting of the Carpathian Convention's Implementation Committee	Carpathian Convention	The annual meeting of the Convention's Implementation Committee	December 2016
Forum Carpaticum	Science for the Carpathians	Bi-annual scientific conference of Science for the Carpathians	October 2018
Science for the Carpathians Steering Committee meeting	Science for the Carpathians	Meeting of the committee that guides the work of the Science for the Carpathians	October 2018
Science for the Carpathians Steering Committee meeting	Science for the Carpathians	Meeting of the committee that guides the work of the Science for the Carpathians	April 2019

After identifying the actors of the regime through archival data analysis and participant observation, I carried out **semi-structured interviews** with them. Interviews were not limited to representatives of organizations included in the social network survey, but also included individuals who were active members of the network in the past.[41] In total, I interviewed 62 people covering all seven Carpathian countries and several organization types, see Table 6-2. My interviews were semi-structured interviews: after briefly introducing myself and my research, I asked my open-ended questions covering the past, present and future of the Carpathian Convention, see Annex 1 for the interview questions.

Table 6-2: Organization types represented by interviewees.

Type of organization	Number of individuals interviewed
Governmental bodies (ministries, agencies)	20
Secretariat of the Carpathian Convention	2
Non-governmental organizations	20

[41] Interviews were also carried out with representatives of organizations connecting to the Carpathian Convention. These interviews were used predominantly for the chapter on regime interactions.

Type of organization	Number of individuals interviewed
UN Agencies	3
Academic and research bodies	9
Private business organizations	4
Inter-governmental bodies	3
Protected area administrations	2

I also collected **social network data through surveys**. I drew the network boundaries for the survey-based social network analysis using both the nominalist and relational approaches (see Box 6-1). The survey listed 20 organizations and allowed respondents to add further organizations they perceived were missing from the list. Organizations on the survey's list were identified through desktop research, participant observation and a few pilot surveys and interviews. Since ministries are often renamed and reorganized after elections, parties' national focal points were specified not at the ministerial level, but only as "the national focal point of XY country", "working group member of XY country". Further to my list generated through the nominalist approach, the survey provided space for respondents to add up to 10 additional organizations.

Box 6-1: Overview of methods for defining network boundaries.

In the *nominalist approach* the researcher, based on conceptual and analytical purposes, defines the boundaries of the social network (the list of actors) and asks actors to evaluate their relation to all other actors in the network. The nominalist approach ensures that the whole network–as defined by the researcher, will be evaluated by the actors. However, it can become problematic if it is difficult to define all actors of the network in advance. New actors cannot be added to the network later since it would require everybody to fill in the survey once again in relation to that new actor.

The *relational approach* asks respondents to generate the network boundaries by asking respondents to list members of their network (usually asking only for a specific number of contacts) and then answer questions relating to them. A benefit of this approach is that it more flexibly captures actors outside of the core group. However, a significant drawback is that the "whole network" will result from the aggregation of the individual lists–and not all actors that appear on one's list will be able to elaborate their version of the connection

The social network survey contained four questions, two of them asking respondents to evaluate on a 0-5 Likert scale[42] their interactions with other organizations (outgoing ties in question 1 and incoming in question 2). The third and fourth questions were asking about the qualitative aspects of the relationships, see Annex 2 for a sample of the network survey.

In practice, I explained and handed over the questionnaires at the end of the interviews. The surveys were recorded over a 6 months long time period.[43] The social network survey was completed by representatives of 20 organizations: 19 organizations

[42] "0" meant no connection and "5" was the strongest connection.

[43] During this time period no major events happened under the Convention: no project proposal was submitted, nor project launched, no change in presidency.

from the network survey's list (all organizations except for the Secretariat of the Alpine Convention), and one additional organization that was marked by several respondents as an important player albeit missing from the original list (Ukrainian NGO Green Dossier).

6.2.2 Data Analysis

My data analysis involved two methods. Data collected through participant observation and interviews were analysed through qualitative data analysis, while the social network surveys were analysed through network methods.

Qualitative Data Analysis. Data from interviews and meetings were captured in recordings, transcripts, field notes and field diary memos. During meetings, key interventions and speeches were recorded. Furthermore, detailed field notes were taken including on the setting (location, venue, atmosphere, posters) of the meeting, participants, speakers and contents of presentations and discussions. Available non-confidential documents such as the list of participants, agenda of the meeting, meeting report, presentation slides were obtained from the meeting organizers. After receiving consent, the interviews were recorded and later fully transcribed. Additionally, I wrote sets of interview field notes and personal field diary memos to capture my perceptions of the interviewee, the setting and other personal observations and reflections. Interview and intervention transcripts, interview and observation field notes together were imported into Atlas TI software package for qualitative data analysis.

The analysis of the qualitative data followed a grounded theory approach. As a first step, initial codes were identified from the data. During the second step of the analysis, these codes were categorized into larger code groups. Finally, as the analysis advanced themes were identified; some of which are discussed in the Findings section of this Chapter (Charmaz 2014).

Social Network Analysis. For the social network (similar to other chapters of this dissertation), the nodes were defined at the level of organizations. Links of the network were defined from the survey responses. Answers to question 1 (*How closely do you work together with them?)* were conceptualized and coded as outgoing directed links point from the respondent to their partners. Question 2 (*How do they support your work?*), on the other hand, was conceptualized and coded as an incoming link pointing from the partner to the respondent.

The Likert-scale ratings that respondents marked in the survey were translated into link

weights. When more than one individual filled in the survey from an organization, the higher (highest) weight marked on the Likert-scale was used since the differences might result from one individual working closer with another organization than their colleague (Kumar, Stern, and Anderson 1993). The whole network in this sense is a weighted directed network,[44] with organizations as nodes and two sets of links[45] between the nodes.

The network measures used for analysis, and social network principles and theories influencing and explaining social phenomena relevant to regime effectiveness are discussed in detail in the Conceptual Framework chapter. That chapter also explains how the social network principles and theories were applied to and were reconceptualized for regime effectiveness studies.

Mixed Methods. The representatives of the organizations included in the social network survey were also interviewed[46], and at the events I observed, several (but not all) of the interviewees and survey respondents were also participants. Thus, I was able to collect and analyse data of the same actors through different methods. The themes of the qualitative data analysis were integrated into the four pillars of outcome-level regime effectiveness (see Conceptual Framework chapter): shared knowledge generation, social cohesion, leadership and power structures and diversity and inclusion.

6.2.3 Limitations

The general challenges of qualitative and relational data collection and analysis are addressed in the Methodology chapter. This section focuses on specifics related to this chapter.

Inter-organizational network studies' common struggle is how to get individual perspectives to represent the network between organizations. The characteristics and personalities of the people completing the survey matter: for example, their time at the organization, their role, their focus all have an impact on whom they know, whom they work together with. Interestingly, under the Carpathian Convention many organizations are represented at most events by a single or a few individuals–which made it easier to

[44] However, for some analysis (e.g. density, centrality) the network was transformed into an undirected and unweighted network.

[45] The links originating from questions 1 and 2 were combined to create one social network.

[46] There are two exceptions: one representative completed the network survey but refused to be interviewed, and another organization was interviewed but did not fill in the survey.

reduce this inherent problem of inter-organizational networks (Kumar, Stern, and Anderson 1993).

In cases where it was apparent that there is a single individual responsible for all activities relating to the Convention, I asked only that one person to complete the survey. However, there were three cases where there was a recent change in the person representing their organization. Naturally, with only a short engagement period, the connectedness of the actor is not the same as it would be after a more extended time period. The 6-month data collection period allowed to mitigate some of this, by asking the people to fill in the survey more towards the end, by which time they have been exposed more to the network.

In other cases, where more than one person was engaged, my contact points have asked to share the questionnaire with their colleagues to ensure the reply was consistent with everybody's work partners. In such cases, the "negotiations" of how to answer were done inside the organization and I received one single answer sheet. Thus, I did not have to deal with the problem of aggregating multiple replies.

Some actors realized upfront or during the completion of the survey that their responses could shed positive/negative light on their organization and its interactions. There was one case when the respondent during the interview clearly pointed out this fact, and then later sent an answer sheet that contained only 5s for all of its official contacts. Despite this acknowledged flaw, the answer sheet was included in the analysis as submitted by the respondent.

6.3 Findings

6.3.1 Social Network

6.3.1.1 Basic Characteristics of the Network

The Carpathian Convention's internal network, based on the network surveys, consists of 76 organizations (nodes): 20 organizations are from the survey's list defined by me through the nominalist approach (see Box 6-1), and in total, 56 were added by the respondents (relational approach). There are ten organizations that were added to the lists by more than one respondent: the Alpine Network of Protected Areas (ALPARC),

the Secretariat of the Alpine Convention[47], the Bile Karpaty Education and Information Centre, the Daphne Institute of Applied Ecology, the Ecopsychology Association, the EU-level organizations working on the implementation of the European Strategy of the Danube Region (EUSDR)[48], the Romanian Mountain Area Agency, the Romanian National Authority for Tourism, Szent Istvan University of Hungary and the Union of Cities and Towns of Slovakia. Although the methodology did not allow asking all of these organization to fill in the survey, the representatives of these organizations were interviewed.

6.3.1.2 Shared Knowledge Generation

Science-based decision-making is a fundamental pillar of the Carpathian Convention, from the Secretariat's perspective. The Secretariat has emphasised this principle during many meetings I participated in. Theoretically, the network position of the Secretariat allows it to access information, since it has a diverse ego-network with actors from many different countries, sectors and organizations. This is, however, not necessarily the case for other actors in the network.

[47] Convention on the Protection of the Alps (Salzburg, 1991)

[48] The EU Strategy for the Danube Region (EUSDR) is a macro-regional strategy of the European Union to enable countries and stakeholders to address their common challenges along the Danube.

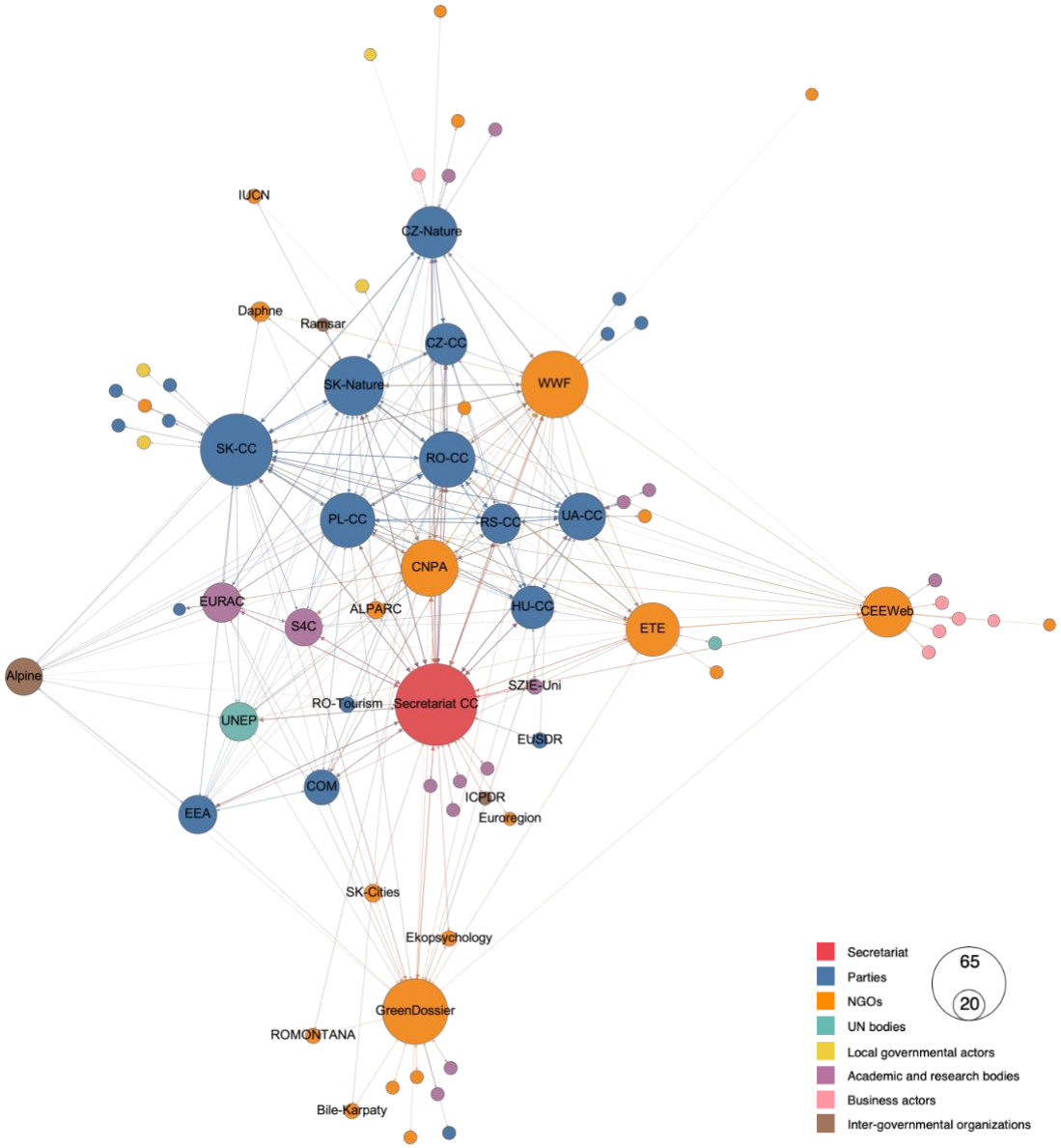

Figure 6-1: Network of actors of the Carpathian Convention, as perceived by the actors.

Notes: The social network is based on survey data. Nodes are coloured according to the organizations' type and sized according to their degree. The layout is generated by Gephi's Force Atlas 2 algorithm (Jacomy et al. 2014).

As illustrated in Figure 6-1, the social network of actors has a well-connected core which is beneficial for *sharing* knowledge in the core (but not in the periphery) (Lu et al. 2017). However, the interviews indicate a more hierarchical structure for information sharing. Communication between parties and other stakeholders happens nearly exclusively through the Secretariat: parties and observers do not directly share their comments and suggestions with each other, instead they send their ideas to the Secretariat, which shares these with the others. Such a system would indicate a hierarchical network structure: the Secretariat being the focal point of the network to

which all other actors connect to (see illustration in Figure 6-2). A hierarchical structure for information sharing works against *shared knowledge* since in such a network structure the knowledge flows into one central node that can then (if it wants to) redistribute the information.

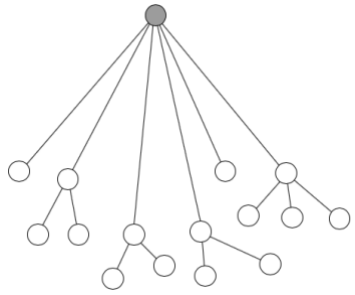

Figure 6-2: Illustration of hierarchical network structure

The crucial information sources of the Secretariat further to the parties are EURAC Research (a private research organization based in Italy), the Science for the Carpathians (S4C, an informal network of scientists) and a few independent scientists. The three actors all work on Carpathian natural and social sciences but have markedly different roles in the regime process.

- EURAC, as pointed out through my interviews, was part of the Carpathian Convention's processes from the very beginning. It has an established working relationship with the Secretariat (including staff seconded to the Secretariat) and has prepared several reports and draft policy documents for the Secretariat. EURAC has also acted as a project partner in several projects. Although the quality of the work EURAC delivers is welcomed by all actors, their involvement is felt to be too strong by some actors.
- On the other hand, S4C is a loose network of scientists in and outside of the Carpathian region united through their research foci. S4C and the Convention's Secretariat and parties signed a Memorandum of Understanding in 2012 with a goal to "provide a durable basis for collaboration in the field of scientific research, project development and implementation, information exchange and knowledge transfer" (Secretariat of the Carpathian Convention and Science for the Carpathians Initiative 2012, 1). S4C's main contribution to the regime's network comes through the biannual conference that it organizes: this is where researchers share their most recent findings, and the Secretariat of the Convention is a regular participant at these conferences. The Secretariat also

invites S4C representatives to its meetings, giving them space as observers to share their scientific updates and recommendations to policymakers. However, as S4C currently stands (no legal entity, no budget, no staff) it is ill-suited to deliver overarching, Carpathian-level reports, project proposals and project leadership.

- The third group of academic actors in the regime network is the group of independent scientists. For example, Dr Sandor Szalai is a professor of the Szent Istvan University (Hungary). Dr Szalai has been actively engaged in the Carpathian Convention's process through his research interest in climate adaptation. Initially, the cooperation began with climate-focused projects but then developed into a more long-term working relationship leading to the adoption of Article 12.b at COP5 on climate adaptation.

These three different scientific bodies supply a stream of information to the Secretariat (*knowledge generation)*. However, this information (although it is generally shared publicly in for example reports and scientific publications) cannot be considered per se *shared ("joint") knowledge* among the actors. In most cases, I observed that the information was travelling in one direction: from scientists (EURAC, S4C, others) to the Secretariat and other actors. During the course of my research, I came across two cases, where *shared knowledge* was in focus, beyond *knowledge generation:* the Carpathian Ecoregion Initiative (CERI) and the red lists of the BioREGIO project.[49]

Prior to the establishment of the Carpathian Convention, CERI coordinated a multidisciplinary, international network of 50 organizations (NGOs and research institutions) to study the environmental and social status of the Carpathians. CERI invested considerable effort into developing a shared data collection and analysis methodology, which enabled them to carry out studies, compile inventories and publish reports on the *whole* Carpathian Mountain range using nearly the same methodologies in all countries. Although those actively engaged in CERI from the initial moments, such as Jan Scheffer and Viera Schefferova from the think-tank called Daphne claim it was not an easy thing to set up CERI, and they still have positive memories of the initial times.

> Jan Scheffer (JS): From the beginning, the Carpathian Ecoregion Initiative was an umbrella organization for NGOs and also scientific or research institutes. And that was unique. And that was why I liked it, because logically in nature conservation we are allies. […]
> Viera Schefferova (VS): The beginning was a fascinating period; we were all so…

[49] *BioREGIO Carpathians - Integrated management of biological and landscape diversity for sustainable regional development and ecological connectivity in the Carpathians* was a project under the Carpathian Convention from January 2011 to December 2013. Its main aim was to implement the Biodiversity Protocol.

JS: …it was fascinating…

VS: …we were all so enthusiastic…

JS: …and young (laughs)…

VS: …and young, and it was such nice cooperation, great involvement of whole teams from the countries, it was very, very nice. And I think, also with great expectations.

(Quote from a personal interview with Jan Scheffer (JS) and Viera Schefferova (VS) former coordinators of the Carpathian EcoRegional Initiative CERI)

The other *shared knowledge* generation example I came across was the preparation of the Carpathian red lists of species and habitats under the BioREGIO project. The red lists were prepared through coordinated work of the Parties and their national scientific bodies. The red lists (although they were never finalized and officially adopted) were a tool to generate *shared knowledge.*

The significance of CERI and the red lists is that these initiatives were able to create fora reaching across organization types, countries and scientific disciplines to generate shared knowledge, and not only new knowledge. Unfortunately, CERI "became dormant" (Jan Scheffer) and the red lists were never officially adopted, and S4C, as it stands right now, is far from being able to fill in this niche.

6.3.1.3 Social Cohesion

Based on the analysis of the social network, the actors' network forms one single connected component (see Figure 6-1). The average path length in the network is 2.45, meaning that on average, there are one or two intermediaries necessary for pairs of nodes to connect. The network diameter is 4, meaning that the most distant nodes have three intermediaries on their connecting path. The density of the network is 0.082; however, when considering only the organizations included in the list drawn through the nominalist approach, the density is 0.77. This significant difference is due to the list-generator technique under the relational approach, which resulted in specific organizations having "unique" contacts that are not connected to other organizations.

Analysis of the interview data explains how actors perceive their network cohesion. Social cohesion is seen by actors through two lenses: being a close "family" and being open to new actors. However, as discussed in detail below, not only do these two perceptions contradict each other, there are even more profound internal contradictions.

"Family" or Neutral Negotiators?

The actors of the regime network struggle to find a balance between developing solid social ties to each other and being neutral delegates to a multilateral environmental agreement. "Carpathian family" was an expression used by more than one of my

interviewees (including actors of UNEP, the Secretariat and a research organization). Others referred to the friendly, supportive atmosphere and informal interactions, not working through the traditional political structures, the small size of the network; and the benefits and vulnerabilities this brings, as illustrated by the quotes below:

> The Carpathian Convention is a small agreement, which means a small number of parties are involved, so people are more familiar with each other. (Quote from my personal interview with a national focal point)
>
> I think it's a good thing that it is informal. But it has its dangers [too], because then everybody speaks, and everybody seems to be equal, there is no clear order. So that there is an inherent danger in that. But generally, I definitely prefer to have it this way, and I don't think it would be possible to have it the other way, to have it very formal. (Quote from my personal interview with a national focal point)
>
> It needs to be more institutionalized. I don't know if this sounds horrible, suicidal, but at the moment it's still based on the goodwill of the Carpathian Convention family, and this network of people. So, I think we have to find a balance to institutionalize it by not killing it. (Quote from my personal interview with Harald Egerer, Secretary of the Carpathian Convention)

As we can see from the quotes, the "family" perspective is seen both as an advantage (knowing each other and the procedures) and as a risk (lack of institutionalization).

Working against social cohesion is the official role of actors in the network: they are all negotiators of their country or organization. Some interviewees claimed that the Carpathian Convention is "showing the usual characteristics of international agreements", i.e. the norm of being friendly in terms of not stepping into each other's competency areas, national sovereignty and not questioning (the lack of) actions taken by others. In practice, the actors try to balance between being a family and being negotiators. I observed a difference in the interaction between meetings and dinner events and smooth and challenging negotiation sessions.

Stakeholder Involvement or Cohesion?

The openness of the Carpathian Convention to stakeholders was evident to me from the very beginning of my research. The Carpathian Convention's meetings are open to any registered stakeholders, observers sit around the same negotiation table, and in certain debates, observers are as engaged as parties. The culture of involving stakeholders as partners was established by UNEP during the first negotiations of the Convention (personal interview with Frits Schlingemann, former director of UNEP's Regional Office for Europe), and has by now been internalised by all actors. However, the role of observers is also questioned by parties (see also Section 6.3.3).

The social network analysis identified six communities in the social network using Gephi's modularity class algorithm[50] based on the Louvain method (Blondel et al.

[50] Algorithm was run on the aggregate (support + work) network and considered the links of the network directed and weighted. The modularity resolution of the algorithm was set at 0.9. The algorithm

2008b). The six communities are (as shown in Figure 6-3): (1) community of the national focal points (except Slovakia) and a few other loosely connected organizations; (2) Community of the international actors and two Czech governmental organizations (note the survey was recorded during the Czech Presidency); (3) Community of nature conservation and research-focused organizations; (4) Community of the tourism-focused organizations; (5) Loosely connected NGOs and (6) Group around the Slovakian national focal point.

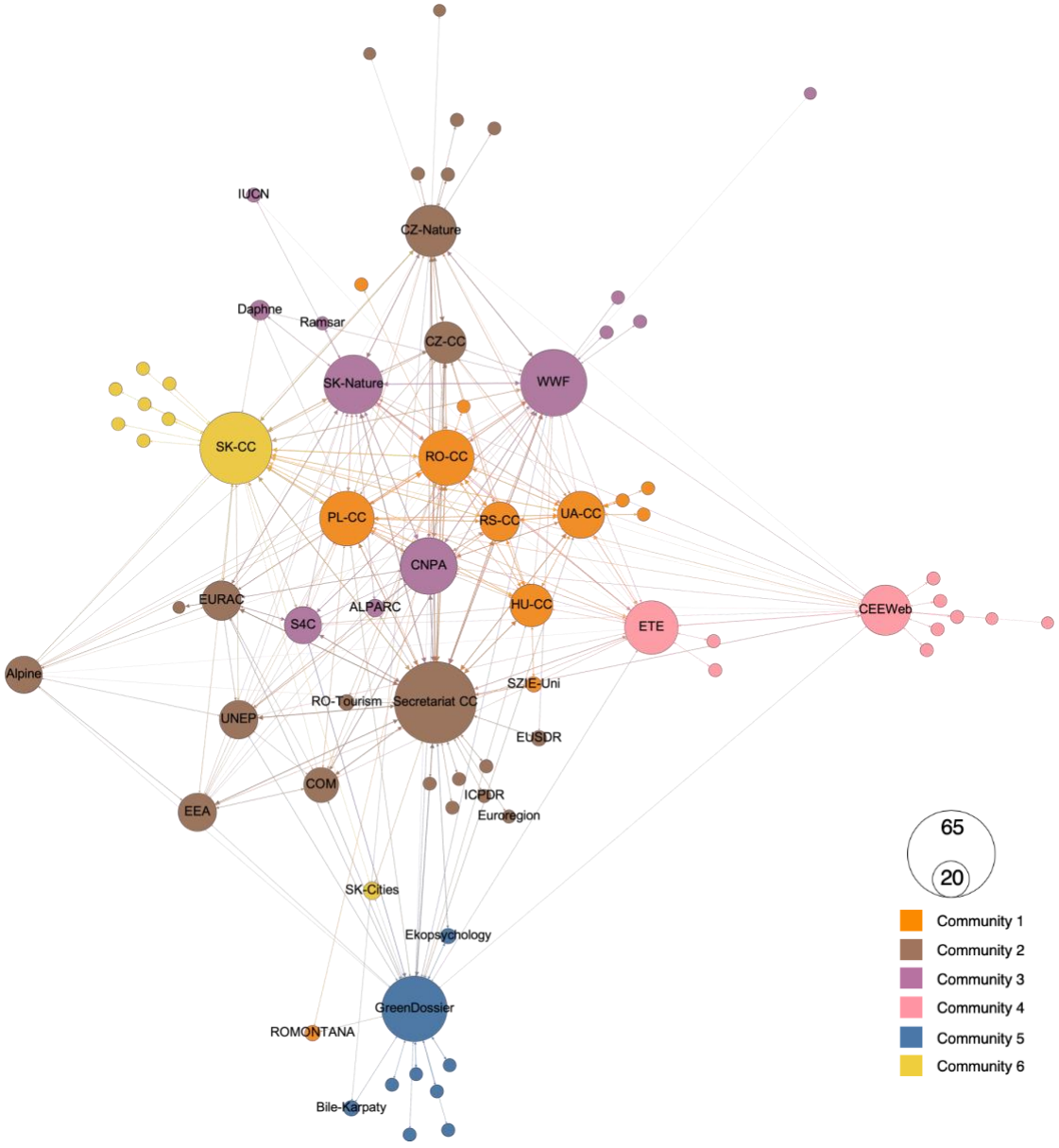

Figure 6-3: Communities of the social network.

Notes: The social network is based on survey data. Nodes are coloured according to modularity class and sized according to their degree. The layout is generated by Gephi's Force Atlas 2 algorithm (Jacomy et al. 2014).

The community detection algorithm's results underline outcomes of interviews and participant observation. Both methods show that trans-boundary interaction (ties between countries, especially parties of the Convention) is developing in the regime network. However, interactions between sectors and organization types are slower to emerge: the communities are dominated by actors from similar sectors (e.g. biodiversity-focus, tourism-focus) and from similar organization types (e.g. parties, NGOs, international actors), see further elaboration under Section 6.3.3.

6.3.2 Leadership and Power

Network theories relying on social network data can identify actors that are in structural positions that benefit leaders: having ties to a large number of other actors (degree centrality), having direct connections to most actors of the network (closeness centrality), acting as a bridge or broker between different parts of the network (betweenness centrality and measures relating to the theory of structural holes). On the other hand, social network analysis cannot tell if these actors are, in fact, leaders of the network and if they are using their structural position for the benefit of the network. In my analysis, by using mixed methods, I am able to analyse both structural and qualitative characteristics of leadership in the Carpathian Convention's social network. Table 6-3 shows the top 10 actors along all of these four centrality measures, and interviewees, when asked about whom or what they perceive as a driver of the Carpathian Convention, gave varied responses. The next paragraphs overlay the findings of the social network analysis with interviews and participant observation to come to a holistic understanding of the regime actors' network. The next paragraphs discuss the leadership positions and roles of these actors.

Table 6-3: Centrality values of top 10 nodes.

Name of organizations	Degree Centrality	Weighted Degree Centrality	Closeness Centrality	Betweenness Centrality
Secretariat of the Carpathian Convention	103	287	0.65	0.25
Slovakian Carpathian Convention focal point	82	215	0.59	0.19
WWF (Worldwide Fund for Nature)	77	175	0.61	0.11
State Nature Conservancy of SK	68	173	0.56	0.06
Romanian Carpathian Convention focal point	66	160	0.56	0.08
Carpathian Network of Protected Areas	65	149	0.58	NA

Name of organizations	Degree Centrality	Weighted Degree Centrality	Closeness Centrality	Betweenness Centrality
Polish Carpathian Convention focal point	65	144	0.58	NA
Ecological Tourism in Europe	57	121	0.58	0.06
Green Dossier	53	NA	NA	0.17
Nature Conservation Agency of the Czech Republic	53	121	0.56	0.14
Ukrainian Carpathian Convention focal point	53	137	NA	0.08
CEE Web for Biodiversity	NA	NA	0.54	0.15
Network-level centralization	*0.37*		*0.45*	*0.22*

Notes to Table 6-3: Both incoming and outgoing ties considered. "NA" means not part of top 10 on that specific measure. Similar results are obtained when incoming and outgoing ties are not merged.

6.3.2.1 Secretariat

The social network analysis highlighted the **Secretariat of the Carpathian Convention** as the most central node in all four measures, see Table 6-3. The Secretariat, and even more specifically Harald Egerer, the Secretary-General of the Convention, was named by several interviewees as a key actor of the Convention: "the one who brings in new ideas and searches the terrain if this is acceptable for parties" (interview with a national focal point). One respondent went even as far as claiming that Mr Egerer is "impersonating" the Convention. From the perspective of the Secretariat, the picture is quite different. According to Mr Egerer, the Secretariat is not the driver but acts as a "stage, forum, neutral platform" for Carpathian-related issues and interests to meet. His view is in line with Article 15[51] of the Convention, that specifies the Secretariat's role to be coordination and facilitation, and not leading. Thus, there is definitely a tension between the Secretariat's legally defined role and its perceived role. While the Secretariat is supposed to be only facilitating parties' discussions, it is perceived by several actors as one of the leaders of the regime.[52]

[51] The Secretariat is responsible for organizing meetings (Article 15 a), preparing and disseminating reports (b, d), coordinating the activities of the Carpathian Convention with other MEAs (c) and facilitating communication between stakeholders of the Convention (e).

[52] The observation that the Secretariat of the Carpathian Convention is taking up roles outside its legally defined scope is not unique to the Carpathian Convention. Environmental treaty secretariats' role in diplomacy, influence in politics, impacts on shifting power relations, shaping knowledge and understandings, redistributing capacities has been described for other environmental agreements (Biermann and Siebenhüner 2009; Jinnah 2014; Mirasola 2019; Mauerhofer 2019).

6.3.2.2 Parties

Some **Parties** also ranked high in centrality measures: the Slovak and Romanian focal points were among the top 10 nodes in all four measures, while the Polish and Ukrainian focal points were in the top 10 for three of the four measures. The Czech and Hungarian focal points were among the top 15 for these measures, while the Serbian focal point was beyond top 20 for betweenness and closeness centralities. These outcomes of the social network analysis are supported by my meeting observations. I observed that there were usually only a few party delegates who were actively participating: taking the floor, expressing their views, posing questions etc., while others were silently observing the meeting, or (guessing from the intensity of typing and sound of music) even dropping out to read e-mails or watch clips on their laptop.

Parties were pointed out as the drivers of the Convention by some interviewees. I was told that parties are the signatories and sole decision-makers, thus naturally they have to be the drivers. On the other hand, when asking interviewees about the reasons for the observed unequal engagement of official party delegates, my interviewees pointed to poor English language skills (which I also observed during meetings and interviews), an inappropriate level of preparedness, lack of clear negotiation mandates, and the mismatch between national and Convention-level priorities.

At the level of parties, similar to the Secretariat, there seems to be a tension between the perceived leadership roles of parties and their actual roles. Legally parties are the decision-making actors; however, their leadership was neither underlined by the network analysis, nor by interviews or participant observation - except for specific individuals whose commitment seems to stem from personal motivations (see below).

6.3.2.3 NGOs

The social network analysis identified several **non-governmental organizations (NGOs)** as occupying structural positions beneficial to leadership, for example, the Carpathian Network of Protected Areas (CNPA), CEEweb for Biodiversity, Ecological Tourism Europe (ETE) and World Wide Fund for Nature (WWF). I also observed that NGOs were active participants of the meetings, even taking leading roles, for example, during the Conference on Large Carnivores. Several of my interviewees also named NGOs as the drivers of the Convention, despite the fact that legally NGOs are only observers in the

Convention's processes.[53]

The main claim made by interviewees perceiving NGOs as drivers was that NGOs' persistence and long-term involvement is vital to the regime. This is in contrast to the changing national priorities of parties, as illustrated by the quote below:

> Not just the NGOs, but especially the NGOs provide continuity because most of these [transboundary initiatives] are long-term, so it's not something you can realize within two years, you need to have a long-term vision. NGOs are the only ones that are staying in power since they're not dependent on elections that much and funding cycles. So, I think, NGOs have played a key role […] The extent to which things have been achieved in the Carpathian Convention, I think a big part of that is thanks to the NGOs that have provided this continuity, engagement and drive. (Quote from my personal interview with NGO representative)

Along similar lines, NGOs were also seen as "honest brokers" (Jan Dusik) without vested national interest. This characteristic was claimed to allow NGOs to be in a role that can bridge between states and work towards the goals set by the Convention.

Interviewees also claimed that NGOs could help the Convention in accessing funds as fundraisers and "project professionals". Since projects are seen as a vital element of the Convention (see discussion in Section 6.3.4.1), the fact that NGOs have access to certain funds that the governments cannot access (fundraiser role) places them in an exceptional position - what Burt (1992) would call the "broker" network position. Furthermore, certain NGOs are claimed to have experience, knowledge, capacity and cash flow to run large regional projects, qualities that are lacking in many governmental bodies in the region (project-professional role).

However, the "driving" role of NGOs was not perceived positively by all actors. Some interviewees highlighted that they feel that NGOs are occasionally using the Carpathian Convention to push their own agenda and fundraising goals forward and not contribute to the vision and strategy of the Carpathian Convention. I also observed an occasion when an NGO representative was ready to organize a workshop for parties. However, the NGO's project timeline was stricter than parties' availability and caused tension and raised voices during the meeting.

As we can see, the actors' perceptions of the leadership roles of NGOs is quite

[53] It is not unique to the Carpathian Convention that NGOs influence the evolution of an international environmental agreement - despite the "interesting empirical puzzle" (Betsill and Corell 2001, 68) that they do not have any legal standing to do so. This phenomenon has been described since the 1990s, following United Nations Conference on Environment and Development (UNCED, the Earth Summit). Current research defines the following driving roles that NGOs play in international environmental agreements: placing issues on the political agenda (Betsill and Corell 2001), providing information and expertise (Bernauer and Betzold 2012; Orsini 2013), having impacts on procedures and outcomes (Betsill and Corell 2001; Orsini 2013), providing legitimacy (Bernauer and Betzold 2012), policy implementation, assessment and monitoring; and advocacy for environmental justice (Gemmill and Bamidele-Izu 2002).

complicated. While some parties feel that certain NGOs are sometimes acting beyond their legally defined observer role, others appreciate the proactivity of NGOs and value the resources (funds, knowledge, expertise and continuity) that these organizations deliver to the Convention. From an external perspective, it is highly unlikely that the Convention would have been able to come as far as it has, without the active participation of NGOs.

6.3.2.4 The personal commitment of individuals

My interviewees perceived that the **personal commitment of individuals** was also pushing specific individuals into leadership roles. In several cases, it was seen that the individual person at the organization (and not the organization) is driving the Carpathian Convention's processes, as the following two quotes illustrate:

> The Carpathian Convention for me is more about the people. It's [driven by] the people who are working for the Convention, and if they change, then really the Convention itself might change. Which is, of course, not the case of bigger conventions or international agreements. (Quote from an interview with a national focal point)
>
> It is also about the enthusiasm of the people who are working [on the Convention]. There is a lot of personal commitment to the cause of the Carpathians, and that has steered the engagement. (Quote from my personal interview with Jan Dusik, Director of UNEP Regional Office for Europe)

The social network analysis highlighted a couple of such organizations: nature conservation agencies of Slovakia and the Czech Republic, and CNPA. At the meeting, I also observed that representatives of these organizations were indeed highly engaged: for example, by carrying out their own initiatives, suggesting project ideas, monitoring follow-up of activities. The difference between the engagement level of parties, beyond the reasons explained before, probably has to do with the personal commitment of individual focal points.

6.3.2.5 Inherent leadership tension

As we have seen in the previous pages and also in Chapter 5, there are several organizations that occupy a leadership network position and play a driving role in the actors' network. We know from research (Emerson, Nabatchi, and Balogh 2011) that the existence of a few key driving organisations or individuals can be vital for the emergence and development of a regime. However, the picture for the Carpathian Convention is not black and white. As Table 6-4 illustrates, there is a tension between organizations occupying central positions of the network (Secretariat, NGOs, some parties, other actors), those that are perceived as leaders (Secretariat, NGOs, other actors), those that consider themselves leaders (NGOs, Parties, other actors) and those that under the legal framework of the regime can be leaders (Parties only).

Table 6-4: Leaders in the network analysis, interviews and from a legal perspective.

	Does it occupy central network positions?	Is it perceived as a leader by others?	Does it consider itself as a leader?	Is it defined as a leader in the legal framework?
Secretariat	Yes	Yes	No	No
Parties	Some	No	Yes	Yes
NGOs	Yes	Mixed	Yes	No
Other actors	Yes	Yes	Yes	No

This mixed leadership system, according to my observations, is functioning well in practice and forms part of the unwritten rules and norms of the Carpathian regime. On the other hand, it could increase transparency of decision-making and provide legitimacy of decisions if the system was more precisely defined.

6.3.3 Inclusivity

Inclusivity for this research was measured along three axes (see also methodology section of the Chapter 5): (1) trans-boundary interactions, (2) cross-sectoral interactions (e.g. biodiversity, tourism, transport, forestry) and (3) interactions between different types of organizations (e.g. governmental bodies, NGOs, research institutions, protected area administrations), see Conceptual Framework chapter. All three axes are rooted in environmental governance research: calling for (1) regional regimes, (2) policy integration and (3) moving away from governments to network governance.

During my interviews, my respondents also addressed the issue of diversity, albeit not directly but through e.g. success of the Convention, key actors, current hurdles. The interviews were giving details about how connections between different kinds of organizations are formed, and why the formation of such ties is successful or unsuccessful. These are insights that network science and descriptive statistics cannot analyse.

6.3.3.1 Transboundary interactions

The Carpathian Convention is signed and ratified by seven countries[54]. Since 2001, when the negotiations of the Carpathian Convention started, representatives of these

[54] While the Framework Convention is signed and ratified by all parties, the protocols to the Convention show a more fragmented picture. The biodiversity and tourism protocols have been signed and ratified by all seven parties. However, the forest protocol is missing the ratification of Poland, the transport protocol was not signed by Hungary, and is not ratified by Romania. The protocol on sustainable agriculture and rural development has only four signatories and two ratifications to date (2019).

countries regularly meet and discuss. Several of my interviewees considered trans-boundary interactions as one of the most significant achievements of the Convention, as the two interview excerpts highlight.

> The process has delivered a cohesion of the countries which come from very different backgrounds and very different political settings. [Now there is a] quite cohesive group agreeing on the way forward and also successful on promoting these interests and improving the situation for life in the Carpathians. That's good. (Quote from my personal interview with Jan Dusik, head of UNEP's Regional Office for Europe)
>
> It's ever the biggest success that these countries are able to talk to each other. They are able to sit at one table: all of these countries and ministers together. Even if they are coming for a half a day, even if they are coming for some meetings, or only to have the glass of wine together; this is already a big success. It makes a contribution to peace in Central Europe. (Quote from my personal interview with NGO representative)

Of course, the picture of trans-boundary interactions is not always rosy - as the principle of homophily would also indicate. There were many interviewees who pointed to the problems that hinder interactions between countries; albeit also claiming that this is not unique to the Carpathian Convention but typical of all multilateral agreements. Different levels of involvement between parties, and national priorities determining the focus of engagement were highlighted by several respondents, which other research (Andersen 2000) has also shown to be typical of international agreements.

Further to formal processes under the Carpathian Convention, trans-boundary connections are also developed in satellite organizations of the Carpathian Convention, such as S4C, and CNPA. However, it also has to be said that a couple of interviewees felt that the Carpathian Convention was to be partially blamed for CERI and the Carpathian Euroregion losing ground and becoming mostly inactive.

6.3.3.2 Cross-sectoral interactions

The Carpathian Convention is a sustainable development convention, which lists 11 topics[55] that it aims to address; and is striving to have an integrated approach (Article 3). This means that according to the legal text of the Convention, cross-sectoral interactions are a necessity. Similar to the actors of the meeting affiliation network (see Chapter 5), organizations falling into the "general" (covering more than one topic of the Convention) and "biodiversity" categories are represented in larger numbers than the other sectors in the survey-based network, see Figure 6-4.

[55] Article 4 - Conservation and sustainable use of biological and landscape diversity; Article 5 - Spatial planning; Article 6 - Sustainable and integrated water/river basin management; Article 7 - Sustainable agriculture and forestry; Article 8 - Sustainable transport and infrastructure; Article 9 - Sustainable tourism; Article 10 - Industry and energy; Article 11 - Cultural heritage and traditional knowledge; Article 12 - Environmental assessment/information system, monitoring and early warning; Article 12bis - Climate Change; Article 13 - Awareness raising, education and public participation

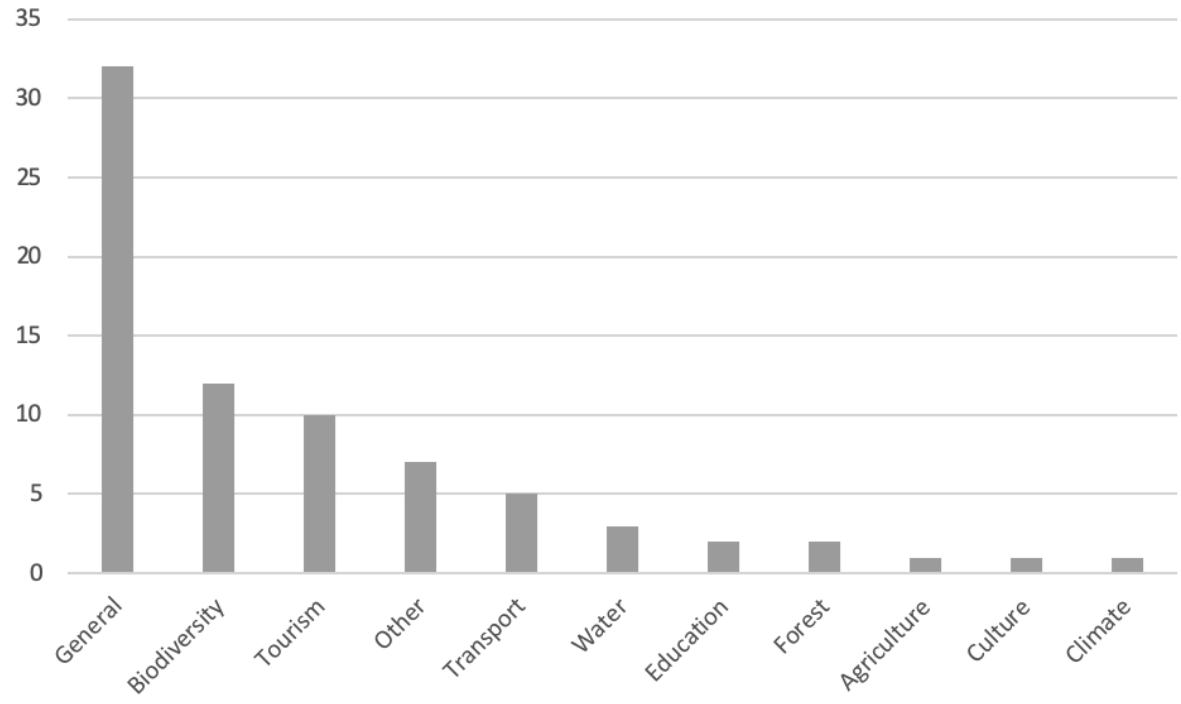

Figure 6-4: Sectors represented by nodes of social network.

The overrepresentation of "general" and "biodiversity" sectors reflects the history and evolution of the Carpathian Convention: in the initial years it focused more on biodiversity: the Protocol on Conservation and Sustainable Use of Biological and Landscape Diversity was the first protocol (adopted in 2008), followed by a biodiversity strategic action plan (2008) and then the BioREGIO project[56] that implemented the action plan. Later the scope of the Convention was gradually broadened.

Some of the interviewees named cross-sectoral interactions as one of the most significant achievements of the process. The Protocol on Sustainable Transport (2015) was often referred to as a case of cross-sectoral interaction. One national focal point explained to me:

> The transport protocol was an interesting case. They [parties' delegates] tried to find compromise solutions to align transport and biodiversity objectives. At the side meeting in Mikulov [COP 4], it was so exciting to see that experts from both sectors made speeches. There they told us that at first, they both looked at askance at each other, and then later they understood each other's problems and aims. This means that environmental experts learned that it is possible to think outside of the "dark green" box, and the transport experts understood that there are other issues beyond traffic and accessibility that need to be considered. (Quote from my personal interview with a national focal point)

Many of my respondents were disappointed by how slowly the cross-sectoral

[56] BioREGIO Carpathians – Integrated management of biological and landscape diversity for sustainable regional development and ecological connectivity in the Carpathians was a project under the Carpathian Convention from January 2011 to December 2013. Its main aim was to implement the Biodiversity Protocol.

connections were developing. At the international level, for example, joint sectoral working groups are rarely happening; despite repeated calls for them. My database of 47 meetings, which is discussed in Chapter 5 of this dissertation included only a single joint working group meeting (Joint Meeting of Working Group on Conservation and Sustainable Use of Biological and Landscape Diversity (WG on Biodiversity) and Working Group on Spatial Development, 2014); all other working group meetings were along individual topics. This, however, does not mean that cross-sectoral interactions are not being driven by the Convention: the interactions happen at the national level.

Interviewees have repeatedly pointed out that the Carpathian Convention is leading to cross-sectoral interactions not at the international, but at the national level. A representative from WWF claimed that they had observed that the countries' delegates participating to the meetings of the Carpathian Convention are able to think beyond their usual sectoral boundaries and are able to realize how different sectors interact and overlap (paraphrased from my personal interview with WWF representative). To interviewees, as illustrated by the quote below, although this might be new, but is seen as a success and felt like a complicated process:

> The international cooperation is closely related to national cooperation, I mean within the nation, within the state. If it is difficult for us to find a common language with the ministry of agriculture or the ministry of transportation, then it's difficult to go forward on the international level, because at first, we have to formulate our national position and then we have to go outside with it. And sometimes it's difficult as well, but I would say this is very similar everywhere else. (Quote from my personal interview with policy officer and working group member)

Some countries have developed formalized procedures to assist cross-sectoral discussions between ministries. My interviewees from the Czech Republic, Poland and Slovakia have all described their own tools, ranging from an official inter-ministry committee, through regular expert-level meetings, to committees involving actors beyond the governmental structures.

6.3.3.3 Interactions between organization types

Most of the meetings of the Carpathian Convention can be attended by observers. Frits Schlingemann, head of UNEP's Regional Office for Europe at the time the Carpathian Convention was negotiated, recalled that they initially set the norms of the Convention to be inclusive, which was very well received by the actors:

> The beauty is that [the Carpathian Convention] almost immediately received support not only from the countries themselves, but there was huge interest from non-governmental organizations. Of course, that came first and foremost from the biodiversity sector. The national parks' directors already had efforts going on and were interested in this type of additional coordination. (Quote from my personal interview with Frits Schlingemann, former head of UNEP's Regional Office for Europe)

This engagement between different types of organizations (NGOs, protected area administrations and scientists) however, is neither fast nor smooth, and there are some organization types that are missing. The following paragraphs provide an overview of the types of organizations (beyond parties and the Secretariat) regularly participating in the Convention's meetings and often mentioned by my interviewees as their essential partners.

Non-governmental organizations have been represented at nearly all the Convention's international meetings. However, the presence of NGOs in the regime process was perceived ambiguously by my interviewees. Comments ranged between NGOs being vital topical "experts" and "project professionals", to NGOs perceived to be "hijacking" the Carpathian Convention for their own purposes (see previous section). I observed that NGOs sit around the same negotiation table as parties and actively offer their advice and project ideas. Reactions to interventions made by NGOs was usually friendly, although I also witnessed a case when voices were elevated, and the air filled with tension. I was told that interaction between NGO representatives and focal points is also happening at national levels in some countries.

Cooperation with administrations of national parks and other protected areas is mentioned in the text of the Carpathian Convention.[57] The Carpathian Network of Protected Areas was formally top-down created at COP1, although it had its origins in the Association of the Carpathian Protected Areas[58], an earlier cooperation network between protected areas in the Carpathian Mountains. During the initial years of CNPA, it had several joint meetings with the Working Group on Biodiversity. I observed that the head of CNPA (who is also director of a national park) regularly attends the meetings of the Carpathian Convention, sometimes as an official delegation member. His presentations were a clear indication that he sees his work directly related to the Carpathian Convention, and this was well received and applauded by other participants. Other protected area managers and experts were also invited to events of the Carpathian Convention: for example, Hungary was represented by an expert from the Bükk National Park to the Conference on Large Carnivores and the subsequent meeting

[57] Article 4.5. calls for the establishment and support for the Carpathian Network of Protected Areas (CNPA)

[58] The Association of the Carpathian Protected Areas (ACANAP) was founded in 1991 after the initiative of the former director of the Tatra National Park in Slovakia (Niewiadomski 2010). It was a voluntary network of Carpathian national parks and protected areas from Slovakia, Ukraine, Hungary and Romania. ACANAP's main focus was initially on network development and scientific cooperation between the protected areas. Later it started to orient to more practical issues including the management of protected areas. ACANAP organized several conferences and published reports on Carpathian protected areas and related conservation efforts and research needs. However, their activities remained limited due to lack of funding (Niewiadomski 2010).

of the Working Group on Biodiversity. This indicates that both at the international level, and at the national level managers of protected areas are seen as competent and important actors who can contribute to the advancement of the regime.

Scientists and scientific bodies (research organizations, academic institutions) also regularly participate at the meetings of the Carpathian Convention as I observed and have also been mentioned by my interviewees as important actors of the regime network. The most regularly mentioned actors are EURAC Research, the Science for the Carpathians network and Sandor Szalai, professor at Szent Istvan University (Hungary). Scientists are regularly involved in the Carpathian regime process: through reports, meeting participation, conferences, information sharing and leadership roles. The active involvement and development of bridging ties with academic institutions can be observed in the Carpathian regime process.

There are some actors that the interviewees perceived as "missing actors": organization types they suggested were not well represented in the network.

1) Several interviewees have pointed to the fact that they would like to see a stronger engagement from the local level, through local authorities, NGOs and private actors. There have been concerns raised by several interviewees that the Carpathian Convention is not going to the local level, and it would be fully implemented if this happened. Even the motto of COP4 was "think Carpathian act locally". Some parties are actively trying to reach out to local level actors to involve them more in the Carpathian Convention. However, the local actors in many cases feel distanced from the Convention and do not have the capacity and funds to attend the meetings of the Convention.
2) International umbrella organization for NGOs: In the 1990s and early 2000s there were two organizations (CERI and ANPED) that acted as a consultation and cooperation body for local NGOs in the Carpathians, and as a representative of NGO voices towards the Convention. But both umbrella networks ceased to exist, so now NGOs are only engaged individually (if they have the financial means and human resources to travel to meetings and follow the direction of the negotiations). In practice, what I observed at the meetings, and what is also shown in the network analysis is that only a few international NGOs regularly participate in the Convention's events.
3) Although it has not been raised as a concern by my interviewees, to me it is very strange that private sector actors are practically absent from the meeting affiliation network. Some have participated in a few meetings, usually because of

their involvement in some projects; however, there is no actor (or group of actors) that is following the evolution of the Convention (not even in the tourism sector); which is different in other conventions that might even have a subgroup for business actors.

6.3.3.4 Emerging Diversity

This section has shown that the Carpathian Convention, through its inclusive approach to decision-making from the beginning, has managed to draw many countries, sectors and organization types into the regime's network. Although the decision-making power rests exclusively with the parties, the observers are considered being partners, and the regime is leading to the formation of ties between countries, sectors and organization types. However, it was often claimed that interactions between different organizations are rather slow to emerge (as one would expect since this means working against the principle of homophily). On the other hand, once bridging connections exist, they are (1) leading to knowledge and skill-sharing (2) enabling the exchange of information; and (3) creating a forum to develop and promote new projects. And importantly for this research, such diversity is thought to benefit the effectiveness of regimes, since it enhances their adaptive capacities (Armitage et al. 2009).

6.3.4 What travels through the links?

There are many types of social interaction that happen in the Carpathian network. This section discusses what travels through the ties in the social network - something that network analysis cannot do but is important for moving the regime process forward. The actors interact with each other on three markedly differing themes: information, culture and norms of interaction and vision for their future.

6.3.4.1 Project ideas, updates

Discussions of projects were always on the agenda at the meetings of the Convention: information was shared about opportunities for joint projects (funding sources, project ideas, organizational partners), presentations on ongoing projects and accounts of completed projects. I had a feeling after attending a few events that the Convention is more like a project-fare than a regime. This was shared by one interviewee used a neologism in Hungarian, "projektezés" to describe the phenomenon of organizations and institutions constantly running one project after the other. Several of my interviewees noted that the projects are not always driven by a long-term vision but are opportunistic attempts to access money for something that is within the scope of the

Convention and in which the project results might not be used in the future.

However, many other interviewees thought that having projects was both a key success of and a necessity for the Convention. Success in the sense that they perceived that the Carpathian Convention moved "from the legal framework to the implementation through projects" (personal interview with EU expert). With some actors even claiming that "everything that is happening under the Carpathian Convention is linked to projects" (interview with NGO representative). For example, the BioREGIO project was designed to implement the Biodiversity Protocol and the TRANSGREEN and ConnectGREEN projects are running to implement the Transport Protocol. Projects were also seen as a necessity: projects give visibility to the Carpathian Convention and visibility of the Convention draws in politicians. When ministers see that something concrete can be delivered during their term, they are more likely to consider it as a priority. The Carpathian Convention is such a platform for them.

From an analytical perspective, focusing on the evolution of the social network of actors, I saw projects as the thread that kept actors together. Projects were in fact creating ties between organizations, further to the meetings (Vetier 2015; 2016). Projects were also able to keep engagement and motivations of individuals/organizations high and gave the feeling that things were moving forward (somewhat) in line with the Convention's aims. However, relying so much on projects depending on external funding also induced competition between some actors. I witnessed cases of organizations being hesitant to share data because of fear of their data being used in another project application. Thus, projects were used to connect and initiate cooperation between actors, and also set actors apart in competitive environments.

6.3.4.2 Information

As discussed before, information on the advances of scientific knowledge is shared in the network. In most cases, I observed that the information was travelling in one direction: from scientists (S4C and EURAC) to the Secretariat and other actors. S4C scientists are invited to present their findings at conferences of the parties; and the Secretariat of the Convention attends S4C's biannual scientific conference, "Forum Carpaticum". EURAC also regularly attends the Convention's events, presents its reports and also organizes workshops for discussion. See more elaborate discussion on the role of science in the network in Section 6.3.1.2.

Another dimension of sharing information relates to policy translation and transfer from the regional to the national level (see also Chapter 7). My interviewees perceived that the Carpathian Convention is facilitating information flow from European member states to non-EU member states. The importance of the Convention in helping non-EU countries to implement EU law, EU policies, action plans and best practices was highlighted as one of the driving forces that lead to the inception of the Convention. It was also claimed to be one of the successes that the Convention is delivering to non-EU countries. Serbia's national focal point, for example, told me that although their geographic share of the Carpathians is small, they aim to implement the Convention's policies to the whole of Serbia. My Ukrainian respondent also perceived the Carpathian Convention as a tool to stay connected to the EU and to use the EU's policies as a basis for policy translation.

6.3.4.3 Vision

The actors of the regime network also interact with each other on their vision for future developments under the regime and of the regime: ranging from the short-term perspective of a single project application (see the previous discussion), through protocols and action plans for the Carpathian Convention, all the way to a long-term vision. "Becoming an international competence centre" (personal interview with Egerer) was the grand vision of my interviewees connected to UNEP, EU and other conventions (Alpine, Ramsar). They perceive that the knowledge and experience gained in the Carpathian region can be shared with other mountain regions and conventions aiming to set up similar regime structures.

However, at the level of parties, the vision appeared to be less grandiose. The parties' and stakeholders' vision for the Convention's priorities, protocols and action plans is regularly discussed. During my observations and interviews I did not have the impression that the Carpathian countries had a clear shared vision for the role of the Convention (beyond providing a cooperation platform to apply for project funds, "projektezés", see the previous section): is it about protecting nature or developing the region; in the mountain area only, or the mountain area integrated with their neighbouring low-lands? I was missing a uniting vision for the countries: what is the number one problem that they want to solve with this convention, what is the common challenge? My analysis showed that parties' vision for the future of the Carpathian Convention varies; and can be driven by national priorities (e.g. the Czech Republic pushing for transport to address ecosystem fragmentation between Slovakia and the Czech Republic), EU commitments (e.g. Serbia and Ukraine use the Carpathian

Convention as a tool to assist them in policy transfer and thus keep them close to the EU and possibly advance their future EU accession), obligations under other international agreements (e.g. the Carpathian Wetland Initiative discussed in detail in the next chapter and Carpathian work on large carnivores' management are regional implementations of the Ramsar and Bern Conventions, respectively), and the perspective of accessing funds.

6.3.4.4 The hurdles and challenging topics

There are hurdles within the network that make it more difficult for connections to form and strengthen; and there are also some issues that are not (or *no longer*) travelling through the network, as discussed in the following paragraphs.

English is the official language of the Convention. This was decided during the initial negotiation phases and has not been revisited. Although it might sound convincing that English allows equal participation of all actors and saves money on translation and interpretation, I have observed, and was told by some respondents, that communication between parties is hindered by lack of appropriate language skills as not all actors' English skills are at the level that would allow them to fully participate. The reliance on English also excludes some local actors (local governments, small businesses, protected area manager) from the regime, and from accessing information because several of these actors do not speak English.

Geographic issues have also drawn heated debates in the Carpathian network. For the first ten years of the Convention, up to the 4th COP, its geographic scope and the location of its Secretariat were continuously on the agenda. Through creative diplomatic solutions, these problems are now off the table. At the 4th session of the COP it was decided that parties are not ready to agree on the location of the Secretariat[59] and delayed the decision to the future without a specific deadline. As for the geographic scope of the Convention, the decision was made (also at COP4) that the parties will not continue debating towards a joint agreement, but all parties shall decide at the national level for each protocol what geographic scope of their country it will apply to; and notify the Secretariat of their decision. This means that each protocol has a different geographic scope for its application, but at least this solution resolved the previous

[59] The issue of the location of the Secretariat was on the agenda of COP4. After parties could reach an agreement during the plenary meeting, a contact group consisting only of parties', the Secretariat's, UNEP's and the Alpine Convention's delegates was established. The next day the contact group concluded that the decision will be postponed to COP5 or COP6; and also moved responsibility from the Secretariat to the parties to find the permanent location.

deadlock.

6.4 Analytical Reflections on Using Mixed Methods in Network Analysis for Regime Studies

In this chapter, I combined survey-based social network analysis with qualitative data from semi-structured interviews and participant observation. I applied this mixed methodology to the case study of the Carpathian Convention, to test its application and develop methodological contributions on further scientific use for the study of the outcome-level effectiveness of environmental regimes. This discussion is about using a mixed qualitative and quantitative methodology for network analysis, and not about discussing the advantages and disadvantages of each method (see Methodology chapter for such a discussion). The benefits and weaknesses of combining qualitative (interviews, participant observation) and quantitative (social network survey and social network analysis) data collection and analysis methods are discussed from a regime effectiveness research perspective in the next paragraphs. This reflective, analytical section builds upon three recent publications that call for combining qualitative and quantitative social network analysis methods, often called qualitative network analysis (Ahrens 2018; Crossley 2010; Yousefi-Nooraie et al. 2018), and see also Methodology chapter.

Relational data for social network analysis is regularly collected through surveys (J. Scott 2012); depending on the size of the network (see discussion later) this data collection method can be readily used in environmental regime contexts as well. But the size of the regime network can be a limiting factor for survey-based and interview data collection. From a social network analysis perspective, a nearly full response rate is required, and the more extensive the network, the more likely it is that a 100% response rate cannot be achieved (Kossinets 2006). As the number of actors in the survey increase, more time is required from respondents to fill in the survey (which can be a tedious task). For my research, the list of 20 organizations and four relating questions was within the limits that respondents completed without difficulties. However, with a larger network, or more questions it would have become a time consuming exercise. Based on my research experience, it is not possible to give a cut-off number for the length network surveys that respondents can still be asked to complete, but it should be considered in other research projects.

Interviews can also help to avert some common challenges of social network surveys. (1) Interviews can help maximize response rate to SNA and reduce discrepancies in survey completion. During my research, once I established rapport during the interview, I could explain the role and relevance of the network survey to my research and also, if necessary, clarify the network survey's questions to the respondent. I believe that sequencing the network survey after the interview helped me to receive nearly full survey completion. (2) I also had some respondents who decided to complete the survey while I was still present. As they were working their way through the survey, raising questions, adding further information to their choices, I could understand how they define ties, the intensity of interaction, etc. This provided further valuable information I could use during data analysis.

(3) Some regime studies, similar to my analysis, are carried out at organization-level. Inter-organizational network studies' common struggle is how to get individual perspectives to represent the network between (Seppänen, Blomqvist, and Sundqvist 2007). The characteristics and personality of the person (people) completing the survey matter: for example, their time at the organization, their role, their focus, all have an impact on whom they know, whom they work together with etc. Interviews can help to mitigate this surveying challenge, in case the interviewee and the person completing the survey are the same, then the respondents can elaborate in detail their working relationships.

Participating in meetings, experiencing and observing the interactions of the actors of the regime network can give general impressions of how actors work together. It can also shed light on the "untold" interactions and allow the researcher to look behind politically correct survey or interview responses. Observing participants in their own settings can also give a deeper understanding of the meaning of certain concepts or metaphors used by interviewees. Participant observation can also be used, as I did in my research, to identify actors that should be included in the network survey and/or should be interviewed.

To sum up: using a mix of methods for analysing the effectiveness of environmental regimes has several benefits: it allows quantitative analysis of the social network of actors, which can be seen as the skeleton of interactions. Interviews can put the flesh on the skeleton by giving actors perceptions of their own network, its functions, its evolution etc. - depending on the analytical lenses of the researcher. And finally observing participants in their own meetings can shed light on the untold stories. However, the number of actors in the regime network and their availability can be a

limiting factor for combining network surveys with qualitative methods. With an increased number of actors, a full response rate is less likely to be achieved, which significantly reduces the reliability of the network analysis' findings.

6.5 Summary

This chapter used a combination of three methods to analyse the internal network of actors of the Carpathian Convention. I combined observation, interviews and survey-based social network analysis to get a picture of how actors perceive their own network and how their network functions. The analysis was carried out from a regime effectiveness perspective and focused on the four pillars of outcome-level effectiveness: shared knowledge generation, social cohesion, leadership and power and inclusivity.

The analysis of the internal network of the Carpathian Convention highlighted that certain actors are more actively engaged in the process than the others, while some of these same actors have legally only observer status under the convention. For knowledge generation, there seems to be a hierarchical structure at the international level, with nearly all information arriving directly to the Secretariat. There were only a few projects that focused on shared knowledge generation. Social cohesion processes in the network were driven by projects and legal processes that bring actors together into a "family". However, the Convention's openness to observers' participation generated a process working against cohesion: bridging sectors and organization types was putting pressure on the network. Leadership was perceived ambiguously by actors: whereas those that were in legally defined leadership roles were less ready to lead and leaders from this group were mostly driven by personal commitments; organizations in coordinating and observer roles were perceived as the leaders of the regime. Officially, the function of the network is to advance the Carpathian Convention. However, maintaining social cohesion of actors oftentimes prevails: sensitive and delicate topics are dropped, and the focus is on discussions that unite the actors, in several cases projects and funding.

7 The Network of Regimes

7.1 Introduction

The previous two chapters analysed the Carpathian Convention's actors' network. This chapter looks at the network of regimes around the Convention. Research has highlighted that interactions between regimes can also impact on individual regimes' effectiveness - not only the processes inside a regime (Young 2011). A critical aspect of regional environmental governance is what role and position does the regional regime have in the multi-dimensional *patchwork* (Héritier 1996) of all other regimes: where is its spot vertically defined between the national legal structures and global regimes; and horizontally placed between the other sectoral regimes; and through what mechanisms does it interact with other regimes. Regime architecture, regime interaction mechanisms and connections between regime effectiveness and regime interactions are the main themes of research in this field.

From a regime architecture perspective, one approach taken by many researchers and decision-makers is to see the governance system as a multi-level, nested, hierarchic system in which one regime is super- or subordinate to another one (Wyborn and Bixler 2013). Another perspective considers the architecture of regimes as a polycentric network system, with overlaps, redundancies and changing power relations (Nagendra and Ostrom 2012; Silveira and Richards 2013) in which decision-making between levels, institutions and actors is dispersed (Balsiger 2012). A recent publication claims that the two perspectives are, in fact, not contradictory but offer different perspectives of the network of regimes (Kim 2019).

Further to the structure of regime architecture, researchers also aim to understand the interaction pathways and mechanisms. Gehring and Oberthür (2009) identified four causal mechanisms of regime interaction, see Figure 2-3. Recently, Gehring and Oberthür's model featuring uni-directionality and the strict separation of source and target was questioned by Jordan et al (2015), who describe regime interactions as an evolving system.

The aim of this chapter is to analyse the network of regimes and organizations that the Carpathian Convention is connecting and to explore how these coexist and interact with the Carpathian Convention, and thus contributes to Objective 3 of this dissertation (see Section 1.3). It uses mixed methods: (1) quantitative citation/ego-network analysis to analyse the network around the Convention, and (2) qualitative interview analysis to

understand how the network functions and what it means to its actors.

Ego-network analysis is a method to analyse the qualities of the network around a single entity (the ego), the Carpathian Convention in this concrete case. Ego-network analysis has been used, among others to analyse the phenomena affecting individual entities across different settings (networks) (Crossley et al. 2015). For regime effectiveness, ego-network analysis is a method to shed light on how other regimes might impact the effectiveness of the target regime. This chapter contributes to Objective 3 of this dissertation by providing an analysis of regime interactions' impact on the effectiveness of the Carpathian Convention.

The chapter is structured similar to the previous analytical chapters. First, it discusses the conceptual and theoretical foundations and then describes the methods of data collection and analysis. The Findings section (7.3) applies the methodologies to the case study of the Carpathian Convention. Finally, I reflect on the advantages and limitations of using this methodology for the analysis of the effectiveness of regional environmental regimes.

7.2 Methodology

This section gives a review of the specific methods used in this chapter. It should be read together with the Methodology and Conceptual Framework chapters of this dissertation (Chapters 3 and 4) which addresses the general points relating to data collection, analysis and mixed methods research.

To analyse how regime interactions impact on the Carpathian Convention, I used a combination of ego-network analysis and qualitative interview analysis. I carried out an ego-network analysis of the regimes and institutions that the Carpathian Convention connects to; and I asked my interviewees in the semi-structured interviews (see Chapter 4) about how they perceive the Carpathian Convention's role in relation to other environmental agreements. These two data sources were overlaid in the analysis in order to allow a better understanding of both the structural and qualitative details of regime interactions and their impacts on the Carpathian Convention's effectiveness. This section describes in detail the steps of data collection and analysis.

7.2.1 Data collection

Ego-network data collection: First, I searched the texts of the Carpathian Convention and its Protocols for references to any other regime, policy or institution; then I

explored the Secretariat's official website for contracts (memoranda of understanding (MOU), memoranda of cooperation (MOC), partnership agreements etc.) that they have signed on behalf of the Carpathian Convention with other bodies. The alters[60] of the resulting *citation network* were defined by these regimes and institutions.

Second, I searched for connections between alters using the same method as described above: reading legal texts and looking at the official websites of the secretariats and organizations. I coded any textual reference in the legal texts (conventions and protocols, but not decisions) or MOUs/MOCs that the organizations (secretariats and other bodies) have signed. All links in the network were coded as undirected and unweighted ties (binary links).

As the third step alters were categorised into attribute classes. The attributes, as discussed in the Conceptual Framework chapter, were (1) the geographic scope of the activities of the alter (Carpathian, regional, EU, European, global), the sector of the alter (general environmental, agriculture, biodiversity, forest, transport, tourism, and other) and the type of the alter (EU policy, multilateral environmental agreement (MEA) or MEA secretariat, organization).

I carried out **semi-structured interviews** with a total of 63 people. Approximately half of them were current or former members of the Carpathian Convention's network, and the other half were representatives of regimes and organizations with which the Convention regularly interacts, as identified through the ego-network analysis.

While my interviews with the Carpathian actors were semi-structured interviews using the same set of topics, the questions for the interviews I conducted with external actors were tailored to the interviewee and their organization's relation to the Convention. For both groups, the interviews were more at the looser end of the structured to less-structured spectrum. After briefly introducing myself and my research, I asked my open-ended questions.

Data gaps identified during the analysis were filled by secondary data sources and archival data.

[60] An ego-network's boundary by definition is defined as nodes being at a distance of one degree from the ego (the Carpathian Convention in the current case).

7.2.2 Data analysis

Ego-network analysis, by definition, analyses two sets of links: one set is formed by the links that the node in question (the ego) has to other nodes (its alters) and the second set comprises the connections between the alters (Crossley et al. 2015). Typically, ego-network analysis describes the size, composition and structure of the network in order to answer research questions like how many contacts does ego have; does ego interact with others like him/herself; and does ego connect otherwise unconnected alters. To understand what role the Carpathian Convention as a regional convention is playing in the regime network it is part of, some of these ego-network analysis concepts need to be re-conceptualized.

It is important to understand the **size and composition** of the network so that one is aware of how many and what kinds of regimes and institutions the network consists of. A *node count* tells us the size of the ego-network, or to put it in simple terms, how many regimes and instruments the Carpathian Convention is formally connected to. The composition of the network analyses (dis)similarity in alter-ego and alter-alter relations. In order to find out what role the Carpathian Convention is playing in its regime network, we need to be able to tell if the network consists of nodes that are all similar to or dissimilar from the ego since this information would hint for example if the Convention is positioned to address conflicts arising from different sectoral objectives or to make the most synergies arising from parallel existing regimes and institutions.

Network science employs two concepts to describe the composition of an ego-network: homophily and alter dispersion (also called as categorical heterogeneity). Homophily measures if alters are similar (or dissimilar) to ego and alter distribution compares alters to each other. To analyse *homophily* in the ego-network I used Krackhardt and Stern's EI Index (EI Index), which is an index that shows on a scale of +1 to -1 the level of similarity (homophily in network terms, EI Index closer to +1) or dissimilarity (heterophily, EI Index closer to -1) of the alters (Krackhardt and Stern 1988). To describe *alter dispersion*, I used Agresti's IQV (Index of Qualitative Variation), which gives a normalized value between 0 and 1, where 0 means that all the alters fall into the same attribute category, and 1 if all alters are dissimilar (Agresti and Agresti 1978).

Structure: Going one level deeper we would want to see if the Carpathian Convention is connecting otherwise unconnected regimes since this would be an indication that it could be positioned to realize or maybe even solve at regional level the conflicts between the regimes' goals, and benefit from their mutual objectives. *Density* of the

ego-network gives an indication of how many links of all possible links are present. At a density value of 1, all nodes are connected to all other nodes, and this would indicate that the ego in a network structural perspective does not have a special role. On the other hand, at density values lower than 1 not all nodes are connected to each other (though by definition of the ego-network all of them are connected to the ego). In such case, the structure of the network can take many forms and the position of ego within the network can be further explored.

Brokerage is a network measure that is able to indicate if a node is acting as a "bridge", or "broker" between two or more otherwise unconnected or only weakly connected parts of the network. A brokerage role in social sciences is usually understood to be a key position since it can control the flow of information between two segments of the social network (Burt 1992). For the current research question, it needs to be re-conceptualized a bit since there are limits to what bridging role a convention can play between other regimes. It is unlikely, for example, that the Carpathian Convention would control the flow of information between two (or more) other multilateral environmental processes. On the other hand, if it is connecting to two or more otherwise unconnected regimes it is positioned to deal with conflicts and synergies that materialize on the ground from the lack of connection between processes; and also to tap into resources (e.g. information, financial resources) in the various regimes and institutions.

However, being connected to many otherwise un-connected regimes and institutions might constrain the Convention by the many obligations they are putting on it (Crossley 2008). The third[61] network science measure that I employ to describe the structure of the ego-network points explicitly out that nodes that have many ties to others may actually lose freedom of action rather than gain it, depending on the connections among the other nodes. *Constraint* is a measure that indicates resources spent to connect to a specific alter (Burt 1992). In the concrete case, what it means is that if the Carpathian Convention wanted to assist parties in implementing the commitments and objectives of all regimes and institutions it is connecting to, meaning splitting its time

[61] There is a fourth commonly used network science measure for ego-network: effective size. Burt suggests effective size as a measure to define if the ego is connecting to alters that are all connected to each other, and thus probably have access to the same kind of resources. I have decided not to use effective size in my research, since in the concrete case it does not make sense. Because even if, for example the five biodiversity-related global MEAs form a clique (meaning that they are all connected to each other), the Carpathian Convention would still commit to implementing different kinds of commitments by connecting to them all. So, having ties to the Ramsar Convention, Bonn Convention, Bern Convention, CITES and CBD cannot be considered redundant.

and resources among all connections, then it would be spending lots of efforts, especially if the alters were not connecting to each other.

After having understood the size, composition and structure of the Carpathian Convention's ego-network to answer my research question, I looked into the detailed functioning of four links and how the regime network is perceived by actors of the Carpathian Convention. These were analysed through qualitative data analysis. I analysed in detail how the four selected alter-ego links function: through what mechanism(s) is the connection enabled, what are the connection's objectives and what outputs has it delivered. This analysis was based on interview data, participant observation and publicly available documents. Furthermore, I asked my interviewees about their perceptions on the role the Carpathian Convention is playing in relation to other regimes and institutions. These two sets of qualitative data put the "flesh" on the ego-network and allow me to answer the question of this chapter.

7.2.3 Limitations of the ego-network data collection method

As with all kinds of methods, the data collection method I used also has limitations. The next paragraphs outline the most pressing problems I have faced during data collection and explain how I dealt with these issues, how these might affect my research findings, and what could be done in the future to limit the occurrence of similar problems.

Some alters were only very vaguely defined by the Carpathian Convention. For example, the Protocol on Sustainable Transport Preamble text says: "TAKING INTO ACCOUNT the legal and policy framework on transport and environment of the European Union". I was faced with a similar terminology in the Preamble of the Protocol on Conservation and Sustainable Use of Biological and Landscape Diversity: "TAKING INTO ACCOUNT the legal framework on nature protection and biodiversity conservation of the European Community". Both the EU's transport policy framework and its legal framework on nature protection and biodiversity conservation include several pieces of policy documents. For these cases, I referred to the official website of the European Commission and took those pieces of legislation that they identify as parts of the legal and policy frameworks. However, the EU's transport policy framework was not defined by the European Commission, and according to expert reviews (Department of Transport, no date) contains nearly a hundred pieces of legislation. The current research framework did not allow me to go through all of these pieces of legislation, so the EU's transport legislation remained one single node in the network.

I decided to treat all links as equal and unweighted, meaning that I have not recorded if the link was formed through textual reference or through a partnership agreement. This means that the ego-network analysis only analyses the skeleton of the ego-network, without directionality, time dimensions and strength or type of connection. On the other hand, the qualitative analysis of the interviews sheds a much clearer light on the functioning of the links, than the ego-network analysis would be able to do so. Future research could refine the network analysis and explore the differences between the network based on textual references and based on contractual agreements, see Table 7-1. It would also be possible in future studies to define attribute data based on how and where the citations appear, and thus add weights to the links.

I have identified some alters (most importantly the European Environment Agency, EEA and the European Academy, EURAC) during interviews and participant observation that are connecting to several alters, however, the ties did not appear in my data collection method. For example, the EEA is analysing EU policies but there were no documents available on the internet that would include this relationship. Similarly, my interviews highlighted multiple times that EURAC connects to the Alpine Convention and possibly to other nodes as well, but no sign of these connections were found. My current research did not allow to reach out to these organisations with an official access to information request[62] , which could have possibly provided further information on their contacts. Future research could include approaching all alters with a standard request form to clarify the functioning of their institutional connections.

In the current research I analysed the functioning of four links in detail. The cases were selected based on data accessibility and cannot be considered representative of the whole network. On the contrary my impression is that these four links were best operationalized at the time of the research, hence people were talking about these connections, documents were readily available. These four cases should be treated as illustrative or exploratory cases: adding richness to the data and showing directions for future research.

The above-discussed limitations do not impact the findings of my research significantly, they instead highlight critical points to consider in future research that applies the same or similar methodology for assessing regime interactions. The next chapter looks at the

[62] Access to information request is a standard procedure within European public institutions to gain access to data. In the case of the EEA this could have resulted in more information about their links to EU policies. However, since EURAC is a private entity they are not obliged to give out information that they might consider sensitive or business interest.

findings of the ego-network analysis.

7.3 Findings

7.3.1 Network Analysis

This section gives an overview of the structural characteristics of the Carpathian Convention's ego-network.

Network size: The Carpathian Convention's ego-network consist of 39 alters and the ego, in total, it is a network with 40 nodes. Table 7-1 lists all nodes in alphabetical order, shows in what way the connection is established between ego and alter, and displays the three coded attributes that were used for the analysis. A full list of all legal pieces, multilateral treaties, organizations and institutions with explanations and where appropriate legal references can be found in Annex 3.

Table 7-1: Overview of nodes in the Carpathian Convention's institutional network

ID	Label	Type of reference between nodes							Assigned Categories		
		Convention Preamble	Biodiv. Protocol	Forest Protocol	Tourism Protocol	Transport Protocol	SARD Protocol	MoU / MoC etc.	Geographic scope	Sector	Type
Carpathian Convention	Carp.Conv								Carp	General	
Carpathian EcoRegion Initiative	CERI							MoU	Carp	Biodiv	Org
Commission on Sustainable Development (CSD)	CSD				Acknowledging				Global	General	Org
Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972)	WHC		Noting	Recalling	Noting	Noting			Global	General	MEA
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Århus, 1998)	Aarhus		Noting		Noting				Europe	Other	MEA
Convention on Biological Diversity (Rio de Janeiro, 1992)	CBD		Noting	Recalling	Noting	Noting		MoU jointly with the Alpine Convention	Global	Biodiv	MEA
Convention on Conservation of European Wildlife and Natural Habitats (Bern, 1979)	Bern		Noting			Noting			Global	Biodiv	MEA
Convention on Conservation of Migratory Species of Wild Animals (Bonn, 1979)	CMS		Noting						Global	Biodiv	MEA
Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991)	Espoo		Noting		Noting				Europe	Other	MEA
Convention on International Trade in Endangered Species of Wild Fauna	CITES		Noting						Global	Biodiversity	MEA

ID	Label	Type of reference between nodes							Assigned Categories		
		Convention Preamble	Biodiv. Protocol	Forest Protocol	Tourism Protocol	Transport Protocol	SARD Protocol	MoU / MoC etc.	Geographic scope	Sector	Type
and Flora (Washington, 1973)											
Convention on the Protection of the Alps (Salzburg, 1991)	Alpine	Recognizing	Noting			Recognizing			Regional	General	MEA
Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar, 1971)	Ramsar		Noting			Noting		MoU	Global	Biodiversity	MEA
Council of Europe	CoE		Acknowledging				Acknowledging		Europe	Other	Org
Declaration on Environment and Development ("Agenda 21", Rio de Janeiro, 1992)	Rio-Decl	Recognizing		Recalling	Recognizing, Recalling				Global	General	MEA
Declaration on Environment and Sustainable Development in the Carpathian and Danube Region (Bucharest, 2001)	Bucharest-Decl	Recalling							Carp	General	MEA
EU cohesion policy	EU-Cohesion						Acknowledging		EU	Other	EU
EU Common Agricultural Policy	EU-CAP						Taking into account		EU	Agri	EU
EU Forestry Strategy and its Forest Action Plan	EU-Forest			Noting					EU	Forest	EU
EU legal framework on nature protection and biodiversity	EU-Nature		Taking into account						EU	Biodiversity	EU
EU legal framework on transport	EU-Transport					Taking into account			EU	Transport	EU
EU Strategy for the Baltic Sea Region	EUSBSR					Emphasizing			EU	General	EU

ID	Label	Type of reference between nodes							Assigned Categories		
		Conven-tion Preamble	Biodiv. Protocol	Forest Protocol	Tourism Protocol	Transport Protocol	SARD Protocol	MoU / MoC etc.	Geographic scope	Sector	Type
EU Strategy for the Danube Region	EUSDR					Emphasiz-ing		MoC (PA 03, 04, 1A)	EU	General	EU
EU Trans-European Transport Network Development	EU-TEN-T					Taking into account			EU	Transport	EU
European Academy, EURAC	EURAC							MoC	Global	General	Org
European Environment Agency (EEA)	EEA							Partnership Agreement	EU	General	Org
European Landscape Convention (Florence, 2000)	ELC		Noting	Recalling	Noting				Global	Biodiversity	MEA
Executive Secretariat of the Central European Initiative	CEI							MoU	Regional	Other	Org
Forest Law Enforcement and Governance processes	FLEG			Recalling					Global	Forest	MEA
International Commission for the Protection of the Danube River (ICPDR)	ICPDR			Recalling					Regional	Other	MEA
Resolutions of the Ministerial Conference for the Protection of Forests in Europe	MCPFE			Recalling					Europe	Forest	MEA
Science for the Carpathians Initiative (S4C)	S4C			Recalling				MoU	Carp	General	Org
Sustainable Development Goals	SDGs							MoU	Global	General	MEA
UN Framework Convention on Climate Change and its Kyoto Protocol	UNFCCC						Taking into account		Global	Other	MEA
UN Non-Legally Binding Instrument	NLBI-			Recalling					Global	Forest	MEA

ID	Label	Type of reference between nodes							Assigned Categories		
		Conven-tion Preamble	Biodiv. Protocol	Forest Protocol	Tourism Protocol	Transport Protocol	SARD Protocol	MoU / MoC etc.	Geograph ic scope	Sector	Type
on All Types of Forests	Forest										
UNECE Trans-European network for motorways (TEM)	UNECE-TEM			Recalling					Europe	Transport	MEA
UNECE Trans-European network for rail (TER)	UNECE-TER					Taking into account			Europe	Transport	MEA
United Nations Forum on Forests' decisions	UNFF					Taking into account			Global	Forest	MEA
UNWTO	UNWTO				Acknow-ledging				Global	Tourism	Org
World Summit on Sustainable Development, Johannesburg Declaration on Sustainable Development	WSSD-Decl							Mutual observer status	Global	General	MEA
World Summit on Sustainable Development, Plan of Implementation	WSSD-Impl	Recog-nizing			Recalling				Global	General	MEA

Network composition: As discussed in the conceptual framework (Chapter 3) and in Section 7.2 above, there are two indicators that allow comparison of the attributes of alters-to-ego and alters-to-alters. *Homophily* compares alters to the ego. Krackhardt and Stern's EI Index[63] (EI Index) to measure homophily shows for the different node attribute categories that the Carpathian Convention's ego-network is most diverse in terms of geographic scope of the alters (EI Index 0.85), less diverse on topics (EI Index 0.33) and relatively similar in types of alters (EI Index -0.18). *Alter dispersion,* on the other hand, compares alters to each other, and not to the ego. Using Agrestis's Index of Qualitative Variation (IQV) I have found that alters are most diverse on their topics (IQV = 0.92), and less diverse on their geographic scope (IQV = 0.87) and type (IQV = 0.85).

Table 7-2: Overview of the composition of the Carpathian Convention's institutional network

	Homophily EI index (values -1 to +1)		**Alter Dispersion Agresti's IQV (values 0 to 1)**	
Geographic scope	0.85	Most diverse	0.87	
Sector	0.33		0.92	Most diverse
Type	-0.18	Least diverse	0.85	Least diverse

The Carpathian Convention's ego-network consist of 39 alters, and the alters show a relatively high level of diversity regarding all three recorded attributes. In terms of their (dis)similarity to the Convention itself, the alters are somewhat dissimilar in their geographic scope and topics, and relatively similar in their type (MEA). These findings do not yet answer the "how", but they already indicate that the Carpathian Convention has a sizeable and diverse ego-network, including alters that are dissimilar from each other and from the Convention.

Structure: Size and composition of the ego-network of the Carpathian Convention are important to understand how many and what kind of regimes and institutions the Carpathian Convention has connections with. However, these measures do not show us the structure of the network: how alters are connected and what is the network structural position of ego in relation to its alters. Figure 7-1 illustrates the structure of

[63] Informal networks and organizational crises: An experimental simulation. David Krackhardt, Robert N. Stern - Social Psychology Quarterly, 1988

the Carpathian Convention's ego-network.

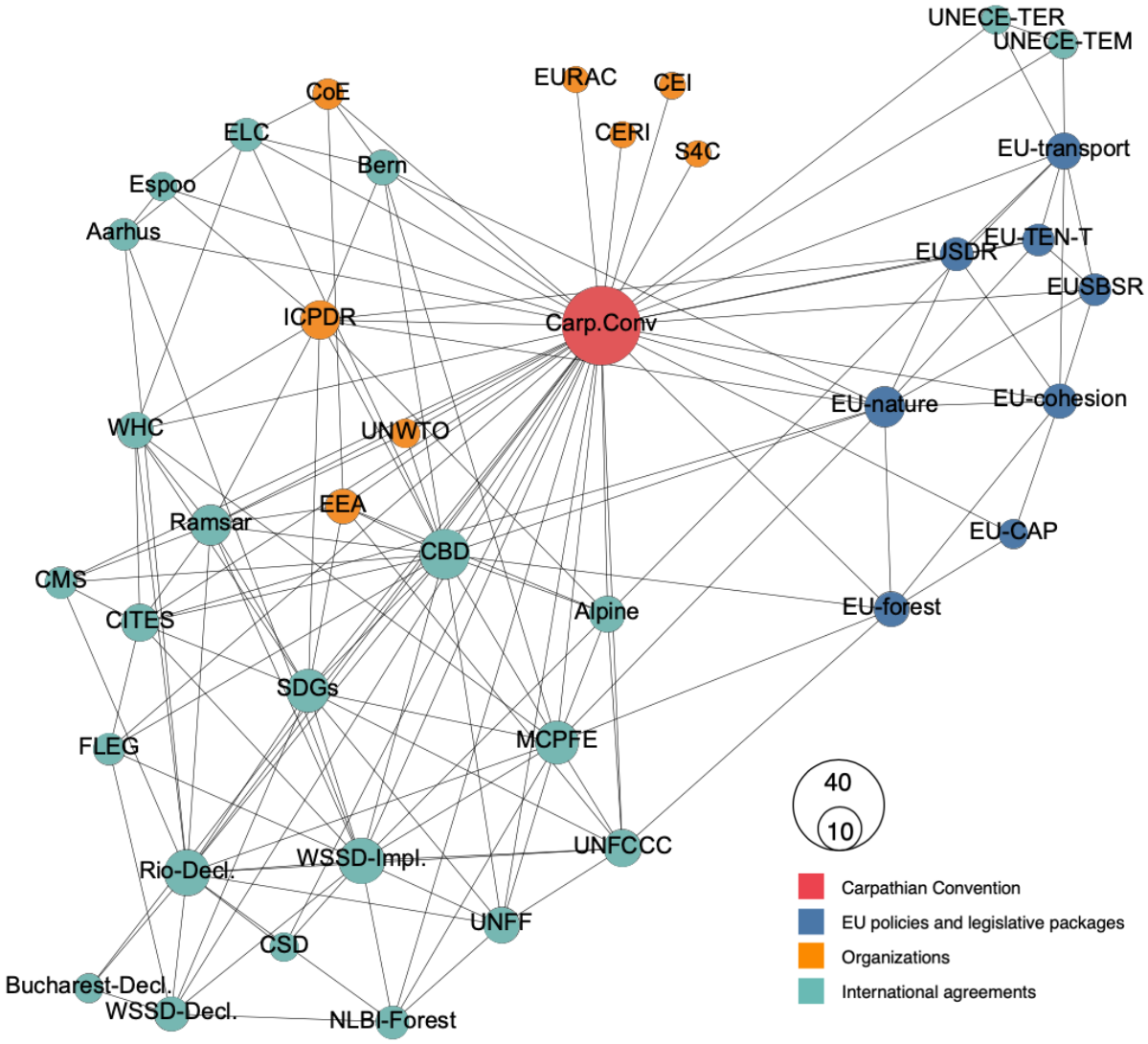

Figure 7-1: Carpathian Convention's institutional ego-network

Notes to figure: Nodes are coloured according to their sector, and their size is relative to their degree. The layout is generated by Gephi Force Atlas 2 layout (Jacomy et al. 2014). Node labels are explained in Table 7-1.

Density is a measure to describe how many links are present in relation to all possible links. In total there are 151 links in the ego-network among the 40 nodes, of which 39 connect alters to the Carpathian Convention, and the rest are links between alters. The ego-network of the Carpathian Convention has a density of 0.194, meaning that nearly 20% of all possible connections are actually present. This value means that the network is not a fully connected network since 80% of the links are missing.

In an ego-network, by definition, all nodes are connected to ego. However, if not all others are connected to each other, as it is the case in the currently discussed network, then ego may take up the role of a "broker" on the paths between other nodes. Brokerage explores if ego is the "go-between" for pairs of other actors (Hanneman and Riddle 2005). It could act as a coordinator, consultant, representative, gatekeeper or liaison actor (Nooy, Mrvar, and Batagelj 2011; Fernandez and Gould 1994), see also Figure 3-4 in the Conceptual Framework chapter. **Brokerage** is the network measure that captures to what extent a node is connecting two otherwise unconnected nodes. The Carpathian Convention has the highest brokerage value (0.849) in the current network: it connects the most pairs of unconnected nodes. It is followed by the Convention on Biological Diversity (CBD)[64] (0.634), the International Commission for the Protection of the River Danube (ICPDR)[65] (0.578), the Rio Declaration[66] and the EU legal framework on transport[67] (both at 0.571), EU legal framework on nature[68] (0.564) and World Summit on Sustainable Development's Guide to Implementation (WSSD-Implementation)[69] (0.543).

Constraint analyses a similar characteristic of the nodes of the network as brokerage, however from a slightly different angle. Constraint assumes that one's time, energy and other efforts are equally spent between their alters. This is, of course, true for alters as well, who will similarly equally distribute their resources among their connections. Constraint points out that actors with many ties may actually lose freedom of action rather than gain it - depending on the relationships among the other actors (Hanneman and Riddle 2005). A lower constraint value is an indication of many structural holes in the node's network that may be exploited. The Carpathian Convention has the lowest aggregate constraint value in the network (0.079), followed by the CBD (0.145), Rio Declaration (0.174), WSSD-Implementation (0.177) and ICPDR (0.178).

[64] Convention on Biological Diversity (Rio de Janeiro, 1992)

[65] ICPDR is an international organization focusing on sustainable and equitable water use in the Danube River Basin.

[66] Declaration on Environment and Development, also known as "Agenda 21", adopted at the United Nations Conference on Environment and Development (UNCED, "Earth Summit") in Rio de Janeiro (1992)

[67] EU legal framework on transport, covers hundreds of pieces of legislation and was not further detailed in this research.

[68] EU legal framework on nature protection and biodiversity, which according to the European Commission includes: the Birds Directive, the Habitats Directive, the Zoos Directive, the Wildlife Trade Regulations, the Invasive Alien Species Regulation, see also Annex 3.

[69] World Summit on Sustainable Development, Plan of Implementation: A/CONF.199/20, Chapter 1, Resolution 2, Johannesburg, September 2002, World Summit on Sustainable Development, Plan of Implementation of the World Summit on Sustainable Development.

The structural characteristics of the Carpathian Convention's ego-network show that the regime is positioned to connect a diverse group of regimes and institutions: different sectors, various geographical scopes and types of regimes and institutions are nodes in the network. The network shows that the Carpathian Convention lie in between some otherwise unconnected regimes and institutions. This observation, however, can arise from limitations in data collection. It is highly unlikely that European nature and transport legislative instruments would not have direct connections to global environmental agreements. This instead highlights the limitations of network analysis. The connection might not be enshrined in the legal text. And network analysis does not tell us if this is happening in practice. The next section describes in detail the functioning of four links.

7.3.2 The functioning of the Ties between Convention and other Institutions

The previous section gave an overview of the ego-network of MEAs and organizations that the Carpathian Convention is connected to. However, it did not tell any details about what is precisely happening under the links. How and what kinds of activities, if any, are the institutions carrying out with each other? For us to understand *how* regimes interact, it is crucial to go deeper into the actual functioning of the links.

Table 7-3: Overview of the functioning of particular regime interaction ties

Name of alter	Mechanism(s) of interaction	Objectives and Outputs of cooperation
Ramsar Convention	Informal regional organization	Coordinate implementation of Ramsar commitments among Carpathian countries
Alpine Convention	Regular bilateral meetings, attending each other's events	Bi-directional information flow, Policy transfer (mainly Alpine to Carpathian) Joint outreach to international fora
EU nature policies	Some parties as EU member states	Policy transfer (EU policies to non-MSs parties) Policy implementation (EU MS parties)
EU Strategy for the Danube Region (EUSDR)	Parties (except for Poland) as EUSDR partners Secretariat attending meetings of three priority areas	Access to EU funds to implement the Carpathian Convention The "voice of the mountains" in the EUSDR

This section looks into the operational details of four links: the Carpathian Convention's ties to the Ramsar Convention, the Alpine Convention, the European Union's nature protection policies and the EU Strategy for the Danube Region (EUSDR). Each of these

four links shows different types of interactions: they are implemented through different mechanisms and have different objectives and outcomes, as it can be seen in Table 7-1. The next sections describe details of each of these four links based on information I have received from my interviewees, my observations and publicly available documents.

7.3.2.1 Ramsar: Information Organization for Regional Coordination

Description of the tie. As we have seen in the previous section, there is a link between the Carpathian Convention and the Ramsar Convention[70]: both the Biodiversity and the Transport Protocols "note" that all Carpathian parties are also parties to the Ramsar Convention. Furthermore, there is a Memorandum of Cooperation between the two secretariats (see Table 7-1). In practice, this link is operationalized through an informal organization, the Carpathian Wetland Initiative (CWI), which aims to coordinate the implementation of commitments of parties under the Ramsar Convention in the Carpathian region.

Mechanism. In 2004 there was an initiative from Jan Kadlecik from Slovakia's State Nature Conservancy (SNC-SK), to launch an initiative in the Carpathian region that establishes formal cooperation between the Carpathian and Ramsar Conventions. After a few years of preparatory work supported through two projects[71], in 2006, the key points of the Carpathian Wetland Initiative's (CWI) work plan were agreed. At the First Conference of the Parties of the Carpathian Convention (2006), the two secretariats signed a Memorandum of Cooperation. The mission of the CWI was defined to "facilitate collaboration between the two Conventions and its Parties in their efforts in conservation and wise use of wetlands in the Carpathian region and beyond, through local, national, regional and international activities" (UNEP 2006).

The CWI assists the implementation of global wetland commitments at the regional level, which is a role of regional regimes described by previous researchers (Conca 2012). However, the Carpathian Wetland Initiative exists even today as an informal organization:

- It does not have a legal entity; its activities are administered through the Slovak

[70] The Ramsar Convention (Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar, 1971) concerns the protection and sustainable use of wetlands.

[71] "Network of Carpathian protected areas and Ramsar sites" (Slovakian-Norwegian project 2004-2005) and the "Carpathian Project" (Interreg project financed by the European Union, running from 2005 to 2008).

State Nature Conservancy;

- neither does it have a permanent budget, it runs on an annual planning system with contributions from project funds and organizations, though the lion share of funds are given by SNC-SK (see Figure 7-2);
- its secretariat is located in the offices of SCN-SK, but does not have a permanent employee, the leadership and administrative functions are covered by the staff of SCN-SK;
- it does not have a defined geographical operating space; its partners can decide which Ramsar sites they consider falling under the CWI's scope.

Despite this informal set-up, the CWI has been working towards the objectives defined by the Memorandum of Cooperation between the two Secretariats.

Objectives of the link. The Carpathian Wetland Initiative was designed to be a regional collaboration tool: all seven parties of the Carpathian Convention and further six organizations (Ramsar Convention Secretariat, Carpathian Convention Secretariat, ICPDR, World Wide Fund for Nature (WWF), International Union for the Conservation of Nature (IUCN)[72], Daphne) are listed as, respectively, national focal points and partners. From the beginning it was understood by the Ramsar Convention Secretariat that the agreement with the Carpathian Convention would be a case of a regional convention implementing global commitments, as pointed out in my interview by Tobias Salathe, Senior Advisor for Europe of the Ramsar Convention:

> By signing a memorandum of cooperation with the Carpathian Convention [we wanted to] make clear a fundamental principle: if in a region, like here, there are seven countries that said that they want to work together [on wetlands], and there is also a Carpathian Convention, which brings the countries together in the exact the same region on environmental issues, then we think that this regional treaty is obviously more able to help the countries to do concrete things in the region. Therefore, we wanted to establish this link clearly and formally. (Quote from my personal interview with Tobias Salathe)

The Carpathian Wetland Initiative was recognized officially by the Ramsar Convention as one of the 19 regional initiatives[73]. With core financial support from the Ramsar Convention Secretariat for the first six years of its operation (2007-2015) the CWI was carrying out many activities.

Outputs. The activities of CWI can be grouped under the following overarching themes:

[72] IUCN is an international organization focusing on nature conservation and sustainable use of natural resources.

[73] Ramsar Regional Initiatives include training and capacity building centres and regional cooperation networks. Regional Initiatives aim to provide support for implementation of the Ramsar Convention in specific geographic regions by increasing international cooperation on wetland-related issues.

(1) implementing the Ramsar Convention's decisions and strategy in the Carpathian region through wetland designation, data collection, data harmonization and information sharing, etc.; (2) network development among involved actors through for example workshops and conferences (e.g. peat-land management, eco-tourism, preparation of projects) and (3) training and capacity building.

CWI is currently in a challenging situation, with more permanent funding and stronger engagement of actors it could deliver greater outputs, as highlighted by Jan Kadlecik (the head of the Department for International Cooperation at the Slovak State Nature Conservancy), who has been the coordinator of CWI from the first moments:

> Everybody wants to see some practical results, but nobody wants to pay for some minimal activities. There was a question if we should ask for some membership fees, […] maybe this is the way how to work in the future. Because if they pay, there is also some responsibility. [laughs] Because now everything is free of charge and free of responsibility... (Excerpt from my personal interview with Jan Kadlecik)

The uneven sharing of burden highlighted by Kadlecik in this quote can be seen when we look into the financial contributions given by different organizations to CWI. Jan Kadlecik's organisation, the Slovak State Nature Conservancy, has contributed by far the most: four times more than the Ramsar Secretariat, and ten times more than any ministry of environment, see Figure 7-1.

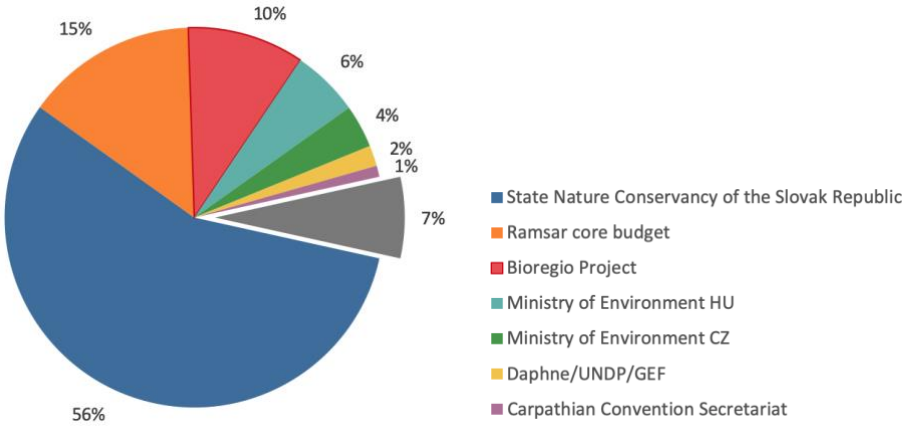

Figure 7-2: Share of Organizations' Contribution to CWI's budget 2009-2017.
Source of data: CWI Annual reports.

Analysis and summary. As we have seen, the link between the Carpathian Convention and the Ramsar Convention is implemented through an informally operating organization, the Carpathian Wetlands Initiative. Albeit facing some financial and human resource problems, this organization has been carrying out activities to enhance the cooperation of actors on wetlands in the region. It has been officially recognized in its role as the regional coordination body of Ramsar commitments. The Ramsar-

Carpathian tie is a case of a regional regime assisting the implementation of global commitments in a specific geographic area. This type of regime interaction has been hypothesized in previous studies on regional regimes (see Conca 2012).

7.3.2.2 Alpine: Information Flow and Joint Interest Representation

Description of the tie. The link between the Alpine Convention[74] and the Carpathian Convention predates the signing of the Carpathian Convention: the Alpine Convention presented a workable legal framework that could be adapted to the Carpathian context and demonstrated to Carpathian actors that it is beneficial for countries to work together to govern their shared mountains. Furthermore, the Alpine Convention's parties, secretariat and NGOs were actively engaged in the policy translation process from the Alpine to the Carpathian Convention leading to the establishment of the Carpathian Convention, as highlighted in nearly all of my interviews and pointed out in scientific publications (Bilobran 2003; Fall and Egerer 2004), see Box 7-1.

The Alpine Convention's achievements are "recognized" in the Carpathian Convention's preamble and Transport Protocol, and "noted" in the Biodiversity Protocol. However, the two conventions do not have a bilateral MOU between themselves. This section describes in detail how the link between the Alpine and the Carpathian Conventions functions: from sharing information, through joint outreach activities, to serving as a policy role model for each other.

Box 7-1: History of Alpine-Carpathian Cooperation

The interactions between Alpine and Carpathian stakeholders predate the start of the Carpathian Convention. The Association of the Carpathian Protected Areas and its Alpine counterpart ALPARC had had some exchanges before the Carpathian Convention's negotiations even started. NGOs also interacted with each other: WWF was definitely a bridging entity, and ANPED provided a more formalized platform for interaction. So, it was not absolutely "new" for these regions to work together. Bilobran (2003) recalls that the Alpine countries' more formalized engagement in the Carpathian process came after "the Executive Director of the United Nations Environment Programme (UNEP) appealed to the Alpine region countries for their help in introducing similar initiatives for the Carpathian and Caucasus mountains" (Bilobran 2003, 203). Some Alpine countries then offered their support: sharing their experiences, providing funds, offering their office infrastructure for meetings and later, Austria offering to host the secretariat. Since this offer to help came in times when the Carpathian countries were open to external ideas, it was well-received.

Looking at the Alpine-Carpathian cooperation from the other side: Alpine countries had their own motivations to push for the setting up of the Carpathian Convention. Marco Onida, who was Secretary-General of the Alpine Convention from 2007 to 2013 and is currently working for the European Commission's DG REGIO, interestingly claims, that "the Carpathian Convention […] was started by the Alpine Convention, it was actually Italy and Austria that wanted the Carpathian Convention. It was financed in the beginning by the Environment Ministry of Italy and Austria, via the Alpine Convention." (Quote from my personal interview with Marco Onida) Austria and Italy, however, had different kinds of motivations to support the emergence of the Carpathian Convention.

Austria continued its tradition of being interested in anything that happens east of Vienna. Austria is regularly labelled

[74] Convention on the Protection of the Alps (Salzburg, 1991) is a regional convention for the protection and sustainable development of the Alpine Mountains.

as Europe's gateway to the east, and the country that benefited very much from the fall of the Iron Curtain and EU accession, as it regained its historic role as mediator between east and west. For them, everything matters that happens in the region east of Vienna.

Italy, on the other hand, was seen by my interviewees as a more curious case. From 2001 to 2002 Italy had the presidency of the Alpine Convention, and this was the same time the Carpathian Convention's negotiations began. Italy and their then environment minister Corrado Clini were actively involved in the preparations of the Carpathian Convention from the beginning. Italy offered EURAC Research's (EURAC) offices in Bolzano as the venue for two of the preparatory meetings, provided funding for people to travel to the meetings, and later seconded EURAC staff to the Secretariat.

It is questionable whether their interest was purely genuine, or rather a vested interest to have a certain influence on the process in order to have the possibility to trigger projects later and thus get access to funding:

There was a clear interest. I think from Austria it was more genuine, from Italy it was more related to the possibility to have certain influence on the process. And in fact, the proof of that is that staff of the Carpathian Convention are paid by the European Academy of Bolzano, which is paid by the Italian Ministry of Environment. Except for Egerer, the rest of the staff dealing with Carpathian are Italian staff [sic]. And there is a clear vested interest there. Because through the environment ministry, the European Academy was thinking of having basically influence on the process, and also having the possibility to trigger projects, and therefore money. I'm not sure if this is an entirely transparent process, but better this than maybe nothing. But there is a clear vested interest in Italy to have kind-of an influence on the Carpathian secretariat and the Carpathian Convention. (Quote from my personal interview with Marco Onida, Secretary-General of the Alpine Convention at the time)

Whether based on genuine and/or vested interests, the support given by the Austria and Italy played an instrumental role in the initial phases of the Carpathian Convention. Especially when we also consider the fact that their support was not limited to knowledge transfer. As soon as the idea of the Carpathian Convention started to materialize, it received not only attention and assistance from aforementioned Alpine countries but also financial support from Austria, Italy, Switzerland and interestingly also from the Netherlands. Several of my interviews have highlighted that the financial support was also key in enabling the negotiations of the Carpathian Convention.

Mechanism. The different actors of the Alpine and Carpathian Conventions (Secretariats, NGOs, umbrella organizations for protected areas, networks of scientists, etc.) regularly attend each other's meetings and events. Furthermore, the two Secretariats also have regular bilateral meetings and phone calls despite the fact that the secretariats' cooperation is not formalized in legal documents (MOUs, MOCs, partnership agreements etc.).

Objectives and outputs. The outputs of the cooperation can be seen along three axes: knowledge exchange, policy translation and regional-to-global thematic interest representation, as discussed in the paragraphs below.

Knowledge exchange: The Alpine and Carpathian Conventions actively exchange information and expertise which is seen as something benefitting both conventions, as highlighted by Markus Reiterer, the Secretary-General of the Alpine Convention:

> We can learn a lot from each other. We have experts on various issues that can be useful for the Carpathians, and the Carpathians have experts on various issues that can be useful to our work. (Quote from my personal interview with Markus Reiterer)

When asked about a concrete example of "learning from each other" many of my interviewees highlighted a recent case, in which the Alpine Convention's community is turning towards Carpathian actors to learn from their experiences on human-wildlife coexistence with large carnivores. Since large carnivores (lynx, bear and wolf) never

became extinct in the Carpathians, there are traditions and recent practices of human-wildlife coexistence, whereas wolfs are just starting to return to the Alps and local communities are facing coexistence challenges (Bortoli and Favilli 2018).

Policy translation: Looking back a bit in the history of the cooperation between the two bodies (see Box 7-1), policy translation can also be pictured as a way of sharing information and experiences. But even the institutional structure created by the two conventions is similar, and probably not by chance. For example, they both have a network for their protected areas (Carpathian Network of Protected Areas (CNPA) and Alpine Network of Protected Areas (ALPARC)) and a network for scientists which is recognized as the convention's scientific advisory body (Science for the Carpathians (S4C) and International Scientific Committee on Research on the Alps (ISCAR)).

Regional-to-global thematic interest representation: Beyond sharing information and learning from each other, the Alpine and the Carpathian Conventions also cooperate to give a stronger voice to mountain interests at the global level. This can be seen as a case of regional regimes acting as a stepping stone: however, not from global to national levels (as the case of the CWI and as hypothesized in Conca 2012), but from regional to global level along shared topics and interests. My research shows that the Alpine and Carpathian Conventions have joint outreach to larger international and global regimes. Markus Reiterer explained to me in detail the rationale behind this cooperation:

> First of all, if you take a global perspective […] you have mountain ranges all over the world. You have perhaps only two mountain ranges that are really well organized in the sense that they have international treaties with international obligations and international bodies that ensure a certain level of cooperation [between states]. So, the two of us, we can be quite active in steering global politics as well when it comes to mountain regions. Take almost any type of environmental issue, like climate change, biodiversity what have you, and you will always see that mountain regions have a very special role to play. So, I think we benefit from this global level cooperation (Quote from my personal interview with Markus Reiterer)

One form of "global level cooperation" that the two conventions carry out together is towards the Convention of Biological Diversity (CBD), with which they have a joint Memorandum of Understanding. Under this MOU the two bodies have hosted and partnered for side events at CBD's COPs (COP10: Implementation of the CBD Programme of Work on Mountain Biodiversity: Regional Approaches and Conventions and COP13: Mainstreaming the Conservation and Sustainable Use of Mountain Biodiversity for Wellbeing).

Summary and analysis. As we have seen, the link between the Alpine and Carpathian regimes predates the signing of the Carpathian Convention. There has been a strong flow of information between the two regimes on many levels, including institutional set-

up, policies, scientific information, concrete activities. The two convention secretariats also cooperate to represent mountain issues at other fora, including global conventions. This latter is a case pointing to regional-to-global regime interaction, with information flowing not from the global to the regional level (as for example the previous case of the Ramsar-Carpathian cooperation), but regional sectoral interests pushed to global regimes in order to have stronger representation at those levels.

7.3.2.3 EU Nature Policies: Implementation and Policy Transfer Tool

The Carpathian Convention has links to seven EU-related alters through both textual references and memoranda of cooperation (see Table 7-1). The next two sections give a detailed overview of the ways the Carpathian Convention interacts with the European Union, specifically focusing on two of the seven alters, the EU's nature and biodiversity protection policies and the European Union's Strategy for the Danube Region (EUSDR).

Description of the tie: The reference to the European Union's policy frameworks is quite ambiguous in the legal texts of the Carpathian Convention. Although EU policies are mentioned in three protocols of the Carpathian Convention, the references are not specific and in most cases define merely a policy field without specifying which pieces of legislation they are referring to, see Section 7.3.1 above. Reference to "the legal framework on nature protection and biodiversity conservation of the European Community" is included in the Biodiversity Protocol, which "takes into account" this policy package, albeit not specifying concretely which pieces of legislation or other policy documents it considers to be relevant.

Mechanism: Five of the seven parties of the Carpathian Convention are EU member states, who are present at EU meetings and are thus able to voice Carpathian concerns towards EU fora and are also able to channel information from European processes to the Carpathian Conventions' meetings. The Czech Republic, for example, was noted by several of my interviewees as being particularly active at European level as well while holding the rotating presidency of the Carpathian Convention.

Objectives and outputs. There is a difference in how the Carpathian Convention's parties relate to EU policies, the division is seen between parties that are EU member states, and parties that are not. I have been told by several of my interviewees that for those parties that are EU member states, implementing EU legislation is the top priority, and they put more effort (time, human resources, money) into the implementation of EU requirements than into other commitments that may arise from e.g. the Carpathian

Convention. It has also been raised by some interviewees that the Carpathian Convention is not going beyond "business as usual", meaning that some actors have felt that the commitments parties make under the Convention would otherwise also be met through some other channels (for example EU policies).

On the other hand, interviewees claimed that non-EU countries see the Carpathian Convention as a means to push EU policies and norms to their countries. Serbia, for example, applies the Carpathian Convention's requirements not only in its Carpathian area, which is a small part of the country but uses it as a way to push for stronger environmental legislation in the whole country.

Summary and analysis. While EU member states "only" do what is required by the EU and are prioritizing the implementation of EU requirements above everything; for non-EU countries, the Carpathian Convention is seen as a way of moving forward: stronger environmental legislation and staying (or moving closer) to the EU. In essence what this means is that there is again policy translation happening: as a first step the EU policies are probably impacting commitments made under the Carpathian Convention, and as a second step, these commitments are then changing national-level legislation.

7.3.2.4 EU Strategy for the Danube Region: Mutual Benefits

Description of the tie: Several of the Carpathian Convention's parties are within the Danube Macro-region of the EU, which is the geographic scope of the EU Strategy for the Danube Region (EUSDR)[75]. The geographic scope of the Danube Macroregion is much larger than the Carpathians: it includes 14 countries[76] that share the Danube River basin. However, Poland and Lviv Province in Ukraine are outside of the Danube Macroregion. The Carpathian Convention's parties and Secretariat of the Convention were actively involved in the developments of the Danube Strategy from its very beginning (interview with an independent EU expert).

The Carpathian-EUSDR link is clearly a powerful link between the EU and the Carpathian Convention, maybe the strongest currently, it is established both as textual references and memoranda of cooperation (MOCs). The EUSDR is mentioned in the text of the

[75] The EUSDR is a macro-regional strategy for the Danube region. It is a framework for cooperation in the region, aiming to "to create synergies and coordination between existing policies and initiatives taking place across the Danube Region".

[76] 9 EU countries (Germany, Austria, Hungary, Czech Republic, Slovak Republic, Slovenia, Bulgaria, Romania and Croatia) and 5 non-EU countries (Serbia, Bosnia and Herzegovina, Montenegro, Ukraine and Moldova).

Transport Protocol which emphasizes the role of Carpathian transport in the EU's macro-regional strategies for the Baltic Sea region and the Danube region. The Carpathian Convention's Secretariat has signed memoranda of cooperation with three priority areas (PAs)[77] under the EUSDR: Mobility Rail-Road-Air (PA 1B), Energy (PA 02) and Water Quality (PA 04). These MOCs establish the mechanisms for cooperation between the priority areas and the Secretariat of the Carpathian Convention. This means that the Secretariat of the Carpathian Convention is invited to the steering groups of these priority areas, and is able to report about activities under the Carpathian Convention and exchange information.

Mechanism: On the one hand, except for Poland, all parties of the Carpathian Convention are also included in the EUSDR, so the countries have rights and obligations to participate in meetings of the EUSDR. For example, Hungary is the lead coordinator of PA04 Water Quality. On top of this, the Secretariat of the Carpathian Convention, with the MOCs, has gained access to meetings of three priority areas. So, both at the level of the parties and the level of the Secretariat there is direct access to the meetings of EUSDR.

Objectives and outputs: The inclusion of the Secretariat of the Carpathian Convention in the EUSDR is beneficial for both sides, albeit in a slightly different way. For Carpathian actors, nearly all of my interviewees have perceived EUSDR and its Danube Transnational Programme (DTP)[78] as the most relevant and adequate funding source (and as discussed in Chapter 6 access to project funding is vital to the Carpathian Convention's actors). Though, it has to be noted, that there are severe limitations in relation to DTP funds: firstly the Polish Carpathians and the Province of Lviv are outside of its scope, and secondly, there is fierce competition for its limited amounts of funds since the funds are available to all 14 countries that share the Danube river basin. Despite these limitations, the Carpathian countries were able to run two large projects from DTP funds, the TRANSGREEN project[79] and ConnectGREEN project[80] which were

[77] The EUSDR is split into large overarching themes, which are called "priority areas". These priority areas have one or two countries as their responsible coordinators and set define their operating mechanisms quite independently.

[78] The Danube Transnational Programme is one of the EU's financing instruments. It focuses on economic, social and territorial cohesion in the Danube Region.

[79] TRANSGREEN - Integrated Transport and Green Infrastructure Planning in the Danube-Carpathian Region for the Benefit of People and Nature, was a project running from January 2017 to June 2019. Its aim was "to contribute to safer and environmentally-friendly road and rail networks in mountainous regions of the Danube Basin with a special focus on the Carpathian Mountains" (DTP website)

[80] ConnectGREEN - Restoring and managing ecological corridors in mountains as the green infrastructure in the

implementing the Transport Protocol.

For the European Commission and other EUSDR parties, there is also a rationale for signing MOCs with the Carpathian Convention. The Convention is seen to be the mountain voice in the water strategy (interview with an independent EU expert). Although some actors (Bulgaria and the European Commission, as highlighted in my interviews) would rather see a general approach to mountains under the EUSDR and not only a focus on the Carpathians. The Carpathian Convention is seen as only the first step in this process by Marco Onida, coordinator of the EUSDR at the European Commission:

> I would like to have something in general for mountains in the Danube strategy. But you have to start with what you have. We have an international convention on mountain protection, which is the Carpathian Convention. We started there. (Quote from personal interview with Marco Onida)

Thus, from this perspective, similar to the Alpine-Carpathian cooperation towards international regimes, this is again a case of a regional regime representing topical interest to an international institution with a different thematic focus (the EUSDR focuses on Danube and water). For the EUSDR actors, the interaction with the Carpathian Convention is a way of including mountains in the water strategy, to have a more holistic approach that also integrates the sources of water in the Danube.

Summary and analysis. The link between the EUSDR and the Carpathian Convention is mutually beneficial for both sides, and each has its own objectives with this cooperation. For the Carpathian Convention, it is seen as a source of funding to allow the implementation of commitments made at the regional level. And for the EUSDR actors, it is a way to have mountains also represented in the Danube Strategy. Thus, this tie, from a regime interaction perspective, is a connection that is both global (European in this case) to regional, and regional to a larger scale.

7.3.3 Regime Interaction Mechanism in the Carpathian Convention's Network

The previous sections analysed the Carpathian Convention's regime ego-network from a regime interaction perspective. However, research claims that regime interactions can have an effect on regime effectiveness (Young 2011) see also discussions in the

Danube basin, is a project running from June 2018 to May 2021. It aims "to increase the capacity of ecological corridors identification and management and to overcome the conflict between infrastructure development and wildlife conservation." (DTP website)

Literature Review and Conceptual Framework chapters. This section describes the results of my analysis on how the interactions between regimes impact the effectiveness of regimes in the Carpathian Convention.

My interviews showed that the actors of the Carpathian Convention are also experiencing regime interactions that the Convention has established: with other regimes and institutions, EU-level policies and institutions and global regimes. Interviewees felt that they have more interaction with regional regimes (specifically the Alpine Convention, ICPDR and EU institutions) than with larger-scale and global regimes (CBD, Ramsar Convention, UNFCCC[81], Bern Convention[82] and Convention on Migratory Species (CMS)[83] were mentioned). They have mixed perceptions on what this interaction actually means for their work, the Carpathian Convention and for the other institutions: some experience parallel existence of the institutions, others feel that the Carpathian Convention is the implementing agent and there are also Carpathian actors who fell that the EU legislation is providing the limits to commitments made under the Carpathian Convention, as detailed in the next three paragraphs.

Desk-level mechanism: same actor responsible for multiple regimes: In many cases, the same individuals are responsible for several regimes, including for example the Carpathian Convention and global biodiversity regimes (CBD, Ramsar Convention, Bern Convention, CMS). Interviewees reported that in their everyday work, they personally experience the opportunities, importance and benefits of coordinating regimes. On the other hand, interviewees pointed out that the regional regime could be adding more burden to policy officers overseeing the regimes and thus duplicating policies and draining resources and attention from already defined commitments. The solution they saw was that the policy outputs and projects of the Carpathian regime need to be very specific, concrete and "tailor-made" for the regional area (see also Projects section in The Internal Network of Actors chapter).

Yo-Yo mechanism: regional regime contributing to global regime's impact through concrete projects: Interviewees generally perceived that the role of the Carpathian Convention is to establish concrete, territorial approaches. Compared to the "broad" and "abstract" global conventions, to them, the regional regime offered ways to

[81] United Nations Framework Convention on Climate Change (1992, Rio de Janeiro)
[82] Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979)
[83] Convention on Conservation of Migratory Species of Wild Animals (Bonn, 1979)

implement global commitments in practice, as the two quotes illustrate:

> Conventions, like the CBD, are so broad that you can always say that a project, like TRANSGREEN, is helping through the protection of the ecological corridors, which in the end affects or maintains ecosystems somehow, and will, in the end, implement the CBD, actually. (Excerpt from my personal interview with a national focal point)
>
> I think that the Carpathian Convention deals with a niche and should implement other more general conventions' provisions on the regional level. Because […] CBD, and also Bonn and Bern, and Ramsar as well, are more general conventions. I think it is a very good thing that we have such an original instrument for the implementation of those conventions. And on the other hand, the Carpathian Convention can give some input to those international broad instruments. (Excerpt from my personal interview with a national focal point)

These interview excerpts show that there is a Yo-Yo effect in the regime interaction system: the projects of the Carpathian Convention help countries to move forward on other MEAs and EU policies, making the regional convention an implementation tool and enhancing the larger regime's impact-level effectiveness. What this means is that a regime's positive environmental impacts (see Conceptual Framework) arising from regime interactions can in fact materialize at the level of the larger-scale or global regime and not at the level of the regional regime.

Stowaway mechanism: regime interactions leading to national policy outputs: The Carpathian Convention, as claimed by my interviewees, is used to transfer EU policies and legislation to non-EU parties. Interviewees in Serbia and Ukraine perceived that the Carpathian Convention is facilitating information flow on policies, management practices etc. from European member states to non-EU member states (see also Information section in the chapter on The Internal Network of Actors). In this case, the regional regimes enable a country to gain insight to and potentially implement a regime (EU policy in the current case) that it is not a party to.

Further to the above three mechanisms that were highlighted by my interviewees as way in which interactions between regimes, EU and national policies impact each other; I also identified the **hands in hands mechanism.** This mechanism describes how the two mountain conventions (the Alpine and the Carpathian) and the two multilateral agreements in the Danube-Carpathian region (EUSDR and Carpathian Convention) exercise joint interest representation at other fora, such as CBD, UNFCCC. In this case the regional regimes are not implementing higher level regimes but aim to influence the higher level regimes to recognize their unique interest. Thus, it is not a top-down mechanism, but a bottom-up regime interaction mechanism.

7.4 Summary

This chapter analysed regime-level interactions of the Carpathian Convention with other regimes and institutions. I used a methodology that combined citation-based ego-network analysis with qualitative data analysis (interviews, document analysis, observation). This is a unique combination in the scientific field of regime impact analysis: traditionally this field relied on qualitative analysis, and more recently a couple of publications emerged using network science methods, including citation network of regimes (see Literature Review chapter). In my research, I combined the two for the case study of the Carpathian Convention. This enabled me to understand not only the structural characteristics of the regimes' network but also how certain ties function and how actors perceive regime interactions.

The first finding of this chapter is that the Carpathian Convention does not link to any bi- or trilateral regional agreement that has been signed by its parties, but only links to global or regional agreements expanding beyond the geographical scope of the Carpathians.[84] It is important to pause here for a moment. Researchers have found that the largest number of environmental agreements are in fact, regional agreements (Balsiger, Prys, and Steinhoff 2012). Even between the seven Carpathian countries, there are many bilateral and trilateral agreements, such as those relating to river basin management or trans-boundary protected areas. The Carpathian Convention in its text and contractual agreements does not acknowledge the existence of these small regional agreements. The Carpathian Convention sees itself more in a role to implement global and other higher-level commitments at the regional level (possibly ask these high-level institutions for funds to do their implementation) — rather than an umbrella for local and bilateral agreements between its parties.

On the details of how regime ties are functioning, I found different types of interactions under the four links included in the analysis. Whereas the Carpathian Convention's connection to the Ramsar Convention is in fact information flow through an informal organization, the Alpine-Carpathian connection is implemented by direct participation and exchange between actors of each convention. The connection to the EU packages (nature policies and Danube strategy were discussed in detail) are implemented through

[84] The Carpathian Convention has MOUs with three organizations that are Carpathian-based: the Carpathian Ecoregion Initiative (CERI), The Science for the Carpathians (S4C) and the Central European Initiative (CEI).

those countries that are parties/members in both clubs, and we can see a difference between the roles of insiders and outsiders.

Furthermore, the in-depth analysis of the four ties has shown that some links are one-directional, and others are bi-directional. The Alpine-Carpathian connection is an excellent example of an emerging bi-directional link. As we have seen in a previous chapter, the link between the two conventions dates back to the first days of the Carpathian Convention. The connection has developed over the years from a directed information and support flow from the Alpine Convention to the Carpathian Convention, into a mutual exchange of information and knowledge, and joint lobby forces that it is now. On the other hand, the link between the Carpathian Convention and the EU's nature policies is rather one-directional, the European Commission is not closely engaged in the Carpathian Convention, and their minimal engagement comes through regional development (e.g. EUSDR) and not nature policies.

Scientists have been trying to understand the role(s) that a regional convention can play in relation to larger-scale and global regimes. My data showed several dimensions of this interaction. Regional regimes can represent specific interests (mountain interests in the current case) towards the global processes, which was observed in the case study under its link with the Alpine Convention and the EU Strategy for the Danube Region (hands-in-hands mechanism). My data also showed that the intensity of interaction at the regimes' level could be different than at the level of individuals: regional-to-regional interaction was more significant at regime-level, while interaction along sectoral regimes materialized for policy officers (desk level mechanism).

The research identified further two impact mechanism, the so-called Yo-Yo and stowaway mechanism. Yo-Yo mechanism describes the phenomena that global commitments, which are too abstract for national decision-makers are implemented through the regional regime - the Yo-Yo stating at global level, bouncing to the regional level and then back up to global level. The stowaway mechanism describes the feature that through the regional regime countries that are not parties to a third regime (EU policies in the current case) can implement third-regime commitments in their national legislative system.

These – along with the findings of the previous two analytical chapters – will be discussed and synthesised in the next chapter of the dissertation.

8 Discussion

8.1 Introduction

This dissertation builds upon four fields of knowledge: regime effectiveness, regime interactions, regional environmental governance and social network analysis. As discussed in the Literature Review chapter, each of these fields has its research agendas and open questions. My dissertation's theoretical, methodological and empirical contributions bridge these fields of knowledge, and builds upon these different fields to offer new and innovative perspectives. This chapter offers a summary and synthesis (or even a series of syntheses) of my findings. It points out the interrelationships between the findings discussed in each analytical chapter and also explains the significance of my findings in relation to the integrative conceptual framework of this dissertation.

8.2 From Familiarity to Family – Network Structure

The effectiveness of regional environmental regimes outcomes, as discussed in the Literature Review chapter, is debated in literature. However, several authors point to social network-related characteristics that could make a difference. Barrett (2005) argues that regional problems are easier to solve, because they concern only a smaller number of actors and thus it is easier to reach full participation in the regime. Conca (2012) hypothesized that regional regimes can be more effective (at least in their initial stages) because they can enjoy the familiarity of the actors with each other and the similarities of the problems they are facing. Furthermore, Bodin and Crona (2009) argue that the structural characteristics of social networks make a difference for natural resource governance, even if they might not be a predictor of overall effectiveness of regional governance networks as Sovacool and Van de Graaf (2018) claim.

My dissertation, through the analysis of the establishment and first 15 years of the Carpathian Convention, further develops these hypotheses. I show in chapters 5 and 6 how the Carpathian Convention's social network emerged and evolved, and what its structural and functional characteristics are.

I found that although "familiarity" can enhance the early stages of regime formation (in line Conca's (2012) study). "Familiarity" with each other and with the shared problems, in the Carpathian region was enhanced by the several trans-boundary and cross-sectoral

networks that existed already prior to the Carpathian Convention: the Carpathian Ecoregional Initiative (CERI) united scientists and NGOs, the Carpathian Euroregion created cooperation among local governments, the Northern Alliance for Sustainability (ANPED) was an umbrella for NGOs, the Association of the Carpathian Protected Areas (ACANAP) was a network of protected areas, and the East Carpathian Biosphere Reserve united Poland, Ukraine and Slovakia in their efforts to protect a part of the Carpathian Mountains. These networks contributed to developing "familiarity" among actors, and through CERI's Status of the Carpathians report (Webster, Holt, and Avis 2001) also to a shared understanding of the status of and vision for the Carpathians. This familiarity of actors with each other and their shared problem contributed to the success of the Convention's negotiations, which was concluded in merely two years.

Another contributing factor to the initial success, supporting Barrett (2005), is the small number of parties (seven countries) in this regional agreement. As discussed in Chapter 4 (see Table 4-1), the Convention and its five protocols are receiving nearly full participation[85]. This level of ratification supports Barrett's argument that at regional level it can be easier to have all actors participate to the regime, than at larger scales.

The less understood scientific question is, what happens to actors' "familiarity" as the regional regime evolves? Is it maintained, strengthened or loosened? And how do changes in the level of "familiarity" affect the regime's outcomes? Analysing social actors' networks under the Carpathian Convention, I found over time "familiarity" can transform into a closed, homogenous group of actors, a "family" (as it was called by my interviewees) - as suggested by network principles of homophily and triadic closure and hypothesised by Bodin and Conca (2009). From a network structural perspective, I uncovered a core-periphery network (see Figure 5-9). The core of the network consisted of a group of actors that were all connected to each other, and actors of the periphery only connected to core actors.

I analysed in detail the characteristics of the core and found that the core includes some typical regime actors (several parties, the secretariat and a regional-focused umbrella NGO) (Young 2011). It also has several atypical actors: national NGOs, national agencies, research institutes including EURAC Research, which is not even based in the Carpathian

[85] Two protocols are lacking only one signatory and the fifth protocol was signed in 2019 only thus signatures and ratifications are expected yet to happen.

region. I also found that participation from parties was uneven: some parties were missing from the core.

The transformation of the social network from “familiarity” to “family” has consequences for regime outcomes. Core-periphery network structure has an impact on many activities and aspects of governance networks (Bodin and Crona 2009). Dense social networks (such as those of the core, Figure 5-9) can enhance the development of social cohesion, trust and knowledge sharing. On the other hand, new information generation and maintaining the diversity of the social network, both of which are necessary for adaptive capacities of the regime, rely on ties that bridge structural holes: meaning the existence of connections that reach outside of the core (i.e. to the periphery or to the sectors).

Network evolution principles suggest that it is quite natural for dense, homophile networks to emerge in social networks. Thus, it is not surprising that this is happening in the Carpathian Convention’s social network. The emerging core probably enhanced the outcomes of the Convention because it allowed the rapid development of trust and shared knowledge. On the other hand, conscious efforts should be made by the actors of the core to maintain their bridging ties and to allow actors to access the core. Otherwise, they risk missing out on new information, resources and reducing the diversity of the network - which would all work against regime effectiveness, see further recommendation is section 9.2.1.

Based on the Carpathian Convention’s exploratory case I suggest to test the following logical argument in future research: since regional regimes involve a smaller number (Barrett 2005) and more homogenous actors (Conca 2012), the network driving forces of homophily and triadic closure lead to the swift emergence of a core-periphery network structure, which is known to be beneficial for several regime outcomes (Bodin and Crona 2009). Future research should test the causality of the elements of this chain.

8.3 Diverse Impacts of Network Functions on Regime Outcomes

Previous research suggests that there are multiple ways in which actors of a regimes many affect the effectiveness of the regime. Most studies are conducted at the sub-national and global levels (see Literature Review), and there are repeated calls to better understand causality and applicability of the findings for other scales, set-ups and topics (Bodin 2017). I studied the functioning of the Carpathian Convention’s actors’ network,

and focused on the implications of actors' activities, characteristics and roles on the evolution of their social network. From a social network perspective, I argue, that functioning of the network including the activities its actors carry out a has impacts on strengthening social cohesion (bonding ties), reaching new actors (bridging ties) and limiting the emergence of negative ties.

Inclusivity and holistic approach driving bridging ties: As detailed in Chapters 5 and 6 the Carpathian Convention covers many topics and aims for an integrated approach. It is open to participation, and the regime's actors come from many different countries, sectors and organization types (see Section 8.6 for more details). The inclusive character of the regime has impacts regime outcomes.

- The Convention drove the emergence bridging ties between organizations from different countries, sectors and types. As we know from other studies, bridging ties are necessary for accessing new resources, ideas and information, establishing connections outside of subgroup (Bodin and Crona 2009), all of which have implications for environmental governance (Bodin 2017). However, my research also showed that such bridging ties are slower to form and more challenging to maintain, in line with the network principle of homophily.

Projects for regime outputs and reinforcing social cohesion: Under the Carpathian Convention, I found that activities aiming to secure external financial resources for joint projects and running shared projects took a large share of the activities carried out by actors (described by one actor with the neologism "projektezés"), in line with Gruby's (2017) findings on Micronesia's regional climate cooperation. Under the Carpathian regime, joint projects had impacts on both regime outputs and outcomes.

- Actors used several projects to develop and implement protocols (for example, BioREGIO for the Biodiversity Protocol, and TRANSGREEN and ConnectGREEN for the Transport Protocol and a couple of smaller projects concerning large carnivores' management). Thus, specific projects, for the Carpathian Convention, enabled moving from "paper to implementation" right away.
- There were also projects with only weak contributions to the regime's aims. From a regime outcome perspective, I argue that shared projects lead to the perception of doing something together, having a joint vision and aims, and peace-building and maintaining peace (see also (Buscher 2013)). Analysing this phenomenon through social network analytical perspective points out that these activities are, in fact, network-bonding activities that actors deploy to strengthen

social cohesion in the network.

Social cohesion versus environmental objectives: On the other hand, my research shows that Carpathian actors halt processes that work against social cohesion, see section 6.3.4.4. Even issues that, from a legal perspective, would be necessary to be agreed upon (such as, in the case of the Carpathian Convention, the location of secretariat, geographic scope of regime, protocol on cultural heritage) are taken off the table or delayed if they are seen as working against cohesion. This observation underlines what Young (2011) calls the "participation versus depth" dilemma. My research points out that from a social network perspective, these activities can be perceived as attempts to limit the emergence of negative ties.

The Carpathian Convention's exploratory case demonstrates that many of the impacts of the functioning of the social network can have multiple impacts on regime outcomes, and may require balancing: for example, between development of bonding and bridging ties, between increased participation and depth of environmental problem solving, between strengthening social cohesion and delivering regime outputs, between having immediate tangible project outputs and focusing on long-term regime perspectives. Based on this single case study it is not possible to identify the full extent of impacts, nor the right balances and the tipping points when positive impacts turn into negative ones. The proposition of this dissertation needs to be refined and tested. I suggest further research to better understand the impacts of network functions on regime outputs.

8.4 Mechanisms of Regime Interaction and Their Impact on Regime Effectiveness

Previous research hypothesises that regime interactions impact regime effectiveness (Young 2011), and regime interaction studies describe the causal mechanisms of interaction (Gehring and Oberthür 2009), however it is not yet understood how regime effectiveness is effected by interactions, see also Literature Review chapter. With regional regimes, the scientific question is even more strongly phrased: are regional environmental regimes building or stumbling blocks in the national to global governance pathway (Conca 2012). Through the exploratory cases of interaction analysed in my dissertation from the Carpathian Convention's regime interaction network (see Chapter 7, especially Section 7.3.2.), I identified four different

mechanisms of how regime interactions affect environmental regimes at national, regional and global levels.

1. Desktop mechanism: regime interaction at policy officers' level. Researchers claim that environmental governance is distributed among many institutions that interact with each other (Bodin 2017; Lubell 2013; McGinnis 2011). My research shows that regional regimes are one of these venues and supports Bodin's (2017) observation that often the same individuals are responsible for several regimes. In the case of the Carpathian Convention, several focal points of the regional regime were also responsible for other global biodiversity regimes (CBD, Ramsar Convention, Bern Convention, CMS), see Section 7.3.3. When the same people work on several environmental regimes, and they have to find the synergies and solve the regime interaction problems at their desktop (or in their heads). I found that desk-level interaction of regimes drives national processes (policy integration, cross-sectoral interactions) and advances regime interactions at the operational level (see next point).
2. Yo-Yo mechanism: regional regime as an implementation tool. My research shows that the Carpathian Convention acts as an aide of national policy officers to implement global regimes (see cases of the Ramsar Convention and EU Nature policies discussed, respectively, in Sections 7.3.2.1 and 7.3.2.3). The pathway of the Yo-Yo mechanism starts at the global level, where an "abstract" aim is set. Then the regional regime is used to coordinate joint projects in the region which in practice are implemented at the national level. Finally, the project's impacts are reported as contributions to the global regime. Under the Yo-Yo mechanism, the role of a regional regime is to establish a concrete, territorial approach suitable for the region, assist actors in acquiring external funds, network development and project execution. Along this impact pathway, a regional regime is an implementation tool enhancing the global regime's impact-level effectiveness. Thus, the regime's environmental impacts arising from regime interactions, in fact, materialise at the level of the larger-scale or global regime and not at the level of the regional regime.
3. Hand-in-hands mechanism: regional regime cooperation for global interest representation. My research highlighted a case of regime interaction that is directed from the regional to the global level. I show that regional regimes with similar topics (in my concrete research case the Alpine and Carpathian mountain conventions, as discussed in Section 7.3.2.2.) are working together to increase

their impact on, and ensure stronger representation of their sectoral perspectives in processes running under global regimes and institutions, such as the Convention on Biodiversity and the UN Framework Convention on Climate Change. This impact mechanism starts at the regional level, is targeted towards the global level and influences the global level through thematic interest representation.

4. Stowaway mechanism: regional regime as an agent of policy transfer. My interviewees claimed that Carpathian convention was and is used by countries that are not member states of the European Union to implement EU policies in their national legislation (as elaborated in Section 7.3.2.3.). In such a case, the regional regime acts as an agent of policy transfer: allowing countries that are not a party to a *third* regime to gain insight to and potentially implement that *third* regime at the national level. In this case the regime interaction affects national level environmental regimes by channelling policy examples.

These four mechanisms that I identified through the Carpathian Convention are cases that support the "building block" hypothesis since all four mechanisms lead to positive effects on national or global regimes.

In my research I identified these four mechanisms from my exploratory case. This does not mean that these mechanisms would be generally true to all regional regimes, but their existence cannot be excluded. I suggest for future research to test how widely spread these mechanisms are, and whether the causal pathways outlined above are true in other contexts as well. The identified mechanisms, furthermore, illustrate that the impact mechanisms of regime interactions on regime effectiveness is very complex, and will need to be studied further and in more detail.

8.5 Network Science Methods for Regime Studies

Although social network analysis is a widely accepted method in political science, in environmental regime studies it is still not widely used. My dissertation underlines other researchers' call to use social network analysis in this field (Hafner-Burton, Kahler, and Montgomery 2009; Maoz 2011; 2012; Pattberg and Widerberg 2015; Kim 2013; 2019) and shows that researchers can gain deeper analytical insights when combining network analysis with more traditional research methods such as statistical analysis, interviews, surveys and participant observation (Crossley 2010; Yousefi-Nooraie et al.

2018; Edwards 2010).

The traditional research methods cannot analyse structures of interaction between actors, which can influence future interactions of actors. For example, in the case of the Carpathian Convention interviews and observations could not have shown the core-periphery network structure of the actors (see Figure 5-9); neither the bridging role of Secretariat and the World Wide Fund for Nature (WWF) (see Figure 5-7). Understanding these structural roles can explain patterns in interaction, and can also identify steps that actors might want to take to enhance the effectiveness of their regime (Bodin and Crona 2009).

Network formation principles (for example, homophily, triadic closure), as shown in my dissertation, can explain recurring phenomena of regime network evolution. The principle of homophily explains why the establishment of ties that connect different actors (e.g. trans-boundary, cross-sectoral, between organizations) is a slow and challenging process. From another perspective, network theories can answer how to overcome such difficulties: placing effort into establishing ties that bridge structural holes in the network has been shown to enhance access to resources and creative capacities of social networks.

From an applied methodological perspective, I show the benefits and limitation of three different social network methods:

- Meeting affiliation network analysis: I suggest that the meeting-affiliation based network analysis method that I describe in Chapter 5 can be used in analysing the network structure of large and long-standing regimes, where other types of data collection methods are not feasible. Meeting affiliation network analysis enables researchers to analyse the evolution of regime actors' networks and can also be used for comparative studies, although it has to be emphasized that affiliation networks (if not complemented with other methods) cannot show the functioning of the network only the structure of participation and co-participation. The method can be adapted to data availability: co-participation, jointly run projects or co-voting patterns can also be used. Since this methodology cannot give an insight into the functioning of the network, I suggest complementing it with qualitative methods.
- Survey-based social network analysis: the size of the regime's actors' network puts a feasibility limit on the survey-based network method. Because for

network analysis, a near-full response rate is required, in regime with large networks (e.g. UNFCCC, CBD) this method is neither practical nor feasible.[86] However, for smaller networks, it is an often-used method, since it is relatively easy to execute. Survey-based networks, compared to meeting affiliation networks, can provide information about real interactions (both positive and negative ties).

- Citation-based ego-network analysis: Kim (Kim 2013; 2019) analysed the whole network of environmental regimes as a citation network; and also discussed the advantages and disadvantages of this approach. My research, building upon Kim's work, complements this method with qualitative data to gain an analytical insight not only of the structure of regimes' networks, but also the network's functions and meanings for regime effectiveness.

In my research, I combined the network methods with qualitative data (interviews and participant observation) from data collection to data analysis, in line with recent calls on applying such combined methodology (Raeymaeckers 2016; Oancea, Petour, and Atkinson 2017; Ahrens 2018; Yousefi-Nooraie et al. 2018). My dissertation shows how mixed methodology can enhance the depth of analysis of regime effectiveness and interaction. Network methods were used to analyse the structure of the interactions between actors and regimes; and qualitative methods were used to analyse the functioning of the network, roles of its actors and meaning of the interactions to the actors. This mixed methodology, for example, shed light on ambiguities in leadership and communication (as discussed in Chapter 6):[87] in both cases, preliminary conclusions based upon the network analysis were supplemented by actors' perceptions to yield a more complex picture.

8.6 15 years of the Carpathian Convention

My research focused on a single case: the Carpathian Convention, which is a regional environmental regime. The following paragraphs provide an integrated overview of the findings of the three empirical chapters concerning the first 15 years of the Convention.

[86] As discussed in Chapter 4, there are methods to deal with missing data, however with their own limitations.

[87] The network analysis of the internal network and meeting affiliation network both showed a core-periphery structure, however the interviews pointed out that for information flow actors' network is not a core-periphery, but a hierarchical structure. The members of the core do not directly share information with each other, but channel everything through the Secretariat.

I discuss recommendations to the Convention based on my analysis in Chapter 9.

Diverse network: During the first 15 years of the Carpathian Convention (from its signing to the fifth session of the Conference of the Parties), more than 346 organizations participated in its official events, as discussed in Chapter 5. However, most of these organizations only attended a single meeting, usually one of the COPs. The figures in Chapter 5 and 6 illustrate that these organizations form a diverse network including protected area administrations, NGOs, scientists, academic and research organizations and organizations without legal entity; coming from all seven Carpathian countries and many other states; and focusing on different topics. But the Convention's network is missing local governmental actors (or their umbrella organization) and business actors.

My analysis of the meeting affiliation network (Chapter 5) showed that biodiversity sectoral working groups meetings and the meetings of focal points (sessions of the Conference of the Parties and meetings of the Carpathian Convention Implementation Committee) were the network weaving events, i.e. events that repeatedly create a forum for actors to meet. On the other hand, the network analysis also showed that sectoral working group meetings, other than the biodiversity working group meeting, were attended by somewhat isolated groups of actors, with only a few organizations (the Secretariat always and WWF regularly) providing a bridge between the sectoral meetings (see network figures in Chapter 5).

A densely connected core: Both the meeting affiliation network (Chapter 5) and the survey-based network (Chapter 6) and interviews showed that a densely connected group emerged from the actors of the Carpathian Convention (the core of the network), which stayed nearly unchanged from the beginning. The core actors of the regime include the Secretariat, the environmental ministries of the parties, WWF, EURAC Research, the Slovak State Nature Conservancy, Green Dossier NGO and the Carpathian Euroregion. While the Secretariat and parties are naturally part of the core actors of a regime, the central role of NGOs and organizations without legal entities[88] is less typical.

Maintaining social cohesion: My analysis of interviews (Chapter 6) showed that actors

[88] The scientists network (Science for the Carpathians, S4C), the protected areas' network (Carpathian Network of Protected Areas, CNPA) and the regional initiative under the Ramsar Convention (Carpathian Wetland Initiative, CWI) are all "organizations" without legal entity, budget or staff.

of the Carpathian Convention invest considerable effort into maintaining social cohesion of their network in line with what the network principle of triadic closure would suggest, as discussed already previously in this chapter. Actors, on the one hand, prioritize activities that lead to the emergence of positive ties (e.g. shared projects); and on the other hand, halt processes that create negative ties between actors (e.g. negotiations where consensus is difficult to reach). Giving such a strong priority to social cohesion created a situation in which actors face a tension between being a "family" as they refer to it and being negotiators to an environmental agreement. From a network perspective, it also leads to the core-periphery structure (see Chapter 5).

Ambiguities in leadership: While leadership is seen as an essential pillar contributing to outcomes of regimes, in the case of the Carpathian Convention, my analysis has highlighted ambiguities in leadership. Organizations in legally defined leadership roles (parties) are not all taking on this role, while organizations whose legally defined role is coordinating or observing are, in fact, acting as leaders.

- Parties: While one would expect the parties to be in a leadership position of a regime that is a legal document between states; the lack of the Slovakian environmental ministry and the presence of its State Nature Conservancy is less typical. The personal commitment of representatives seems to play a decisive role if an organization becomes a leader of the network.
- Secretariat: My analysis highlighted a difference between the Secretariat's legally defined "coordinating" role and its perceived role. While the Secretariat is supposed to be only facilitating parties' discussions, it is perceived by several actors as one of the leaders of the regime, this observation supports other scientists findings on secretariat dynamics (Mirasola 2019; Mauerhofer 2019; Jinnah 2014).
- NGOs: from a legal point of view, NGOs are observers of the regime. However, my analysis showed that some NGOs (especially WWF, and also ETE, Green Dossier, Carpathian Euroregion) are in leadership positions both based on their network structural position and actors' perceptions. This mixed position of NGOs is supported by other research (Orsini 2013; Betsill and Corell 2001; Bernauer and Betzold 2012). Under the Carpathian Convention NGOs are seen as actors possessing project management skills and acting without vested national interests. My analysis also highlighted that they occupy bridging network positions: connecting sectors and countries (see Figure 5-1). These

characteristics enable them to take leadership roles even if legally, NGOs are only observers of the Convention. However, not all activities of NGOs were well received by parties, as explained in the next paragraph.

Slowly emerging cross-sectoral connections: As the Carpathian Convention widened its scope from biodiversity and forestry to include transport, tourism, agriculture and rural development etc. and established working groups for these sectors, its network also changed. In the period between the fourth and fifth COPs, the core-periphery structure changed into a network with two communities and two bridging organizations (Secretariat and WWF), Chapter 5, Figure 5-1. While at the international level, cross-sectoral connections are emerging only slowly, the Carpathian Convention is driving national level cross-sectoral cooperation, as discussed in Chapter 6.

Regime interactions: The Carpathian Convention has a regime network of 39 alters at the Carpathian, EU and global levels, but not to bilateral and trilateral agreements between Carpathian parties (Chapter 7). What this means is that the Convention is not acting as an umbrella for bi- and trilateral environmental agreements between its parties in the region, but rather as a building block between the national and global regimes. Regime interactions are operationalized through various means: under the Ramsar Convention an informal organization provides regional coordination, with the Alpine Convention there is bilateral information flow and joint interest representation, the Carpathian Convention is seen as an implementation and policy transfer agent of the EU's nature legislation, and the Carpathian-EUSDR cooperation offers mutual gains for both sides. As discussed already in this chapter, the Carpathian Convention, as a regional regime, makes positive contributions to global regimes.

8.7 Limitations

Limitations that arose from my research design and methods are discussed in the Methodology and Research Design chapter (Chapter 4) and in the methods sections of the empirical chapters (Chapters 5-7). This section reflects upon limitations of the findings of the whole research.

My findings hold true for the Carpathian Convention (the single case of this exploratory research). The Carpathian Convention, as discussed in Chapter 4, is a case from the larger population of regional environmental regimes. Both *regional* and *environmental* need to be considered when addressing limitations. My findings contribute to

knowledge on this population but do not necessarily apply to all regional environmental regimes, global regimes, or regional regimes addressing topics other than environmental problems, such as peace, trade, human rights. Further research is needed to understand the broader applicability of my findings.

I relied only on English language for interviews and document analysis. I did not use interpreters for interviews, although (see Chapters 4 and 6) I probably would have received more detailed and in-depth responses from some of my respondents. I also did not search for documents and scientific studies relating to the Carpathian Convention but published in languages other than English. These documents could have provided more insight into the meanings of the Convention for national-level bodies (protected areas, NGOs, museums, local governments, tourism operators, etc.). I believe that the research design choices I made at the beginning of the research provide strong internal validity of my findings; however, further details could have been added to the research if my budget and time restrictions would have allowed me to include non-English sources as well.

I carried out my analysis at the organizational level (see also Chapters 4 and 5). However, in reality, it is not *organizations* that interact, but *individuals* who represent those organizations. Thus, it can be possible that although my network analysis shows a connection between two organization nodes, in reality, those were represented by different individuals and ties did not form between the people. I used my interviews to reduce the effects of this limitation, but there can be some ties in the network figures that are not implemented in practice. Further research, for example, re-analysing the data at the individuals' level, or with new data collected through observations, interviews and surveys could mitigate this limitation.

8.8 Summary

In this chapter, I provided a synthesis of my findings and contributions. I discussed three major theoretical themes that emerged from my research: (1) evolution of the structure of the actors' network from "familiarity" (Conca 2012) to a "family" and its positive and negative consequences for regime effectiveness; (2) the impacts of resource mobilization attempts on regime outputs, outcomes and impacts; and (3) mechanisms of regime interactions affecting regimes. Furthermore, I describe my methodological and empirical contributions. Table 8-1 provides an overview of my contributions.

Table 8-1: Overview of contributions

Fields of knowledge	Theoretical contributions	Empirical and Methodological contributions
Regional Regimes and Regime Effectiveness (1: network structure)	I claim that a regional regime's actors' initial "familiarity" can transform into a closed, dense social network, a "family"; which works against two pillars of the effectiveness of regime outcomes: generating knowledge and inclusivity.	I identified a densely connected "core" group among the actors of the Carpathian Convention, which stayed nearly unchanged from the beginning. The core consists of the Secretariat, the environmental ministries of some parties, WWF, EURAC Research, the Slovak State Nature Conservancy, Green Dossier NGO and the Carpathian Euroregion.
Regional Regimes and Regime Effectiveness (2: maintaining social cohesion)	I show that actors of a regional regime deploy strategies that help them maintain and strengthen social cohesion.	I show that actors maintain social cohesion through resource mobilization and abandoning discussions where consensus is difficult to reach.
Regional Regimes and Regime Effectiveness (3: resource mobilization)	I claim that resource mobilization attempts can have a diverse set of aims for the social network's actors and can lead to positive and negative impacts on regime effectiveness: developing bridging and bonding ties, and also the emergence of negative ties.	I identified cases of non-environmental motivation keeping actors on board (regional being more interesting to politicians, project fair bringing money), and cases of interaction between environmental and non-environmental motivations
Regional Regimes and Regime Interactions	I identified four different impact mechanisms through which regime interaction affects regime effectiveness (well beyond the "building block - stumbling block" dilemma): desktop, Yo-Yo, hands-in-hands, stowaway. I also call for more research in this field	I collected regimes and institutions that the Carpathian Convention connects to. I provided an in-depth analysis of four cases of regime interaction from the Carpathian Convention's regime network. I show that the Carpathian Convention does not connect to the bi- and trilateral environmental agreements between its parties. It does not possess an "umbrella" role for environmental agreements in the region, but rather a "stepping-stone" between national and global.
Network Analysis and Regime Studies	I developed a conceptual framework that provides a bridge between regime studies and social network analysis principles, theories and measures.	I present a comparative analysis of applying different network methods (affiliation network, survey-based, ego-network, citation network) and using mixed methods for regime studies
Carpathian research	I provide an in-depth analysis of the Carpathian Convention (a regional environmental regime), which is a contribution to calls for more research at the regional level.	See above.

9 Conclusions and Recommendations

9.1 Introduction

In this chapter, I elaborate on the meanings of my findings from a broader perspective. The chapter is a collection of my thoughts, ideas and opinions about the findings of my dissertation. I address three fields: the first one is future research agendas, the second is a set of recommendations for actors of the Carpathian Convention, and the third is what lessons decision-makers, policy officers, advocacy groups can learn from my dissertation to make global environmental governance work better.

9.2 Recommendations and Next steps

9.2.1 Practical and Policy Recommendations for the Carpathian Convention

My research analysed the network characteristics of the Carpathian Convention concerning regime effectiveness. Based on my findings, I have several concrete recommendations that can enhance the Convention's effectiveness in the long term.

Access to the core: Currently, the Convention's network has a strongly connected core. My recommendation is that core actors should ensure the network and its core remains open and accessible to new actors. As a second step, the actors should make concrete attempts to reach out to and, in case needed, provide support (e.g. financial capacity) for new actors to participate in the regime.

Bridging connections: I would also recommend paying particular attention to maintaining and building bridging connections from the core to sectoral actors, and between different sectors. Although the Convention drives cross-sectoral interactions at the national level, such interactions are slower to emerge at the international level. Shared working group meetings could be the first step in this process. Integrated projects like CERI's research projects and BioREGIO's red lists that require different sectors and countries to work together and generate shared knowledge (both generate and share) can be the second step.

Situation of CWI, CNPA and S4C: I showed that there are (at least) three organisations in the Carpathian network (the Carpathian Wetland Initiative, the Carpathian Network

of Protected Areas and the Science for the Carpathians) that do not have a legal personality, set annual budget or permanent staff, while these organisations play crucial roles in the network. These organisations and other actors of the network should find solutions to this unusual situation since the current situation not only leads to uncertainties but also cuts them off from project funds.

Projects: Projects play an essential role in the Carpathian Convention's outcomes and impacts, and to a certain extent, its outputs. Projects deepen social cohesion, deliver environmental impacts and are also used to develop protocols. On the other hand, projects also lead to competition. My recommendation is to maintain a long-term strategic vision of the regime and develop project proposals within this framework - and not just for the sake of having projects ("projektezés"). Furthermore, actors should openly discuss how they can limit the adverse effects of competing for limited funding sources.

Implementing agents: The people sitting around the Carpathian Convention's negotiation table are "negotiators" and not "implementors". Negotiators' tasks end when the protocols are transposed into national law. However, the Carpathian Convention is not known enough by the typical implementing agents (NGOs, not-for-profit companies, consultancies) so that they can apply for projects. I recommend that there should be a way of bridging ideas and actions from the negotiation table to implementing agents. This could either be done by raising awareness about the Carpathian Convention in the local areas so that local actors can take it onboard or through a more top-down manner, e.g. by creating a not-for-profit organization that is explicitly aiming to implement the Convention (see also capacity development point). The three tourism centres seem to be one step into this direction. It has yet to be seen how they manage to fulfil the expectations.

Leadership: The current leadership structure of the Carpathian Convention is riddled with ambiguities. Despite this, it seems to be working fine for the actors - with only a few interviewees complaining about problems. The leadership structure does not necessarily have to change, but actors must be aware of the fragilities of the current system. Some (co-)leaders can "leave" the network any time since they are not legally connected to the regime, and if these organisations leave, then the leadership system experiences problems.

English: many delegates don't speak good enough English to enter into the

conversations that are happening between those with better language skills. They might not be able to follow the discussion, understand what is at stake - or on the other hand, make their voices and opinions heard. Delegates and observers, based on the recommendations of Alpine countries decided to make English the official language of the Convention, and it probably does not make sense to revert this decision. I would, however, recommend, to think of alternative solutions that could ease access of people to meetings, reports, projects etc. of the Convention.

Capacity development: NGOs are seen as project professionals by others in the Carpathian Convention's network. Parallel to this, I observed and was told that several other organisations struggle to write, manage and pre-finance projects: mostly because they lack the time, capacities and cash-flow required for large projects. This results in cases when, for example, a project focusing on the Carpathians is run and managed by an organisation outside of the region. My recommendation is to invest in capacity-development in the region or create an organisation (e.g. an international foundation or association) under the Carpathian Convention that can carry out project development and management.

Umbrella NGO: The NGOs in the region should think of creating some kind of umbrella to fill in the gap left by CERI and ANPED. If they pool their knowledge and funds, they could probably raise to the same level as WWF and ETE are and could become a strong actor in the governance system. This would also help to bring the Convention closer to the local level and implement it locally.

Regime implementation role: My research shows that there are many ways of how the Carpathian Convention contributes to global and national environmental governance. The role of the Carpathian Convention, as a tool to contribute to implementing global regimes and to assist policy transfer, would deserve more attention and action from actors within and outside of the Carpathians. Furthermore, parties could even consider thinking of the Carpathian Convention as the framework to really implement the obligations that they have under other conventions: using the meetings of the Carpathian Convention to address problems and obligations they have in their other conventions.

Success communication: A lot of activities and projects are happening in the Carpathians, but in many cases, information about the activities is difficult to find: during my research, I encountered several websites that were not updated (despite the

fact that the project or organization was continuing with its activities) or even taken off the internet without being publicly archived (for example the InRouTou project's and CERI's sites). Furthermore, during my interviews, several actors outside of the Carpathians (for example, the Ramsar Convention's representative and the European Commission's staff) complained that information flow from the Carpathians is limited. I would recommend investing even more efforts into sharing successes stories with the world outside of the Carpathians. I also feel that the Carpathian Convention has delivered already that it is time that they become self-confident and look not at their Alpine counterpart but invite the Alpine community to take a look at the Carpathian successes.

Visegrad 4+ connection: Four out of the seven Carpathian Countries have a common political platform called "Visegrad 4" (V4). Currently, environmental issues are not on the agenda of V4 meetings. I believe that the Carpathian Convention could be a good starting point for V4 countries if they decided to broaden the scope of their interactions. As the first step, the Carpathian Convention could explore possibilities of making itself more visible to V4 countries, for example, by using parallel presidencies hosted by its parties.

9.2.1.1 After 10 CCIC meeting

A week before submitting the full draft of this dissertation, I attended the Carpathian Convention's 10th CCIC meeting (December 2019). The aim of participating in the meeting was not to collect new data, neither to rewrite the analysis or conclusions of my findings. I went to the meeting out of curiosity and respect to the people I got to know during my research. I wanted to understand what happened to the Convention and to its actors since I stopped data collection in 2017. Without going through rigorous scientific data analysis, the next few paragraphs describe my personal impressions and perceptions on how the Convention and its actors' network changed.

The first thing that struck me at the meeting was its level of formalization and attendance numbers. Compared to the CCIC meetings I attended during my data collection years, this meeting apparently was more formal and received more participants. Some participants were well known to me - many of them greeted me with the "Carpathian family's" wide smile; others were entirely new for me; some even represented organizations that did not appear in my research; and the Serbian delegation and ETE was absent.

Even before the meeting started, I observed that the processes, at least at this meeting, became more formalized. There was a separate half-day meeting for focal points only that was not open to observers, so I do not know what was discussed there. During the "public" sections of the meeting, there was an official chair of the meeting, who was chairing; people were called by their delegating country or organization and not by their first names. Another sign of formalizing was the lengthy discussion on the to-be-adopted implementation reporting template. For the first 17 years of the Carpathian Convention, there was no officially adopted reporting template, but the parties are on track to have a preliminary version by the 6th COP session, and a final one by the 7th COP session. Possibly the Carpathian Convention started to take one more step along the familiarity to family path, which could be called formalities.

The Carpathian actors presented concrete steps they have taken and shared their detailed plans to increase cooperation with sub-national local and regional governments, with EU institutions and with international actors. The Podkarpacki Region from Poland became the Carpathian Convention's face and lobby power at the European Committee of the Regions, Poland continued to push for the creation of a Carpathian Macroregion, the Secretariat prepared a detailed step-by-step plan to persuade the European Union to accede the Convention. Cooperation agreements were foreseen with Euromontana (an organization focusing on mountain farming) and ICPDR's Tisza Group. The Science for the Carpathians increased its activities with scientists of the Caucasus mountains and presented plans to engage young scientists.

Interactions with other regimes were openly discussed at the meeting, which was not the case previously. At this meeting, several actors pointed out that they see a strong role for the Carpathian Convention in the Post-2020 Biodiversity processes. Work done together with other mountain regions was also presented, including the reference to the Carpathian Convention's SARD protocol in the UN Secretary-General's report on the Sustainable development of mountain areas (adopted at UNGA's 74th session in September 2019 (UN General Assembly 2019)).

I would also claim that the projects that were presented were a bit more strategic, and the discussions about projects also emphasised long-term impacts. Actors were discussing how to make sure project outcomes, and recommendations end up as regime outputs, how to strengthen connectivity between currently running and previous projects, especially those around similar issues, how to use projects to support processes under the regime (development of protocols, working group meetings). There

were also initiatives to combine scientific data from different datasets and make them easily accessible.

The three informal organizations (S4C, CWI and CNPA) were represented at the meeting; all of them were given presentation time. Science for the Carpathians and the Carpathian Wetland Initiative seemed to have maintained their working structure and activities.

- S4C launched new communication channels (website, newsletter, twitter, data channel), but the Secretariat was still asking for more input from the scientists' network. My understanding is that under the current structure of S4C, it will not be able to become the Secretariat's scientific advisor. There is a lot of research (e.g. on water, climate, tourism, cultural heritage) that is not channelled into the S4C, and S4C is not an organization coordinating joint Carpathian-level research projects, rather a depository of individual research outputs.
- The Carpathian Network of Protected Areas seemed to be inactive in the last years, probably due to lack of funding. In the next years, they will probably rebuild the network with the help of two projects (Central Parks and ConnectGREEN).

On the other hand, cross-sectoral interactions at the international level were still not common practice. At the project level, and national levels I heard examples of fruitful cross-sectoral interactions, and project plans with strong cross-sectoral foundations were also presented. However, at the international level working group meetings are still taking place one-by-one, despite repeated calls from the climate adaptation working group's chair to have shared meetings. In the absence of shared working group meetings, the climate working group started to send individual climate-delegates to other working group meetings; however, this falls far behind international level cross-sectoral interactions.

I also sadly heard that parties were not providing national input into a couple of processes despite repeated reminders from the Secretariat. For example, the red lists were still not finalized and adopted. To the Secretariat's calls to parties to submit official comments, apparently, only the Czech Republic responded.

The Secretariat presented a map, as submitted by parties and complied by the European Environmental Agency (EEA), that shows the spatial applicability of the Carpathian Convention and its protocols. It took me a couple of minutes to understand the map

since at first sight, it seemed to have little to do with the Carpathian Mountains' geographic extent (see Figure 9-1). The Secretariat also stated that they believe these boundaries are instead a "political statement". The map also does not support what my Serbian and Ukrainian interviewees told me, that they are using the Carpathian Convention as a guide to improve national-level environmental legislation. However, the map definitely underlines my finding that the parties are ready to adopt political compromises in order to avoid confrontation.

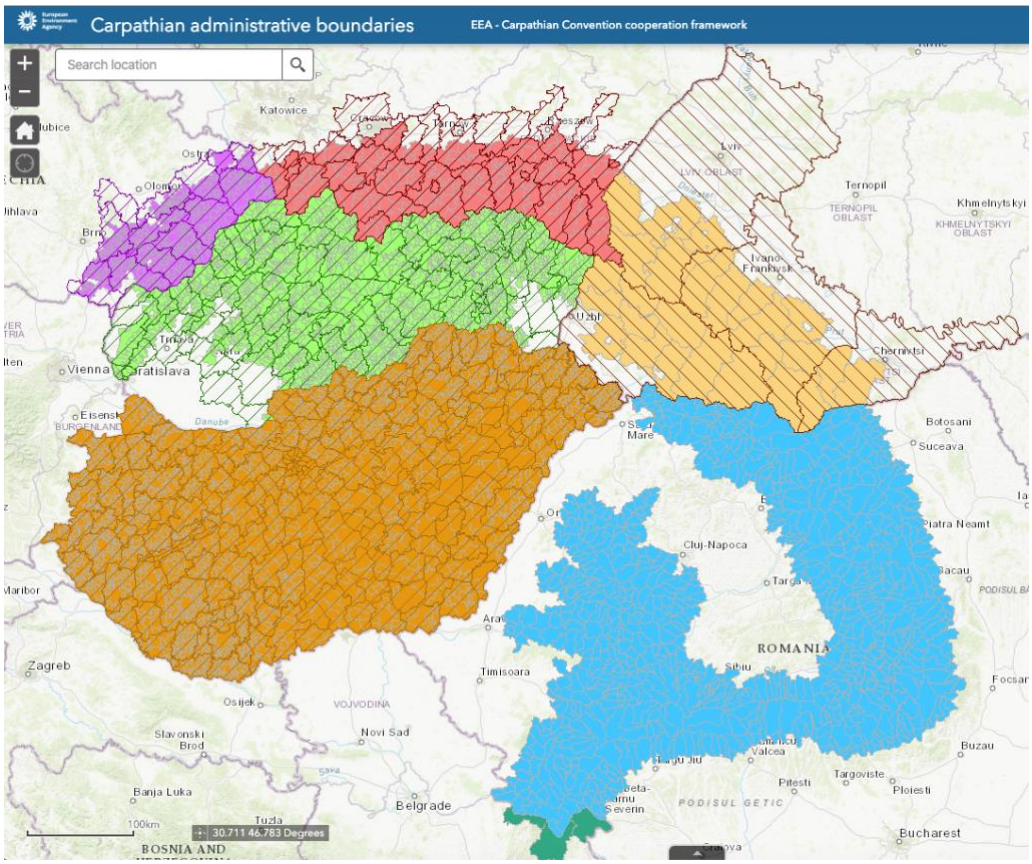

Figure 9-1: Map of Carpathian Administrative Boundaries (source (EEA n.d.)

I again felt that English is still a barrier. The meeting was told that the Hungarian Presidency's work plan was "ambiguous", I assume it was ambitious. The Slovak State Nature Conservancy handed over a book on Carpathian plant species published in Czech and asked the Secretariat to find funds to translate it to English. Apparently, the region's meetings are also often not taking place because of the lack of interpreters.

To sum up, I had the impression that several things I identified as recommendations for the Convention's actors already started. And that there is still room for improvement.

9.2.2 Further Research Agenda for Scientists

My research identified several directions for future research. The findings of my research definitely apply to the Carpathian Convention, and further comparative studies could help understand how widely spread these phenomena are: both within regional environmental regimes and also beyond them. Are my findings typical for other regional regimes, are other regional regimes also acting as implementing agents for global regimes; do actor networks generally transform into “families” etc.?

I suggest that meeting affiliation based network data collection can be used for more extensive and longer-existing regimes since data collection can be automated. This would open the doors for large comparative studies to understand how the network-level outcomes of a regime that can (pre)determine the success or failure of its environmental impacts.

Compared to the large number of regional environmental regimes in global governance, and the emergence of regional initiatives other than formalized regimes in global governance; there are still very few studies focusing on regional governance. My study suggests that regional regimes can play an essential role in solving global problems, however many more studies would be needed to fully understand the potentials and limitations of regional regimes for global environmental governance.

The mechanisms between regime interaction and regime effectiveness are practically a new field of research. Previous studies identified that there is likely an impact mechanism between the two, and my research pointed to four mechanisms that I found in the case of the Carpathian Convention. Further research is needed to test the validity of my findings for other cases and to uncover other interaction and impact mechanisms.

9.2.3 Leadership Roles of NGOs Engaged in Transboundary Regimes

In the Carpathian Convention NGOs, despite not having any legal rights or obligations to do so, have become (co-)leaders of the regime. Why is this the case in the Carpathians? Of course, for NGOs to become leaders of a convention, the legal set-up of the regime and the official actors (parties and secretariat) have to be open to their participation. Other actors claimed that NGOs have a long-term vision and commitment for engagement; contrary to parties whose political agendas and national delegates might change every 4-5 years. NGOs were also seen as honest brokers; parties perceived them as organizations without vested national or private interests. NGOs were also one of the

project professionals of the Carpathians, having project writing and management skills and capacities, and the necessary cash flow and budgeting flexibility that is required for many grants.

Although many other conventions also allow NGOs to participate as observers and the characteristics of NGOs highlighted by Carpathian actors are not unique to the region but are generally valid for NGOs, yet the role they play in the Carpathian Convention seems to be unique. For the effectiveness of the Carpathian Convention, NGOs co-leadership is highly beneficial. Could or should NGOs receive more important roles in regimes? Could or should regimes become substitutes for governance systems[89] and treat all actors at an equal level? In my opinion, NGOs - and recently unformalized citizen movements - deserve to have a stronger say in decision-making; however, I would argue that it is better to do this through governance systems and not regimes. Regimes should be one actor in the governance system: the actor that represents parties' joint aims and objectives. NGOs should be another set of actors with their own visions, agendas and other actors such as local governments, businesses, think tanks, research institutions, intergovernmental bodies should be equally allowed and encouraged to join. And this brings me back to regimes. Regimes can play a role in setting up a governance system of which their regime will be one actor, among several other actors. Regimes' actors can encourage and support the emergence of the inclusive actors' system.

9.2.4 Regional Regimes in Global Environmental Governance

Global environmental governance is becoming fragmented, polycentric or complex - depending on the analytical perspective (Kim 2019). Regional environmental regimes, such as the Carpathian Convention, are one set of nodes in this global governance network. Should decision-makers' efforts (and attention of those who care about the environment) focus on the regional level more, or should regional regimes be de-prioritized to allow other higher or lower levels to gain more attention? There are some environmental problems that are purely regional, such as river basins, fisheries and mountains. And there are also environmental problems that are of a larger scale but can benefit from regional cooperation, for example, migratory species, desertification and

[89] Under governance arrangements NGOs are considered vital actors together with governments and businesses.

even climate change (Gruby 2017).

For regional-level environmental issues, the solutions should also be sought at the regional level: escalating the problem to a higher level or moving to a lower level leaving out some segments will be less effective. For these problems, my answer is to prioritize actions at the regional level. However, as my research shows, even those regional regimes that are meant to solve "merely" regional-level problems can contribute to global impacts. This finding should be heard by decision-makers. Currently, the potentials of regional regimes are not recognized at the global level: the Secretariat of the Carpathian Convention was given an *NGO* badge for one of the global agreement's COP session. Global regimes should start to consider regional regimes as their implementing and solution-finding agents. Investing resources (funds, capacities, knowledge) could provide a good return. I am not claiming that regional regimes are the panacea for all environmental governance problems, and I am confident that there are malfunctioning regional regimes, but at least attempts should be made to recognize their contributions to global governance.

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Annex 1: Interview Field Guide

PAST

Tell me about when you (your organization) first got involved with the Carpathian Convention and how that went…

Possible follow-up questions:

- …and then what happened
- How did *that XXX* process evolve?
- You mentioned *XXX* how did they get involved?

PRESENT

Have you tried to do something under the Carpathian Convention? What, how, why, how did it go (or not work)?

Tell me about things that work and do not work currently!

Who or what, if any, are the drivers?

What, if any, do you consider the success/failure of the CC?

What, if any, do you consider the added value of the CC?

What, if any, is the role of the Carpathian Convention in relation to other biodiversity related MEAs?

FUTURE

How could the Carpathian Convention (governance system) develop in the future?

OR FOR SHORTER INTERVIEWS:

How do you see the evolution of the Carpathian Convention?

- Drivers
- Successes and failures
- Impacts
- Dynamics
- Future

BEFORE THE END OF THE INTERVIEW

Is there anything that we have not touched upon that you consider relevant in relation to biodiversity governance in the Carpathians?

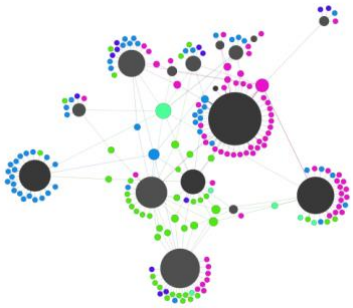
Annex 2: Social Network Survey

Dear

Carpathian biodiversity governance social network survey

My name is Márta Vetier, I am a PhD candidate at the Central European University (Budapest, Hungary) researching transboundary biodiversity governance in the Carpathian Mountains. The aim of my research is to analyze how a regional convention, namely the Carpathian Convention can contribute to ecosystem-based transboundary biodiversity governance.

My research includes a social network study in which I will map out ways in which organizations interact under the Carpathian Convention. Social network analysis provides both visual and mathematical analysis of human interactions. Once data have been collected, I will make a social network map like the one here.



The findings of the social network analysis will be an integral part of my PhD dissertation, and will also be presented at scientific conferences, in publications and possibly used as case studies for teaching.

Since your organization is one of the important actors of the Carpathian Convention and your expertise on the issue is very valuable to the research, it would be crucial for me to receive your input too. I am asking you to complete this survey, which should take no more than 15 minutes of your valuable time.

Survey goals

The immediate goal of this survey is to understand which organizations you have regular contact with. Four different dimensions of "having contact with" will be recorded in the survey. You will be asked to provide answers to statements and questions like: *"Who do you work together with in relation to biodiversity governance under the Carpathian Convention?"*

Feedback

Taking part in this social network research provides you a unique opportunity to get an insight into the position of your organization in relation to other organizations in the governance network as well as an understanding of the whole network of actors. I am happy to provide you with feedback about the findings of this social network analysis and also about my whole research on biodiversity governance in the Carpathians. At the end of the survey you can specify if and what kind of feedback you would like to receive.

Consent

Participation in this survey is voluntary; completing the entire survey will greatly improve accuracy of my research, however you can decide to skip any question that you do not wish to answer.

Data collected through this survey will be kept confidential; I will not share your responses with anybody else.

You personally will remain anonymous, your name will never appear on any analyses of this data. Ideally, I would like to be able to make some data about your organization available to readers, especially the country where your organization is based and where you operate, and what sector you belong to. However, there might be circumstances when you do not want your organization to be recognizable at all, in such case your organization will be replaced by an alphanumerical code. On the back side of the answer sheet you will be able to specify what type of information can appear publicly of your organization in relation to the social network analysis.

Questions, comments

Should you have any questions, comments or concerns relating to this survey or other parts of my research, you can contact me at:

Márta Vetier
vetier_marta@phd.ceu.edu
+36 20 531 0504

Mailing

Once you have completed this survey please place the answer sheet in the self-addressed envelope and mail it to me or send a scanned version to me via e-mail:

Márta Vetier, Remetehegyi ut 155, Budapest, H-1037, Hungary
vetier_marta@phd.ceu.edu

Thank you very much for taking the time to complete this survey!

Márta Vetier

Instructions

Thank you for taking the time to complete this survey – I value your time and responses. Steps 2 to 5 will ask you to think about four different aspects of the relationships you are having with other organizations in relation to biodiversity protection under the Carpathian Convention.

Please record all you answers on the answer sheet!

Step 1. On the answer sheet, please carefully read the list of organizations. **Add any further organizations to the empty rows that you interact with in relation to biodiversity protection under the Carpathian Convention. I**nteraction could mean anything from information exchanges to running joint projects.

Step 2. Please rate on a scale from 0 to 5 all organizations, on **how closely you work together with them in relation to biodiversity protection under the Carpathian Convention,** where 0 means no interaction and 5 means close, regular and long-term joint work. *Working together* means concretely doing things together, for example participating in the same project, contributing to a joint report or study, carrying out research together, developing a shared proposal.

Step 3. Please rate on a scale from 0 to 5 all organizations on **how they support your work on biodiversity protection under the Carpathian Convention,** where 0 means no support received and 5 means the strongest level of support. *Support* could mean for example receiving relevant information, expertise, funding, technical or logistical support, and administrative or organizational assistance.

Step 4. Please rate on a scale from 0 to 5 the organization you interact with on **how easy or difficult it is to work together with them.** On the scale 0 means no interaction, 1 means difficult to work together with and 5 means easy to work together with.

Step 5. Please rate on a scale from 0 to 5 the organizations you interact with on **how they treat problems in your inter-organizational relationship: rather in a cooperative fashion, or in an individualistic, self-maximizing manner.** On the scale 0 means no interaction, 1 means not cooperative, and 5 means treating problems in highly cooperative fashion.

Step 6. Please **turn over the answer sheet** and answer all questions relating to **consent and feedback**

Step 7. Once you have completed this survey please place the answer sheet in the self-addressed envelope and mail it to me or send a scanned version to me via e-mail:

Márta Vetier, Remetehegyi ut 155, Budapest, H-1037, Hungary
vetier_marta@phd.ceu.edu

Thank you very much for taking the time to complete this survey!

Márta Vetier

Answer sheet

Your organization		**Step 2** Working together 0 none – 5 closely	**Step 3** Support received 0 none – 5 strong	**Step 4** Working style 0 none 1 difficult – 5 easy	**Step 5** Problem solving 0 none, 1 non-coop. – 5 very cooperative
	Secretariat of the Carpathian Convention (SCC)				
	UNEP, other departments than the SCC				
	European Commission				
	Alpine Convention Secretariat				
	European Environmental Agency (EEA)				
	CZ member of the biodiversity working group				
	CZ Carpathian Convention focal point				
	HU member of the biodiversity working group				
	HU Carpathian Convention focal point				
	PL member of the biodiversity working group				
	PL Carpathian Convention focal point				
	RO member of the biodiversity working group				
	RO Carpathian Convention focal point				
	SRB member of the biodiversity working group				
	SRB Carpathian Convention focal point				
	SK member of the biodiversity working group				
	SK Carpathian Convention focal point				
	UA member of the biodiversity working group				
	UA Carpathian Convention focal point				
	EURAC European Academy of Bolzano/Bolsen				
	Science for the Carpathians network (S4C)				
	WWF (Worldwide Fund for Nature)				
	CEE Web for Biodiversity				
	Ecological Tourism in Europe				
	Carpathian Network of Protected Areas (CNPA)				
	State Nature Conservancy of Slovakia				
	Nature Conservation Agency of the Czech Republic				
Step 1 – Further organizations					

Consent and feedback

I would like to know your name and organization so that I can contact you in case I would need to follow-up something with you. You personally will remain fully anonymous, your name will not be shared with anybody; this information is only for my personal records.

Your name: ……
Your e-mail address: ……
Name of your organization:……

Consent. Please tick which of the following data can be made publicly available of your organization on the social network map and relating analyses. A minimal amount of information would be at least necessary for the social network analysis to be most meaningful: the sector and country of your organization.

☐ Full name of your organization (*optional*)

☐ Country where your organization is based (*preferred*)
If so, then please specify:…….

☐ Country where your organization is active in relation to protection of the Carpathian Mountains' biological diversity (*preferred*)
If so, then please specify. In case your organization is active in more than one Carpathian country, then please list all:……..…….
……..

☐ Sector where your organization belongs (*preferred*)

☐ Public sector (e.g. national official body, authority, agency, ministry)

☐ International organization

☐ NGO sector (e.g. campaigning organization, advocacy group, think-tank)

☐ Academic sector (e.g. university, research institute)

☐ Private sector (e.g. business)

☐ Other, please specify: ……

☐ I request full anonymity for my organization: none of the above can be made public within the research; I wish my organization to remain fully anonymous and be replaced by an alpha-numerical code in the social network analysis.

Feedback. I am happy to give feedback to you. If interested, please tick which parts of the research you would like to get feedback on.

☐ Social network analysis only

☐ Whole research project on transboundary biodiversity governance in the Carpathians

Once you have completed this survey please place this answer sheet in the self-addressed envelope and mail it to me or send a scanned version of both sides to me via e-mail:

Márta Vetier, Remetehegyi ut 155, Budapest, H-1037, Hungary
vetier_marta@phd.ceu.edu

Thank you very much for taking the time to complete this survey!

Annex 3: Regimes and Institutions in the Carpathian Convention's Ego-Network

The following list includes, explains and where appropriate gives legal references to all regimes and institutions that were included in the analysis of Chapter 7.

10.1.1 EU-specific alters

EU-specific alters. The Carpathian Convention connects through textual references and contractual agreements to nine alters that I have categorised as EU policy areas. Whereas some alters are single concrete pieces of legislation, others as referenced in the Convention's and its Protocols' texts cover dozens or even hundreds of pieces of legislation. As described in the methodology section, I have not "split" the alters that include several pieces of legislation into multiple alters, but have kept them as a single node, since this is how they were mentioned in the legal texts. The nine EU-specific alters of the Carpathian Convention are:

1. EU Cohesion Policy, which is the regional policy of the EU spelled out in the Treaty on the Functioning of the European Union and aims to achieve economic, social and territorial cohesion in the European Union. According the European Commission[90], there are eight regulations that spell out the details of the cohesion policy:
    - the common provisions regulation (CPR): Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006;
    - the Regulation on the European Regional Development Fund: Regulation

[90] http://ec.europa.eu/regional_policy/en/information/legislation/regulations/ and http://ec.europa.eu/regional_policy/sources/docgener/guides/blue_book/blueguide_en.pdf

(EU) No 1301/2013 of the European Parliament and of the Council of 17 December 2013 on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006;

- the Regulation on the European Social Fund: Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006;
- the Cohesion Fund Regulation: Council Regulation (EU) No 1300/2013 of 17 December 2013 on the Cohesion Fund and repealing Council Regulation (EC) No 1084/2006;
- the Regulation on support for rural development by the European Agricultural Fund for Rural Development: Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005;
- the Regulation on the European Maritime and Fisheries Fund: Regulation (EU) No 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund and repealing Council Regulations (EC) No 2328/2003, (EC) No 861/2006, (EC) No 1198/2006 and (EC) No 791/2007 and Regulation (EU) No 1255/2011 of the European Parliament and of the Council;
- the European Territorial Cooperation Regulation: Regulation (EU) No 1299/2013 of the European Parliament and of the Council of 17 December 2013 on specific provisions for the support from the European Regional Development Fund to the European territorial cooperation goal; and
- the Regulation on a European Grouping of Territorial Cooperation: Regulation (EU) No 1302/2013 of the European Parliament and of the Council of 17 December 2013 amending Regulation (EC) No 1082/2006 on a European grouping of territorial cooperation (EGTC) as regards the clarification, simplification and improvement of the establishment and functioning of such groupings.

2. EU Common Agricultural Policy (CAP), that shapes food and farming in Europe.

According to the European Commission[91], the foundation of the common agricultural policy is laid down in the founding treaty of the EU, and the key CAP legislations govern:

- direct support: Regulation (EU) No 1307/2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy;
- market measures: Regulation (EU) No 1308/2013 establishing a common organisation of the markets in agricultural products;
- rural development: Regulation (EU) No 1305/2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD); and
- horizontal issues: Regulation (EU) No 1306/2013 on the financing, management and monitoring of the common agricultural policy.

3. EU legal framework on nature protection and biodiversity, which according to the European Commission[92], includes:

- the Birds Directive: Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version of Directive 79/409/EEC as amended);
- the Habitats Directive: Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora;
- the Zoos Directive: Council Directive 1999/22/EC of 29 March 1999 on the keeping of wild animals in zoos;
- the Wildlife Trade Regulations: Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein, Commission Regulation (EC) No 865/2006 (as amended by Commission Regulation (EC) No 100/2008, Commission Regulation (EU) No 791/2012 and Commission Implementing Regulation (EU) No 792/2012), and Commission Implementing Regulation (EU) No 792/2012 of 23 August 2012 laying down rules for the design of permits, certificates and other documents provided for in Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating the trade

[91] https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/cap-glance_en#legal-aspects

[92] http://ec.europa.eu/environment/nature/legislation/index_en.htm

therein and amending Regulation (EC) No 865/2006 (the Permit Regulation), and

- the Invasive Alien Species Regulation: Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species.

4. EU legal framework on transport, covers hundreds of pieces of legislation;
5. EU Forest Strategy and the Forest Action Plan give a framework to forest governance in the European Union:
    - Forest Strategy: COM(2013) 659 final, A new EU Forest Strategy: for forests and the forest-based sector;
    - Forest Action Plan: The 2013 forest strategy does not have an action plan, the previous forest strategy's action plan was: COM(2006) 302 final, Communication from the Commission to the Council and the European Parliament of 15 June 2006 on an EU Forest Action Plan.
6. EU Trans-European Transport Network Development (TEN-T), aims to foster projects throughout the EU in order to establish a well-connected transport infrastructure network in Europe: *Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU*[93].
7. EU Strategy for the Danube Region (EUSDR), which is a macro-regional strategy for the Danube region, aiming to "to create synergies and coordination between existing policies and initiatives taking place across the Danube Region", it is a framework for cooperation in the region: *COM/2010/0715 final, Communication from the Commission to the European Parliament, the Council, the European Economic And Social Committee and the Committee of the Regions, European Union Strategy for Danube Region.*
8. EU Strategy for the Baltic Sea Region (EUSBSR), similar to the Danube Strategy is a macro-regional strategy fostering cooperation in the Baltic Sea Region: *COM/2009/0248 final, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the*

[93] According to https://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/legal-basis_en

Committee of the Regions concerning the European Union Strategy for the Baltic Sea Region.

10.1.2 MEAs and MEA Secretariats

1. Convention Concerning the Protection of the World Cultural and Natural Heritage (Word Heritage Convention), which defines the kinds of natural and cultural sites that can be listed as World Heritage Sites, and prescribes the roles of parties in identifying, protecting and preserving these sites: *Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972).*
2. Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention), focuses on interactions between the public and public authorities in environmental matters, and spells out public rights on access to information, public participation and justice:
    - Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Århus, 1998);
    - Protocol on Pollutant Release and Transfer Registers to the Aarhus Convention (Kiev 2009).
    - Convention on Biological Diversity (CBD), focuses on the conservation, sustainable use and sharing of benefits arising from biological diversity:
    - Convention on Biological Diversity (Rio de Janeiro, 1992),
    - the Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Cartagena, 2000), and
    - Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (Nagoya, 2014).
3. Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) is about protecting natural habitats and endangered species in Europe and promoting cooperation between its parties in these matters: *Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979).*
4. Convention on Conservation of Migratory Species of Wild Animals (CMS) calls on parties to protect migrating species and their migratory routes: *Convention on*

Conservation of Migratory Species of Wild Animals (Bonn, 1979).

5. Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention), sets out the responsibilities of parties to assess the environmental impacts of certain activities and also obliges them to notify and consult each other on projects that are likely to have environmental impact across boundaries: *Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991).*
6. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) aims to protect endangered species by specifying the rules of their international trade: *Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, 1973).*
7. Convention on the Protection of the Alps (Alpine Convention) is a regional convention for the protection and sustainable development of the Alpine Mountains:
    - Convention on the Protection of the Alps (Salzburg, 1991) and its protocols.
    - Protocol on the implementation of the 1991 Alpine Convention in the field of transport
    - Protocol on the implementation of the 1991 Alpine Convention in the field of mountain farming
    - Protocol on the implementation of the 1991 Alpine Convention relating to nature protection and landscape conservation
    - Protocol on the implementation of the 1991 Alpine Convention relating to mountain forests
    - Protocol on the implementation of the 1991 Alpine Convention in the field of tourism
    - Protocol on the implementation of the 1991 Alpine Convention in the field of energy
    - Protocol on the implementation of the 1991 Alpine Convention in the domain of soil conservation
8. Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) concerns the protection and sustainable use of wetlands: *Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar, 1971)*.
9. Declaration on Environment and Development (Rio Declaration), also known as

"Agenda 21", was adopted at the UN's Earth Summit in 1992 and spells out 27 principles intended to guide countries in sustainable development:

- Declaration on Environment and Development, also known as "Agenda 21", adopted at the United Nations Conference on Environment and Development (UNCED, "Earth Summit") in Rio de Janeiro (1992).

10. Declaration on Environment and Sustainable Development in the Carpathian and Danube Region (Bucharest Declaration) is the document paved the way for the start of the negotiations of the Carpathian Convention: *Declaration on Environment and Sustainable Development in the Carpathian and Danube Region (Bucharest, 2001)*.
11. European Landscape Convention (ELC) is a treaty concerning all landscapes of its parties (natural, rural, urban and peri-urban) and focuses on the protection, management and planning of landscapes as well as raising awareness of the value of a living landscape: *European Landscape Convention (Florence, 2000).*
12. Forest Law Enforcement and Governance processes (FLEG) are regional processes to tackle illegal logging, there are two regional processes which the concern parties of the Carpathian Convention:
    - The process for the EU (EU FLEGT): COM/2003/0251 final, Communication from the Commission to the Council and the European Parliament - Forest Law Enforcement, Governance and Trade (FLEGT) - Proposal for an EU Action Plan, and Regulation (EU) No 995/2010 of the European Parliament and of the Council of 20 October 2010 laying down the obligations of operators who place timber and timber products on the market
    - The process for EU and North Asian countries (ENA FLEG), this latter includes Ukraine and Serbia, which are non-EU parties of the Carpathian Convention: *Saint Petersburg Declaration on Forest Law Enforcement and Governance in Europe and North Asia (ENA FLEG, St. Petersburg, 2005)*
13. International Commission for the Protection of the Danube River (ICPDR) is an international organisation which was established by the Danube River Protection Convention (to which all Carpathian-parties, except for Poland are also parties to), and aims coordinate the implementation activities of its parties.
14. Ministerial Conference for the Protection of Forests in Europe (MCPFE) is a pan-European ministerial level voluntary political process for the promotion of sustainable management of European forests, its resolutions available at foresteurope.org have defined guidelines, and criteria and indicators of

sustainable forest management;

15. Sustainable Development Goals (SDGs) were adopted by the UN's General Assembly in 2015, the SDGs are a set of 17 global goals with 169 concrete targets addressing environmental, social and economic issues: *Transforming our World: the 2030 Agenda for Sustainable Development, United Nations General Assembly Resolution A/RES/70/1 (adopted 25 September 2015).*
16. UN Framework Convention on Climate Change and its Kyoto Protocol (UNFCCC) is the global agreement to mitigate climate change, and the Kyoto Protocol spells out concrete emission reduction targets for certain countries, including the parties of the Carpathian Convention;
    - UNFCCC: United Nations Framework Convention on Climate Change (1992);
    - Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto, 1997).
17. UN Forum on Forests' (UNFF) decisions: the Forum on Forests is an intergovernmental body under the UN's Economic and Social Council aiming to promote the management, conservation and sustainable development of forests: *Decision 2015/254 Ministerial declaration of the high-level segment of the eleventh session of the United Nations Forum on Forests on the international arrangement on "The forests we want: beyond 2015"*
18. UN Non-Legally Binding Instrument on All Types of Forests, aims to strengthen political commitment and action on sustainable forest management and to provide a framework for national action and international cooperation: *A/RES/62/98, Resolution adopted by the General Assembly on 17 December 2007.*
19. UNECE Trans-European network for motorways (TEM) is a regional cooperation project among Central, Eastern and South Eastern European countries, that aims to improve road traffic networks in the region;
20. UNECE Trans-European network for rail (TER), similar to TEM TER is also a regional cooperation project, but focusing on rail networks in the region;
21. World Summit on Sustainable Development, Johannesburg Declaration on Sustainable Development (WSSD-Declaration) was adopted at the second UN "Earth Summit" in 2002, its signatories "commit [them]selves to building a humane, equitable and caring global society, cognizant of the need for human dignity for all": *Johannesburg Declaration on Sustainable Development, World*

Summit on Sustainable Development, 2002.

22. World Summit on Sustainable Development, Plan of Implementation (WSSD-Implementation), spells out the concrete step that countries committed to taking in order to reach the milestones set out in the Rio Declaration and its follow-up documents and the Millennium Declaration: *A/CONF.199/20, Chapter 1, Resolution 2, Johannesburg, September 2002, World Summit on Sustainable Development, Plan of Implementation of the World Summit on Sustainable Development*.

10.1.3 Formal and informal organizations

The Carpathian Convention has eight alters that are formal or informal organisations (note that secretariats of a specific MEAs have been included in the previous list).

1. Carpathian EcoRegion Initiative (CERI) was an umbrella uniting around 50 NGOs and scientific bodies working in and on the Carpathians in order to unify their knowledge and actions, it is largely dormant since the early 2000s;
2. UN Commission on Sustainable Development (CSD) was a body under the UN ECOSOC tasked with overseeing the outcomes of the 1992 Earth Summit;
3. Council of Europe (CoE) is an international organisation aiming to uphold human rights, democracy and the rule of law in Europe;
4. European Academy (EURAC) is a research institute based in Bolzano, Italy;
5. European Environment Agency (EEA) is the EU's independent advisory body on environmental matters;
6. Central European Initiative (CEI) is an intergovernmental forum of regional cooperation in Central and Eastern Europe supporting European integration and sustainable development;
7. Science for the Carpathians Initiative (S4C) is the voluntary network, an informal organization, of scientists carrying out research on the Carpathian Mountains;
8. UN World Tourism Organization (UNWTO) is the UN's body on sustainable tourism matters.