



Sam Grönholm

Governing the Baltic Sea

A study of the functionality of contemporary environmental governance



Governing the Baltic Sea

A study of the functionality of contemporary environmental governance

Sam Grönholm

Public Administration

Faculty of Social Sciences, Business and Economics

Åbo Akademi University

Turku, Finland, 2020

ISBN 978-952-12-3898-7 (printed)
ISBN 978-952-12-3899-4 (digital)
Painosalama Oy, Turku, Finland 2019

Abstract

The research interest of this thesis is outlined by the concept of governance. Governance is used to describe, understand and explain the development of governing styles applied to solve complex societal problems. Governance embodies a societal shift in governing problems by emphasizing the need of interaction across and between state and non-state actors to augment the capacity of public policy. Governance transforms the role of the government by subverting the hierarchical principles for governing through interface and collaboration. The normative perception of governance is that it improves governments' ability to develop alternative and innovative governing solutions to intricate problems and challenges.

The study of governance entails the research on complex and interactive governing. The design of innovative governing commands an integration of a range of actors in the development of programs, strategies and policy. In contemporary interactive governing the position of the government is redefined. Formal and hierarchical governing is interlinked with informal and multi-level governing through networks. Networks join the interests of public entities operative on different levels, with non-state actors, e.g. citizen, business and local organizations. Networks operate based on varied institutional interests and diverse socio-political preferences and often have their own view of societal problems and opinion of methods to deal with these problems. A functional interactive governing implies that the design of innovative policy solutions is a result of a coordinated interaction where the interests and preferences of different networks are respected and integrated. This is a precondition for an informed problem understanding that reflects the complexity of contemporary societal challenges.

This thesis describes and examines governance endeavors designed to solve contested and ill-defined environmental challenges. The thesis contributes to the academic literature by using the Baltic Sea Region (BSR) as a research area. The BSR is a relevant area to study governance, as it has been a laboratory for alternative modes of governing ever since the 1950s. The focus of this thesis is the environmental governance of the Baltic Sea. The BSR environmental governance is synonymous with autonomous network endeavors that aim to generate policy responses that target the shared challenges of the Baltic Sea. The BSR network governance is tasked with the multi-level governing of the environmental degradation of the Baltic Sea ecosystems. The destruction of the Baltic Sea ecosystems is largely a consequence of extensive chemical pollution, eutrophication and overfishing.

The thesis examines how the current BSR environmental network governance functions in practice and summarizes the key features that define the reality of governing the Baltic Sea. The thesis illustrates how the current mode of Baltic Sea governing does not comply with normative logic. Modern environmental governance advocates interactive governing through inclusive actor arrangements to attain a holistic view of the underlying structures and features defining complex challenges. The hierarchical conditioned BSR network governance fails to transform and reframe the Baltic Sea governing style to comply with and respond to the conflict-ridden and intricate ecosystem challenges. Ecosystem based challenges are difficult to solve, as there is not a shared view of the scope of their true nature, because of diverging and conflicting societal and actor interests. In particular, the governing of the Baltic Sea does not properly consider the social dimension of ecosystem challenges. Technical and expert guided

governance cannot solve the underlying socio-cultural tensions in the region, which impedes the usefulness, efficiency and the true potential of current policy actions.

A future Baltic Sea environmental network governance must be defined based on a broad and varied actor base. The governing of the Baltic Sea needs to accept normative reasoning. This entails adaptive governing that combine technical actions with interactive and participatory governance styles to enable a functional governance of the Baltic Sea. This offers improved provisions for integrating multilayered knowledge, by joining expert, lay and indigenous actors into the development of policy. This enhances the conditions for an informed governance approach of the ecosystems of the Baltic Sea.

Svenskt abstrakt

Denna avhandling analyserar konceptet governance. Governance används för att beskriva, förstå och förklara utvecklingstendenser i styrningen av ofta komplexa och svårlösta problem. Governance innefattar en förändring i sättet att hantera problem, genom att framhäva behovet av ett nödvändigt, integrerat samspel mellan statliga och icke-statliga aktörer för att öka den offentliga politikens förmåga. Governance förändrar statens roll genom att reformera de hierarkiska principerna för styrning. Governance skapar förändringar i styrningssystem genom interaktion och samarbete. Den normativa uppfattningen om governance är att den förbättrar den offentliga politikens kapacitet att utveckla alternativa lösningar för en innovativ styrning av svårhanterliga problem.

Studiet av governance innefattar forskningen i komplex och interaktiv samhällsstyrning. Utformande av innovativ styrning förelägger en integration av ett flertal aktörer i utvecklingen av program, strategier och policy. I en interaktiv samhällsstyrning omformuleras statens position. Den formella hierarkiska styrningen förenas med informell och flernivå styrning genom olika nätverk. Dessa nätverk ansluter offentliga aktörer statliga, aktiva på olika nivåer, med icke-statliga aktörer såsom representanter från medborgar- och företagsorganisationer. Nätverk agerar efter institutionella egenintressen och olikartade socio-politiska preferenser, vilket resulterar i att nätverken oftast har en egen problemförståelse och föreställning om vissa åtgärders lämplighet. En funktionell interaktiv samhällsstyrning förutsätter att utvecklandet av innovativa lösningar är ett resultat av ett koordinerat samspel där olika nätverksaktörers intressen och preferenser beaktas och integreras. Detta är förutsättningen för en informerad problemförståelse som reflekterar komplexiteten i samtida samhällsproblem.

Denna avhandling beskriver och analyserar governance system utvecklade för att hantera svårlösta och konfliktfyllda miljöproblem. Forskningsintresset för denna avhandlingen är fastställd av det fler-nivå system som kännetecknar Östersjöområdet. Östersjöområdet är ett relevant forskningsområde för att studera governance, speciellt med tanke på att området sedan 1950-talet fungerat som ett laboratorium i utvecklingen av alternativa och nya styrsystem. Fokus för forskningen är miljöstyrningen av Östersjön. I Östersjöområdet är detta synonymt med autonoma nätverks försök att utveckla åtgärder som avser bemöta de miljöutmaningar som präglar Östersjön. Det nätverksbaserade governance systemets främsta uppgift är att hantera fler-nivå styrningen av en utbredd eutrofiering, kemisk förorening och ett rovfiske som utgör grundorsaken till de utmaningar som hotar Östersjöns ekosystem.

Denna avhandling undersöker hur det nätverksbaserade governance systemet fungerar i praktiken och summerar de viktigaste faktorerna som beskriver den konkreta styrningen av Östersjön. Avhandling påvisar att det nuvarande styrningssystemet är inte förenlig med normativ logik. Modern miljörelaterad governance förespråkar en interaktiv styrning genom ett inkluderande aktör arrangemang för att uppnå en holistisk förståelse av de underliggande strukturerna och de särdrag som definierar komplexa utmaningar. Den hierarkiskt betingade nätverksstyrningen misslyckas med att omvandla och omstrukturera styrningen av Östersjön för att bemöta svårlösta och konfliktfyllda ekosystem utmaningar. Miljöproblem associerade med ekosystem är svårlösta på grund av inneboende sociala konflikter. Det finns inte en gemensam uppfattning om utmaningarnas verkliga omfattning på grund av olika värde intressen och konfliktfyllda åsikter om användningen av Östersjön. Styrningen av Östersjön beaktar inte de sociala dimensionerna av de miljöhot som angriper dessa ekosystem. En

teknisk och expert baserad styrning av Östersjön är inte förmögen att lösa de underliggande socio-kulturella spänningarna i området, vilket förhindrar användbarheten, effektiviteten och potentialen av den nuvarande styrningen.

En framtida nätverksbaserad miljöstyrning av Östersjön bör baseras på en bred och mångsidig aktör bas som styrs utifrån normativ logik. Detta betyder en anpassningsbar styrning som integrerar tekniska procedurer med interaktiva, deltagande processer som möjliggör en funktionell styrning av Östersjön. Dessa erbjuder förbättrade förutsättningar att integrera särintressen genom att sammanföra expertkunskap med icke-statliga värdegrunder och intressen i utvecklingen av policy. Detta förbättrar beslutfattarnas kapacitet att genomföra en anpassad styrning av Östersjön och dess ekosystem.

Preface and acknowledgments

In an early stage of my studies, several academic lecturers used to term '*from government to governance*' to summarize the scholarly debate defining our field of research. This thesis is an addition to the academic attempts that discuss and reflect on the formation and the result of the experimental forces driving the evolution of governance designs. Governance is viewed as an alternative to conventional governmental control, providing options to pursue and develop new modes of governing. As a concept, it is associated with different meanings. At the core of the different interpretations is the transformation of the role of the state and limitation of governmental power. Governments are increasingly dependent on non-hierarchical measures and multi-level collaborative arrangements to attain policy goals. Governance represents a change in governmental operational procedures, from asserting hierarchical control in policy processes, towards using informal and interactive practises by actors outside of governmental authority to augment public policymaking capacity.

This thesis is a result of my research endeavors to study governance. Others that have written a thesis generally describe it is challenging task, spanning numerous years. Yet, few can claim they have been a doctoral student for almost two decades. I was the doctoral student that enrolled to each new academic year and the mirror image of how *not to* conduct your doctoral studies. However, my 'career' as a doctoral student has not been a total vast of time. It has given me possibilities to engage in the academic and in the practical analysis of the governance of the Baltic Sea. It has assisted me in interpreting not only empirical but also tacit knowledge of my research topics. Above all, it has helped me to write a thesis. A responsibility that is defined by demonstrating your academic maturity as a researcher.

This thesis would not exist were it not for the financial support received from Ella and Georg Ehrnrooth Foundation, Otto A. Malm Foundation and Åbo Akademi University. Their financial support allowed me to work and focus fulltime on concluding my thesis. I am also thankful to the various research funding bodies that permitted me to conduct the research that constitutes the foundation of the peer-reviewed articles in this thesis. These include Academy of Finland, the Baltic Sea research and development program and the European Regional Development Fund and then in particular the INTERREG IIIB program.

I have always worked in a supportive academic community. I am truly grateful to my wonderful colleagues at public administration and political science at Åbo Akademi University. My professor Marko Joas has constantly been supportive and given me the liberty to pursue my endeavors, even though he has provided at times, gentle, reminders that it would be worthwhile for me to conclude my thesis. Also, a special thank you to the two examiners of my thesis, professors Katarina Eckerberg and Stefan Gänzle. Their valuable comments helped me to improve the final version of the thesis. Finally, a sincere thank you to my co-supervisors, Dr. Savitri Jetoo and Dr. Nina Tynkkynen. They gave me the mental fortitude and emotionally supported me in the final stages of concluding my thesis.

Summary

The Baltic Sea is without statehood. No sovereign entity with absolute authoritative power governs the Baltic Sea through deliberately designed arrangements that aim to protect it from widespread exploitation. The governing processes of the Baltic Sea have been created in an intricate and incoherent context that seeks to generate alternative and experimental modes of governing. There is an intrinsic demand of transformative governance of the Baltic Sea. This demand is rooted in the difficulty of governing the Baltic Sea. BSR governance needs to link the socio-ecological complexities of the Baltic Sea, by creating a functional governance of adjacent ecosystems through reconciling the diverse political and economic preferences that connect actor interests, values and stakes in the region.

This thesis is guided by *two principal ambitions* in relation to the governance of the Baltic Sea. The *first ambition* is guided by a societal orientation. The thesis contributes to the debate on the environmental governance of the Baltic Sea. It informs on the dynamics of BSR governance by reflecting on the direction of the operative context that ultimately defines the governing of the challenges of the Baltic Sea. The thesis expands the knowledge of the extent to which the operative BSR governance is capable to develop suitable policy responses relative to the ecosystem challenges of the Baltic Sea. The Baltic Sea ecosystem challenges are considered 'wicked problems'. They are multifaceted and contested as to their scope and the policy responses needed for dealing with these problems. Academic scholars generally agree that these require responses that look beyond hierarchical, sectorial boundaries and technical governance styles. Governing attempts need to veer away from technocratic and narrow governance approaches towards an inclusive and holistic governance style advocated by an Ecosystem Approach to Management (EAM). A governing approach that emphasizes the co-production of knowledge and use of a mix of scientific, local and indigenous knowledge in the governance of complex challenges. An EAM approach is viewed as allowing the identifying of non-hierarchically defined solutions, reconciling conflicts and legitimizing policy processes and policymaking. This is the foundation for a functional governance of the Baltic Sea.

To accomplish the first ambition, the *second ambition* is designated based on a theoretical aim to contribute to the research on the concept of governance. The thesis develops the concept from a network governance perspective, as the governance of the Baltic Sea transpires through explicitly established and designated networks. It adds to theory by investigating the positive normative premise underpinning the concept of network governance. As a concept it is viewed as ideally positioned to govern 'wicked problems', cutting across traditional hierarchical norms and ideas to produce innovative and feasible policy responses that match conflict-ridden and ill-defined problems.

This thesis contributes to the research into network governance by using the broad academic field that define this concept. Initially, the thesis delivers conceptual clarity by addresses the ambiguity of the extent to which networks are changing and framing the processes of policy development and policymaking. This is achieved by developing the limited knowledge of how network governance as a mode functions in practice, especially in a transnational setting that links different networks and actors through joint socio-ecological policy challenges. This thesis also develops the concept of network governance relative to governing socio-ecological challenges by responding to the academic calls for interlinking network governance with

social learning. Social learning enhances the ability of network governance to adhere with the principles of an EAM induced functional governance of socio-ecological challenges.

A general conclusion of this thesis is that the current environmental governance of the Baltic Sea does not adhere to the premise that defines the concept of network governance. A normative logic of BSR network governance is that it conveys a governance transformation that is navigated and supported by an underlying change in the relational conditions of general policy development and policymaking. Normatively, the BSR network governance is regarded as linking traditional hierarchical forms of government with innovative governance modes through changing the structural power division relative to the formation of policy. It is viewed as eroding the hierarchical basis and expanding the scope of actors involved in policy processes, using multi-actor, multi-level collaboration and interaction procedures to design policy. This is viewed as augmenting problem-solving capacities for governing the Baltic Sea.

The network governance of the Baltic Sea is generally ineffective in supporting and sustaining the proliferation of innovative governance modes. It fails on a general level to generate policy development processes associated with the normative demands prescribed to social learning and an EAM governance approach. BSR operational routines are defined by hierarchically fortified policy procedures. A BSR institutional network premise confines the operative setting and the conditions for policy development processes and policymaking. The governing of the Baltic Sea that has developed and expanded the network governance throughout decades has fostered a gradual institutionalization of the region. The relational composition of operative BSR networks are structurally related with features portraying regulated formal hierarchical policy networks, as oppose to the features associated with informal non-hierarchical network conveying innovative governing modes. The relational composition of operative BSR networks are not congruent with the relational principles of network governance policy design.

The current network governance of the Baltic Sea follows a traditional 'command and control' paradigm. This is oftentimes prescribed to contemporary environmental governance. Policy is designed with the view to generate measurable results, quantified with the help of science-based approaches. This reinforces the proliferation of expert and technical approaches in the governance of the Baltic Sea. The integration of actors into BSR policy procedural processes follow a functionalist approach. An institutionalized pretext frames the involvement of non-governmental actors in policy design. The conditions for this involvement are to some extent instrumentalized for legitimizing the policy process and the role of governmental actors. The involvement of non-governmental actors is voluntary; not only in terms of whether actors take part but also in terms of also how governmental actors use the results of the process.

A future network governance of the Baltic Sea needs to navigate the complex current network governance operational reality. The BSR operative setting is shaped by a Europeanisation, as most BSR Nation States (NS) are members of the European Union (EU). This expands an already complex BSR network governance operational setting. BSR policy design is modelled based on EU endorsed policy beliefs, proliferated with the help of best practice studies and benchmarking. The targeted funding of EU project funding schemes is used to foster these beliefs. The production of best practice studies, through project proliferation, expands the temporal dimension of policy development and innovation practices as well as distorts the timeframes of operating actors. The result is policy fragmentation, causing friction concerning

policy continuity, coherency and transparency. Even though BSR networks governance is oriented by long-term visions that target the challenges of the Baltic Sea, the actual policy orientation is defined by short-term projects. This weakens the viability and capacity of BSR policy development processes. Collectively, this impairs the ability of the BSR networks governance to navigate the challenges of the Baltic Sea by exploring sustained, innovative and inclusive governance policy alternatives advocated by EAM.

This thesis calls for broader societal and scholarly recognition of the embedded challenges in governing complex socio-ecological challenges. There is a need for debate of the overarching beliefs and norms used to guide and incentivize policy design and innovation in a transnational setting that is linked by shared environmental challenges. The tools currently used to advance policy development are usually inclined to serve traditional technocratic, expert driven policy solutions. However, these cannot produce optimal solutions to all of the 'wicked problems' of the Baltic Sea. The network governance of the Baltic Sea is based on scientific reasoning, enhancing actors to conduct informed policy decisions and actions. Science is invaluable, but scientific thinking needs to be integrated with tacit multi-level knowledge about socio-cultural settings. Policy attainment should not be limited to produce only hierarchically determined tangible result, as there is extensive heterogeneity in the factors that define the Baltic Sea ecosystem challenges. These challenges are framed and reframed in different ways and from different perspectives. The socio-ecological complexities of Baltic Sea are contested and a shared view of the true nature of these challenges does not exist.

Table of Contents

Chapter 1	
1. Introduction	1
1.1. Research objective and question	2
1.2. Analytical approach	5
1.3. Theoretical framework	9
1.4. Research contribution	10
Chapter 2	
2. Methods and material	13
2.1. Article methods and material	15
Chapter 3	
3. Emergence of network governance	18
3.1. Network governance – the evolving conditions of policymaking	19
3.2. Proliferation of network governance	22
3.3. A functional network governance – a theoretical point of departure	24
Chapter 4	
4. Network governance and the Baltic Sea region	27
4.1. Baltic Sea region as a study area	27
4.2. Operationalization of Baltic Sea region network governance functionality	28
4.3. A functional Baltic Sea region network governance	29
Chapter 5	
5. Conceptualization of learning in relation to the environmental challenges of the Baltic Sea	31
5.1. Learning – a multifaceted function	31
5.2. Preconditions for social learning	35
Chapter 6	
6. Conceptualizing and operationalizing social learning in Baltic Sea region network governance	38
6.1. Network governance and learning	39
6.2. Modes of network governance learning	40
6.3. Learning functions of network governance	41
6.3.1. Network and policy network theory – a premise for conceptualizing social learning	42
6.3.2. Key transnational network governance social learning functions	44
6.4. Transnational learning mechanisms and social learning	47
6.4.1. Benchmarking – learning by imitation	48

6.4.2. Multi-actor learning platforms	50
---------------------------------------	----

Chapter 7.....

7. Preconditions for Baltic Sea region network governance learning – an empirical evaluation	53
7.1. Empirical findings – a premise for understanding Baltic Sea region network governance	53
7.2. Social learning and Baltic Sea region network structures	57
7.3. Social learning in the Baltic Sea region network governance	58

Chapter 8.....

8. Conclusions	67
8.1. The relational conditions of Baltic Sea region network governance – a basis for developing theory	67
8.2. Evaluating the functionality of Baltic Sea region network governance	71
8.3. Baltic Sea region network governance – a functional governance of the Baltic Sea?	75

Chapter 9.....

9. Baltic Sea region network governance – future considerations	80
---	----

References	85
------------	----

Tables and Figures

Table 1. A functional BSR network governance – an analytical overview	7
Table 2. Overview of theoretical framework	10
Table 3. Empirical data – an overview	16
Table 4. General social learning principles	34
Table 5. Supportive preconditions for social learning	36
Table 6. Outline for operationalizing social learning in a functional BSR network governance	38
Table 7. Networks and learning functions – viewed from social learning types	43
Table 8. Network characteristics and their influence on GNs ability to foster learning	46
Table 9. Multi-actor learning platforms and social learning	51
Table 10. Preconditions for social learning in BSR network governance – an analytical overview	59
Table 11. BSR network governance functionality requirements	72

Figure 1. Key features of BSR network governance policy-making conditions	68
---	----

Figure 2. BSR network governance challenges relative to a functional governance of the Baltic Sea	76
---	----

Annex 1.....

Annex 1 contains the peer reviewed version of article 1: Grönholm, S (2018). A tangled web: The Baltic Sea region governance through networks. *Marine Policy* 98: 201-210. Elsevier 2018. The original article is published in final form at <https://doi.org/10.1016/j.marpol.2018.09.013>. Article 1 is an open access article distributed under the terms of the Creative Commons CC-BY license.

Article 1 is the result of my research. The conception and design, as well as the collection and analysis of the material in article 1 was carried out within the Multi-Level Regulation of the Baltic Sea Region-project, financed by Academy of Finland, grant number 290331.

Annex 2.....

Annex 2 contains the peer reviewed version of article 2: Grönholm, S (2009). Governing National Parks in Finland - the Illusion of Public Involvement. *Local Environment: The International Journal of Justice and Sustainability*, 14(3): 233 – 243. Taylor & Francis 2009. The original article is published in final form at <https://doi.org/10.1080/13549830802692955>. Republished by permission from Taylor & Francis.

Article 2 is the product of my research. The data used in article 2 is part of data collected by the project 'Coastal Sustainability as a Challenge'. In this project I was responsible for the design and the implementation of the data collection and the analysis of the collected data. The data was collected for a study titled: "Cooperation between coastal protected areas and local societies: from experiences to recommendations" (ISBN: 978-952-446-586-1). The study examined the cooperation between coastal protected areas in the Baltic Sea region and their stakeholders. The data in article 2 was not used in the aforesaid study.

Annex 3.....

Annex 3 contains the peer reviewed version of article 3: Hassler B, Boström, M & S. Grönholm (2013). Towards an Ecosystem Approach to Management in Regional Marine Governance? The Baltic Sea Context. *Journal of Environmental Policy & Planning*, 15(2): 225-245. Taylor & Francis 2013. The original article is published in final form at <https://doi.org/10.1080/1523908X.2013.766420>. Republished by permission from Taylor & Francis.

Article 3 is a joint research effort. The conception and design, as well as the analysis in article 3 is the result of work carried out by Hassler and Boström. My contribution is related to condensing the theoretical insights of the conceptual framework that constitutes the analytical premise of the article. Part of the data used in the article 3 originate in data collected by the Risk Governance of the Baltic Sea-project. All of the authors of article 3 were part of this project and tasked to collect data by arranging and participating in stakeholder roundtable discussions. The project was financially supported by the joint Baltic Sea research and development program.

Annex 4.....

Annex 4 contains the peer reviewed version of article 4: Grönholm S and S Jetoo (2019). Fostering a functional governance of the Baltic Sea region: Network governance of the EUSBSR. *Environmental Policy and Governance*, 2019: 1-13. Wiley 2019. The original article is published in final form at <https://doi.org/10.1002/eet.1870>. Republished by permission from Wiley.

Article 4 is a joint research effort. The conception and design of the article, as well as the collection, interpretation and analysis of the material in the article is the product of my research. The drafting of the article is a joint effort, however the final revision of the article content is a result of my work efforts. The research for article 4 has been made possible by the URMI –project - Urbanization, Mobilities and Immigration, financed by Academy of Finland, grant number 303619.

List of acronyms – alphabetical order

Baltic Sea Action Plan	BSAP
Baltic Sea Region	BSR
Council of the Baltic Sea States	CBSS
Double – loop learning	DL – learning
Ecosystem Approach to Management	EAM
European Commission	EC
European Union	EU
European Union Strategy for the Baltic Sea Region	EUSBSR
Governance Networks	GN
Helsinki Commission	HELCOM
Horizontal Action Leader	HAL
International Council for the Exploration of the Sea	ICES
Member State	MS
Nation States	NS
Non-Governmental Organization	NGO
Nordic Council	NC
Nordic Council of Ministers	NCM
Policy Network	PN
Priority Area Coordinator	PAC
Single-Loop learning	SL – learning
Steering Group	SG
Risk Governance of the Baltic Sea	RISKGOV
Union of the Baltic Cities	UBC

1. Introduction

A lack of institutionalized legislative entities with absolute authoritative power and exclusive enforcement competence over the numerous operative states, local, non-governmental actors in the BSR have created space for a network-based governance. The BSR has a long network-based governance history. The first network was established in the 1950s and during the 1970s, the number expanded, to mushroom in the 1990s as a reaction of societal changes in the region. The BSR governance through the formation of networks, or network governance, is synonymous with various actor endeavors that aim to generate policy responses that address the complexity of the challenges of the Baltic Sea. These challenges are well documented and are linked to a pollution and exploitation of the Baltic Sea. This pollution and exploitation result from e.g. eutrophication, overfishing and oil discharges (Gilek et al., 2016). The complexity of these challenges is amplified by that these constitute 'wicked problems', implying that they are ill-defined, since actors have diverging opinions as to their extent and scope, as well as to the responses needed for handling these challenges (Gilek et al., 2016).

The proliferation of BSR network governance largely rest on a positive normative assumption. It is a reflection of the need to augment BSR problem-solving capacities for governing complex policy challenges that cross the territorial and the physical borders of NS. Network governance as a governance mode is encouraged by the EU and by NS (Sørensen and Torfing; 2009). The view of network governance is that it improves policy processes by creating adequate problem definitions, achieved by broad collaboration. Networks are suited to address environmental and pollution challenges, because these cross the boundaries of public organizations and their hierarchical levels (Bache and Flinders, 2002; Agranoff and McGuire, 2003; Marks and Hooghe, 2004; Hajer and Versteeg, 2005). Networks enhances problem-solving capacities because of their perceived ability to enable a functional base for providing cooperative, efficient and innovative policy responses. This originate in that networks are underpinned by informal and non-hierarchical collaborative structures. Network governance embodies actor efforts to govern challenges that transcend national borders and require cross-sectorial policy action (Carlsson and Berkes, 2005; Bodin and Crona, 2009; Newig et al., 2010; Blanco et al., 2011).

The BSR is an interesting area for studying network governance as a mode of governing. BSR governance is made up of informal efforts of interdependent networks, which are distributed across multiple scales, sectors, domains and levels of society: many of these are located outside the public domain. These self-governing networks have different ambitions and preferences relative to the environmental challenges of the Baltic Sea. BSR network governance is linked through a disjointed web that operate without a designated point of authority (Grönholm, 2018). No center of hierarchical control or formal coordination authority guides the overall policy development, policy action and policy implementation in the region. BSR network governance has evolved and expanded throughout decades, without hierarchical and institutional oversight. Despite this fragmented setting, the general view and assumption is that BSR networks are expected to navigate this and act as problem-solving endeavors that generate suitable policy responses.

This contextual setting provides a point of departure for my research interest. My interest is guided by the self-organizing features of the BSR network governance, comprising numerous

operative yet autonomous networks. These serve different centers of authority and include members with wide ranging backgrounds, operating under different conditions, constitutional systems and societal preconditions. The BSR is a transnational and intercultural polycentric affair that provides a stimulating research context concerning the extent that this setting supports a functional basis for the general governance of the Baltic Sea. Exploring how and if the key features of BSR network governance augments the policy problem-solving capacities relative to the challenges of the Baltic Sea is of particular interest.

1.1. Research objective and question

The research conducted in this thesis is designed to develop network governance theory. The first generation of research into network governance established and outlined the positive normative assumption of network governance (e.g. Sørensen and Torfing 2007). Drawing from the first generation of network governance research, a theoretical premise is that BSR network governance as a mode is positioned to govern environmental policy challenges, such as those associated with the Baltic Sea. This originates in the claims of benefit of network governance (Dedeurwaerdere, 2005; Bevir, 2010; Sørensen and Torfing, 2009; Blanco et al., 2011).

The theoretical aim of the thesis is to contribute to the second generation of research into network governance. The second generation acknowledges governance networks existence and aspire to promote the use of them by seeking to explain their formation, their functioning and development, the sources of their success, failure and how they can be regulated (Sørensen and Torfing, 2007; Lewis, 2011). However, hitherto there is limited evidence of how network governance functions in practice, the opportunities for different actors to influence, interact and the outcomes of joint decision-making (Van Bortel and Mullins, 2009). There is ambiguity regarding network governance's actual ability to enable a functional governance of policy challenges (Hajer and Versteeg, 2005). This denotes to the latent gap between the aim and success of network governance arrangements: the advantages of network governance do not accrue just because the system is explicitly networked (Thatcher, 1998; Robins et al., 2011). Networks may be well placed to respond to complex policy issues; however, the fact is that any particular network, built up from collaboration ties among actors and institutions does not automatically deliver intended governance outcomes (Robins et al., 2011).

Insofar the research on the functionality of network governance has largely been absent in network governance research (Lewis, 2011; Robins et al., 2011). In particular, there is limited empirical evidence of how network governance functions in a transnational setting that interlink different networks and actors through shared environmental policy challenges. This thesis contributes to theory building by identifying and suggesting an approach how network governance can be developed as a governing mode in a transnational setting. This is achieved by evaluating the operational functionality of BSR network governance relative to whether it as a mode sustains the positive normative premise underpinning the theory. The evaluation of the functionality of BSR network governance, involving many networks and network modes, responds to the call for network governance researchers to broaden their academic focus. Researchers should move away from describing internal network actions, towards examining entire networks. Ideally, large-scale comparative network studies would be undertaken, examining many networks across a range of different forms of governance (Provan and Kenis, 2007).

From a normative perspective, the functionality of network governance refers to its ability as a mode of governing to deliver policy outcomes that would not be not be attainable by isolated and independent network action alone, or actors acting independently (Provan and Kenis, 2007; Robins et al., 2011). Network governance emphasizes that outcomes of policy are a result of the interaction of many actors rather than of the action of one single actor (Klijn and Koppenjan, 2012). The functionality of network governance is related to its capacity to generate feasible policy options relative to the challenges facing networks (Sørensen and Torfing, 2009). Multi-level network governance functionality refers to the extent to which networks and actors operating on different scales within various network modes are involved in policy-making processes and the influence they have in designing policy.

This thesis contributes specifically to the research on network governance by conducting a theoretically informed empirical study of the environmental network governance of the Baltic Sea. This research design expands the understanding of the operative features that define BSR network governance in relation to its capacity to functionally govern the Baltic Sea. The rationale that motivates my research objective is the extent to which the features of the BSR network governance support and align with the normative demands of the governing of Baltic Sea ecosystems. A functional network governance of the Baltic Sea is particularly demanding, as environmental policy-making efforts need to consider the difficulty of managing ecosystems. These need to contend with policy uncertainties and admit that understanding is incomplete, as there is a lack of complete knowledge on suitable policy interventions and the effects of these interventions (Olsson et al., 2004; Kooiman et al., 2005; Folke et al., 2005; Brunner et al., 2005; Armitage et al., 2008).

This thesis defines a functional governing of the Baltic Sea from a view that broadens the conventional approach to environmental governance. Traditionally, environmental governance has been shaped by a unilateral engineering approach (Pahl-Wostl, 2002). This approach has usually been categorized as a command and control, or predict and control paradigm (Gleick, 2003; Pahl-Wostl, 2009; Rijke et al., 2012). Typical features are centralized governance with narrow actor participation and a dominance of governmental actors, operating based on rigid regulations, applying large-scale technology by mainly expert knowledge. Policy uncertainty is quantified by probability distribution through a technical approach to risk management (Pahl-Wostl, 2009; Rijke et al., 2012). This approach has allowed technological advances and proved to be efficient in solving a number of challenges, such as wastewater treatment, addressing hygienic and pollution problems (Pahl-Wostl, 2002).

However, technical solutions that are resource intensive and expensive cannot be applied to all challenges. Environmental challenges are complex, and an engineering approach does not necessary support the various social dimensions linked to these challenges (Pahl-Wostl, 2002). A shared view of the true nature of an environmental challenge does seldom exist. For example, engineers, ecologists, lawyers and farmers all have quite different views of a river basin. They perceive different aspects of the basin, construct a different image of how it functions, observe different problems, view each other differently and identify different solutions (Mostert et al., 2007). For instance, in the Baltic Sea the diffusion of pollution from agriculture contributing to eutrophication cannot be easily solved by means of technology and remains a controversial topic, due to conflicting interests.

This thesis suggests a holistic environmental governance approach relative to the governing of the Baltic Sea. The EAM advocates a holistic and inclusive approach (Hassler et al., 2013). EAM promotes a holistic environmental governance approach, the co-development and production of policy through the inclusion of a range of different actors. The expansion of a holistic approach is a reaction to the narrow actor participation enabled by the traditional approach. It is also a response to that the social aspect of environmental challenges has gained increased importance in discourses relative to a functional environmental governance (Pahl-Wostl, 2002). The social aspect with processes of social learning offers an interesting path for shifting from a prediction and control to a more integrated approach vis-à-vis the governance of environmental challenges (Lebel et al, 2010). Processes of social learning are considered of major importance for a functional governance of environmental challenges (Pahl-Wostl, 2002; Muro and Jeffrey, 2008).

The functional orientation of BSR network governance is linked to the governing mode's ability to allow and support a holistic environmental governance approach relative to the challenges of the Baltic Sea. A holistic approach exemplifies a move towards an integrated approach that include the social aspects partly defining some of the Baltic Sea challenges. A holistic approach is supported by its latent potential to enhance problem-solving capacities of operating actors through broad based collaboration that aim to generate policy learning. Learning processes involving extensive and systematic collaboration of actors could integrate, synthesize and bridge the distributed expert and lay knowledge situated at different scales and levels in the region. This could potentially reduce uncertainty about policy goals and actions, which is rooted in the governance of environmental challenges (Lebel et al., 2010; Newig et al., 2010).

This thesis views social learning as a necessity for developing functional BSR environmental policies. A functional BSR network governance is regarded as arising from functions of social learning. Accordingly, the functional orientation of BSR network governance is evaluated by parameters emphasized by social learning. Social learning is key in enabling and supporting a holistic environmental governance approach, as it provides a path for reducing conflicts, reconciling differences of opinion (Lebel et al, 2010) and helps to cope with policy complexity and uncertainty (Lee, 1993; Pahl-Wostl, 2002; Ison and Watson, 2007; Cundill et al., 2011).

Social learning as an element in enabling a functional governance derives from its potential to improve problem-solving capacities by aggregating explicit, technological information, but also implicit, tacit lay knowledge. Social learning processes have the capability to transfer tacit and complex information, which is distributed and located across problem-solving capacities, networks and other affiliated actors. The exchange of novel non-quantified, non-measurable information supports the process of creating mutual views of environmental challenges. The capacity to generate feasible policy options that match the shared view of the challenges is related to creating favorable relational conditions for cooperation. Social learning through extensive and systematic cooperation may expand the opportunities for co-development of policy problem definitions, plans and strategies.

The key research question of this thesis is as follows:

What are the preconditions for network governance learning in the Baltic Sea region?
--

The general objective of this thesis is to improve the understanding of whether, or to what extent, the BSR network governance contextual setting supports the presence of learning related processes. The particular aim is to produce contextual knowledge for pursuing social learning in a BSR network governance relational setting. Collectively, the thesis generates a baseline for reflecting on the preconditions for BSR network governance learning, relative to the social learning demands for a functional network governance of the Baltic Sea. This is dependent upon examining the capacity of the BSR network governance to offer favorable relational conditions for social learning to occur. A tangled web of linkages between governments, public regional and local entities, as well as academia, businesses, interest groups and civil society actors defines the BSR network governance relational context. These interact and engage in the governance of the Baltic Sea through voluntary memberships in various networks. This thesis evaluates the bearing and the effect this complex relational setting has viewed from functional network governance of the Baltic Sea.

1.2. Analytical approach

This thesis consists of four independent, yet interconnecting peer-reviewed articles or case studies, which seek to advance the knowledge of the latent BSR network governance learning opportunities. These articles provide a basis for evaluating the preconditions for BSR network governance learning. The articles were conducted to determine whether the BSR contextual setting enables the presence of learning related processes. The evaluation captures the diversity and the complexity of the BSR multi-level network governance setting. The scope of the articles varies from a national setting, to selected networks operating in a transnational setting. One of the articles is tasked to survey the broader BSR multi-level network governance relational setting. As a whole, the articles synthesize knowledge about learning challenges and opportunities embedded in the BSR network governance. The articles also offer an examination of the conditions of the BSR network governance system's capacity to facilitate suitable learning outcomes. The evaluation of the preconditions for BSR network governance learning is condensed and outlined in table 1.

To enable an evaluation of the preconditions for network governance learning, the evaluation is guided by **two overarching tasks** (table 1). The **first task** (article 1: *Grönholm, 2018: 'A tangled web: the Baltic Sea region governance through networks'*) is to provide an explanatory framework for the second task, by evaluating contextual challenges embedded in the BSR network governance. Article 1 provides an illustration of the general operational setting of the BSR network governance, as it maps the operative features of this context and examines the various forms of self-organizing networks in the region. It describes compares and analyses the general features of over 20 operative BSR networks.

Article 1 informs the extent to which the operational self-organizing BSR network governance features compares with the normative assumption of network governance. Article 1 offers empirical insights of the assumed proficiency of BSR network governance. The functionality of the BSR network governance is assessed based on the capacity of the operational setting to instigate and support extensive and systematic relational conditions. Favorable relational conditions are key for learning processes, as cooperation and interaction within and across various forms of networks is a preset necessity and premise for learning to occur. Essentially, article 1 provides a contextual BSR relational overview and an understanding of the underlying capacity of the BSR network governance to enable and foster learning.

The **second task** is to perform a three-step examination of the preconditions for network based learning relative to particular BSR governance levels and scales through three case studies; article 2, (Grönholm, 2009: *'Governing national parks in Finland – the illusion of public involvement'*), article 3, (Hassler, Boström and Grönholm 2013: *'Towards an Ecosystem Approach to Management in Regional Marine Governance? The Baltic Sea Context'*) and article 4 (Grönholm and Jetoo, 2019: *'Fostering a functional governance of the Baltic Sea region: Network governance of the EUSBSR'*). These case studies are chosen with the purpose to examine the general conditions for learning both *in* a national guided network and *in* and *across* transnational networks. Moreover, the case studies provide information on the learning challenges present at different levels and scales of the BSR multi-level network governance setting.

The examination of the preconditions for network learning relative to BSR governance levels and scales is guided by environmental governance theories. Each of the three case studies is analyzed based on guidelines set by specific environmental governance theories (table 1). These are linked by their attempt to, both explicitly and implicitly, evaluate the underlying relational conditions of typical BSR network settings. The three case studies offer a basis for evaluating the inclination of different network settings to support the presence of learning related processes relative to the BSR multi-level network governance.

Article 2 is a case study of a national environmental network in the Baltic Sea vicinity. The network, comprising of national and local level actors, is assigned to govern a contested protection of the Archipelago national park, stretching across the Archipelago Sea, which is a part of the Baltic Sea, between the Gulf of Bothnia, the Gulf of Finland and the Sea of Åland, in Finnish territorial waters. This network has pursued an instrumentalist approach relative to the governing of the national park but has an ambition to integrate a participatory approach to management. Article 2 illustrates an attempt of a national network to introduce participatory governance to mitigate disputes and to improve the governance of the national park. It offers an account of national level efforts and procedures to enable and support national agency and local actor interaction.

Article 3 is a case study of the BSR marine environmental governance. It offers a view of BSR challenges and opportunities in the development of EAM-based marine governance. It provides an analysis of the fit between EAM ambition goals and network realities. The article examines the extent to which preconditions for applying EAM exist in the BSR. It evaluates whether BSR networks and their action programs are focused on changes towards a holistic approach to governing. The article expands the knowledge of BSR marine environmental governance compatibility and readiness for a mode of governing that operates as a continued learning process. Two BSR transnational networks are the subject of interest in article 3. The first network is the International Council for the Exploration of the Sea (ICES). The ICES provide scientific advice on the governing of oceans and their ecosystems and is key for understanding the area of fishing in the Baltic Sea, as it makes recommendations to the European Commission (EC) regarding quotas for different species. Fishery governance is under the exclusive competence of EU and binding directives exist regarding its management. The second point of interest is the Baltic Sea Action Plan (BSAP) of the Helsinki Commission (HELCOM). The BSAP is the action program of HELCOM and is designed with an EAM approach as its core philosophy, to improve the capacity to deal with the environmental challenges of the Baltic Sea.

Table 1. A functional BSR network governance – an analytical overview

The operational functionality of Baltic Sea region network governance - a contextual overview		
Article 1: A tangled web: Baltic Sea region governance through networks		
Advances the knowledge on the operational functionality of BSR network governance relative to the normative expectations of the environmental governance of Baltic Sea. Provides an elementary understanding of the underlying capacity of the BSR network governance to foster learning		
Preconditions for Baltic Sea region network governance learning - a general surveying relative to governance levels and scales		
Article 2: Governing national parks in Finland – the illusion of public involvement	Article 3: Towards an ecosystem approach to management in regional marine governance, the Baltic Sea context	Article 4: Fostering a functional governance of the Baltic Sea region: A theoretical case study of the network governance of the EUSBSR
Evaluates the preconditions for public participation in an institutionally guided policy network, tasked with governing natural resource systems Analyzed through a participatory governance and adaptive co-management lens	Evaluates the extent to which preconditions for applying an Ecosystem Approach to Management exist in the BSR marine environmental governance Analyzed through a reflexive governance lens	Evaluates the potential to foster network governance learning in the BSR through the EU Strategy for the BSR (EUSBSR) Analyzed through an adaptive governance and adaptive co-management lens
Surveys the preconditions for learning in a national policy network	Surveys the preconditions for learning in transnational networks	Surveys the preconditions for learning across transnational networks
Evaluates the relational conditions in a hierarchical network, by mapping the interactive setting for institutionalized local participation in adaptive management efforts of natural resources The governance of contested natural protected areas may benefit from an adaptive management, which highlight collaborative multi-actor learning via inflow of feedback from local users Local actor feedback in a top-down steered network provides multiple perspectives on environmental challenges and provides a channel for managing possible conflicts arising between various interests	Evaluates the extent which two institutionally guided BSR networks and related action programs are geared towards a learning-based management Reflexive governance provides a framework for capturing the extent to which BSR marine governance is prepared for a management, which operates as a continuous learning process, in which the role of feedback mechanisms are accentuated Reflexive governance emphasizes the critical role of broad actor involvement and social feedback, providing a platform for social learning. Reflexive governance underlines the relevance of broad based monitoring as a key component in effective environmental governance	Evaluates the potential of the EUSBSR to foster learning across BSR networks by mapping the relational and structural conditions in Steering Groups (SGs), which interconnects BSR networks across various policy areas in the region Maps the relational and structural conditions of SGs from a network governance learning perspective, interlinking networks with learning features emphasized in adaptive governance and adaptive co-management. Adaptive governance accentuates collaboration of actors, which fosters cooperation and dialogue, a preset necessity for multi-actor deliberation, i.e. open dialogue of different actors, a precondition for social learning
An analytical framework to determine Baltic Sea region network governance functionality relative to the environmental challenges of the Baltic Sea		
This thesis emphasizes a holistic environmental governance approach relative to the governing of the Baltic Sea. The traditional unilateral engineering approach to environmental governance is expanded by an approach that includes the social learning dimensions linked to addressing environmental challenges. An analytical framework is developed to determine the functionality of BSR network governance relative to dealing with the environmental challenges of the Baltic Sea. Central to the analytical framework is the network governance system's ability to provide favorable relational conditions for social learning to occur. The analytical framework is centered on network governance social learning parameters and the functionality of BSR is discussed based the content of the articles, which offer contextual knowledge of the BSR relational setting.		

Article 4 focuses on the broad operational spectrum of the BSR network governance by using the EU Strategy for the BSR (EUSBSR) as a case study (table 1). The EUSBSR encapsulates the promise of network governance, to foster interaction by networks, with the view to support and join these to develop policy arrangements needed for governing the BSR challenges. The EUSBSR is the principal cooperation, information and knowledge broker in the region. It builds relational capacity by constructing horizontal and vertical linkages among networks and actors across policy levels and sectors. It links national, regional, local levels, balances between top-down, bottom-up, and formal and informal governance approaches. It directly engages almost half of the operative BSR networks, through tasks assigned to specific BSR networks in the Strategy and others via linked occasions, such as the EUSBSR Annual Fora.

Article 4 evaluates the potential to foster network governance learning in the BSR through the EUSBSR. The basis of the evaluation is the latent learning potential of the EUSBSR. The Strategy constitutes a suitable framework for evaluating the potential of the EUSBSR to foster learning *across* BSR networks. The subjects of evaluation are the Steering Groups (SGs), which constitutes the EUSBSR's collaboration and interaction platforms. These connect a number of BSR networks and their members across policy areas. The SGs supports the Priority Area Coordinators (PAC) and the Horizontal Action Leaders (HAL) in implementation activities and enables interaction with relevant policy actors and functions as a cooperation platform. The PACs and HALs leads work in policy areas assigned as a part of the Strategy. The aim of article 4 is to evaluate the SGs from a network governance learning perspective. Article 4 evaluates whether the structures and key relational features of the SGs provide the required conditions for fostering learning across BSR network. The policy learning mechanisms utilized by the SGs are also subject to evaluation, in relation to the suitability and causal capacity to facilitate learning outcomes, deemed necessary to govern the challenges of the Baltic Sea.

Altogether, the articles in this thesis show the varied operational character of BSR network governance. Multilayered efforts and interests guide the network governance of the Baltic Sea. Albeit, BSR governance comprises various network modes are most BSR networks internally organized based on an institutional premise (article 1). These operate under institutionalized and hierarchical structures and forms. This institutional base frames and outlines the boundaries of the BSR relational and cooperation context. The articles of this thesis reflect this operational reality. Article 2 offers an understanding of a national relational interaction context, transpiring under institutionalized structures and practices. Article 3 uses two BSR networks as case studies, which are internally organized around a hierarchical basis. This base steer the development of operational practices and programs. Article 4 outlines the wider BSR relational and structural conditions of networks, thereby capturing the interaction boundaries of the ecological challenges of the Baltic Sea. The articles in this thesis evaluates the BSR relational cooperation context at different levels and scales with the view to examine the preconditions for network-based learning in the region.

The analytical framework for the examination of the content of the four articles is as follows: initially the theory of network governance is introduced and discussed. This is used to provide a basis for describing the logic of BSR network governance and to constitute a theoretical baseline for operationalizing BSR network governance functionality. The notion of functional BSR network governance is expanded in the following chapter, by defining and theorizing social learning relative to the environmental challenges of the Baltic Sea. Next, social learning

is conceptualized and operationalized in a BSR network governance setting. Drawing on the key theoretical conclusions of these chapters, an analytical framework is outlined to evaluate the content of the articles. The outcome of the analytical discussions of the content of the articles expands the scope of understanding of the underlying capacity and potential of BSR network governance contextual space to allow and support the presence of social learning processes and outcomes.

The final part of the thesis reflects on the operational realm of BSR network governance. It compares the normative preconditions for BSR network governance learning, set by specific environmental theories, to the current conditions for social learning processes and outcomes in the region. This offers a basis for reflecting on the operational functionality of BSR network governance. This discussion is framed by how transnational learning and related processes in the BSR are influenced and shaped by features associated with network governance. How does the informal, flexible and self-governing feature of network governance influence the conditions for BSR network governance learning? What effect has this on fostering functional responses addressing the environmental challenges of the Baltic Sea? The thesis is concluded through a final synthesis offering recommendations for improved BSR network governance learning capabilities. These may enhance the opportunities for the co-design of policy objectives and selection of policy options, ultimately augmenting the problem-solving capacities of the region.

1.3. Theoretical framework

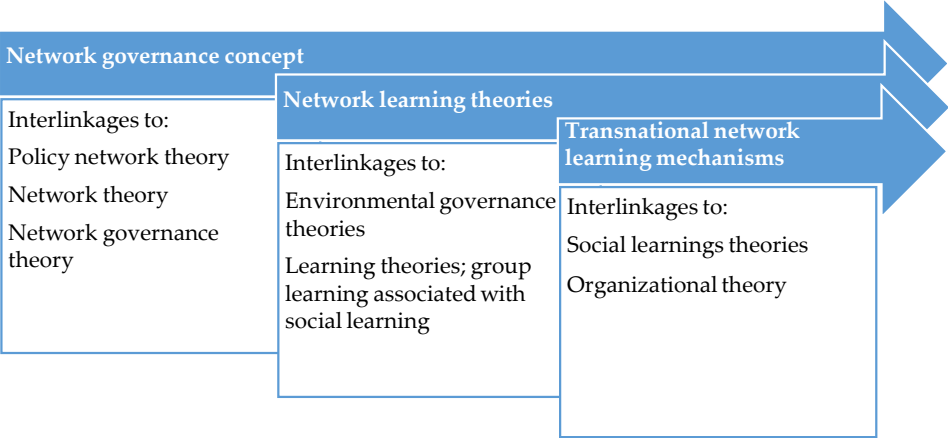
This thesis utilizes a combination of theories to answer the research question. These theories are interlinked to create a cohesive theoretical framework. Table 2 outlines the structure of the theoretical framework and condenses the variety of theories and concepts applied to answer the research question. The mix of governance concepts, environmental governance theories and group learning theories all fulfil vital roles relative to capturing the essence of the BSR governance. This mix allows and facilitates the evaluation of the transformative BSR governance character. The logic of using different theories and concepts originate in the need to improve the understanding of the complex BSR governance, and to offer insights of the challenges relative to a holistic governance of the Baltic Sea.

The concept of network governance outlines the structures of the theoretical framework. As a concept it is sustained by a multi-disciplinary research field that connects political studies with sociological and organizational studies (Sørensen and Torfing; 2007; Lewis, 2011). In this thesis, network governance is the pivot for linking the mix of theories and concepts, with the view to operationalize and analyze the functionality of BSR network governance. The *first* part of the theoretical framework discusses the proliferation of network governance, with linkages to policy network theory and network theory. This part offers a foundation and a point of departure for reflecting upon the normative expectations of BSR network governance as enabling functional governance of the Baltic Sea. An operationalization of the functionality of BSR network governance regarding the Baltic Sea is presented in chapter three and contextually discussed in chapter four.

The *second* part of the theoretical framework, elaborated upon in chapters five and six, links network governance with the concept of learning. The concept of learning as a key element in

dealing with environmental challenge is underlined by environmental governance theories. The scope of the analysis of suitable learning traits, processes and outcomes is guided by a subset of theories, namely adaptive governance, adaptive co-management, participatory governance and reflexive governance. Generally, these advocate a governance of ecological challenges by featuring collaboration of actors and draw upon ideas related to group learning (Armitage et al., 2008). These collaborative environmental governance theories inform on adequate learning conditions by which the BSR network governance need to adhere in order to cope with the normative demands of governing the Baltic Sea.

Table 2. Overview of theoretical framework



The *third* part of the theoretical framework expands the operational understanding of the BSR network governance capacity to develop learning processes and generate learning outcomes that corresponds with the demands of governing the Baltic Sea. This part condenses the key content of the first and second part of the theoretical framework to evaluate the preconditions for BSR network governance learning. Informed by social learning theory, the third part of the framework evaluates the structural and relational properties of BSR network governance. These offer an outline for assessing the processes by which social learning can be catalyzed in the region. A preset necessity for social learning is mechanisms that integrate a diversity of actors into collaborative learning processes. This last part advances the knowledge of BSR network learning mechanisms. It reflects on the capacity, suitability and potential of these to facilitate and catalyze social learning within and across BSR networks.

1.4. Research contribution

The thesis contributes to develop network governance theory in two ways. First (I), it *provides general conceptual clarity* by illustrating the evolvement and the broadening of the functions of networks relative to the role of state interests and viewed responsibilities in a transnational context. Network governance as a concept condenses the evolving nature of state-society relations, emphasizing the shifting relational role and function of governments relative to policy development and attainment of desired policy goals.

As a concept network governance, rests on a recognition that policy is the result of processes that are not fully controlled by governments but occur via collaborative forms of governing that involve networks and actors from different domains (Lewis, 2011). The BSR embodies the

transitional shift of co-producing policy through expansive collaboration. The dynamics of BSR network governance are framed by the changing nature for transnational policymaking, the successive expanding functions and roles of networks relative to the role of governments. This thesis advances the knowledge of the impacts and the consequences of this change in relation to the normative expectations and views that sustains the concept of network governance.

This thesis adds to theory development by providing conceptual clarity through the process by which policy is developed in transnational multi-level network governance and the wide-ranging function networks have in these *policy processes*, as well as the broader consequences of this from a policy perspective. The evolving conditions for policy processes, which interlinks traditional forms of government with innovative governance modes designed to govern ecological challenges, underline the role of networks. Understanding the functioning of networks is key, as only then can we better understand why networks produce certain outcomes (Provan and Kenis, 2007).

(I) Conceptual clarity:

- ❖ Provides a descriptive overview of the operational functionality of multi-level transnational network governance.
- ❖ Contributes towards conceptual clarity of the evolving conditions for transnational policy-making relative to the changing nature of state-society relations. Addresses the ambiguity on the extent to which networks are changing and framing the character of transnational state-society relations and thus policymaking. This is achieved by providing a synopsis of the relational conditions in various network modes relative to policy development and attainment of desired policy goals in a transnational setting.

Second (II), the thesis contributes to theory building by proposing a method to *evaluate the functionality of network governance* by the means offered by social learning. This suggested method answers the calls for linking network governance as a concept with social learning, as hitherto the debate on network governance and processes of social learning has been limited. There have been calls for more scholarly attention regarding interlinking network governance and processes of social learning (Folke et al., 2005; Armitage et al., 2008; Pahl-Wostl, 2009; Newig et al., 2010).

Evaluating the functionality of network governance through social learning creates an opportunity to develop the concept relative to governing environmental challenges. The premise of both network governance and social learning is that no single actor, or network, has all the necessary information, competence and funds to govern challenges that transcend sectors and national borders (Mostert et al., 2007). Therefore, actors need to collaborate. The basis for developing network governance is its capacity as a concept to amass novel information through collaborative processes of social learning. In network governance, amassing novel information is dependent on collaborative learning processes as knowledge of the challenges that is target for policy development is distributed across network actors (Ostrom, 1990; Olsson et al., 2004; Huppé and Creech, 2012). Moreover, this knowledge is tacit rather than explicit in nature (Berkes, 1999; Huppé and Creech, 2012). Collaborative learning processes that transfers tacit knowledge depends on dialogue among networks and actors (Huppé and Creech, 2012).

The efforts to evaluate BSR network governance with the help of social learning are twofold. *First*, as social learning is fostered through a collaborative setting, this thesis with the help of evaluation of the preconditions for network governance learning, offers a relational overview for collaborative social learning in the BSR. The thesis provides insights into the suitability and comparability of different BSR network modes' structural and relational properties with social learning parameters. The ambition of these are not only to reflect on specific BSR network modes suitability to support social learning, but to add to the knowledge of the conditions of wider social learning in a BSR network governance system setting.

Secondly, though the theory on social learning is able to provide a general framework for the structural and relational requirements of a network governance setting to support social learning, the theory is limited in relation to how to facilitate social learning through multi-actor network processes (Armitage et al., 2008; Armitage et al., 2009; Reed et al., 2010; Beers et al., 2014; Medema et al., 2014). There is ambiguity in particular regarding transnational multi-level network governance social learning processes. Underpinning the ambivalence relative to social learning processes is a lack of a general debate of the functionality of selected and applied mechanisms for fostering learning. The uncertainty refers to the applicability and suitability of these for fostering social learning outcomes, which are deemed necessary to tackle environmental challenges. The few scholarly efforts on this subject, Medema et al (2014) have reflected on the potential of virtual learning platforms (social media) as a mean to facilitate social learning in dealing with ecosystem challenges.

The literature on multi-actor learning mechanisms is scarce to which mechanisms make collaborative learning processes useful, especially in a context of a transnational multi-level network governance setting, where learning across and within networks can be catalyzed. Also, the ability and the requirements of the network governance setting to cater and support learning mechanisms has received little attention, as to the required structural horizontal links and vertical links between networks, institutions and knowledge systems (Hahn et al., 2006; Pahl-Wostl, 2009; Lebel et al., 2010; Medema et al., 2014). Generally, learning in a transnational setting is reliant on learning approaches that interlink organizational tools, such as generic benchmarking and best-practice studies, to facilitate learning. However, the extent to which these are suitable in relation to enable network governance social learning deemed valuable to govern the Baltic Sea is uncertain.

(II) Contributes towards a format for evaluating the functionality of network governance:

- ❖ Suggests a framework for evaluating network governance as a mode, by evaluating social learning elements that underpin the normative orientation of the concept of network governance.
- ❖ Provides clarity of the structural and relational requirements of network governance setting to support social learning in a transnational multi-level network governance system.
- ❖ Expands the understanding of the requirements of learning mechanisms applied in a transnational setting by investigating their suitability, applicability and potential of transnational learning mechanisms in relation to fostering social learning outcomes that align and correspond with the normative demands of a functional governance of the Baltic Sea.

2. Methods and material

As a concept network governance is supported by a research field that is cross-disciplinary, problem-driven, multi-level, comparative and stimulates interactive research (Sørensen and Torfing, 2007). Political studies of institutions, power and decision-making are integrated with sociological studies of communication as well as organizational studies of learning and rational resource exchange. Different theoretical approaches are employed in the attempt to address research problems derived from studies of concrete, empirical cases of network governance. As a concept it is guided by theoretical ambitions, yet the research area is young and has not yet become sedimented into a new paradigm with its own clear-cut definitions, taxonomies and methods (Sørensen and Torfing, 2007).

Proper network governance theorization is no easy task. Similar to multi-level governance, theory building is a hard and a continuous task (Piattoni, 2009). The reflection on multi-level governance, like that on network governance, inevitably analyzes all three aspects of state-society interactions: political mobilization, policymaking and polity restructuring (Piattoni, 2009). Thus, network governance research design is often based on retroduction rather than pure cases of empirical induction or theoretical deduction (Sørensen and Torfing, 2007). The study of collaborative modes of policymaking based on a problem-driven, retroductive research design inspires interaction with the analytical object. Interaction with network actors can help to sharpen the research questions, to provide access to hidden aspects of network processes and to validate the analytical conclusions on a pragmatic basis (Sørensen and Torfing, 2007).

The theoretical ambitions on network governance is guided by the goal to produce descriptive, open-ended, context-bound knowledge relevant for actors engaged in network governance (Torfing, 2005). Even if network governance research has a descriptive connotation, the study of the conditions, functioning and effects of collaborative forms of network governance carry explanatory ambitions, though not in the classical sense of aiming to establish deterministic causalities with a law-like character, or produce accurate predictions (Sørensen and Torfing, 2007). However, the explanatory ambitions of network governance are not always clearly delineated and broadly reflects the novelty of the research field.

The thesis conducts descriptive and explanatory research. The descriptive research ambitions are steered by the conceptual foundations of network governance. This part defines and clarifies the central notions that are used in network governance research and applies them in the description of the actual network governance of the Baltic Sea. Collaborative environmental governance and social learning theories guide this thesis's explanatory research ambitions. The underpinnings of these theories facilitate and informs the process of identifying and evaluating challenges vis-à-vis the governance of the Baltic Sea

The evaluation of the functionality of BSR network governance relative to the Baltic Sea follow a retroductive research design. This implies a form of logical suggestion that starts with an observation, and then seeks to find the simplest and most likely explanation for the observation (Sober, 2013). This process, unlike deductive reasoning, yields a plausible conclusion but does not verify it. Relevant conclusions are qualified as having a remnant of uncertainty or doubt, which is expressed in terms such as 'best available' 'most likely' or 'best explanation' (Sober, 2013).

The evaluation of the functionality of BSR network governance is problem-driven, multi-level, and comparative. The evaluation of the collaborative modes of BSR policymaking is based on interactive research focusing on empirical cases of BSR network governance. The evaluation of the empirical cases is guided by the research question of this thesis. The research question is theoretically deduced from collaborative environmental governance theories to facilitate a descriptive and an explanatory evaluation of the capacity of the BSR network governance to govern the Baltic Sea.

The interactive research design is enabled by my over decade long active involvement in the BSR. My participation in BSR network governance, as a researcher in research driven projects, networking with numerous governance actors during many years on several occasions and my background as an employee of the Council of the Baltic Sea States (CBSS) Secretariat, an intergovernmental BSR network, has provided me with invaluable context-bound BSR network governance knowledge and insight. This has shaped my interest for BSR network governance, in terms of how the complexity that defines the operational reality coincide and align with the environmental challenges of the Baltic Sea. My background as a BSR project researcher and a CBSS project manager has provided an impetus to reflect on the perceived capacity of the BSR network governance to govern the challenges of the Baltic Sea. My involvement in the BSR governance enables me to offer a general understanding of the operational intricacy of the region, which ultimately delineates the contemporary dynamics of network governance of the Baltic Sea.

The method for conducting the research in this thesis is designed to permit a reliable and valid approach of evaluating the functionality of BSR network governance relative to the Baltic Sea. Generally, network governance theory is established via theoretically informed empirical examination of network-based policy processes and policy outcomes (Torfing, 2005). Normatively these processes and outcomes represent results of institutionally conditioned interactions between network actors, form and character of networks and the external conditions for network governance, including the socio-economic conditions and the co-existence of different modes of regulation (Torfing, 2005).

The research in this thesis is conducted on different governance levels and in diverse network settings, contributing to portray a representative evaluation of the functionality of the BSR network governance. The focus of the research is the institutionally conditioned interactions within and across BSR network, whilst considering the form of networks. The research conclusions are contextualized to reflect the broader external operative conditions outlining the network governance of the Baltic Sea. However, the research does not explicitly include the different modes of regulation that regulate network actor ambitions and activities in the region.

The research is based on the content of articles published in peer-reviewed publications. All four articles are based on empirical work, highlighting results over a period of ten years (table 3). The articles outline the variety of BSR networks that are involved in multi-level network governance policy processes. The articles offer the possibility to carry out an evaluation of the governance functionality of the Baltic Sea. All articles are based on a descriptive ambition, with the view to offer explanatory conclusions reflective of particular features and contexts that define the broader multi-level BSR operative setting.

A quantitative approach is used to condense and subtract the content of the articles. The basis of this generalization is quantification of the empirical content of the articles by employing a Likert scale measurement table. The empirical content is subtracted and compared to social learning parameters through a five level Likert scale (table 10). The interactive research design facilitates the usage of a quantification approach to generalize findings. Interactive research underlines the role of the researcher to generate conclusions on a rational and pragmatic basis. The summarization of the empirical content of the articles through a quantitative approach clarifies and elucidates the key contextually derived knowledge, as to whether BSR network governance has the capacity to enable a functional governance of Baltic Sea.

2.1. Article methods and material

A mixed methods approach is used to conduct the research in the articles, with much of the work orientated towards qualitative empirical methods. The articles use qualitative research methods, which are designed to seek to understand phenomena in context-specific settings (Golafshani, 2003). Three out of four articles are based on qualitative data collection methods, derived from both primary and secondary sources. The primary research data is collected with the help of semi-structured interviews with experts, focus groups and workshops (article 3), while a substantial review of written sources spanning several scholarly disciplines are used as secondary sources (primarily article 1 and 4). The review of the written sources is guided by discourse analysis, which assists in identifying, analyzing and reporting patterns within data (Braun and Clarke, 2006). The discourse analysis of the secondary data sources is navigated by the concept of network governance, collaborative environmental governance theories and by social learning theory.

Article 1 uses a qualitative method to collect and evaluate data. A significant volume of documentary sources, including policy network, network and network governance theory are used as a theoretical basis to guide the evaluation. The evaluation is based on discourse analysis, analytically mapping available online information of operative BSR networks. The evaluation maps feature of networks by methodically categorizing their internal operative mode and basis, the structure of their membership base and their scope of interest relative to the challenges of the Baltic Sea. The evaluation includes official documents that regulate the function of BSR networks, e.g. resolutions, statutes or terms of references. In addition, other relevant documents are used, network strategies, action plans, budgets, meeting minutes and newsletters. The evaluation includes 24 BSR transnational networks active in the public domain on various governance levels, categorized based on prevailing BSR network modes, serving to illustrate the emerging features of the network governance of the region.

Article 2 uses a quantitative approach as a method to amass primary research data. The data is collected based on a structured survey with defined questions and response alternatives, along with open-ended responses. The data was collected in conjunction with a comparative research project (Coastal Sustainability as a Challenge) aiming to expand the understanding of actor cooperation in four national parks and biosphere reserves situated in the coastal areas of the Baltic Sea. The evaluation is based on quantifying survey data of the Finnish case study. The survey population included actors influenced by the governance activities and plans of the Archipelago national park. The survey population was grouped into local permanent inhabitants and local nature tourism entrepreneurs.

Article 3 uses a qualitative method to collect and evaluate both primary and secondary data. There are two sources for the data collection. The *first* source is data amassed in the research project, Risk Governance of the Baltic Sea (RISKGOV). RISKGOV analyzed the most significant threats (eutrophication, overfishing, biological invasions, chemical pollution, oil spills) relative to the ecologic integrity of the Baltic Sea. The governance of these threats is the key source for the inbuilt policy complexity associated with the environmental governance of the Baltic Sea. The analysis in the RISKGOV-project was carried out with the help of discourse and text analysis, sectorial expert interviews and participant observations in roundtable discussions. The primary data originates from expert interviews and roundtable discussions that facilitated the mapping of the governance structures and the conditions for collaboration vis-à-vis these challenges. The *second* source of data for article 3 are HELCOM and ICES text documents. The discourse analysis of relevant documents is steered by scholarly findings emerging from collaborative environmental theories, in particular adaptive and reflexive governance.

Article 4 is based on a qualitative research method that uses discourse analysis to aggregate and subtract data from secondary data resources. The discourse analysis encompasses a broad review of scholarly discipline literature and a multitude of relevant EUSBSR reports, including proposals and action plans commissioned by the EC, the EU and EU members. In addition, online information of EUSBSR actors, including PACs and HALs documentation related to the SGs, and official strategical documents that outline the purpose and function of the various SGs as well as available meeting minutes are included in the discourse analysis.

Table 3. Empirical data – an overview

Article 1	Article 2	Article 3	Article 4
<p><i>A tangled web: the Baltic Sea region governance through networks</i></p> <p>Evaluation based on secondary data sources. The basis of the evaluation is available online information of the operative BSR networks. These include official documents that determine the base and function of networks: terms of references, resolutions and Statues.</p> <p>Also, other relevant documents are used, e.g. network strategies, action plans, network budgets, network meeting minutes and newsletters.</p>	<p><i>Governing national parks in Finland – the illusion of public involvement</i></p> <p>Evaluation based on primary data. The basis is survey data, comprising of questions with structured response alternatives and of questions with open answers.</p> <p>The survey population included affiliated actors, affected by the governance of the national park. The survey population was grouped into local permanent inhabitants and local nature tourism entrepreneurs.</p>	<p><i>Towards an ecosystem approach to management in regional marine governance, the Baltic Sea context</i></p> <p>The evaluation is based on the usage of primary and secondary data. Evaluation based on the findings of text analysis of expert interviews and participant observations in three expert roundtable discussions.</p> <p>Also, secondary document sources linked to the case studies was utilized. These include relevant HELCOM and ICES documents and the text analyses of these available secondary sources.</p>	<p><i>Fostering a functional governance of the Baltic Sea region: A theoretical case study of the network governance of the EUSBSR</i></p> <p>The evaluation is based on secondary data. The evaluation is based on various official EUSBSR reports, proposals and action plans commissioned by the EU and EU member states and the European Commission.</p> <p>In addition, the evaluation is also based on information derived from the EUSBSR webpage and in particular the PACs and HALs documentation related to the SGs. These include strategical protocols and meeting minutes</p>

A separate analytical framework is constructed through theoretical deduction to navigate the discourse analysis. The analytical framework incorporates the multi-disciplinary theoretical literature that underpin the concept of network governance and provides a basis for the evaluation of the EUSBSR. The framework informs the identification and the evaluation of repeated patterns of meaning within the broad field of data used to evaluate the EUSBSR. The purpose of the EUSBSR evaluation is to use the strategy as case study that allows for context specific knowledge for advancing theory development. This is attained by social learning theory reasoning. Thus, the evaluation of EUSBSR is guided by the normative components of social learning.

3. Emergence of network governance

The emergence of the concept of governance is a response to the changing nature of state-society relations. Governance as a concept is supported by a variety of different connotations. At the core of these is the limitation of governmental power and emphasis on the *process* of governing and related relational conditions by which policy is pursued, instead of the structure of government (Klijn, 2008). Governance entails a transformation of the state, a '*state-organized unburdening of the state*', rather than its demise (Börzel, 2011 p. 53). The role of governments is changing, governments are dependent on societal actors to achieve policy goals because of the increasing complexity of the challenges governments face (Klijn, 2008).

Governance denotes to a shift in governmental procedures, from asserting structural centric power in relation to policy processes, towards accentuating the actual process through which policy outcomes are achieved (Klijn, 2008). Central to this view is the relational interaction changes and the effect of these changes. These reflect the normative demands of governance outcomes that are expected to enhance the problem-solving capacity required to functionally govern complex policy challenges. Governance catalyzes the transformation of the role of the state and its relations with societal actors. The relational conditions for policy development, decision-making, policy implementation and coordination are not solely bound by hierarchal functions, but relies on non-hierarchical, multi-level collaborative structures and measures (Koppenjan and Klijn, 2004; Olsson et al., 2004).

The governance of the Baltic Sea is a symbol of transformative and experimental governing processes. The governance has evolved through decades in a transnational setting, alongside the rising societal demands to govern the shared BSR environmental challenges. The BSR transnational context has delimited NS' assertive operational power. This originates in the changing relational conditions of BSR policymaking. The procedures that set the boundaries for BSR transnational policymaking are formed based on long enduring attempts to join forces in integrating and pooling policy efforts that target the challenges of the region. These attempts begun with the establishment of the Nordic Council (NC) in the 1950s, an inter-parliamentary network, driving Nordic policy cooperation in the region. The 1990s represent a key moment in defining the current BSR network governance. Historical societal changes, primarily the end of the Cold War, accelerated the attempts by subset of actors to join forces through various networks to advance their policy interest relative to the region. This expanded the scope of actors entering the policy-frame, escalating the diversity of policy interest and expediting the transformation of the role of NS and their relations with other societal actors.

BSR network governance and the relational conditions that frame BSR transnational policymaking have their origins in EU formed governance. In the 1990s scholars of European politics discovered network governance in their attempts to capture and describe the nature of EU shaped governance comprising of multi-level, non-hierarchical and regulatory institutions interlinking a hybrid mix of state and non-state actors (Hix, 1998; Börzel, 2011). Network governance as a mode is encouraged by EU and by NS, as it is viewed as key to a proactive governance that enhances problem-solving capacity (Sørensen and Torfing 2009). Network governance as a mode of governing rests on a positive normative assumption. It is a reflection of the underlying need to augment problem-solving capacity for governing complex policy challenges that cross the territorial and the physical borders of NS.

However, network governance as a mode expands the complexity that underpin it. Network governance signify a move towards plural modes of governing (Blanco et al., 2011). As a mode, it is not bound by hierarchical norms, but operates through an informal and flexible approach (Carlsson and Berkes, 2005; Bodin and Crona, 2009; Newig et al., 2010). Network governance promotes unilateral policy efforts that are not subordinated by hierarchical intervention enforcing compliance and coherence. It rests on a recognition that policy is the result of governing processes that are not controlled by governments (Lewis, 2011). It portrays contemporary government-society relations in multi-level actor settings, where actors are interlinked by policy challenges. Network governance enables policymaking through a web of relations between government, business and civil society actors (Klijn, 2008). These constitute the basis for processes of informing complex decision-making. However, the character and scope of these relations varies. The scope may be bound by the boundaries of an individual network, comprising the relations with public and non-public actors in a network (Klijn, 2008). The scope can also have a broader basis, encompassing the relations between groups of networks, which jointly cover a wider network governance setting, such as the BSR.

Critical for network governance is the self-governing features of networks. The presence of self-governing features maintains the coherence of unilateral policy efforts by individual networks. Network governance as a mode lack an overarching coordination function, as networks often function in the absence of clearly defined constitutional, stable and routinized rules and norms (Hajer and Versteeg, 2005; Klijn, 2008). Even if network governance is viewed as composed of autonomous networks do not equate that networks govern themselves without deliberate intervention from public network actors (Klijn, 2008). Self-governing features are particularly important in a system setting that interlink policy undertakings across multitude of networks, where hierarchical influence and insight of public actors is reduced. The role of broker organizations is important in a multi-level setting, where governance is based on the interests of network members operating on different levels (Provan and Kenis, 2007). Broker organizations relevance derive from their role of policy coordinators and possible relational platforms for reconciling diverging policy interests.

The relevance of a BSR broker organization is particularly relevant. There are over 20 operative networks with diverging interest relative to the BSR policy sphere (article 1). The need for an overarching BSR policy coordinator and a relational broker is underlined by article 4. Article 4 identifies the EUSBSR as having the potential to fulfil this task by offsetting and coordinating policy interlinkages emerging from the exponential number of relationships that constitute the relational basis of the region. The EUSBSR captures the relational boundaries of the shared BSR challenges, as it interlinks the distributed policy-capacities of the region.

3.1. Network governance – the evolving conditions of policymaking

Network governance encapsulates the changing relational conditions of policymaking, where traditional forms of government are interlinked with innovative governance modes. Network governance captures the essence of the changing conditions of policymaking through an evolving policy related network narrative. A distinction in the network narrative is generally made between Policy Networks (PN) and Governance Networks (GN), though in the network literature these are often used interchangeably (Blanco et al., 2011; Lewis, 2011). While these two different types of networks share similarities, their purpose and interpretation differ. This

derives from the broader governance debate and reflects the changing nature and relational conditions of policymaking.

PN are regarded as longstanding features of government, focusing on policy fields that tend to correspond to the departmental boundaries of national governments (Blanco et al., 2011). Even so, PN are exposed to transnational environments. EU shapes and effects domestic ones and enables a proliferation of transnational policy networks (Kriesi et al., 2006; Kaiser, 2009). PN are formed based on resource dependencies between different social and political actors (Sørensen and Torfing, 2005). PN are grouped based on the underlying structure of their membership base; they operate either as a closed policy community or as an open issue network (Rhodes, 1990; Sørensen and Torfing, 2005). Jointly, these comprise the token of traditional hierarchical state-society relations.

GN are associated with innovative governance modes, aiming to provide adequate responses to complex, conflict-ridden and ill-defined policy challenges (Marcusson and Torfing, 2007; Torfing and Sørensen, 2014). GN are considered a key element in the production of efficient public governance, reflective of the contemporary, fragmented and multi-layered society (Sørensen and Torfing, 2005). GN set the political agenda, frame and define policy challenges and design policy solutions that are deemed appropriate (Sørensen and Torfing, 2005). The GN literature is inspired by the theories of PN (Kooiman, 1993; Kickert et al., 1997; Jessop, 2000; Sørensen and Torfing, 2005). However, GN constitute a distinctive form of governance, which separates from traditional ideas of hierarchical control of the government. The relationship between actors in GN are defined based on consensus seeking decision-making, with collectively negotiated solutions (Börzel, 1998; Torfing, 2005; Sørensen and Torfing, 2005; Besussi, 2006).

GN operate based on relational non-hierarchical conditions, accepting that the exchange of resources is the best way to achieve common goals (Börzel, 1998; Besussi, 2006). The basis of the relational conditions is what Torfing (2005) call '*reflexive rationality*', by which GN base their decision-making through reflexive interaction, involving ongoing negotiations between a plurality of actors, who aim to produce collective solutions in spite of the persistence of diverging interests (Scharpf, 1994). These operate based on negotiated consensus (Börzel, 1998; Besussi, 2006). Decision-making is not enforced by legal measures, economic incentives, nor by normative control (Torfing, 2005; Sørensen and Torfing, 2005). This is referred to as '*negotiation rationality*' (Jessop, 2002; Sørensen and Torfing, 2005). The relational basis in GN is key in relation to compliance with common decisions. Actors comply because they trust that other actors feel an obligation to contribute with the realization of mutual objectives (Scharpf, 1994; Sørensen and Torfing, 2005). The negotiated relationships among the plurality of network actors are sustained through self-constituted rules and norms (Nielsen and Pedersen, 1988; Torfing, 2005).

The operative understanding and definition of GN differ, depending on theoretical viewpoints and approaches (Torfing, 2005; Sørensen and Torfing 2005; Torfing and Sørensen, 2014). The basis of defining GN in the context of the BSR is *governability theory* and *interdependency theory* (Torfing and Sørensen, 2014). This refer broadly to that BSR GN are viewed as functional responses to the increasing societal complexity, dynamics and diversification that undermine the ability to govern society functionally through traditional methods of hierarchy (*governability theory*). GN are formed to enhance coordination, held together partly by the

anticipated gains from resource pooling and joint action and partly by the development of mutual trust that helps to overcome collective action problems (Torfing, 2005; Sørensen and Torfing, 2005; Torfing and Sørensen, 2014).

The activities of GN are driven by institutional condition calculations of rational actors (Torfing and Sørensen, 2014). BSR GN operate as inter-organizational medium for interest mediation between interdependent actors, each of whom has a role and resource base of their own (*interdependency theory*). GN are formed based on strategic calculations of self-interested collective actors who choose to interact because of the presence of mutual resource dependencies makes it rational to exchange resources (Torfing and Sørensen, 2014). GN shape policy through negotiated consensus between interdependent actors and bring into conflict the traditional procedural and normative rationalities (Sørensen and Torfing, 2005).

GN adhere to an institutionalized framework of rules and norms (Sørensen and Torfing, 2009; Torfing and Sørensen, 2014), but are bound by inbuilt operating principles of a network, providing them with soft, non-coercive tools to enforce these rules and norms. GN are characterized by different levels of institutionalization. Typically, networks that are in place for a longer period have more stable and explicit rules than others that have recently emerged (Koppenjan and Klijn, 2016). Ongoing interaction of GN actors eventually lead to the formulation of a framework of rules, norms, values and ideas (Hajer and Versteeg, 2005). The institutionalized interaction in GN facilitates a self-regulated policy-making process that proceeds in the '*shadow of hierarchy*' (Scharpf, 1994; Hajer and Versteeg, 2005).

Guided by the *governability theory* and *interdependency theory*, BSR GN are defined as relatively stable sets of interdependent, but operationally autonomous and negotiating actors, focused on joint problem-solving (Hajer and Versteeg, 2005; Provan et al., 2007; Newig et al., 2010). GN refer to networks of actors: politicians, administrators, interest groups, businesses, social movements and citizen groups involved in public governance (Torfing, 2005). Torfing (2005) provide a definition of GN by describing them as '*relatively stable horizontal articulations of interdependent, but operationally autonomous actors who interact with one another, within a regulative, normative, and cognitive framework that is self-regulating within limits set by external forces and which contributes to the production of public purpose*' (Torfing 2005, p. 307).

GN are usually organized horizontally (Jessop, 2000; Torfing, 2005). As a result, the relations between the actors are horizontal, rather than vertical. Network actors are not equal in terms of authority and resources (Mayntz, 1991; Torfing, 2005). Some actors are materially stronger and more central than others. Membership in networks is conditional: members must prove their stake in policy issues and their capacity to contribute resources and competencies to the other actors (Torfing, 2005; Sørensen and Torfing, 2005). At the same time, participation is voluntary; members are not under the force of system of any hierarchical rule. Members of GN typically have limited formal accountability to policy co-production and implementation, as conformity to rules and procedures is purely voluntary in GN (Provan and Kenis, 2007).

The relations of network members are viewed as result of negotiations that combine elements of bargaining with elements of deliberation (Sørensen and Torfing, 2005). Actors may bargain in relation to the distribution of resources to maximize their outcome. To ensure the production of trust and commitment amongst actors this bargaining must be embedded in a framework of deliberation that facilitates understanding, learning and joint action (Sørensen

and Torfing, 2005). The bargaining through actor negotiations takes place in a relatively institutionalized framework (Sørensen and Torfing, 2005). The framework provides rules, roles and procedures; it conveys norms, values and standards; it generates concepts and knowledge and it produces identities and common visions (Sørensen and Torfing, 2005).

Members of GN are to a certain extent self-regulating. They do not abide by hierarchical chains of command (Scharpf, 1994; Sørensen and Torfing, 2005). Rather, they aim at regulating policies based on its own ideas, resources and capabilities and they do so within a regulative, normative, cognitive and imaginary framework that is adjusted through negotiations between the members (Sørensen and Torfing, 2005). GN contribute to the production of public purpose by engaging in negotiations about how to identify and solve policy problems (Sørensen and Torfing, 2005).

A spatial or territorial base, as opposite to policy networks, which operate based on a functional or policy anchor often determines GN boundaries (Blanco et al., 2011). Actors in GN are unified by joint identities and challenges, stemming from shared complex policy problems (Blanco et al., 2011). This is likely to foster mutual trust, common relationships and cooperation (Koppenjan, 2008). The relationships in networks are mainly based on non-hierarchical, social relational ties (Provan and Fish, 2007; Parker, 2007). Information, material, financial resources, services and social support (Provan and Fish, 2007) link members. However, social relational ties provide the operational basis of GN that are assumed to foster collaborative relations between actors from different sectors (Perri et al., 2002; Sørensen and Torfing, 2011).

GN blurs the boundary between state and society by facilitating negotiated public co-governance (Kooiman, 1993; Sørensen and Torfing, 2009). They bring together public and private actors in processes of collaborative governance, cutting across the distinctions between global, national and local levels of governance in the creation of multi-level networks (Bache and Flinders, 2004; Sørensen and Torfing, 2009). GN cut across political jurisdictions and policy areas (Hajer and Versteeg, 2005; Sørensen and Torfing, 2009). As a result, these networks consist usually of a polycentric, transnational and intercultural collaboration of multiple actors (Hajer and Versteeg, 2005). Some also assume operative roles at local and national levels, or across different scales (Sørensen and Torfing, 2005; Sørensen and Torfing, 2009; Torfing and Sørensen, 2014). GN may be self-grown from below or mandated and designed from above, intra- or inter-organizational, open or closed, tightly knit or loosely coupled, sector-specific or society-wide (Provan and Kenis, 2007; Sørensen and Torfing, 2009). That GN proliferate at all levels and settings, attest to the relevance of network governance for describing the contemporary forms of societal governance (Sørensen and Torfing, 2005; Sørensen and Torfing, 2009).

3.2. Proliferation of network governance

Network governance as a mode signify a fundamental transformation in governance, whereby a more decentered and pluralistic governing process including increased involvement of non-state actors is coordinated through networks (Ansell, 2008; Robins et al., 2011). The evolving changes to the relational preconditions of policymaking and the broadening scope of policy challenges provide an impetus for the existence of GN. These networks are attributed as functional responses by actors to address complexities, enabling joint policy co-production,

which is not considered likely in a hierarchical setting (Provan and Kenis, 2007). GN are crucial in providing alternatives to hierarchies as governance mechanisms (Lewis, 2005).

Network governance is associated with the growing complexity, dynamism and diversity of society (Kooiman, 1993) and the expansion of transboundary policy challenges (Christensen, 1999; Bevir, 2010). Network governance, conveyed through the actions of GN, has its relative strength in relation to the growing number of '*wicked problems*' (Sørensen and Torfing 2005). The proliferation of GN lies in the expectations of solving these complex and ill-defined problems, in the face of uncertainty, conflicting demands and objectives. These enable processes of collaborative pro-active problem solving that encourages mutual learning and fosters joint ownership to new solutions (Koppenjan and Klijn, 2004; Torfing, 2005; Sørensen and Torfing, 2005). Advocates of network governance highlight the need of network-based decision-making to govern uncertainty, access expertise and enable citizen engagement in a complex society with distributed power and resources (Koppenjan and Klijn, 2004).

A view of network governance is that it might help solve environmental challenges (Clarke and Stewart, 1997; Dedeurwaerdere, 2005; Voß et al., 2007; Sørensen and Torfing, 2009; Bevir, 2010). This originates in the view that GN facilitates innovative, flexible and efficient governance responses (Sørensen and Torfing, 2009; Blanco et al., 2011) in multi-level policy settings, characterized by an array of social and political actors, vague and incomplete problem definitions (Koppenjan and Klijn, 2004). Decision-makers praise GN ability to identify new problems and provide a negotiated response that is both flexible and feasible, which allow for adjustments to policy challenges (Klijn and Koppenjan, 2000; Torfing, 2005; Sørensen and Torfing, 2005). Central decision-makers and political theorists view GN as legitimate and efficient mechanisms of governance (Torfing, 2005; Torfing and Sørensen, 2014), as oppose to traditional hierarchical, rigid and reactive forms of government (Sørensen and Torfing, 2009). GN are considered as a discrete form of governance. Their relevance is built on their ability to uphold conflict resolutions and bases of legitimacy and to coordinate mutual collective action required for problem solving (Provan and Kenis, 2007).

The acceptance of GN as enablers of functional governance responses is advanced by the recognition of the need to look beyond disciplinary boundaries and technical approaches and engage a variety of actors in solving complex transboundary challenges (Dietz et al., 2003; Folke et al., 2005; Bodin and Prell, 2011). These mobilize resources in situations where resources are dispersed between public and private actors. GN enable problem-solving capacity of actors with specialized tasks and limited resources, characterizing a form of public-private interaction that is based on non-hierarchical coordination (Börzel, 1998). The efforts provided by GN are regarded as appropriate endeavors to govern environmental challenges, primarily because the problem space is congruent with their operative space. The operative setting of GN provide a functional opportunity to govern these challenges. They operate in loosely constructed policy spaces, between or alongside formal institutions and processes, extending across and beyond hierarchies, where spaces are overlapping and characterized by vague boundaries (Jachtenfuchs, 2001; Haughton et al., 2009).

A normative view of network governance is that it is expected to provide opportunities for multi-level cooperation to broaden the governance base, which enables innovative governing responses. Responses that are viewed as helping to define complex sets of objectives that reflect e.g. the challenges of the Baltic Sea. GN are viewed as collaborative arrangements

between autonomous actors from different sectors and levels, public and private (Perri et al, 2002; Sørensen and Torfing 2009). These produce problem definitions, visions, ideas and plans that are deemed relevant for their membership bases. GN inform the problem-solving capacity of the members comprising the network.

Key relative to functional network governance of environmental challenges is governance networks ability to foster a flexible, collaborative-based governance, which integrate the distributed capacities for policymaking in complex settings (Filtenborg et al., 2002; Huppe et al., 2012). GN are viewed as informing decision-making processes by means of novel information, amassed through negotiated arguments and assessments. GN are instruments for the aggregation of information, knowledge and assessments that can foster qualified decision-making (Torfing, 2005). Actors in GN are considered as possessing specific knowledge that is important for decision-making. The joint knowledge of network members represents an important basis for making an informed choice of a feasible option (Kooiman, 1993; Scharpf, 1999; Torfing, 2005). The aggregation of novel knowledge that constitute the basis for policy innovation in relation to environmental challenges, is viewed as arising from collaboration among GN members. The generation of innovation is expanded through multi-actor collaboration, which facilitates mutual learning processes (Sørensen and Torfing, 2011).

3.3. A functional network governance – a theoretical point of departure

The proliferation of network governance rest on the normative acceptance as constituting a functional governance mode. The acceptance that sustain the functionality of network governance originate in the first generation of research (Sørensen and Torfing, 2007; Lewis, 2011). The first generation established the novelty of GN, how they differ from other governance modes, how they enhance and contribute to a functional governance. The central discoveries of the first generation are described throughout this chapter and at parts contextualized by using the BSR as an example. The second generation of research into network governance aspire to promote the use of GN by seeking to explain their formation, their functioning and development, the sources of their success and failure (Sørensen and Torfing, 2007; Lewis, 2011).

This thesis evaluates the positive normative assumption of network governance. Drawing from the first generation of network governance research, a theoretical premise is that BSR network governance is in an ideal position to functionally govern the environmental stressors of the Baltic Sea. This originate in the claims of the benefit of network governance. However, there is scant evidence of how network governance functions in practice (Van Bortel and Mullins, 2009). There is ambiguity regarding network governance actual ability to enable a functional governance of policy challenges (Hajer and Versteeg, 2005).

The theoretical aim is to identify and suggest an approach how network governance can be evaluated and developed as a governance mode. This is attained by evaluating the operational functionality of the BSR network governance relative to whether the governance mode of the region sustains the notion underpinning the theory. The evaluation of the functionality of BSR network governance is based on the transnational geographical boundaries of the region. BSR network governance is defined as the sum of actors engaged in the BSR, including the different modes of operative individual GN that have a purpose to further public governance in relation to the challenges of the region. This implies that the functionality of BSR network governance

has a broad scope, one that include over 20 GN. To narrow this scope, the thesis evaluates the functionality based on the BSR network governance's capacity to respond to the environmental challenges of the Baltic Sea with the use of the four case studies (articles) of the thesis.

A starting point in relation to a functional BSR network governance is that policy outcomes that target the challenges of the Baltic Sea are not an outcome of confined, narrow, incoherent approaches of unilateral governance networks. Functionality refers to that policy outcomes would not be achievable by isolated, independent action, by individual actors in GN. This does not suggest that a GN is not able produce functional policy outcomes on its own, as long as the processes are guided by inclusive, holistic approaches. This thesis is interested in evaluating BSR network governance functionality in terms of its joint production problem capacity, representing the entire system of interrelated policy-capacities operating at different levels. This require separate theorizing in ways that have traditionally not been present in the first generation of network governance literature. This thesis interlinks network governance with theories on collaborative environmental governance through an organizational learning approach.

By utilizing this approach, the structural conditions that underpin the BSR relational conditions is emphasized in relation to a functional network governance. Structure in this sense is viewed both as outcomes of network processes and as enablers or inhibitors of network operation. The mere presence of structural interlinkages of a system setting does not enable a functional governance. Although a non-functional network governance may be a result of structural failings, e.g. if suitable structures are not in place, then network governance performance is likely to be sub-optimal (Robins et al., 2011). This suggest that while policy development arises from interaction between actors in networks, the structure of these networks shape the relational basis for co-developing policy (Lewis, 2011). The same logic applies to the broader BSR setting, i.e. a lack of relevant structural interlinkages within and across networks may prove to be detrimental to the relational basis of the region.

The structural features of network governance are evaluated relative to their potential to foster relational embeddedness (Lewis, 2011; Robins et al., 2011). Relational embeddedness in a network governance setting is viewed as arising from patterns of relations linking networks and network actors. The interconnectivity of network governance through relevant structures may facilitate coordination of action, support the development of trust among actors, shared understanding of goals, actions that adequately address the intent of the governance system (Lewis, 2011; Robins et al., 2011).

Relational embeddedness is pivotal in network governance, otherwise the operative context is more likely to be contested than cooperative relative to co-developing policy that address the broader intent of the governance system (Lewis, 2011; Robins et al., 2011). The contextual and operative setting is important for a functional network governance (Jones et al., 1997). In a setting of shared assumptions and values of network actors there is less dispute, more cooperation and agreement about goals and methods of implementation. In a system setting, that is fragmented disputes arise. The first generation of research on network governance often overlook the possible presence of conflicting elements in GN (Ansell, 2008). Early advocates of network governance anticipate that policy deliberation is based on actors having a common understanding of the problem. However, this is not the case and different views of governance

issues surrounding a shared resource affects the way policy is implemented (Robins et al., 2011). This thesis acknowledges that BSR network governance actors are not united in their view on the environmental challenges of the Baltic Sea. Environmental governance is inherently a political process and there is a need for negotiation, deliberation and learning to develop and sustain power-sharing agreements (Myint, 2002).

The concept of network governance provides the framework for evaluating the functionality of BSR network governance. BSR network governance functionality is judged based on its relative capacity to foster a useful governance of the environmental challenges of the region. The logic of the network governance concept that underpin the premise of BSR network governance is not based on governance networks means to attain problem-solving capacity per se. Rather they are defined based on their ability to inform centralized problem-solving capacities in the region. The strength of GN lie in defining a complex set of policy objectives that reflects the complexity of the policy problems, rather than in delivering the outputs that produce the desired outcomes (Kooiman, 1993; Koppenjan and Klijn, 2004; Sørensen and Torfing, 2009).

The operational functionality of BSR GN is related to their ability to augment problem-solving capacity of decision-makers in relation to policy challenges. The task of GN is to enhance policy-makers capacity to make informed decisions, which are considered appropriate to govern the challenges of the Baltic Sea. This is dependent on GN ability to co-produce coherent policy outcomes, through the production of plans, strategies, ideas and visions that foster the development of suitable policy activities. The co-production of relevant policy outcomes is dependent on favorable processes that support the creation of these. Functional BSR GN are dependent of joint procedures and action that identifies and frames policy problems, crafts and selects appropriate joint policy solutions, condensed in various strategies and plans. The production of these is underpinned by the relational capacities of GN, the favorable conditions for multi-actor cooperation, expanding the exchange of ideas and fosters mutual learning. BSR network governance rests on the notion of bringing together actors in different networks with different values, experiences and ideas. The relational embeddedness of network governance is expected to foster the aggregation of the knowledge of these actors, spurring novel and creative policy development, which potentially helps to mitigate the environmental challenges of the Baltic Sea.

4. Network governance and the Baltic Sea region

4.1. Baltic Sea region as a study area

The BSR constitutes a relevant and compelling study area for evaluating the functionality of network governance as mode of governance. The analysis if network governance informs and augments the BSR governance of policy challenges is useful, because of BSR's long network governance history. The first GN was established in the 1950s and during the 1970s, the number of networks expanded, to mushroom in the 1990s as a reaction of societal changes. The expansion of the EU to the Northern Peripheries of Europe also catalyzed the formation of new BSR GN. The Northern Dimension Partnerships were created to extend the cooperation between EU and non-EU States in the broader region.

There are over 20 transnational GN operating in the BSR (article 1). These generate public governance policy efforts relative to the challenges of the Baltic Sea. The BSR network governance is based on the territorial and sectorial interests of these GN. These BSR GN pursues the interests of different levels of public governance and have been established to expand the cooperation in the region. However, the processes and structures of this cooperation vary. This is a testament to the different modes of BSR network governance.

The BSR network governance is a symbol of the changing conditions of policymaking, where traditional forms of government are linked with innovative governance modes. The selection of case studies in this thesis reflect this transformative change. The PN evaluated in article 2 is linked with a traditional form of government, consistent with national borders of NS. This PN is viewed as a feature of traditional government operative based on a top-down institutional premise, with rigid rules and norms and an explicit form of implementation. Transnational GN, evaluated by article 1 and article 3, are associated with innovative governance modes. These GN are self-regulating and associated with generating responses to ill-defined environmental policy challenges by pooling knowledge through transnational intergovernmental or national parliamentary cooperation.

Altogether, the BSR is an interesting area to expand the operational understanding of network governance. BSR adhere to the normative operational assumption of network governance. This entails a mix of different networks that apply self-regulation, based on their own ideas, resources and interactions (Kickert et al., 1997; Milward and Provan, 2000; Sørensen and Torfing, 2005). A key feature of network governance is that the self-governed networks serve different centers of authority. Each adhere to and is regulated by a specific set of normative framework that may not necessary be aligned and have the same interest vis-à-vis the shared policy challenges. In the BSR, there is no unified or single point of policy authority. No supreme center of hierarchical control or formal authority guides the overall policy co-development and coordination among actors in the region. However, the EUSBSR aspire to fulfil this void by acting as an overarching policy coordinator in the region (article 4). BSR networks serve different centers of policy authority, active on various levels. The BSR contextual setting is complex, fluid, jurisdictions are overlapping, lean, and flexible, they evolve as demand for policy change. The operative setting of BSR network governance is by definition a multi-actor, polycentric affair.

Despite the fragmented BSR setting, the general view and assumption is that BSR networks are expected to navigate this and act as problem-solving endeavors. In particular, BSR

transnational GN have emerged as functional responses to address the challenges of the region. However, the ability of BSR network governance to enhance the region's capacity for policy problem-solving rest on the operative context, institutional design and political struggles that regulate BSR GN form and functioning. The BSR is an intercultural transnational affair, where actors conceive the world in different terms. This is typical of a network governance setting (Hajer and Versteeg, 2005). Network members have wide-ranging backgrounds, operates under dissimilar conditions, and are linked to different constitutional systems and different societal premises (Hajer and Versteeg, 2005).

The BSR through its characteristic network governance features is a valuable study area for evaluating the functionality of network governance as a mode of governance. The BSR offers an opportunity to expand the understanding of the operative features of network governance and related actors, which are joined in their effort to govern the challenges of the Baltic Sea.

4.2. Operationalization of Baltic Sea region network governance functionality

The operationalizing of BSR network governance functionality is dependent on interlinking the premise of network governance with relevant efforts that are deemed theoretically suitable to govern the environmental challenges of the Baltic Sea. There is a range of normative criteria for evaluating the operational performance of GN relative to transboundary policy challenges (Sørensen and Torfing, 2009). One of these include the learning capacity of GN (Provan et al., 2007; Sørensen and Torfing, 2009). Learning by networks is perceived as improving networks potential to generate more responsive problem-solving (Rhodes, 1997; Koppenjan and Klijn, 2004; Agranoff, 2007; Sørensen and Torfing, 2011).

The significance of learning by networks is amplified in a BSR setting, because of the intrinsic need to augment the problem-solving capacity of decision-makers in the region. This originate in the difficulty of developing appropriate policy responses to the environmental degradation of the Baltic Sea. These responses need to contend with that policy actors lack comprehensive knowledge on appropriate interventions and the effect of these interventions. Here lies the complexity of governing transboundary environmental challenges; the uncertainty related to the scope of the challenge and the outcomes of governing efforts (Folke et al., 2005; Armitage et al., 2008; 2012). There is an inherent knowledge gap in relation to the governance of environmental challenges and related strategy objectives and efforts.

The concept of learning is emphasized by collaborative environmental governance theories. Adaptive governance, adaptive co-management, participatory and reflexive governance underline the concept of learning with associated traits and processes as a key element in bridging the knowledge gap associated with the governance of transboundary environmental challenges (Ruitenbeek and Carter, 2001; Walker et al., 2002; Olsson et al., 2004; Kooiman et al., 2005; Folke et al., 2005; Brunner et al., 2005; Armitage et al., 2008; Newig et al., 2016). The concept of learning and processes leading up to it are viewed as a promising strategy to deal with increasing policy complexity and uncertainty in the governance of natural resources systems (Folke et al., 2005; Ison et al., 2007; Pahl-Wostl et al., 2008; Reed et al., 2010).

Learning is also viewed as an essential component of network governance (Newig et al., 2010). The general hypothesis behind learning in GN is that they provide access to novel information by communication with other members (Newig et al., 2010). Novel information emerges through integrating different sources of knowledge and expertise (Grin and van de Graaf,

1996; Newig et al., 2010; Huppé et al., 2012). Novel information is expected to influence or inform the problem-solving processes (Newig et al., 2010), by spurring policy innovation and bridging knowledge gaps.

In comparison to traditional hierarchical modes of government, the operational conditions of GN are regarded as promising endeavors for processes that support learning. GN are weakly institutionalized patterns of cooperation where information is processed through loose forms of collaboration and negotiation (Benz and Furst, 2002). These are more open to external stimuli and more responsive to changing circumstances (Benz and Furst, 2002). This creates a suitable context for innovative interaction and information exchange processes that is expected to stimulate learning (Benz and Furst, 2002; Rijke et al., 2012). GN potential ability to organize and enable processes of learning by and between policymakers and policy co-producers (Pahl-Wostl, 2009) are viewed as fostering the collective reasoning that is necessary to take on policy-making functions of greater complexity (Huppé et al., 2012).

The operationalization of the functionality of BSR network governance denotes to the BSR's GN collective ability to support learning. Also, these learning processes need to align and correspond with the normative learning obligations set by environmental governance theories. The operational functionality of BSR network governance is linked to the joint capacity of the governance mode to demonstrate supportive preconditions for learning.

4.3. A functional Baltic Sea region network governance

A functionalist view of BSR network governance is that it constitutes a governance endeavor that enhances the problem-solving capacities of the region. BSR environmental challenges are multifaceted and require policy responses across sectors on different levels, ranging from global to local policy responses. The scope of these responses reflects the evolving policy-making landscape, which is not bound by national borders but transcend scales and levels. From a normative perspective, BSR GN are viewed as having the capacity to develop policy efforts that enable a functional governance of the Baltic Sea. This assumption derives from the notion of network's potential to integrate a broad actor base in the production of policy. As networks operate alongside formal institutions and processes, which extend across and beyond hierarchies, provide them the capacity to allow actors outside of government to contribute their resources in the generation of novel information through the exchange of experiences (Huppé et al., 2012).

The normative value of BSR GN is dependent on their alleged ability to define and develop policy objectives that comply with intricacy of governing the challenges of the Baltic Sea. This originate from the expectation of BSR networks to provide novel information, by communication and cooperation with network members that operate on different levels and settings. BSR networks are supposed to have the ability to aggregate, bridge resources and take advantage of that each member brings different resources to the fore (Börzel, 1998; Creech et al., 2008). GN are useful, as oppose to individual actors or entities that have only a limited view of the whole and restricted capacity to influence outcomes (Smith and Stirling, 2007). The normative value expectation of BSR GN is dependent on their possibility to synthesize and bridge the distributed knowledge capacities of their members, through the presence of processes that support learning.

A requirement of a functional BSR network governance is the system's ability to amass novel information through processes of learning. In relation to this, the BSR operational setting need to demonstrate an openness, a flexibility and an adaptiveness to change (Lebel et al., 2010; Armitage et al., 2012). The network governance literature views networks as innovative, inclusive arrangements (Blanco et al., 2011) that include attributes that exhibit necessary capacity to adapt. This is reflective of the informal network governance approach, where cooperation is based on loose, flexible coupled patterns of negotiation and interaction. This improves GN basic adaptive capabilities, as adaptiveness is presumed to emerge from a dynamic process of learning (Folke et al., 2005).

The premise of a functional BSR network governance is that functions of learning provide a base for developing a holistic environmental governance of the Baltic Sea. Learning processes are viewed as supporting the development of an integrated and inclusive network governance approach. An approach that accentuate a broad and varied governance actor participation in the attempts to bridge the knowledge gap and the mitigation of policy uncertainty associated with the governance of the Baltic Sea.

5. Conceptualization of learning in relation to the environmental challenges of the Baltic Sea

This chapter discusses the boundaries, the scope and appropriate forms of learning relative to a functional BSR network governance of the environmental challenges of the Baltic Sea. The aim is to provide a conceptualization of learning and identify suitable forms of learning with relevant supportive processes. This is achieved by applying normative learning frameworks developed by collaborative environmental governance theories. These provide a base for conceptualizing learning relative to the challenges of the Baltic Sea.

Environmental governance theories are created and guided based on the notion to develop a practical, useful governance of natural ecosystem challenges. Environmental theories grasp the changing conditions of policymaking, recognizing the complexities relative to the efforts to govern these challenges. A preset necessity of these theories is to aspire to understand the basic fundamentals of these challenges and in the process identify latent governance responses that are considered congruent with the problem space. Environmental governance theories define the guidelines, the frameworks and the parameters to enable a functional BSR network governance relative to the shared environmental challenges of the region.

Traditionally the governance of natural ecosystem resources has been shaped by a predict and control paradigm, accentuating a unilateral, engineering approach (Pahl-Wostl, 2002; Gleick, 2003; Pahl-Wostl, 2009; Rijke et al., 2012). However, this approach does not necessarily facilitate the various social dimensions linked to environmental challenges. Thus, the social dimension of these challenges has gained increased importance in discourses vis-à-vis a functional environmental governance (Pahl-Wostl, 2002). The social dimension with processes of social learning offer an interesting path for shifting from a prediction and control to a more integrated approach vis-à-vis the governance of environmental challenges (Lebel et al, 2010). Processes of social learning are considered of major importance for a functional governance of environmental challenges (Pahl-Wostl, 2002; Muro and Jeffrey, 2008).

5.1. Learning – a multifaceted function

A linking feature of environmental governance theories relative to a functional governance of environmental challenges is the concept of learning with associated traits and processes. In the social–ecological systems literature learning is a dominant theme (Berkes et al., 2003; Armitage et al., 2008). Learning is emphasized in resilience management (Walker et al., 2002), in interactive governance (Kooiman et al., 2005), in adaptive governance (Folke et al., 2005; Brunner et al., 2005), in adaptive co-management (Ruitenbeek and Carter, 2001; Olsson et al., 2004; Armitage et al., 2008) and in participatory governance (Newig et al., 2016).

In environmental theories learning is a normative goal and links to a perceived knowledge gap (Fazey et al., 2013), or incomplete knowledge that centralized knowledge arrangements have to cope with (Rosenschold, 2017). Learning and learning processes are viewed as key elements in reducing the knowledge gap, by allowing an integration of a broader governance base in managing environmental challenges. This approach requires a shift from conventional reliance on narrow bodies of knowledge, to more inclusive methods of generating knowledge that draw together different types of knowledge (Jiggins and Röling, 2002; Keen and Mahanty, 2006).

Learning relative to environmental challenges is underpinned by three core elements: *systems thinking, negotiation and reflection* (Keen and Mahanty, 2006). A learning framework need to acknowledge the complex relationships and interactions that occur between and within social and ecological systems. Multi-actor learning processes and the interactions between people and their environments are complex (Keen and Mahanty, 2006). A learning approach that is based on system orientation require the interactions of many actors with diverse and at times conflicting perceptions, interests and understandings. In systems thinking monitoring and reflection play a key role in facilitating feedback between and within the social and ecological systems. These support continuous learning by providing a structured approach to developing hypotheses about system interactions, testing them and critically reviewing and revising policy actions to better accomplish policy goals (Lee, 1993). Traditional governance of environmental challenges regularly place priority on biological monitoring, focusing on the impacts of specific actions. It relies on normative deliberations, underpinning an expert driven technocratic practice. There are calls for social monitoring that do not exclude some types of knowledge from the learning process because of the values and assumptions of dominant actors (Keen and Mahanty, 2006). This assumes that negotiation is not only based on biophysical discussions but also include socio-ecological or systems-based learning. As a result, modes of reflection relative to the governance need to acknowledge that the amassed knowledge is a result of actions, beliefs, cultural and political contexts. Learning processes in environmental governance need to critically assess whose knowledge is being incorporated and how, and attempt to integrate diverse knowledges, including those of local experts and marginalized groups (Keen and Mahanty, 2006).

Learning is a complex process. Learning is viewed as a multifaceted function and the processes leading up to learning are difficult to facilitate and assess (Allan, 2008; Lebel et al., 2010). The complexities involved in expanding and assisting learning and related processes are abundant and needs not only to consider the inherent implications of learning, as to the different connotations and definitions of learning. For instance, Kooiman (2003) defines learning '*as the process in which information becomes knowledge*' (Kooiman, 2003, p. 33), whereas e.g. Farkas (1998) views learning essentially as a process of transferring information (Farkas, 1998). In terms of defining learning and identifying supportive processes for learning, the learning requirements set by environmental theories are key.

Learning and learning processes constitute an important area for research in environmental governance theory approaches (Barrett et al., 2001; Armitage et al., 2012). These have diverse viewpoints and focal points in relation to learning as an element in addressing environmental challenges. Adaptive governance and adaptive co-management, referred to as collaborative governance endeavors, view learning as a method to reduce the governance uncertainty vis-à-vis these challenges. These theories approach uncertainty by emphasizing collaboration of actors through cooperation and dialogue. They aspire to make use of extensive multi-actor deliberations seeking integrative and adaptive approaches to problem solving, with the view to make resulting policies more resilient to complex conditions (Armitage et al., 2008). The inherent features of complex ecosystems cause uncertainty to grow over time and therefore understanding of these needs to be updated and adjusted (Folke et al., 2005). Adaptive co-management is based on a premise that knowledge of the system is always incomplete (Fazey et al., 2005). Adaptive co-management rely on the collaboration of a diverse set of actors

operating at different levels, often through networks from local users to municipalities, to regional and national organizations and to international entities (Folke et al., 2005).

Adaptive co-management is an outcome of collaborative experiences in which learning and horizontal and vertical linking functions of governance are accentuated (Armitage et al., 2008). Building the capacity of individuals, networks and societies to collaboratively learn through change and uncertainty is fundamental to environmental governance (Lee, 1993; Bouwen and Taillieu, 2004; Diduck, 2004; Keen et al., 2005; Armitage et al., 2008). In adaptive co-management, there is an explicit focus on linking collaborative efforts with systematic learning (Armitage et al., 2007). Learning involve the collaborative or mutual development and sharing of knowledge by multiple actors (Armitage et al., 2007). Collaborative efforts link groups and fosters knowledge creation across horizontal and vertical levels (Armitage et al., 2008; Berkes, 2009). Collaborative governance efforts are viewed as problem-solving processes in which learning about social–ecological change is an essential component (Carlsson and Berkes, 2005; Armitage et al., 2008). Learning provide a basis for the joint action required to respond to social–ecological feedback (Folke et al., 2003; Fazey et al., 2005; Armitage et al., 2008).

Collaborative environmental governance literature draws upon ideas related to group learning (Armitage et al., 2008). Group learning is viewed as a collaborative process that include actions undertaken by actors set in specific socio-cultural arrangements, which are guided by institutions in the sense of routines, rules, and conventions (North, 1990; Healey, 1997). Collaborative group learning refers to learning processes, which are a *'process in which participants learn from each other and from each other's learning'* (Kooiman and Jentoft, 2009, p. 830). Central to group learning is learning traits associated with institutional learning (Diduck et al., 2005; Keen et al., 2005; Siebenhuner and Suplie, 2005) and social learning (Pahl-Wostl, 2002; Pahl-Wostl, 2009; Lebel et al., 2010; Scholz et al., 2014; Medema et al., 2014; Romina, 2014). Key in group learning traits are multi-actor collaboration arrangements and joint decision-making, which is viewed as helping to initiate self-organized learning processes (Folke et al., 2005). Multi-actor collaboration arrangements is viewed as pivotal in relation to facilitating self-organized learning processes, as trust is built through collaboration (Armitage et al., 2008), which in turn is viewed as a necessity to foster institutional and social learning.

Social learning is viewed as a process that is fundamental to coping with complexity and uncertainty (Lee, 1993; Ison and Watson, 2007; Pahl-Wostl et al., 2009; Cundill et al., 2011). Social learning is regarded as a premise for tackling environmental policy challenges, because it improves the adaptive capacity of the governance system (Johannessen and Hahn, 2013). Social learning supports participation, collective action and decision-making (Pretty, 1995; Daniels and Walker, 2001; Measham, 2009; Cundill et al., 2011). It provides a collaborative approach to problem solving (Woodhill, 2004; Muro and Jeffrey, 2008).

The environmental governance literature refers to social learning as a collective process (Muro and Jeffrey, 2008). Social learning is defined as the collective action and reflection that take place among both individuals and groups when they work to understand the relations between social and ecological systems (Keen et al., 2005; Cundill et al., 2011). Social learning is conceptualized as a process of gradual social change in which actors critically question and potentially discard existing norms, values, institutions and interests to pursue actions that are desirable to them (Keen et al., 2005; Cundill et al., 2011).

Social learning is based on three key ideas (table 4). The design of social learning builds upon an acceptance that knowledge is dynamic and uncertain because it is formed, validated and adapted in the context of changing conditions (Davidson-Hunt and O’Flaherty, 2007; Mostert et al., 2007; Armitage et al., 2012). A preset condition for social learning is that no individual actor, state or non-state have the full range of knowledge required to govern environmental challenges successfully (Berkes, 2009; Armitage et al., 2012). Drawing from multiple sources of knowledge, including knowledge from scientists, policymakers and knowledge of resource users can lead to improved social and ecological outcomes (Forbes et al., 2006; Pohl et al., 2010; Armitage et al., 2012). Social learning is a necessity for contemporary environmental governance and the co-production of knowledge, engaging diverse actors to build holistic understandings of ecological challenges (Armitage et al., 2011; Armitage et al., 2012).

Table 4. General social learning principles (derived from Mostert et al., 2007)

Actor involvement	Based on long-term interactions	Natural resource management is a learning process
<p>All actors should be involved in natural resource management.</p> <p>Typically, no single actor has all the necessary information, legal competencies, funds and other resources to manage a natural resource. Therefore, actors need to collaborate.</p> <p>Social learning involves the integration of the different ‘frames’ of actors. Frames influence how actors see reality. For example, engineers, ecologists, lawyers, environmentalists and farmers will all have quite different views of a river basin management.</p>	<p>Natural resource management require a form of organization</p> <p>To facilitate collaboration and coordinate their actions in a sustained way, actors need to enter into a long-term working relationship.</p> <p>This can be done through users’ organizations (Ostrom, 1990, Meinzen-Dick, 1997, Pretty and Ward, 2001), multi-actor platforms (Leach and Pelkey, 2001, Warner, 2006), or informal policy networks (Klijn and Koppenjan, 2000; 2006).</p>	<p>Natural resource management is a learning process (Holling, 1978).</p> <p>It requires the development of new knowledge, attitudes, skills, and behaviors to deal with differences constructively, adapt to change and cope with uncertainty.</p> <p>Social learning can be analyzed as a process that take place within a context (Craps, 2003, Ridder et al., 2005, Pahl-Wostl et al., 2007).</p>

Social learning is an outcome of cooperation of actors (Berkes, 2009). Social learning occurs most efficiently through joint problem solving and reflection, with the sharing of experiences and ideas (Berkes, 2009). In relation to environmental challenges, social learning in and with social groups through long-term interaction (Argyris, 1977; Haas, 2004; Siebenhuner, 2008) is expected to stimulate the formation of new knowledge, shared understanding, trust and joint action (Lebel et al., 2010).

Social learning spurs a functional environmental governance by:

- (I) helping to cope with *informational uncertainty*, which reduces the deficit in knowledge about future developments;
- (II) reducing *normative uncertainty*, i.e. uncertainty about goals and actions, through participatory decision processes and perceptions of acceptable risk (Newig et al., 2005; Biermann, 2007; Pahl-Wostl et al, 2007; 2009; Lebel et al., 2010);
- (III) supporting to build *consensus on criteria for monitoring and evaluation*, which are the essential elements of adaptive governance schemes (Lebel et al., 2010);

- (IV) assisting to *reduce conflicts* and identify synergies between adaptation activities of various actors, thus improving overall chances of success (Lebel et al., 2010);
- (V) addressing concerns of relevant actors by bringing together *alternative perspectives* and *forms of knowledge*, with the aim to improve the fairness of decisions and actions (Pahl-Wostl and Hare, 2004; Lebel et al., 2010)

5.2. Preconditions for social learning

The analysis of social learning and of the conditions stimulating social learning must consider and address the complexity and context-dependence of these processes (Scholz et al., 2014). Learning processes are contextual. Learning processes exist in relation to the place in which they occur, the experiences from which they arise and the cultures with which they are associated (Keen and Mahanty, 2006). Table 5 provides an overview of the conditions of supportive preconditions for social learning. It lists the demands for facilitating social learning relative to the (I) contextual governance setting and (II) the actors operating within this setting. These demands are derived from social learning theory to be examined not only for social learning, but also for functional BSR network governance.

With regard to the contextual setting, formal and informal governance arrangements have different abilities to facilitate learning processes and outcomes (Armitage and Plummer, 2010; Lebel et al. 2010). A governance based on formal arrangements is viewed as less benign for social learning. Formal governance arrangements driven by hierarchical modes, with unequal power relations between actors, enables a dominant coalition to impose its problem definition and solutions (Van Bommel et al., 2009). This constrains the space for social learning processes and may generate distrust and disagreement among and between actors. Social learning organized in formal settings, actors may feel scrutinized by their constituencies, resulting in limited freedom to learn from each other and develop alternative solutions (Rijke et al., 2012).

Informal governance arrangements, conveyed through the actions of informal networks are considered to play a crucial role in supporting learning processes (Pahl-Wostl, 2009; Rijke et al., 2012). Informal networks, normatively viewed as flexible in terms of membership, role and power of actors, provide a favorable setting for social learning that proceeds in stepwise fashion (Pahl-Wostl, 2009; Rijke et al., 2012). Informal networks support learning by allowing multi-actor interaction between individuals, agencies and institutions at multiple levels. These networks are viewed as drawing upon various knowledge systems, providing access to novel information and supporting multiple ways of analysis (Pahl-Wostl, 2009; Rijke et al., 2012).

A contextual demand for social learning is the existence of collaboration and communication among and between actors. Interconnectivity is a necessity to improve the understanding of and ability to respond to complex social-ecological systems (Armitage et al., 2008). Social learning is dependent on the embedded system structures and pathways that build horizontal and vertical linkages among actors to improve information and communication flows (Lebel et al., 2010; Medema et al., 2014). A condition of social learning is interaction of actors, whereby knowledge and information are conveyed via information dissemination (Valente, 2005; Newig et al., 2010). Social learning is dependent on the linking functions of governance arrangements, where horizontal and vertical links are accentuated as a way to facilitate social learning (Armitage et al., 2008; Armitage et al., 2012).

The involvement of dissimilar actors in social learning is vital (Mostert et al., 2007). To facilitate the involvement of broad range of actors in social learning processes, the contextual setting needs to provide opportunities for interaction in two directions: horizontal interaction among actors at different scales and vertical interaction with actors at other levels (Berkes, 2009). Horizontal and vertical integration of governance arrangements and synthesis of knowledge are necessary for enabling social learning processes. The development of cross-level linkages of the contextual system are crucial for allowing access to information and provide benefit by linking agents through the use of this information (Berkes, 2009).

Table 5. Supportive preconditions for social learning

Demands of the contextual governance setting	Demands of governance actors
<p>1. An <i>informal governance setting</i> provides favorable contextual conditions for learning by stimulating learning processes (Benz and Furst, 2002; Rijke et al., 2012).</p> <p>2. <i>Interconnectivity of the embedded setting</i> (Armitage et al., 2008; Armitage et al., 2012). The system setting need to display structures and pathways that build horizontal and vertical linking functions among system actors. The premise for social learning is collaboration and communication across actors and levels, whereby knowledge and information are transmitted among actors via information distribution or diffusion (Valente, 2005; Newig et al., 2010).</p> <p>3. <i>The informal governance arrangements need to display and provide opportunities where learning among different governance actors at multiple levels can be catalyzed</i>, e.g. informal networks (Pahl-Wostl, 2009; Rijke et al., 2012), or multi-actor platforms, e.g. forums (Keen and Mahanty, 2006; Mostert et al., 2007; Berkes, 2009; Armitage et al., 2012; Medema et al., 2014).</p>	<p>1. <i>Internal collaboration among actors.</i> Collaboration is underpinned and linked by diversity and pluralism, interconnecting multiple type of interdependent actors (NGOs, farmers, government departments) (Mostert et al., 2007; Armitage et al., 2008; Brummel et al., 2010). The divergence of interests is interlinked and recognized by mutual interdependence (Pahl-Wostl, 2002; Van Bommel et al., 2009).</p> <p>2. <i>Internal communication and negotiation among actors.</i> Actor communication and negotiation characterized by open dialogue building on consideration and appreciation (Pahl-Wostl, 2002; Mostert et al., 2007). Perspectives exchanged and modified via broad communication, with the view to develop shared understandings and trust (Armitage et al., 2008).</p> <p>Multi-actor communication and negotiation can benefit from independent facilitation, extended engagement, repeated meetings or small group work (Keen and Mahanty, 2006; Mostert et al., 2007; Muro and Jeffrey, 2008; Brummel et al., 2010).</p> <p>3. <i>Transactive or negotiated internal decision-making.</i> Decisions are reached through dialogue, with a tendency towards consensus building. Diverse inputs (knowledge types) present in decision-making. Equity and efficiency promoted, multiple types of information accepted via multiple systems of knowledge, e.g. local, traditional, scientific and expert (Pahl-Wostl, 2002; Armitage et al., 2008).</p>

A key contextual criterion for social learning is the presence of opportunities and platforms for catalyzing social learning. Informal networks constitute platforms for catalyzing social learning (Pahl-Wostl, 2009; Rijke et al., 2012). However, social learning processes in individual networks may be limited by the boundaries of the membership basis and the internal network hierarchical orientation. A top-down driven collaborative approach is problematic as engagement by actors outside of hierarchical control may be short-lived (Brummel et al., 2009). Another option for catalyzing social learning in an informal setting is open membership multi-actor platforms (Keen and Mahanty, 2006; Armitage et al., 2012; Medema et al., 2014). These may hold a formal or an informal status but should offer an open platform where social

learning can be catalyzed among policy actors, information providers and interest groups (Mostert et al., 2007; Armitage et al., 2012). Multi-actor platforms represent an opportunity to link actors at multiple governance levels, with diverse and conflicting opinions, interests and understandings (Berkes, 2009). These can be reconciled in multi-actor platforms, in which debate and learning occur by ensuring that exchanges between groups follow some agreed rules of engagement and decision-making (Keen and Mahanty, 2006; Medema et al., 2014).

Processes of social learning is also reliant on the operative networks and multi-actor platforms to display internal learning attributes. Internal attributes that support social learning emerge from suitable forms of collaboration, communication, negotiation and decision-making (Armitage et al., 2008). Appropriate internal collaboration is associated with diversity and pluralism, multiple type of interdependent actors, such as NGOs, farmers and governmental departments. This is to ensure a diverse interest representation with multiple perspectives on the problem domain (Mostert et al., 2007; Armitage et al., 2008; Brummel et al., 2010). This diversity is key to maintain social learning. The divergence of interests needs to recognize by mutual interdependence (Pahl-Wostl, 2002; Van Bommel et al., 2009). Social learning does not occur if dominant actors or technical experts impose their problem perception on the process (Mostert et al., 2007).

Internal collaboration between the diversity of actors in networks is preferably based on open communication and negotiation, where shared understanding is expected to develop (Mostert et al., 2007; Armitage et al., 2008). Open communication, sustained through a transparent approach through extended engagements with continuous feedback, e.g. through the dissemination of meeting minutes furthers the legitimacy and trust of learning processes (Pahl-Wostl, 2002; Mostert et al., 2007; Bommel et al., 2009). Open communication is viewed as building deliberation and appreciation fostering exchanges of perspectives (Armitage et al., 2008). Building a shared problem perception among a diverse set of actors is reliant on open negotiation, where the diversity of interests is communicated (Pahl-Wostl, 2002). In this communication process, there are no major obstacles, such as language and education barriers or travel and financial difficulties (Bommel et al., 2009). Multi-actor communication can benefit from independent facilitation, repeated meetings or small group work (Keen and Mahanty, 2006; Mostert et al., 2007; Muro and Jeffrey, 2008; Brummel et al., 2010). These can contribute towards building trust and a learning environment and mediate diverging interests relative to environmental challenges (Keen and Mahanty, 2006).

Internal decision-making processes beneficial for social learning are built on promoting joint equity (Pahl-Wostl, 2002). Decisions are reached through dialogue, by a tendency towards consensus building providing a basis for transactive decision-making (Armitage et al., 2008). Decision-making processes are based on diverse inputs where multiple types of knowledge, such as local, traditional, scientific and expert is present (Armitage et al., 2008). If internal decision-making is not based on equity, by excluding certain actor perspectives or problem definitions a decision-making bias is introduced (Hisschemöller and Hoppe, 2001; Van Bommel et al., 2009). This generates a mismatch between decision-makers' and other actors' problem frames and other actors are likely to feel disrespected and withhold their trust in policy-making procedures.

6. Contextualizing and operationalizing social learning in Baltic Sea region network governance

This chapter contextualizes and operationalizes social learning in BSR network governance. This task is guided by the norms that define social learning and the required supportive conditions for social learning processes presented in the previous chapter. The aim is to create a framework for evaluating the preconditions for social learning in a BSR network governance context. This framework is used to inform of the underlying capacity of the BSR to functionally govern the environmental challenges of the Baltic Sea.

Table 6 summarizes and outlines the conditional terms for enabling social learning in BSR network governance. The basis of interlinking social learning with BSR network governance is three stipulate learning attributes: (I) learning modes, (II) learning functions and (III) learning mechanisms. These BSR network governance learning attributes are viewed as fundamental for supporting processes of social learning. Table 6 is explained and discussed in a stepwise approach in this chapter. The first subchapters (6.1 and 6.2) view network governance from a learning perspective and reflect on different learning modes relative a functional governance. This refers to the scope of learning, as a part of individual GN, or as part of learning interlinking a plurality of GN in social learning processes. The latter is viewed as having the potential to enhance system wide learning, while the former is viewed as more specifically augmenting internal learning capacities of specific networks.

Table 6. Outline for operationalizing social learning in a functional BSR network governance

Purpose of BSR network governance learning					
To govern the challenges of the Baltic Sea by introducing a broad governance base in reducing the inbuilt knowledge gap in relation to the scope of issues and related strategy objectives and efforts					
Learning modes					
Learning <i>across</i> GN - fostering system wide learning			Learning <i>in</i> GN fostering internal network learning		
Learning functions					
Information transmission	Deliberation	Resilience	Information transmission	Deliberation	Resilience
Learning mechanisms					
Benchmarking – best practices; projects		Multi-actor learning platforms – joint development of tacit knowledge with actors from other networks		Benchmarking – best practices; projects	

Subchapter (6.3) discusses network learning functions from a social learning perspective. This subchapter employs a network and policy learning theory lens to categorize various types of learning in networks. These are central to operationalizing network learning attributes and for labelling learning attributes of networks relative to social learning processes and outcomes. Different types of learning require specific learning functions of networks. This subchapter differentiates learning types and supportive learning functions for each type from a social learning outcome perspective. This separation is critical as each social learning outcome have

different possibilities to support and enhance BSR policymaking. Social learning outcomes are key analytical components in the evaluation of the functionality of BSR network governance.

The final subchapter (6.4) studies the functionality of BSR learning mechanisms. Transnational inter-organizational learning theory underpin this evaluation. The discussions differentiate between network governance learning modes, network learning functions and lists for each network governance mode the most typical learning mechanism. Learning mechanisms are the basis for learning processes, as these collect and aggregate novel information, a preset demand for learning. The evaluation of BSR learning mechanisms focuses on their suitability and applicability to foster social learning outcomes viewed appropriate for a functional network governance of Baltic Sea.

6.1. Network governance and learning

Network governance is considered as a favorable contextual setting for processes of learning to occur (Newig et al., 2010). Network governance demonstrate necessary characteristics that support social learning processes, which target environmental challenges (Pahl-Wostl, 2009). This originates in the potential of governance networks as bridging platforms. Networks have the potential to bring together science and local knowledge, offer an arena for knowledge co-production, and trust building, vertical and horizontal collaboration as well as conflict resolution (Berkes, 2009). This is a premise for social learning.

Although network governance is viewed as providing supportive conditions for social learning, there are a number of inherent learning challenges. A general learning predicament relative to network governance is its limited direct capacity to foster policy learning. The scope of GN as learning agents are bound by their intrinsic mediator function. A reiterating view of networks is that they fulfil intermediary functions (Benz, 1996). Networks intermediary function in transnational governance arrangements derive from their primary function as informing and augmenting problem-solving capacities. This is achieved by the co-production of problem definitions and plans that are deemed relevant by the network member base. The intermediary functions of GN refer to that any concrete proposals or policy plans have to be accepted and implemented in formal institutions.

The structures of institution influence the processes in networks and network actors' behavior (Benz and Furst, 2002). Members in networks are primarily committed to institutions and gain legitimization, competencies and resources from their institutional background (Benz and Furst, 2002). The institutional background makes networks vulnerable to external influences and may reinforce internal deficiencies of cooperation. Behavior learned in institutions impair the learning functions of networks. Network members adhering to bureaucratic routines may not be accustomed to processes that strive to enable adaptability and flexibility as a mean to govern environmental challenges. Besides hierarchical aspects, cultural, behavior aspects, also external factors, political pressure and changing demand structures may constitute obstacles to learning processes (Siebenhuner and Suplie, 2005).

The institutional setting, i.e. rules, norms and structures of the network members frame and outline the preconditions for learning in a network. Different networks have dissimilar abilities and capabilities for learning. Networks intermediary function in a network governance context set boundaries for their role and their potential capacity to foster learning. Because of networks intermediary role to inform policy problem-solving capacity, networks

main role in learning processes should be viewed as intermediators, facilitating information processes and diffusing information (Benz and Furst, 2002; Parker, 2007; Newig et al., 2010). Because of the informal status of networks, lacking any formal authority over their members and towards problem solving bodies, i.e. public institutional entities who steer and develop policy, networks are no panacea for learning (Benz and Furst, 2002). However, network governance constitutes an attempt to integrate actors and their expertise to solve environmental challenges by giving access to novel knowledge and by supporting multiple ways of interpretation of this knowledge (Pahl-Wostl, 2009).

Networks are not learning systems per se (Benz and Furst, 2002), and learning transpiring in networks may not improve the governance of these challenges. Even if a network facilitates learning processes, policy authorities who are tasked to govern environmental challenges may not be included. Some networks are also closed to outsiders or network membership may not be representative, or the legitimacy of a network dealing with an issue of public interest may be disputed (Pahl-Wostl, 2009). Therefore, networks may have abilities to facilitate learning and learning processes, but have limited abilities to influence, adjust and modify policy instruments in order to pursue policy goals, or changes in basic policy beliefs and paradigms, which are deemed relevant for a functional governance.

6.2. Modes of network governance learning

A key learning predicament relative to network governance is the scope of learning, i.e. the potential range of actors involved in learning processes. In a BSR network governance context, the scope of learning is either a function of learning of an individual network, or a system wide function of a number of networks, arising from processes of learning across networks. Viewed from a functional BSR network governance perspective, to advance the collective problem-solving capacity of the region, learning across networks is regarded more beneficial than learning in individual networks. Learning across networks is considered as having the capacity to foster appropriate forms of learning, by engaging and integrating many actors with a broad knowledge base in the network governance of the Baltic Sea. Broad actor involvement is a key fundament of social learning (Mostert et al., 2007). A broad actor base draws on diverse and multiple sources of knowledge, thereby improving the possibilities to reduce the knowledge gap associated with a functional governance of environmental challenges (Pohl et al., 2010; Armitage et al., 2012).

A broad governance base may delimit the inherent learning deficits associated with network governance. The external institutional setting that frames the learning conditions of networks may have less adverse impact as a mode that entails learning across numerous networks, as opposed to internal learning within an individual network. Learning in individual networks is more dependent on the crucial role of certain single actor's external institutional preconditions for learning (Benz and Furst, 2002). This may have detrimental effects on the learning capacity relative to a specific network. Nonetheless, a broad actor base may compromise the overall learning potential. Several network actors with different resources and worldviews operating based on different forms of logics may undermine the learning capacity of a network (Benz and Furst, 2002).

Learning involving many actors underlines the relevance of social learning processes, both as a mean to connect actors from different networks and as a method to mitigate conflicts, by

fostering trust building and conflict resolutions (Olsson et al., 2004; 2006). Network governance learning that is not bound by narrow boundaries, such as a restricted membership base of an individual network, is beneficial for social learning outcomes (Mostert et al., 2007). No single network has the capacity and all the necessary knowledge to govern environmental challenges (Berkes, 2009; Armitage et al., 2012).

6.3. Learning functions of network governance

Network governance learning functions operationally categorized as the learning attributes of GN are operationalized in a policy-learning context. The presence of learning attributes is key, as these are central for GN general ability to foster learning processes. These attributes are identified through and reflected upon network theory and policy learning theory lenses. These theories provide a framework for discussing learning attributes of GN relative to social learning processes and outcomes.

GN learning attributes are compared to PN learning attributes. Learning in GN bear similarities to policy learning (Newig et al., 2010), even if the basic relational conditions between GN and PN differ. This denotes to the innovative and informal relations comprising the operational basis of GN, compared to the hierarchical relationships sustaining policy networks. Still, the learning attributes of GN and PN are viewed as corresponding. The logic of this originates in the policy domain and the relational structural basis of networks. A network as an entity exists in relation to its set task of interacting in public policy processes. Even if the relational basis of networks may differ, the underlying nature of networks are alike; networks are functions of interdependent relational policy interaction.

Network theory and policy learning theory are central to operationalizing GN learning attributes. Network theory and policy learning theory often emphasize similar learning traits (Pemberton, 2000; Koppenjan and Klijn, 2004; Nilsson, 2005; Howlett et al., 2015; Klijn and Koppenjan, 2015), even though their orientation vis-à-vis learning may differ. Pertaining to learning, the network theory approach is based on action theory that explains outcomes of learning processes based on the functional orientation of actors (Benz and Furst, 2002). Members of networks are motivated to learn by the promise of new opportunities, achieving better access to new information and profit from reduced transaction costs when collectively seeking new solutions to collective problems (Scheff, 1999). Contrary to network theory's functional view on learning, learning in policy networks often follow a constructivist orientation, accepting that various perceptions of reality co-exist (Howlett et al., 2015). Development of policy is a political affair. For example, developing policy relative to environmental challenges contradictory truths may emerge, amplified by policy advocacy activities of experts and researchers (Hoppe, 1999; 2011).

Policy learning resulting in policy change is a complex process, involving many actors in varied and dynamic processes (Sabatier, 1988, Lee and van de Meene, 2012). In the policy domain setting, learning refers to learning within specific policy problems (Lee and van de Meene, 2012). Policy learning is a *'deliberate attempt to adjust the goals or techniques of policy in response to past experience or new information'* (Hall, 1993, p. 278). The policy learning process is complex in networks (Betsill and Bulkeley 2004), as policy learning is inherently relational, i.e. dependent on the interaction among participating actors (Lee and van de Meene, 2012).

6.3.1. Network and policy network theory – a premise for conceptualizing social learning

Network theory and policy network theory use traits associated with technical, institutional and social learning to conceptualize network attributes that foster learning (Hall, 2011; Howlett et al., 2015). Generally, these learning traits foster different types of learning, which are broadly categorized as:

- ❖ *cognitive* learning: understanding of new ideas, contributing to factual knowledge;
- ❖ *conceptual* learning: changes in norms, values and belief systems;
- ❖ *relational* learning: understanding of worldviews of other actors, building of trust (Nilsson, 2005; Huitema et al., 2009; Lebel et al., 2010; Hall, 2011).

These different learning types shape and result in dissimilar learning outcomes. Each learning type requires specific learning functions of networks for fostering learning. Technical and institutional learning, which foster cognitive learning, produce learning outcomes that are broadly viewed as incremental learning. This is regarded as a normal part of the policy process (Bennett and Howlett, 1992; Hall, 1993). Cognitive learning leads to new and improved knowledge but is restricted to fostering Single-Loop (SL) learning (Argyris, 1982). Cognitive learning is concerned with adjusting existing policy instruments in order to pursue policy goals (Hall, 2011). In comparison to technical and institutional learning, social learning is viewed as supporting cognitive and conceptual as well as relational learning (May, 1992; Hall, 1993; Fiorino, 2001; Hall, 2011). Social learning provides possibilities to produce learning outcomes that not only is restricted to SL learning, but has also the potential to support Double-Loop (DL) learning outcomes.

SL learning and DL learning are normative labels of the potential effect, or outcome of learning (Bennett and Howlett, 1992). SL and DL serve as analytical components of learning. Broadly, SL learning result in superficial changes with respect to policy goal achievement, while DL learning result in more fundamental changes in policy goals (Argyris, 1992; Busenberg, 2001; Grin and Loeber, 2006; Hall, 2011). DL learning is emphasized by environmental governance theories as an ideal form of learning to functionally govern environmental challenges. DL learning enables reflections on underlying goals, norms and rules and allows for a variety of problem perceptions and alternatives to discussed. This could permit the coexistence of underlying norms and values (Newig et al., 2010; Howlett et al., 2015).

Table 7 provides an overview of network learning functions relative to social learning. Table 7 is based on categorizing social learning based on learning types (*cognitive*, *conceptual*, *relational*) and subsequent learning attributes for each type and resulting learning outcomes.

Cognitive learning in networks strives to increase the factual knowledge of network members. This refers to learning about the nature of the policy problem, pros and cons of measures aimed to address the problem, with the notion to adjust or modify policy instruments to improve the attainment of policy objectives (Howlett et al., 2015). Cognitive learning supports argumentation showing an increased understanding of what works from experience or formal evaluations (Nilsson, 2005). Dominant actors of the network need to enhance the openness of the network to create an environment that is conducive to cognitive learning.

Table 7. Networks and learning functions – viewed from social learning types

Learning trait	Type of learning	Learning attributes	Learning outcome
<p><i>Social learning</i></p> <p>(Howlett et al., 2015; Scholz et al., 2014; Johannessen and Hahn, 2012; Beers et al., 2014; Lebel et al., 2010; Pahl-Wostl, 2009; Pahl-Wostl et al., 2008; Pahl-Wostl, 2002)</p>	<p><i>Cognitive</i> (understanding of new ideas, contributing to factual knowledge)</p> <p>Learning about the nature of the problem, pros and cons of measures aimed to address the problem</p> <p>Concerned with adjusting or modifying policy instruments to pursue policy objectives better</p>	<p><i>Network structures;</i> Heterogeneity of actors, equality of network members,</p> <p><i>Network actor orientation</i> Members can be system-oriented, selfish-oriented, competitive, cooperative, risk-friendly or risk-averse</p> <p><i>Network density</i> Members of a network may be connected through direct linkages, or because all group members connect to each other through a third party</p> <p><i>Autonomy of actors</i> Refers to an actor's position inside the network refers to the actor's capacity to initiate and find acceptance within a network</p> <p><i>The dynamics of networks</i> Learning depends largely on actors' openness to new knowledge, for new ideas and cognitive impulses</p>	<p><i>Single-loop</i></p>
	<p><i>Conceptual</i> (changes in norms, values and belief systems)</p> <p>Process in which actors align, share and discuss their ideas together, with the outcome that they develop new shared mental models, form new relationships, and develop the capacity to take collective action and manage their environment</p>	<p><i>Communication structures</i> Open and transparent structures for information diffusion, also may promote the emergence of trust among different actors</p> <p><i>Reflexive learning mechanisms</i> Regular evaluations, specific committees, workshops</p> <p><i>Shared values, norms and rules</i> Facilitates the solution of actual problems, conflicts over resources, values and identities</p>	<p><i>Single-loop or double-loop</i></p>
	<p><i>Relational</i> (understanding of worldviews of other actors, building of trust)</p> <p>Fosters new relational capacities between actors, which is expected to build trust and improve collaboration and gain a novel understanding of each other's capacities and roles</p>	<p><i>Communication structures</i> Interpersonal communication</p> <p><i>Shared problem perception</i> Network actors learn how to operate thru negotiations and collaboration</p> <p><i>Trust</i> Build trust as base for a critical self-reflection, recognize mutual dependencies</p> <p><i>Network actors</i> Roles of network actors may be vital for social learning as learning conditions may be favorable with the presence of actors who emphasize the need for change and suggest alternative approaches.</p>	<p><i>Single-loop or double-loop</i></p>

The provision of information and knowledge is key to fostering cognitive learning (Benz and Furst, 2002). Cognitive innovation in networks is reliant on network structures and patterns of interaction of network members and the abilities of networks to manage conflicts (Benz and Furst, 2002). A condition for cognitive innovation is a heterogeneity of network members, interacting with equal rights in a network structure that promotes the horizontal flow of information into all parts of the network. The heterogeneity of network members with

divergent interests is a challenge relative to the solutions of conflicts. The solution of conflicts is more likely in homogeneous and hierarchical networks (Benz and Furst, 2002).

Social SL learning is supported by network structures, information flow and the adaptation of the same (Newig et al., 2010). Internal learning attributes that support SL learning include; equality of members, heterogeneity of actors, communication structures, network actor orientation, autonomy of network members and openness to new knowledge. In SL learning established roles and identities of network actors are not called into question, but remain mainly in their networks, reinforcing interaction of practice (Pahl-Wostl, 2009). SL learning excludes examination of goals, while rather involving adjustments than substantial changes (Lee and van de Meene, 2012). Social SL learning in a network refers to that members reflect on the experiences of their collective action, transfer information and knowledge individually gained among the actors and adapt the way to reach a goal (Pahl-Wostl, 2009). In relation to social learning, it is assumed that interactions in *formal* policy cycles are mainly restricted to SL learning, as policy cycle actors mainly engage in bargaining rather than open innovative discourse (Pahl-Wostl, 2009).

Conceptual and relational learning differentiate from cognitive learning mainly by their ability to foster DL learning (table 7). Social DL learning is supported partially by *informal* network of actors with regular meetings (Pahl-Wostl, 2009). For a network to be viewed as informal implies that the rules of the network and how it operates is negotiable, thus analysis is open (Pahl-Wostl, 2009). Explicit search for advice from actors outside of the established network, e.g. invitation to meetings is applied (Johannessen and Hahn, 2012; Howlett et al., 2015). Rules are not formally prescribed; the mandate is open and the results not formally binding (Pahl-Wostl, 2009). DL learning is difficult to achieve in long-term stable network relations, because the effect of social closure and group thinking is likely to hinder actors from reflecting on goals, norms and rules (Newig et al., 2010). Besides reflecting on the goals, DL learning involves a reflection the interrelations between network members (Maurel, 2003).

Processes of social learning that provide the necessary preconditions for DL learning contain elements that underpin the unity of the social context. In relational learning, there is a strong emphasis of building trust and understanding other viewpoints (Lebel et al., 2010). Interactions among and between network members are rather built on trust than on confrontation (Pahl-Wostl, 2002; 2009). Building trust among members is viewed as reducing risks and costs of interactions and collaboration. This can foster new relational capacities between actors, including improved collaboration and a novel understanding of each other's capacities, viewpoints and roles (Pahl-Wostl et al., 2008; Lebel et al, 2010). This may be used as a base for self-reflection, reflecting on members' subjective opinions concerning the dynamics and cause-effect relationships in the system to be governed (Pahl-Wostl, 2009).

6.3.2. Key transnational network governance social learning functions

Learning in a transnational context is demanding and requires adaptation in many directions (Hassink and Lagendijk, 2001). Processes of transnational policy learning need to contend with a series of barriers: dissimilar societal preferences, language difficulties, lack of awareness among actors and lack of time for policymakers to develop an understanding of foreign experiences (Malik and Cunningham, 2006; Borrás, 2011). Transferring transnational learning

into effective policies requires adaptive capacity of networks and contextual intelligence of policymakers (Borras, 2011).

A further premise for transnational social learning to occur is sustained network interaction (Reed et al., 2010; Cundill and Rodela, 2012). The stability of networks is pivotal for sustained interaction. Stable networks not only underpin sustained interaction, they are also critical for the legitimacy of the networks. Stable networks imply that members can develop long-term relationships with at least some other members so that each understands other's strengths and weaknesses and responds to maximize the outcome of the network (Provan and Kenis, 2007). Sustained interaction offers the fundament for building trust among network members (Edelenbos and Klijn, 2007; Provan and Kenis, 2007). Stable networks that facilitate trust among their members are also linked to network effectiveness (Provan and Milward, 1995; Provan and Kenis, 2007).

Sustained interaction is hence a requirement for social cognitive, conceptual and relation learning. The mode of social interaction determines at what level learning takes place: from incremental improvements, through information transmission of new facts, generating SL learning, to reframing where assumptions are reconsidered in dialogue and exchange of arguments, i.e. deliberation that has the potential to result in DL learning (Pahl-Wostl, 2009; Lebel et al., 2010; Medema et al., 2014). Deliberation describes general processes that raise and collectively consider issues, increase understanding and arrive at decisions (Schusler et al., 2003). Deliberation occurs in many formats, from public meetings to alternative dispute resolution techniques. Deliberation processes can empower action and acceptance, enhance learning and democratic practices (Forester, 1999; Schusler et al., 2003).

Information transmission, through the interaction and communication of actors, is a baseline condition for social cognitive learning. It has the potential to enhance networks by combining network members' different competencies and knowledge resources (Newig and Günther, 2005; Newig et al., 2010). Deliberation is therefore a necessity for social conceptual and relational governance network learning. Deliberation occurs when not only knowledge but also norms, values and perspectives of different actors are shared. This leads to solutions that are creative and more broadly accepted (Newig et al., 2010). Deliberation involves exchange of ideas and arguments. Networks can provide opportunities for deliberation, by way of group interactions, or related multi-actor interfaces. Deliberation is expected to produce more creative ideas and solutions through intensive group interactions, compared to a situation in which network actors are reasoning by themselves (Newig et al., 2010).

Transnational social learning sets demands on the structural requirements of networks. Networks need to demonstrate resilience. Resilience refers to the capacity of networks to retain their core functions in the face of change (Newig and Günther, 2005; Newig et al., 2010). A resilient network is more effective with regard to learning, as a sudden exit of a key member or resourceful member does not impede the networks' ability to foster learning. For instance, if an important member in a small network structure suddenly leaves the network, the entire network might encounter difficulty in maintaining its function (Newig et al., 2010).

The potential of networks to allow information transmission, deliberation and uphold its resilience is dependent on key network characteristics (Newig and Günther, 2005; Newig et al., 2010). Table 8 lists characteristics that are central to the learning functions of a network.

The learning characteristics of networks are grouped based on the three key learning functions, either as facilitating or impeding learning in networks (Newig et al., 2010).

Table 8. Network characteristics and their influence on networks ability to foster learning (Source: Newig et al., 2010)

Network characteristics	Information transmission	Deliberation	Resilience
Network size (Number of actors in a network)	+	+/-	+
Network density (Interconnectivity of members)	++	+	+
Network cohesion (Extent which members empathize with each other's objectives)	+	++	+
Network centrality (Concentration of power in a network)	+	-	-
Network homophily (Members sharing common characteristics)	+	+	+
Network multiplexity (Ties of multiple types linking the same actor in and across relationships)	+	+	+

Network density is key in relation to information transmission. The denser a network, i.e. the more relations exist in a network, the more easily information will be transmitted (Newig et al., 2010; Rijke et al., 2012). Density ensures that there are no gaps in the network that might result in a critical break in communication and information sharing (Parker, 2007). Information transmission is easier in centralized, as opposed to decentralized networks (Crona and Bodin, 2006). A centralized network allows information to flow, whereas in a decentralized network, several members have to be linked until communication reaches the recipient (Newig et al., 2010). Larger networks are less dense than smaller ones because of the quadratically growing number of possible relations (Scott, 2000). In a less dense network, information can become distorted when transmitted via a great number of different actors. In relation to this, the role of knowledge brokers in networks is accentuated as these can function as brokers between diverse groups or coalitions (Howlett et al., 2015).

Ties among actors in networks can be characterized in different ways. Strong ties or network homophily, suggests that actors interact with other that share common features, such as beliefs, values and education. They share similar attributes that make relationship formation and communication easier (Newig et al., 2010). The dissemination of knowledge and flow of ideas mostly occurs among members who are similar, or homophilous (Rogers, 1995). Similarity breeds connection (Lee and van de Meene, 2012). Network homophily is valuable for information transmission, since a network with a high degree of homophily is supposed to distribute information and knowledge more quickly, i.e. the actors have a better source for learning (Powell, 1990; Cross et al., 2001).

Network multiplexity, i.e. the ties of multiple types linking the same actor or interaction of exchanges within and across relationships (Koehly and Pattison, 2005), supports information diffusion (Newig et al., 2010). Networks in which ties are of multiplex nature are more flexible than homophilous ties, but at the same time weaker (Newig et al., 2010). Weak ties can bridge

longer distances in a network and may link members with actors outside the borders of the network, providing new information and knowledge for the network. Weak ties are less suitable for creating trust, shared values and norms. Strong ties may support deliberative processes, as homophilous networks can generate trust among actors (Newig et al., 2010). Still, homophily may also breed confirmation bias of network actors, as homophilous actors tend to close their views to outside information (Krackhardt and Stern, 1988).

The more actors there are in a network, the more there is to learn from them and the more resilient the governance network is (Newig et al., 2010). However, a network with a large number of actors may have difficulty to participate in deliberative exercises (Newig et al., 2010). Trust in a network is viewed as originating from dense and small networks. Trust becomes less densely distributed throughout the network, as the number of members gets larger (Provan and Kenis, 2007). Trust is not only critical for deliberation; it is also frequently associated with network performance and efficiency (Provan and Kenis, 2007).

Deliberation is more likely to occur in a dense network, because networks in which actors know each other well show potential for it (Newig et al., 2010). Deliberation is supported by high network cohesion, where members empathize with each other's objectives (Gargiulo and Benassi, 2000; Rijke et al., 2012). A dense and strong cohesive network tends to be less able to adapt to fundamental change, because it tends to be trapped in its own thinking (Newig et al., 2010). Conversely, limited network cohesion suggests that several sub-groups may be present, which may be detrimental to the overall network collaboration, if there is a lack of ties between the sub-groups (Rijke et al., 2012). The existence of several sub-groups may advance the knowledge production, enhancing possibilities for the production of novel information. A network where power is concentrated, as opposite to a network where power is more distributed is less suitable for deliberation (Rijke et al., 2012), as it tends to be more resistant to abrupt change (Newig et al., 2010).

6.4. Transnational learning mechanisms and social learning

Social learning theory outlines the normative demands of the learning mechanisms relative to facilitating transnational social learning processes. Mainly transnational learning mechanisms should constitute platforms, or venues, that support social learning by generating novel information, through their ability to interlink knowledge from a range of actors. The learning mechanisms should amass novel information with the help of collaborative and participatory processes, which eventually catalyzes social learning amongst policy actors, information providers and interest groups (Armitage et al., 2012; Medema et al., 2014).

A basic precondition is that transnational learning mechanisms should support and enable group learning. The mechanisms should constitute transparent participatory platforms that produce novel information on which group learning can be based upon (Mostert et al., 2007). The mechanisms should allow for broad and open horizontal and vertical actor participation that strive to foster the exchange and joint development of tacit knowledge (Keen and Mahanty, 2006). Key is also that the mechanisms support the diffusion of this information to create cross-level interplay across and within participating actors.

The social learning theory also sets particular demands on the governance setting to support the capacity of the transnational learning mechanisms to generate novel information. A demand is the presence of structures that enable horizontal interaction among actors at

different levels and vertical interaction of actors at other levels (Berkes, 2009; Medema et al., 2014). The interconnectivity of the system setting is pivotal to link and transmit information and to support deliberation (Valente, 2005; Newig et al., 2010). Deliberation is dependent on linking the diversity of a transnational knowledge pool, through a learning lens that emphasize cross-scale informal interactions, connecting network actors at multiple levels (Adger et al., 2005; Olsson et al., 2006; Pahl-Wostl, 2009).

6.4.1. Benchmarking – learning by imitation

Generally, transnational learning processes are dependent upon specific mechanisms used for generating and synthesizing novel information and knowledge. These mechanisms have their origin in inter-organizational learning theory (Wink, 2008). Typical transnational learning mechanisms are benchmarking, best practices, peer reviews and projects (Wink, 2008; Borrás, 2011). These are designed to let policymakers and actors learn from each other (Borrás, 2011). Transnational learning is promoted via imitation through exchanges of experiences (Bomberg, 2004). Actors study each other's policy experiences and imitate best practices. However, effective imitation of best practices requires learning capacity and contextual intelligence of policy-makers. The identification of best practices needs to consider socio-cultural differences residing at different levels of governance. It is difficult to classify elements of success in specific cases of policymaking due to elements of tacit knowledge among policy-makers and actors (Nauwelaers and Wintjes, 2008; Borrás, 2011).

The most common transnational learning form is based on benchmarking and best-practice studies. The aim is to look for solutions found in best-practice organizations, analyze these and transfer to other contexts (Browne et al., 1995). Benchmarking has emerged in the last decades as a channel to gain knowledge from experiences in other organizations (Wink, 2008). EU advocates the use of benchmarking in a transnational setting, by accentuating and utilizing best practices and projects (Lundvall and Tomlinson, 2002; Wink, 2008). The EU offers financial support, via various project schemes, to foster learning by producing learning outcomes in the form of benchmarking. This originates from efforts by the EU to stimulate transnational policy learning, by spreading best practices among EU MS (Malik and Cunningham, 2006).

The logic of benchmarking as a mechanism for transnational learning is that it stimulates learning by comparing or by imitation (Lundvall and Tomlinson, 2002). This is expected to provide new knowledge to define, assess and adjust strategies based on the orientation on comparisons between different units (Wink, 2008). Crucial to learning via benchmarking is the process of knowledge transfer and the exchange of experiences through proper structural interlinkages between participating actors. The process of integration experiences from best practices is framed by conditions of the different participating actors. However, benchmarking approaches often lack necessary tools and incentives to integrate experiences and to initiate shared transnational learning processes (Wink, 2008).

The idea to learn by comparing, with the expectation of gaining new knowledge from experiences that have emerged under completely different conditions, implies that learning is restricted to incremental learning, or SL learning. This refers to imitation without consideration of contextual differences (Wink, 2008). Learning by comparing and imitation is bound by the features of path dependency (Malik and Cunningham, 2006). Path dependence

makes it difficult to dispose of prior commitments. Even if there is a new way of dealing with a common policy challenge, policymakers tend to carry on as before, because of the political, economic and social costs of switching a policy they have inherited (Mahoney, 2000; Malik and Cunningham, 2006).

Benchmarking approaches are usually implemented and promoted by the usage of projects. Projects are viewed as suitable transnational mechanisms that foster learning by generating and amassing new knowledge through their transience and interdisciplinary nature (Grabher, 2004; Bakker et al., 2011). Projects are expected to generate novel knowledge to solve multi-causal problems in complex and cross-sectorial settings (Sbarcea and Martins, 2003; Löfgren et al., 2013). The broad usage of project as learning mechanisms is backed by the EU through its various project-funding schemes, e.g. the European Social Fund and the Interreg program, which supports interregional cooperation in Europe.

Though projects generate novel information, the temporary nature of projects inhibits the sedimentation of knowledge. When projects dissolve and participants move on, the created knowledge is likely to disperse (Grabher, 2004; Ibert, 2004; Cacciatori, 2008). This challenge is aggravated in inter-network projects, where multiple actors work jointly to produce a complex service in a limited amount of time and multiple knowledge flows occur at the same time (Jones and Lichtenstein, 2008). In general, project learning is distinctive in several respects (Grabher, 2004; Scarbrough et al., 2005). It is non-repetitive and time-bound, loosely coupled to multiple network contexts (Sydow and Staber, 2002). Projects lack group-building effects, through strong ties continued participation and common identities (Gherardi et al., 1998). Learning in projects is based on knowledge integration activities that involve overcoming, rather than deepening divisions of practice among project members.

Project learning is reliant on transferring project knowledge to a lasting setting (Scarbrough et al., 2005). This refers to that the project owner, e.g. the project funding body, needs to demonstrate high absorptive capacity (Bakker et al., 2011). The project owner needs to identify the value of the knowledge that is created in the project and diffuse this knowledge, so that the knowledge created in the temporary project is broadly available (Bakker et al., 2011). It implies that the funding body needs to be able to capture and sustain knowledge gained by the means of a project (Löfgren et al., 2013). Furthermore, it needs also to safeguard that experience gained in one project is transmitted to ensuing projects, thereby avoiding repeating mistakes (Brady and Davies, 2004). Because when project finishes, members often have little motivation to reflect on their experience and document transferable knowledge for future projects (Coombs and Hull, 1997).

A shortcoming vis-à-vis the role of projects as learning mechanisms is that the achievements of projects are rarely transferred. Rather they tend to give rise to new projects (Löfgren et al., 2013). The issue of knowledge transfer in projects is a complex matter involving configurations of multiple actors. There are usually weak support structures of transferring project knowledge to e.g. funding bodies (Sjöblom, 2009; Rosenschöld, 2017). This could be related to insufficient resources dedicated to gather project knowledge available to funding bodies (Rosenschöld, 2017). A low degree of information diffusion could be explained by the challenges of validating knowledge from contextualized projects, stressing the uncertainties of applying project results in a wider context (Rosenschöld, 2017). In addition, there is no guarantee that project-learning experiences working in one distinct area can work in another

area. This is especially the case in socio-ecological systems, where learning may be very place and time-specific (Armitage et al., 2008). The difficulties of diffusion project knowledge is illustrated by the misfit between the temporal orientation of short-term projects and permanent organizations, such as governmental agencies who develop policy (Sjöblom, 2009; Sjöblom and Godenhjelm, 2009; Rosenschöld, 2017). While the work of the former is driven by unpredictability and need for adaptiveness, the latter is concerned with routines and efforts to create coherence (Rämö, 2002). This temporal inconsistency may cause friction in relation the coherency and stability of the learning process, which may further complicate the vertical knowledge diffusion, i.e. scaling up project knowledge to higher levels of decision-making such as regulatory agencies.

Projects can generate and induce social learning on a basic level, through serving as a platform for including actors from different sectors and with different knowledge. The participation of actors with different knowledge levels can be viewed as enhancing social learning (Valve, 2006). This is dependent on that project actors learn to work together and build relationships that allow collective action (Cundill and Rodela, 2012). However, the temporality of projects hardly leave time for project participants to develop personalized trust based on shared experiences or social coherence (Grabher, 2004). Frequent modes of face-to-face interaction may build social trust, which could serve as a basis for social learning among project actors (Newig and Fritsch, 2009; Scholz et al., 2014). Projects are unlikely to produce deliberative interaction on a large scale amongst multiple actors (Cundill and Rodela, 2012). This would require the support of sustained interaction between project actors, deliberation and sharing of knowledge in a trusting setting. Deliberation is dependent on long-term self-organizing processes, whereas project's overarching focus on deadlines leaves little time for deliberative reflections (Grabher, 2004; Cundill and Rodela, 2012).

6.4.2. Multi-actor learning platforms

Multi-actor learning platforms, such as forums, workshops and seminars, have the potential to catalyze social learning (Berkes, 2009; Armitage et al., 2012). These are viewed as venues for multi-actor arrangements where actors can interact, learn collaboratively and take collective decisions (Keen et al., 2005). The promise of multi-actor learning platforms is their potential to integrate a broad actor base in the co-production of novel knowledge. The latent social learning capacity originate in the emphasis on the co-development of tacit knowledge elements from networks with members from different organizations (Grabher, 2004; Giuliani and Bell, 2005; Steiner and Hartmann, 2006).

There are three general conditions the multi-actor learning platforms needs to display relative to generating social learning. Table 9 lists the general learning functions of a multi-actor learning platform relative to SL and DL social learning. The first general function is generating novel knowledge via *information transmission*. The diffusion of information in learning platforms transpires through an open knowledge production (Pahl-Wostl, 2002; Mostert et al., 2007). The knowledge production is reliant on transparent integrative multi-actor interactions, convening actor's representative of a multi-level setting. This allows for an extensive horizontal and vertical actor participation and a foundation for amassing a broad knowledge production. Social learning is reliant on heterogeneous actor participation in learning platforms (Keen and Mahanty, 2006; Medema et al., 2014). The composition of the learning platforms should accentuate pluralism, involve many types of actors connected across

multiple levels, including the involvement of non-members, e.g. researchers, experts and NGOs (Armitage et al., 2008).

Table 9. Multi-actor learning platforms and social learning

Social learning through multi-actor platforms	Single-loop learning	Double-loop learning
<p>Information transmission</p> <p>The collaboration platform needs to support information transmission through interaction and communication of actors based on:</p>	<p>A heterogeneous base, pluralism among members, involving multiple types of actors, representative of multiple governance levels</p>	<p>A heterogeneous base, pluralism among members, involving multiple types of actors, representative of multiple governance levels.</p> <p>Active involvement of actors, which are not regular members</p>
<p>Deliberation</p> <p>Need to demonstrate support for open dialogue and sharing ideas for spurring creative innovations</p> <p>The operational basis of the platforms determines the underlying shape and form of dialogue:</p>	<p>Operates based on closed formalized procedures, adhering to formal rules and norms</p> <p>Information transmission of new facts and knowledge</p> <p>Responses are made to routine errors</p>	<p>Operates based on open informal procedures, where informal rules and discourse applied</p> <p>Reframing assumptions, new creative solutions and ideas developed</p> <p>Responses are made to values and policies from which routines are derived</p>
<p>Resilience</p> <p>Platforms need to show resilience to support learning</p> <p>The continuity and longevity of the learning processes taken place in platforms is based on the capacity to retain its core function in the face of change</p>	<p>The core function is based on a continuous, reliant source of financing, with attached personnel upholding the activities</p> <p>The continuity and longevity of a platform is interlinked with traits of far reaching institutionalization, providing an institutional memory, with standardized norms and values</p>	<p>The core function is based on a continuous, reliant source of financing, with attached personnel upholding the activities</p> <p>The continuity and longevity of a platform is interlinked with some traits of institutionalization, ensuring a continuity of activities, whilst not compromising the creation of non-standardized innovation</p>

The second condition is that multi-actor learning platforms need to demonstrate capacity for *deliberation*. This is viewed as arising from the internal operational procedures, which defines the form and function of a platform. A necessity for deliberation and social learning is equality among members. Learning platforms should operate on an equal basis and rights (Pahl-Wostl, 2002). They should be system-oriented and open to ideas and knowledge, driven by a transparent knowledge production seeking explicit advice outside the established members. The potential to share norms, values and ideas is easier in learning platforms that operate based on open, informal procedures, as opposite to than with formal procedures (Armitage et al., 2008). Social learning organized in formal settings often results in limited freedom to learn and develop alternative solutions (Rijke et al., 2012).

Informal rules supported by informal discourse are useful for deliberation. Learning platforms should not adhere to any formal set of rules, instead the mandate and analysis should be open

and results not formally binding (Pahl-Wostl, 2009). A key factor regarding social learning and deliberation is the notion of trust as an element identifying common interests and resolving conflicts (Hahn et al., 2006). Multi-actor learning platforms ability to catalyze trust among participating members is dependent on regular modes of face-to-face interaction and iterative interaction between participants (Keen and Mahanty, 2006; Brummel et al., 2010).

The final condition is the *resilience* of a multi-actor learning platform (Newig et al., 2010). This is a precursor to sustained and iterative interaction in a multi-actor learning platform. Social learning requires long-term working relationships to foster e.g. trust. Resilient platforms ensure congruency and longevity of the interaction between actors. Platforms that are of temporal nature often put explicit timeframes for interaction. This is comparable to the temporal nature of projects, supporting temporal learning dimensions. Resilient learning platforms supported by operational longevity have the capacity to support long-term social learning processes (Cundill and Rodela, 2012). The operational longevity of multi-actor platforms is reliant on the structural set-up of learning platforms: financial basis, personnel upholding the learning platforms and the tenure of the involved actors. A preference is that learning platforms are supported by institutional memory, to avoid short-term learning-based functions and to ensure continuous information diffusion.

7. Preconditions for Baltic Sea region network governance learning – an empirical evaluation

This chapter interlinks the principles of the conceptual framework on network governance, operationalized and conceptualized from a BSR network governance social learning perspective, with the key research findings of the articles in this thesis. These operationalized theoretical norms are used to guide the evaluation of the preconditions for social learning in a BSR network governance context. The prime focus is to link the operationalized theoretical framework with the empirical findings of the articles and deliver insights of social learning in a BSR network governance operational context, hence answering the research question posed in the first chapter: *'What are the preconditions for network governance learning in the Baltic Sea Region?'*

This chapter answers the research question in a stepwise approach. *First*, the peer-reviewed articles in this thesis are presented relative their specific task in contributing towards the empirical evaluation of the preconditions for BSR network governance learning. Generally, the articles inform to what extent the BSR network governance operative setting supports the presence of social learning processes. Theoretically, the articles expand the knowledge on and understanding of linking multi-level network-based governance with learning. To this end, the presentation of the articles also includes their theoretical aim, especially relative to developing the theory on network governance.

Second, the structural and relational properties of BSR network governance is discussed. Here, social learning norms are compared to the general internal structural and relational modes of BSR networks. These set the boundaries for social learning and frame the preconditions for social learning in the region. *Third* and *finally*, empirical evidence concerning the preconditions for BSR social learning is presented and evaluated. This evidence is analyzed based on social learning underpinnings to offer an analytical baseline of the operational ability of the BSR network governance system to functionally govern the Baltic Sea.

7.1. Empirical findings – a premise for understanding Baltic Sea region network governance

Primarily, the articles contribute to an understanding of the extent to which the BSR network governance operative setting supports the presence of social learning processes by evaluating the relational embeddedness of this system. The articles develop contextual understanding of the relational interconnectivity of the BSR network governance system. Relational multi-level interlinkages within and across networks are a precondition for supportive conditions of social learning. The articles expand the understanding of the capacity of the BSR governance to support and sustain social learning processes by offering knowledge of the interconnectivity of the system setting and builds insights of the preconditions for BSR interaction. Interaction through communication and cooperation is a necessity for linking the distributed capacities for policymaking into social learning processes. Collectively, the articles offer information of the operative conditions to foster a holistic network governance approach relative to the governing of the Baltic Sea.

A summary overview of each article is presented below:

Article 1: A tangled web: the Baltic Sea region governance through networks

Article 1 is case study that comprises the full contextual spectrum of the BSR. The case study describes the transnational operational setting of the BSR network governance. This is illustrated by evaluating the operative features of this context, describing and comparing the various modes of self-organizing networks in the region. The subject of this evaluation is the structural and relational modes of these networks, which determine their form and function. Article 1 evaluates the relational conditions of the region, which outlines the broader BSR patterns of cooperation and interaction interlinkages. This is of interest relative to social learning, as it develops the knowledge of the BSR network governance learning capabilities, by offering an explanatory framework for interpreting contextual interrelation challenges embedded in the BSR operational setting.

Theoretically, the article evaluates the functionality of BSR network governance as a mode of governing. It delivers insights of the proficiency of BSR network governance, informing the extent to which the structural and relational setting of the region has the capacity to link a broad actor base in providing cooperative and innovative policy responses. Article 1 evaluates if the operational reality of a multi-level network governance setting conforms to the positive normative view associated with the concept of network governance.

The article illustrates that the structural and relational conditions of the BSR GNs are generally aligned with traditional PNs, as oppose to an innovative governance approach that is associated with network governance. The structural and relational composition of BSR GNs are aligned with features portraying regulated PNs, which are generally associated with traditional forms of government. The BSR relation interlinkages are generally defined by hierarchical norms and relational dependencies. The BSR GNs are not structurally composed to serve the relational demands arising from the normative premise of network governance. The article questions the underlining promise of BSR network governance as an innovative mode that is viewed as enhancing the problem-solving capacities.

Article 2: Governing national parks in Finland – the illusion of public involvement

Article 2 is a case study of the Finnish governance model for the protection of natural large-scale resource systems in the Baltic Sea vicinity. This model is rather centralized from a European perspective, as it applies a centralized administration in the protection of national parks. The Finnish model is not obligated by law to involve local actors in the governance of national parks. Article 2 is a case study of an institutionally guided national PN that has hitherto pursued an instrumentalist approach but has an ambition to integrate an adaptive and participatory approach in the governance of natural parks.

The case study evaluates the conditions for local actor participation in the governance of the protection of the Archipelago national park. It describes a PN's attempt to introduce adaptive collaborative means to enhance the governance of natural large-scale resource systems. The ambition to integrate local lay knowledge in the governance is to guide the feedback of governance efforts, to increase the legitimacy of the governance processes and to reduce inbuilt governance conflicts.

This case study is of particular interest for two reasons. First, it evaluates an experimentation of a participatory approach in the governance of natural resource systems. It exemplifies an attempt to move away from traditional forms that place priority on biological monitoring, focusing on the impacts of actions that underpin an expert driven technocratic government practice. The Finnish experimentation aspires to instigate feedback loops between ecological systems functioning and the surrounding society. This is to support the creation of learning induced governance arrangements.

Second, the case study emphasizes the challenges of governing natural resource systems in the BSR. The governance of the Archipelago national park is contested. Since the inception of the park, local actors residing near the park have had quite different views of the usage of the park, as oppose to the conservation efforts of the government authority in charge of the management of the park. There is antipathy shown by local actors towards the management of the Archipelago national park. This was visible during the collection of the survey data for the evaluation of local actor participation in the governance of the national park. Many local actors contacted the survey team, via phone or email, and stated that they would not respond to the survey. They felt that responding would not make a difference on improving the governance of the national park, since they did not have any confidence in management.

This study highlights inherent relational tensions present in governing BSR environmental challenges. In this instance, there are diverging perceptions as to usage of the national park, where conservation interests meet local livelihoods. Article 2 displays the difficulties of creating relational interlinkages in a contested setting. A lack of interaction and relational structures and an absence of ensuing information and knowledge diffusion is detrimental in the creation of a learning-based governance context.

Article 3: Towards an ecosystem approach to management in regional marine governance, the Baltic Sea context

Article 3 is a case study of the BSR marine environmental governance. The study evaluates the extent to which BSR networks and existing network action programs are focused on changes towards a holistic governance approach. The subject of the analysis is the BSAP of HELCOM and the structural changes of ICES. Article 3 expands the knowledge of BSR marine environmental governance compatibility with a shift from traditional governance efforts based on biophysical problem-solving, scientific risk assessments to ideas involving integrated ecosystem approaches. The article evaluates the operational reality of the BSR governance relative to the normative goals of an integrated EAM governance approach. This is achieved through analyzing the BSR marine governance arrangements relative to dealing with environmental challenges via multi-scale, multi-sector and multi-actor approaches in policy design, knowledge production and decision-making. The point of interest is how this operational setting supports the turn towards an integrated BSR EAM approach.

Article 3 conveys insights of the challenges in the development of an EAM approach to BSR marine governance. The focus is on the structural conditions that undermine a successful turn towards an EAM approach. Article 3 identifies insufficient institutional change, limited cooperation over policy sectors and adjustment problems caused by path dependency as key structural challenges for introducing a BSR EAM governance approach.

The article underlines the structural problems of governing the Baltic Sea. For example, the BSR environmental challenges are collective problems that reside at a transnational level, while policy financing, implementation, enforcement and monitoring are placed at national level. The BSR network governance system setting is complex and requires not only a multi-actor and multi-sector, but also a coherent multi-scale approach. The structural deficits relative to introducing a BSR EAM governance approach may partly be an effect of nationally induced path dependency relational behavior, which are mirrored through the actions and behavior of BSR networks and their programs. This suggests that not only the relational behavior of BSR networks, but also the relational patterns that define actor behavior at a national level need to adhere with EAM governing principles.

Article 4: Fostering a functional governance of the Baltic Sea region: The network governance of the EUSBSR

Article 4 is a case study of the EUSBSR. The EUSBSR captures the physical boundaries of the Baltic Sea and encapsulates the promise of network governance: to foster interaction and cooperation by BSR GNs, with the view to support these to develop policy arrangements needed for governing the challenges of the Baltic Sea. The Strategy is the main relational capacity builder in the region. It supports the BSR relational conditions by linking networks, their members and other actors across policy levels and sectors through various interaction and collaboration platforms.

Article 4 is designed to facilitate network governance theory development. It contributes to the second generation of research into network governance by exploring options that could improve the governance of the Baltic Sea. It develops theory by linking network governance with social learning. Article 4 explores the EUSBSR's latent potential to foster social learning in a network governance context. It evaluates the EUSBSR's ability to foster social learning across BSR GNs. The subject of the evaluation the SGs. These function as collaboration and interaction platforms within the broader frame of the EUSBSR. The SGs are to support PACs and HALs in their interaction with relevant actors and to function as cooperation platforms. Article 4 evaluates whether the structures and key relational features of the SGs offer the necessary preconditions for fostering social learning across BSR networks.

The article offers valuable observations of the challenges of fostering social learning through the EUSBSR. These challenges are an extension of the collaboration and interaction patterns that outline the BSR network governance. The structural determinants of the EUSBSR, along with the relational conditions that outline the SGs, are defined based on a command and control regime environment. The operational features of the EUSBSR are constructed based on a learning premise, where policy-learning routines are advocated and facilitated by the proliferation of good practices studies and benchmarking. This creates a social learning dilemma, as interaction and collaboration is shaped by a top-down unidirectional approach. Policy learning is condensed by exchanges of experiences without consideration of contextual divergences.

Article 4 provides a narrative of a broader transformative process that captures the evolving relational conditions for developing policy in the BSR. It shows the growing importance of EU's ability to shape BSR network governance. Indicative of this transformative change is

EU shaped policy development foundations. The ability of the EUSBSR to generate social learning is hampered by the EU principles of policy learning, which underline learning by imitation through short-term, temporal interaction. EU induced learning beliefs advocate policy development through processes of incremental learning, which does not facilitate a holistic governance of the Baltic Sea.

7.2. Social learning and Baltic Sea region network structures

Social learning is context dependent and is essentially an outcome of cooperation of actors operating within this context. The BSR network governance as a system setting is made up of three different modes, each representing a typical model that governs the internal structural and relational basis of BSR networks (article 1, table 1). Each mode adheres to specific network features, which govern their operative structures and their membership base.

The prevailing BSR network mode '*intergovernmental cooperation*' is embodied by a stable, restricted, homogenous and uniform membership structure. A majority (58%) of the public BSR GNs adhere to this mode and operate by a structural premise guided by institutionalized forms, where decision-making is solely reserved for national level authorities (article 1, table 3). Their relational basis is defined by restricting hierarchical procedures that limit the scope of interaction to peers on same level. Other BSR network modes include '*international policy networks*' (13%) and '*transnational networks*' (29%). The former mode operates with an open, heterogeneous membership structure that excludes the involvement of national authorities but allows cooperation among other multi-level actors. The latter mode promotes linkages between actors from government, local government and NGOs, and includes all actors into the internal decision-making (article 1).

A premise for broader processes of social learning to occur in the region is the extent to which the internal structural and relational basis of the operative BSR networks are geared towards learning. Generally, BSR networks are large networks that comprise of many actors (article 1). The largest BSR network is the Union of the Baltic Cities (UBC) with ca 100 member cities. UBC operate based on a decentralized network model. The operations are centered on seven commissions, with selected member cities hosting the various commissions that are in charge of key policy areas.

In addition, the most intergovernmental networks operate based on a rather large number of actors (article 1). For example, the CBSS represents the wider interest of the all 11 BSR MS, including Iceland and Norway that lack a physical border to the Baltic Sea. Each member in the CBSS is represented by a broad representation, covering policy areas targeted by CBSS activity. CBSS and other inter-governmental networks are structurally decentralized into different divisions, each of which heads a policy area. CBSS members need to nominate member representation to all of these divisions. Thus, the actual number of members in inter-governmental networks are quite many.

The majority of the BSR networks operate with a large member base, which provide a basic fundament to generate social learning. The large size of the BSR networks offer opportunities for social learning, through the integration of amassed knowledge diffused in the networks. However, large decentralized BSR networks makes interaction and knowledge diffusion

within the entire network more demanding. In large BSR networks, members have more difficulties to develop interrelations. The decentralized model that most BSR networks structure their internal mode of operations adds challenges vis-à-vis developing and sustaining interrelations across policy sectors. This model may create internal structural silos that impedes the broader development of social ties among the plurality of policy actors engaged in a network.

A particular feature of the BSR networks that adds a temporal element in the development of the internal relational network basis is the inbuilt rotation of administrative personnel and of network member representation. This is particularly relevant of the BSR inter-parliamentarian and inter-governmental networks, which comprise the majority of the operative networks in the region. Administrative personnel are employed based on pre-set working contracts. Often their term of employment is set for four years, with a possibility for a two- or four-year extension. The political network member representation is often aligned with the political mandate originating in their national context. Overall, the internal rotation is a detriment to social learning, as it expands short-term interaction elements that affect not only the formation of relations but is also a disadvantage relative to the long-term knowledge sedimentation in the networks. In addition, it may hinder the overall expansion of the contextual intelligence of BSR actors needed to navigate the social learning processes in the region.

Generally, the operational structures of most BSR networks offer a mixed picture relative to generating social learning. There are structural challenges relative to social learning. The prevailing BSR network mode is detrimental to social learning. It has an inbuilt inclination to restrict the internal network relational capacities for integrating a varied mix of actors with a diverging knowledge base in possible social learning processes. The internal interaction within inter-governmental networks is affected by path dependencies emerging from the institutional context of their members (article 3). The procedures for the formation of most BSR network relational bases are steered based on national institutional pretexts. Nationally driven policy relations shape the relational interaction BSR policy procedures. This rigid setting may be detrimental to broader BSR social learning, as there is an inevitable tension in interlinking relational ties formed under a national pretext of institutional inertia with normative social learning relational requirements.

7.3. Social learning in the Baltic Sea region network governance

The empirical evidence concerning the preconditions for BSR social learning are presented in this subchapter. Table 10 outlines a general framework for evaluating the preconditions for social learning in a BSR network governance context. Table 10 is created based on theoretical deduction. The theoretical reasoning of tables 4, 5, 7 and 9 informs the construction of table 10. The table condenses the operationalized norms and parameters that supports and sustains social learning in a network governance setting. Table 10 is grouped in:

- ❖ *General social learning principles*: broad actor involvement + long-term interaction + learning acknowledged (table 4)
- ❖ *Contextual demands*: informal setting + interconnectivity + opportunities for catalyzing social learning (table 5; table 9)
- ❖ *Actor demands*: internal collaboration + internal negotiation + internal decision-making (table 5; table 7)

The empirical content of the four peer-reviewed articles is evaluated in table 10 based on the employed interactive research design of the thesis. The article content that define and outline the BSR network governance system features relative to social learning is condensed with the help of a five level Likert scale. The summarization of the article content generates descriptive and exploratory context-bound knowledge that is used to create an analytical baseline informing whether BSR network governance can foster and sustain social learning.

Table 10. Preconditions for social learning in BSR network governance – an analytical overview

BSR network governance			
General social learning principles	Broad actor involvement: --	Long-term interactions: +/-	Learning acknowledged: +
Preconditions for social learning – contextual demands	Informal setting: -	Inter-connectivity: -	Opportunities for catalyzing learning -
Preconditions for social learning – actor demands	Internal collaboration: +/-	Internal negotiation: +	Internal decision-making: +

General social learning principles

Broad actor involvement

The theory on social learning maintains and advocates that a foundation for social learning is broad actor involvement and integration of their ‘frames’ in the governance of natural ecosystem resources. As a network governance system, the BSR does not foster a widespread presence of broad actor involvement that could systematically integrate the different ‘frames’ of actors in the governance of the Baltic Sea (article 1; article 4). Different BSR actor ‘frames’ symbolizes the in-built conflict between the exploitation and protection efforts of the Baltic Sea. Key for social learning is to integrate the conflicting views of BSR actors in the governance. Thus, possibly reducing the rooted problems associated with governing the Baltic Sea.

The integration of actors into BSR policy procedural processes follow a functionalist approach (article 2; article 3). An institutionalized learning pretext frames the involvement of actors in the region. Non-governmental actors are expected to provide useful knowledge to improve policy development and implementation. However, the conditions for this involvement is to some extent instrumentalized for legitimizing the policy process and the role of dominant actors. The involvement of non-governmental actors is voluntary; not only in terms of whether actors take part but also in terms of also how governmental actors use the results of the process. In this functionalist learning pretext, the opportunities for involvement is set to a limited timeframe (article 2). Often participation is limited to one-way individual declarations. This bureaucratic and rigid form of involvement leaves actors unable to develop a common language and is not supportive of processes of social learning.

A functionalist learning pretext is not useful for generating trust in the broader BSR network governance context. This is illustrated by article 2. The relational conditions in this network is framed by disagreement, frustration and distrust. A setting characterized by unequal power

relations allow a dominant actor to impose problem definitions and limit possible policy solutions. Affiliated actors in this setting is likely to feel disrespected and withhold their trust in authorities, policy-making procedures and institutions. The result is a mismatch between decision-makers' and other actors' problem 'frames'. This limits the space for deliberation, which is detrimental to social learning.

Long-term interactions

The BSR network governance is organized through unilateral long-term network interactions. The unilateral internal interaction in BSR networks is resilient. For example, the NC was established for more than 60 years ago, whereas e.g. HELCOM and Nordic Council of Ministers (NCM) were established in the 1970s and most others BSR networks in the 1990s (article 1). The long-term working relationships of BSR networks form the basis of the network governance system and offer numerous platforms for social learning. However, the underlying nature of the BSR unilateral long-term interactions and relationships in networks is upheld by horizontal hierarchical relational dependencies. This institutionalized interaction does not regularly include other actors operating at other levels or sectors (article 1; article 2; article 3). The interaction is not systematically based on broad open dialogue with extended engagement from the non-scientific knowledge community but is confined to an enclosed group. The homogeneity of the institutional interactions in networks do not align with the interaction principles fostered by social learning.

The long-term working relationships of BSR networks supports short-term policy cycles. This relates to that even though BSR networks are oriented by long-term visions, their actual policy interaction is defined and underpinned by temporal elements. The use of short-term based interaction measures transpires through an intensifying BSR project proliferation (article 1). Project proliferation enables interaction in and across BSR networks. Project proliferation is promoted by BSR networks themselves and by EU project funding schemes. For instance, in 2016 the NCM alone supported ca 500 projects in the region. The Interreg BSR Program for 2014-2020, an EU funding scheme supporting the BSR has allocated 279 Million Euro towards projects (article 1). Projects constitute temporal interaction platforms for organizing vested interested on a just-in-time basis. Projects are used to assist problem-solving capacities by amassing novel information. However, from a BSR network governance social learning viewpoint project proliferation accentuates the need of contextual intelligence and adaptive capacity of policy actors. Policy actors need to balance the flexibility of short-term interaction cycles facilitating ad-hoc based relationships with lock-in effects, with demands for sustained and stable interaction that is viewed as key in generating social learning.

Learning acknowledged

Even though the operational routines of BSR networks are primarily grounded in hierarchically fortified settings this does not refrain actors from pursuing aspirations that align with a holistic governance approach relative to the Baltic Sea. BSR networks do not resist measures aimed at introducing an ecosystem governance approach, where learning is viewed as improving the fundamentals for governance processes. Learning as an idea that builds governance capacity is recognized in BSR policy-making procedures (article 2; article 3). Central BSR operative programs, in particular the HELCOM's BSAP is guided by a holistic approach in the governance of the Baltic Sea. In addition, structural changes in networks are

underway. This is illustrated by the ICES's aspirations to re-organize the network structures to better align with an integrated ecosystem approach to management (article 3). Changes towards a learning-based governance system is also occurring at national level. This is typified by the governance of the Archipelago national park, which is driven by adaptive governance aspirations (article 2).

Advancing and implementing a learning-based BSR governance is challenging. Key BSR policy-making actors do not show intentional resistance to disregard new modes of governing that aspires to augment the policy process through means offered by e.g. social learning. Yet, the procedural activities of BSR policy-making actors are grounded by their restricting hierarchical operating environment. BSR policy-making actors are shaped and influenced by national level institutional inertia. This institutional inertia is transmitted into the BSR via extensive national level membership representation in BSR networks. Therefore, inertia is not only present at a national level; it is common in BSR networks. For instance, while HELCOM has adapted a holistic ecosystem governance approach as a principle for policy action, the institutional structures of HELCOM have not yet changed in accordance with this approach (article 3).

Preconditions for social learning – contextual demands

Informal setting

The BSR network governance system encapsulates the normative narrative that underpins the concept on network governance. As a system, made up of various network governance modes and actors operating within these, it constitutes an informal setting. The BSR network governance system is not limited by any operative boundaries, it operates in the absence of clearly defined stable and routinized rules and norms. However, from an operational perspective, the BSR is rather institutionalized. Since the 1950s with the formation of the NC, the collective BSR network governance system has expanded and gradually experienced an institutionalization. This originates in that typically networks that are in place for a longer period have more stable, explicit rules than those that have recently emerged.

The institutionalization of the operating basis of most BSR networks has gradually transformed the underlying normative premise defining this system. The BSR network governance does not adhere to the normative parameters underpinning the concept of network governance (article 1; article 4). The relational composition of BSR networks are structurally related with features portraying regulated, national PNs, as oppose to the features associated with informal GNs operating in a transnational setting. This symbolizes the dominance of traditional hierarchical state-society relations in the broader BSR network governance setting.

Interconnectivity

A basis for social learning is the interconnectivity of the system setting. Cooperation and communication across BSR actors and levels is key for processes of social learning as these supports the transmission of information and knowledge. The interconnectivity of BSR network governance is dependent on the structural pathways that have developed over time in the region. Generally, the BSR structural pathways are geared towards building internal horizontal linkages among network actors (article 1). BSR networks internal operative

functions are confined to build linkages with peers, either on national or sub-national levels. The internal interconnectivity in BSR networks are structured around norms that underpin a hierarchical form of collaboration. This type of collaboration is based on internal network regulations with in-built rules for regular interactions, via designated invitations to meetings and workshops. This ensures a systemic approach to interaction and information diffusion in BSR networks. However, this interconnectivity does not regularly include vertical collaboration with actors outside the operate network realm, e.g. NGOs or farmers that could provide alternative lay knowledge. The information and knowledge amassed in networks is framed and restricted by the internal structural boundaries of the network.

Alongside the unilateral BSR network structural pathways that advance the internal network horizontal linkages in the region, an expansion of non-systematic interlinking efforts that build interconnectivity across networks have emerged (article 1). The expansion of BSR interconnectivity through temporal based interlinking efforts is linked to the widespread BSR project proliferation. The usage of project funds has in particular increased in the BSR as the Northern and the Eastern parts of Europe have become during the last decades part of the EU. For example, funds provided by the European Regional Development Fund, the European Social Fund and the Cohesion Fund contribute to build non-systematic interlinking pathways for short-term interaction. These pathways are non-structural and are not bound by top-down centered interlinking framing efforts of BSR networks. Instead, these are specially designated to interlink actors with a broad and varied knowledge base. However, project proliferation underpins a time-based dimension relative the overall interconnectivity of the region. Projects enable interaction by providing short-term collaboration platforms of organizing vested interested on an instant basis. BSR project proliferating changes the orientation of interaction, creating a temporal misfit between the short-term projects and longer-term orientation of networks in the region (article 1).

From a BSR interconnectivity, perspective the EUSBSR is key. The EUSBSR is the only element of the BSR system setting that links the different network modes in the region. The EUSBSR fosters cooperation by developing and coordinating policy arrangement and dialogue. It targets the BSR EU MS and includes Russia and Norway as two partner countries. The Strategy is based on the operative conditions of the region, with the aim of facilitating and coordinating the dialogue between existing network initiatives. It includes a wide spectrum of policy areas that are deemed vital for working towards the shared challenges of the region. The EUSBSR is divided into a number of connecting policy areas; each of these is headed either by a PAC or by a HAL. The PACs are responsible for work in a specific policy area, while the work of HALs are not necessarily confined to a particular policy area. The work of a HAL is guided by topics such as climate change, which necessities broad policy interaction across selected policy areas.

From a normative network governance view, the EUSBSR constitutes a boundary spanner, an independent bridging tool that supports communication and collaboration in the region (article 4). However, the EUSBSR lacks forceful methods to coordinate interaction activities in the region, as it is an extension of the underlying principle of network governance. The EUSBSR is a platform for bridging the different BSR networks, by building communicative interlinkages that supports the co-production of knowledge at different levels and at different geographical scales. To fulfil this role, the EUSBSR needs to build capacity for enabling interaction of different forms of information.

The BSR interconnectivity is enabled by the PACs and the HALs in the EUSBSR. These steers and guide the construction of horizontal and vertical linking functions of the Strategy. There is a clear division in the EUSBSR between which BSR actors act as a PAC and which ones as a HAL. The work of the PACs is typically assigned to national level actors (article 4). This is to safeguard effective policy implementation and to foster the institutional and administrative capacity of the EUSBSR. The HALs are largely operated by BSR networks, with the involvement of sub-national public entities and an NGO. However, this division is detrimental in the role of the EUSBSR to construct communicative interlinkages in the region. The operational activities of national level actors, such as ministerial representatives, are firmly embedded in national level contexts. These often lack the experience of building interlinkages in a transnational context that are defined by different societal and cultural settings (article 4).

The EUSBSR encourages PACs and HALs to set up a SG or utilize existing set-ups to support them in their quest to build collaboration and enable interaction with relevant policy actors in the region (article 4). The EUSBSR does not set any particular limits on the structural factors of the SGs but permit the PACs and HALs to determine how these operate, whether they have a formal or informal mandate, i.e. whether there are any rules concerning interaction. The SGs are viewed as enabling policy interaction and subsequent implementation. How a SG is governed is an internal matter, but it is expected to convene at least twice a year and should be composed of representatives of different BSR EU members. Other PACs and HALs should be included to ensure cooperation and other BSR actors should be included when relevant.

All PACs and HALs have established a SG, either a specifically designated or utilizing an already existing collaboration platform to serve as a SG (article 4). Most have set up a designated one, expect one PAC and one HAL that use existing Working Groups to function as SGs. The latter is designed to ensure congruency and longevity of the interaction between actors as opposite to most SGs, which have specifically been established for this purpose. Most SGs are of temporal nature where interaction and collaboration are linked to a specific strategy, which sets an explicit timeframe for interaction and the relational conditions forming the SGs (article 4). This is similar to the temporal nature of projects, which supports and expands further the temporal dimension of the BSR network governance.

Moreover, the SGs broadly imitate the internal homogenous membership structures of most BSR networks (article 4). Most SGs operate with an enclosed group, linking formal members representing the national level in the BSR. Whilst this promotes an anchoring of national level collaboration and interaction to safeguard policy action, it does not serve the purpose of generating social learning. The SGs do not operate based on an open and equal basis and non-governmental actors are involved only on ad-hoc based principles, e.g. SGs occasionally invites representatives of Pan-Baltic-projects. These promote the actual implementation of the EUSBSR. This is to ensure knowledge diffusion between these projects and the SGs.

The SGs do not constitute suitable social learning multi-actor platforms. They do not regularly interlink with BSR sub-national actors in the region, not directly with sub-national actors nor indirectly with BSR networks that comprise of sub-national actors (article 4). The SGs do not permit broad horizontal and vertical actor linkages that connect and enables multi-level BSR network participation. The SGs enable short-term national level interaction and collaboration that extends at times across policy sectors and to some extent involves EU or global actors.

Opportunities for catalyzing learning

Normatively, the BSR network governance setting offer many opportunities to catalyze social learning. There are 24 operative BSR networks that offer varied platforms for catalyzing social learning among different actors at different levels. However, two overarching factors frame the opportunities for social learning in the BSR. The first one, as explained in the previous subchapter, denotes to the boundaries inherent in the network governance system that shape the structural conditions for social learning in BSR networks. The second factor is the procedural boundaries that outline the conditions and the opportunities for social learning in the region. These procedural boundaries determine through which processes learning are pursued and catalyzed by the BSR networks.

Broadly, the procedures for catalyzing BSR social learning can be compared to a policy process, whilst acknowledging the relative function of networks in this process. The first step in social learning is amassing novel information. This starts the learning process, as novel information is utilized to inform and prepare policy related documents. In the BSR, projects are mainly used to generate novel information. Projects amass novel information either with the purpose to inform directly individual BSR networks or indirectly via e.g. the EUSBSR SGs, with the view to enhance the preparation of policy documents. Projects further condenses novel information by utilizing a standardized approach, without much consideration for contextual variances. This approach is symbolized by the use of benchmarking and best practices studies.

Benchmarking as a learning approach is problematic in the BSR. Benchmarking is based on set stipulate conditions of the BSR project funding schemes. Each of these funding schemes follow different guidelines, which have significant impact of what type of novel information is generated in projects. For example, a considerable number of projects performed within the HELCOM framework is still modelled on traditional scientific objectives rather than on holistic and inclusive approaches (article 3). This EAM approach form the basis of HELCOM's action plan for the Baltic Sea. Hitherto, HELCOM's actual policy activities is based on typical command and control governance objectives.

A drawback with BSR project proliferation is that it requires continuous system support for systematic transmission of novel information. There is no principal instrument for transferring novel information in the region. A tool that can sustain the interlinkages needed to transfer novel information amassed in projects to BSR networks. The generated information in projects is therefore short-lived and the impacts of it minimal due to lack of contextual ownership. The temporary nature of projects inhibits the sedimentation of novel information, as when projects dissolve and participants move on the created knowledge is likely to disperse (article 1). BSR novel information is fragmented and spread amongst the vast number of operative actors in the region. These are inclined to communicate the outcome to a restricted group of actors. The pool of novel information is not necessarily institutionalized in the public sphere. It does not generally reach central solving policy actors operating at national level.

A key component for catalyzing BSR social learning is the contextual capacity of the operative networks and of the EUSBSR SGs. Actors within these needs to have contextual intelligence in order to make use of the amassed novel information. Contextual intelligence is obtained through a broad presence of actors with varied knowledge bases. This is also dependent on the underlying operative procedures that are based on open transparent knowledge

production, which seeks advice outside the network or the group. BSR actors need to operate based on equality and equal participation rights. However, few of the BSR networks fulfil these demands (article 1), including the EUSBSR SGs (article 4). For instance, the SGs are horizontally engaged, restricting membership to actors with same type of institutional backgrounds, which narrows the potential heterogeneity of SGs knowledge. The SGs also separate between formal members with decision-making rights and other members, which are invited on a temporal basis. This does not spur the development of a varied contextual intelligence that allows making full use of the amassed novel information.

Furthermore, the BSR networks lack a direct possibility to influence and augment policy-making capacities in the region. This is also the case with the EUSBSR SGs. The SGs ability to enhance the wider BSR policy-making capacities is undermined by their voluntary nature, often operating without preset roles and rules. SGs convene sporadically a few times per year and most SGs operate without a designated budget (article 4). The SGs are defined by their narrow boundary to diffuse knowledge. The sedimentation of knowledge gained in individual SG, with the view to diffuse it across the BSR, is limited due to the homogenous member base. The SGs do not regularly interlink with actors outside their institutional realm. Participation in SGs is restricted to a few BSR networks, such as HELCOM, CBSS and NCM (article 4).

Social learning processes are iterative. Learning is a repetitive process that involve actors who learn through a cyclical process of setting objectives, planning, taking action, monitoring and reflecting on the outcomes and taking actions again. In enhancing the BSR policy-making capacities dealing with environmental challenges of the Baltic Sea the aspects of monitoring and reflection is emphasized (article 3). Monitoring and reflection play a key role in facilitating feedback between and within the social and ecological systems. The tools that create feedback loops between socio-ecological systems need to employ a holistic and open-ended approach. Key is a system thinking approach, delivering reflections on not only the impacts on specific actions preset by the values of dominant actors. Monitoring with the view of enhancing social learning is also reliant on integrating the different 'frames' of affiliated actors. For example, a social learning induced governance of the Archipelago national park requires that feedback from local lay knowledge is properly included in the learning processes (article 2). Monitoring is an important element of modern environmental governance. Different actors, including non-governmental actors need to be part of the overall monitoring (article 3).

Preconditions for social learning – actor demands

Internal collaboration

The BSR is per definition an intercultural transnational affair, where actors conceive the world in different terms. BSR networks consist of members with varied backgrounds. These operate under diverse conditions and are linked to different constitutional systems and societal premises. Most BSR networks are horizontally organized, interlinking with peers on the same level and their internal collaboration is based on reconciling member interest relative to the shared challenges of the region. This collaboration is mainly focused on integrating members diverging views, which originate in that BSR network members do not necessarily share the same policy ambitions and preferences relative to the governance of the Baltic Sea.

BSR networks with a broad membership base that encompass all the BSR NS, the unification of the diversity of interest is more emphasized, as to e.g. the NC where members are more

unified in their views of the Baltic Sea. The longevity of BSR networks have shaped their internal procedures and have provided a basis for reconciling possible diverging views of network members. The collaboration in networks adhere to established rules and formalized procedures that is implemented by network personal. These have been employed based on nationality, to ensure a cultural and contextual anchoring of the internal norms. However, as the relationships basis in networks is mainly horizontal, the collaboration in networks is formed based on this relational premise. The collaboration interest in most BSR is defined by hierarchical path dependencies. This does not support social learning, where collaboration is viewed as arising from a diverse and a heterogeneous collaboration base.

Internal negotiation

Most BSR networks employ a normative approach to the negotiations that underpin the decision-making procedures in the networks. Negotiation in networks is reserved for formal members. It is based on repeated meetings, in small group work or with the help of extended engagements from a broader group. The negotiation is often facilitated by administrative personal or independent, expert driven facilitation. The dialogue is open for formal members and only these have opportunities to influence the negotiation process. Actors outside of the network realm may be invited on an ad-hoc basis, but they do not have formal influence over the negotiation process. The negotiations in networks are driven by feedback through the circulation of e.g. meeting minutes. The feedback is normally based on elements of bargaining, in relation to the distribution of resources to maximize individual member outcome. The bargaining through actor negotiations takes place within an institutionalized framework. This framework sets the rules and procedures by conveying agreed upon norms and standards for the negotiations. This is to ensure the production of trust, commitment, understanding and joint action among network members.

Internal decision-making

A negotiated consensus guided process defines the internal decision-making of BSR networks. The decision-making of BSR networks is not enforced by legal measures, economic incentives, nor by normative control. Network members have limited formal accountability regarding policy co-production and policy implementation. Conversely, the relational basis in the BSR networks is key in relation to compliance with common decisions. The relational basis of BSR networks have formed throughout decades, generating formal rules and norms and informal codes. Each BSR network is connected and defined by common identities and visions. This is likely to generate trust among actors, feeling an obligation to contribute to the realization of mutual objectives. Generally, the internal decision-making procedures of the BSR networks is based on equity and efficiency, but subject to formalized patterns. Decision-making is mainly reserved for formal national governmental members in the region. Decision-making is pursued via an institutionally organized cooperation and negotiation process. This process is driven by technocratic and expert driven policy endeavors, which fails to integrate multiple types of knowledge into the decision-making processes.

8. Conclusions

This thesis is guided by *two ambitions* in relation to the current governance mode of the Baltic Sea. The *first ambition* is to influence the debate on the present environmental governance dynamics of the Baltic Sea. The thesis reflects on the direction of the BSR environmental network governance operational reality relative to governing the Baltic Sea. The existing efforts to govern the Baltic Sea are defined by and a product of the operative conditions of the region. The BSR system is tasked to develop governance responses relative to the challenges of the Baltic Sea. Many of these challenges are considered 'wicked problems'; they are multifaceted and contested as to their scope and the policy responses needed for dealing with these (Gilek et al., 2016). These require responses that look beyond hierarchical, sectorial boundaries and one-sided traditional 'command and control' governance styles. Instead, what is called for by the EAM approach is a holistic governance, an approach that considers different forms of information, scientific, indigenous and local information in the governance of the Baltic Sea. Integrating multiple types of knowledge into governance processes provides a better foundation for identifying shared solutions and legitimizing the process of developing policy responses.

To accomplish the first ambition, the *second ambition* is designated based on a theoretical aim to contribute to the research on the concept of network governance, a mode that embodies the governance of the Baltic Sea. This thesis adds to theory developing by investigating the positive normative premise underpinning the concept of network governance. As a theoretical concept it is viewed as ideally positioned to govern 'wicked problems', separating and cutting across traditional hierarchical norms and ideas to produce adequate innovative and feasible policy responses that match complex, conflict-ridden and ill-defined problems. The theoretical ambition of this thesis is designed to develop open-ended context bound information relevant for actors in the network governance of the Baltic Sea. The theoretically informed empirical examination of the current governance of the Baltic Sea creates an opportunity to develop the network governance concept relative to governing environmental challenges. It also helps the thesis to fulfil the initial ambition, which is to support the distributed BSR policy-making capacities to develop designated policy endeavors that improves the state of the Baltic Sea.

This concluding chapter reflects on the operational capacity of the BSR network governance system to govern the Baltic Sea based on the theoretical premise underpinning this system. This chapter compares the key features of the BSR operational realm relative to the normative assumptions defining a functional governance of the Baltic Sea. The theoretical principles that determine the purpose and the scope of a functional network governance of the Baltic Sea are used to condense the empirical insights of the articles. This, in turn, outlines the summary discussions for improved BSR network governance fundamentals relative to the challenges of the Baltic Sea.

8.1. The relational conditions of Baltic Sea region network governance – a basis for developing theory

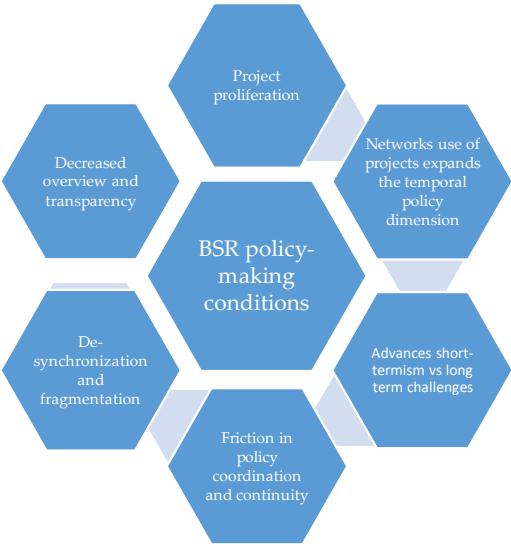
The operational functioning of BSR network governance is shaped by the evolving relational conditions that define current policymaking. Traditionally, the foundation for policymaking has been defined as a task of hierarchical driven policy relations, in where the formal authority of governments are accentuated. However, normative demands arising from the assumptions

and expectations that policy development should be an outcome of multi-actor, multi-level collaboration measures have incentivized a shift in the relational basis of policymaking. These demands stem particularly from the assertion that transboundary challenges, which cross the territorial and the physical borders of NS, need to be govern on a relational basis that joins actors outside of hierarchal control. Informal, adaptive and non-hierarchical relational structures are considered as enabling improved and informed policy responses in relation to the functional demands to govern ‘wicked problems’.

The BSR encapsulates the transition of linking traditional forms of government with innovative governance modes. The operational features of the BSR networks governance are a result of transformative processes that has transpired throughout decades. This experimental form of governing has delineated the current transnational conditions for BSR policy-making. The BSR relational boundaries for policymaking have been shaped by persistent attempts to join forces in integrating and pooling policy responses that target the challenges of the Baltic Sea. These processes have contributed towards an increasing institutionalization of the operating basis of most BSR networks. This has gradually altered the underlying normative relational premise defining the BSR system. The relational basis of the BSR network governance does not adhere to the normative parameters underpinning the concept of network governance.

Figure 1 offers an overview of the key features of the current policymaking conditions of the BSR network governance setting. The figure condenses and conveys the result of experimental governance processes relative how this shape the conditions for delivering policy responses targeting the Baltic Sea. Also, the figure contextualizes the empirical findings and contributes to support the theoretical ambitions of the concept of network governance. It presents conceptual clarity by offering evidence of how network governance works in practice. Figure 1 illustrates how network governance works in general in a transnational system setting that interlink networks and actors via shared transboundary challenges.

Figure 1: Key features of BSR network governance policymaking conditions



The EU has been pivotal in steering the transformation of the BSR network governance. The EU has emerged in the last few decades to have a profound effect in shaping and altering the broader relational development of the BSR network governance. The growing influence of the EU in the BSR derives from that most BSR NS are EU members and required to adhere to EU policy procedures. The growing importance of EU advocated relational policy procedures is also enabled by the BSR network governance operating principles, it operates in the absence of clearly defined rules and norms in relation to policy producers. The EU has tacitly taken the helm of steering the BSR relational development, as individual BSR NS does not have the capacity, or necessary the interest to steer and shape the relational policy conditions in the region. This is exemplified that though different BSR networks have been established decades ago, based on different rationales and by different notions, most networks tend to focus on policy activities advocated by the EU (article 1). The relational conditions, within and across BSR networks, are adjusted to serve policy processes that link with overarching EU policy documents, such as the EU 2020 Strategy or EU 2030 Framework for Energy and Climate.

Current BSR policy innovation is fostered through EU promoted principles for policymaking. EU steers and shapes the foundation for BSR policymaking based on the widespread project proliferation in the region. Prominent EU project funding schemes are applied to develop and influence policy development, to induce change and promote policy process activity. Projects are temporal tools that direct BSR network policy activities. Projects offer temporal relational connections, especially in terms of the external relations linking various BSR networks. The proliferation of projects with the view to support policy development and innovation, by practices of benchmarking and best-practices scenarios are facilitating and steering the active use of projects. BSR networks are keen to engage in projects, as there are inbuilt incentives for BSR networks to engage and align their activities with EU policy documents. The EU and the EC have made financial resources available for networks via their project funding schemes, which engage in activities that serve to fulfil the objects set by the EU. To some BSR networks, especially those operating at sub-national levels, EU project-based funding complements their own budgets (article 1). These BSR networks operate based on membership contributions that often are allocated to maintain the normal functioning of the network and not necessarily to expand the policy activities of the network. Project funding schemes have become financially important for BSR networks and may suggest that policy activity only occur in policy areas, where there is available funding for project activities. A lack of funding for certain policy areas may indicate that activities in these areas are not necessarily pursued.

EU project schemes that financially support the majority of projects in the region set the tone for the broader policy development agenda in the BSR network governance. EU act as the 'grand-tactician' for steering the BSR policy agenda and for shaping the relational conditions in the region. From a functional BSR network governance perspective, this is detrimental. The extensive use of projects to develop and navigate policy expands the temporal relational dimension of policy procedures. This impedes the functionality of BSR network governance policy processes and the relational foundations of these processes. The ability of the BSR networks governance to navigate the long-term environmental challenges are compromised by the temporal relational conditions of projects. The normative beliefs of BSR network governance, as conveying policy outcomes that are considered necessary for governing the challenges of the Baltic Sea, are undermined by the policy-making context of the region. This context impairs the relational conditions for functional BSR policy processes.

BSR policymaking processes are faced with inbuilt barriers that weaken their capacity to develop and implement policy responses that assists them in governing the Baltic Sea. Short-term policy cycles form the basis for expanding the understanding of the Baltic Sea challenges and for implementing policy measures that target these challenges. Even if BSR networks are guided by long-term views that aligns with these challenges, their relational conditions are framed by temporal short-term endeavors. BSR networks are oriented by visions requiring sustained long-term cooperation, yet their cooperation and interaction are steered by transitory non-hierarchical measures. The 'short-termism' alters the behavioral and relational fundamentals of the region, resulting in competing policy timeframes and orientations of actors.

Collectively, this has an adverse effect on policy development and implementation conditions targeting the challenges of the Baltic Sea. Policy processes in the BSR are based on short-term unilateral approaches upheld by horizontal hierarchical dependencies. These do not regularly interlink or include other actors operating at other levels into these processes. This does not accommodate the normative expectations by which BSR network governance rests upon. The contemporary governance demands have altered the fundamentals for BSR policymaking. Behind this demand is a call for informal and adaptive, just-on-time policy efforts designated towards flexible problem-solving intervention alternatives. In the BSR, the collective result is an expansion of short-lived unilateral policy endeavors. The uptake of autonomous policy outcomes is not systematically coordinated. There is no methodical system that caters a broad BSR information and knowledge diffusion, as the independent policy endeavors are not interlinked. This contributes to policy incoherency and reduces the BSR policy transparency. The result is fragmentation and desynchronization, causing friction concerning policy coordination, stability, coherency and continuity.

A drawback in relation to BSR network governance is that it lacks a natural function for policy coordination. From a relational perspective, BSR network governance system is defined by an exponentially number of relationships. Under such conditions, governance is complex, and the activities of networks needs be coordinated (Provan and Kenis, 2007). Shared self-governance is often seen as appropriate by networks, as these can retain control over the direction of the network. However, network governance is inefficient when large networks ignore attempts to coordinate issues across a large number of network members (Faerman et al., 2001; Provan and Kenis, 2007). The problem of network complexity is particularly relevant in BSR networks, where members are spread out geographically making frequent meetings of all actors difficult (article 1). The structural solution to this is to centralize network governance activities around a knowledge and information broker (Provan and Kenis, 2007).

Partly with the view to centralize BSR network governance activities, the EUSBSR was unveiled in 2009. The EUSBSR is the principal knowledge and information broker in the region. It aims to foster cooperation for reconciling the transboundary nature of problems with the mosaic of BSR networks that are driven by different agendas and overlapping interests. It aspires to coordinate policy activities and dialogue needed for governing the BSR challenges. However, as a coordinator of policy initiatives, serving to expand the BSR system capacity for improving policy coherency and continuity, the EUSBSR is bound by its limited capacity. The EUSBSR is an extension of the underlying principle of network governance, lacking any direct means to coordinate policy initiatives and activities (article 4).

The EUSBSR does not sufficiently cater to the needs rising from the challenges of the operative setting of BSR network governance. In fact, it expands the challenges by contributing towards a temporal dimension of the BSR policymaking context. The EUSBSR is implemented through the means offered by short-term Pan-Baltic projects. Moreover, the division where PACs are made up of national level actors, whilst HALs of BSR networks contribute to a widening of policy incoherence (article 4). That the sectorial policy cooperation and interaction is a mostly matter for national level actors, while BSR networks role are to foster horizontal and vertical cooperation across policy sectors, underscores the relevance of SGs. SGs serve as platforms for building and enhancing the BSR relational capacity. The SGs act as tools for advancing and improving the BSR network governance (article 4). However, as most SGs are of temporal nature, interaction and relational ties are defined by an explicit short-term timeframe. This reinforces the temporal dimension of BSR network governance.

The EUSBSR is a reflection of EU advocated governance that fosters a relational transition in policymaking. A transition that hollows out sovereign powers in decision-making procedures (Sørensen and Torfing, 2005). BSR policymaking reflects the increasingly differentiated society, the fragmentation into a variety of interdependent public, semi-public and private agencies, linked into various operative networks. However, BSR policymaking is not detached from democratic accountability and control and nor does it occur in an institutional vacuum. Policy-making producers in BSR networks are guided by intergovernmental hierarchical norms and relational actions. These are operationally steered by institutional norms and protocols, which are the result of nationally defined procedures, conveying democratic values and standards set and agreed upon by national parliamentarians or elected officials.

BSR network governance policy-making procedures are designated to contribute to public purpose, expressed in various visions and values conveyed through policies designed to solve the policy challenges associated with the Baltic Sea. Generally, central decision-makers praise network governance for its ability to augment decision-making processes by means of providing novel information, arguments and assessments (Sørensen and Torfing, 2005). This is dependent on input from a broad range of societal actors, providing different perspectives and viewpoints of policy options. This is viewed as enhancing the legitimacy of the policymaking and the overall policy process.

Even though the EU has succeeded in shaping the broader principles for BSR policy innovation and development, the procedures and processes that define the factual policymaking in the region are still confined to national level relational policy exercises. Relational ties are framed by hierarchical norms, which constitute the basis of most operative BSR networks. A command and control regime are not compatible with the relational principles of network governance policy design. In the BSR the integration of actors into policy procedural processes follow a functionalist relational approach. An institutionalized relational pretext frames the structures for the involvement of actors in the region. This is detrimental to the legitimacy of BSR policy processes and affects the efficiency of policy development and implementation.

8.2. Evaluating the functionality of Baltic Sea region network governance

The normative expectations of network governance policy design are linked to creating adequate responses that considers social-ecological system interactions and changes. A view that supports the concept of network governance is that it offers better options than fortified

hierarchical policy arrangements relative to governing ‘wicked problems’. The analytical component of social learning is used to evaluate whether the BSR network governance fulfills the normative expectations by having the capacity to generate adequate policy responses relative to the Baltic Sea. The analytical parameters of social learning are applied as a basis for evaluating BSR network governance functionality. The BSR network governance – as a mode of governing – needs to facilitate and foster social learning, which originate in an inclusive, holistic view of dealing with the challenges surrounding the Baltic Sea.

Table 11. BSR network governance functionality requirements (based on Pahl-Wostl, 2009)

Network governance functionality requirements	Single-loop social learning	Double-loop social learning
General factors	No calling into question of established institutions, signs or unilateral reinterpretation	Reinterpretation of established institutions by many actors and parties
Regulative factors	Existing regulations are strictly followed and used to justify established routines. New by-laws and interpretations of existing law to accommodate exceptions.	Regulatory frameworks identified as major constraints for innovation. More juridical conflicts about rule interpretation. Exemptions allowing innovative approaches and experimentation.
Normative factors	Established norms are used to justify the prevailing system. Relying on good practices and benchmarking.	Established norms and routines are called into question.
Cultural-cognitive factors	Discourse remains in established paradigms that are refined. Radical ideas dismissed.	New ideas emerge beyond isolated groups.
Operative governance mode	No change in the relative dominance of governance types. Improvement of performance within established governance modes. External alternative governance modes disregarded.	Other than dominant governance types start to become more visible and dominant governance type called into question (e.g. introduction of participatory approaches, emergence of bottom-up participatory processes).
Relational ties of networks	Actors remain in their networks. Roles and identities are not called into question.	Explicit search for advice from actors outside of established network. New roles emerge. Boundary spanners of importance that start to connect different networks.
Network interactions	Vertical interaction in established patterns e.g. increased regulation from the top level. Pattern of flow of authority (by institutions) does not change. Mainly uni-directional.	Increased informal knowledge exchange between levels. Informal interaction groups to improve exchange established.
Policy learning paradigm	Imitation through exchanges of policy experiences. Actors study different policy experiences via benchmarking efforts. Provides knowledge for policy processes to define, assess and adjust strategies, based on the orientation on comparisons, without consideration of contextual differences.	Processes of learning that accentuate the exchange of tacit knowledge elements. Boundary spanners key: these act as inter-mediators of the coproduction of novel information and knowledge. Transparent informal knowledge production, sharing norms, values and ideas. Learning mandate and analysis open.
Governance efforts and policy uncertainty	Uncertainty used to justify non-action. Activities to reduce uncertainties: reliance on science to find a solution. Discourse focuses on technical approaches to dealing with uncertainty with the goal to improve predictive capabilities.	Uncertainty accepted and perceived as opportunity in processes of negotiations and reframing. Existence of different perspective and worldviews explicitly acknowledged. Established approaches to managing uncertainty and risks are called into question.

Table 11 establishes a summary of BSR network governance functionality requirements. The table outlines the factors of the procedural processes that define policy development in a SL

and in a DL learning setting. It considers typical normative, regulative and socio-cultural boundaries that describe policymaking in respective learning settings. The table offers a basis for evaluating whether the BSR policy setting and along with the broader BSR policy-making conditions adhere to a learning environment that abide by the demands set by environmental theories to govern the challenges of the Baltic Sea.

Table 11 offers a framework for descriptive and explanatory reflections relative to the general functionality of the BSR network governance. As oppose to previous tables on social learning, this table does not per se highlight the structural conditions of a network or a system relative to fostering social learning. Rather it discloses and reflects on the underlying norms and values that determine and shape the structural setting boundaries for social learning. The theoretical norms and values for each social learning setting in table 11 is outlined in the latter part of this subchapter. This serves as a theoretical basis for condensing the empirical findings of this thesis, emphasizing advantages, limitations, challenges and future considerations relative to a functional BSR network governance.

General regulative and normative considerations

SL and DL learning settings are guided by different regulative and normative conditions. The difference is maintained by the variances in societal views and cultural preferences. The societal-cultural reasoning sets the logic for interpreting the regulative and the normative framework and determines the broader structures, limits and possibilities for policy processes and subsequent policymaking in each setting. In a SL setting, existing rules and norms are strictly obeyed. Conventional policy routines frame policy-making conditions. A reliance of good policy practices fortifies the prevailing governance mode, incremental improvements are pursued in established modes. Radical ideas or suggestions are dismissed or disregarded, e.g. those initiated by environmental theories, such as adaptive and participatory governance.

In a DL learning environment, regulative and normative frames are challenged and frequently tested. Traditional frames are regarded as obstacles for policy innovation and development. Established policy routines are confronted by demands to expand and change the underlying principle of policymaking processes. Policy routines that are set by the principal governance mode are undermined by internal as well as by external pressure. This originate from demands of actors that are not regularly involved in policy processes and from changing normative requirement and expectation of policy outcomes.

General network interplay considerations

Similarly, the different learning settings are shaped by divergent network relational ties. SL learning is bound by institutional roles and identities. The relational ties are embedded by path dependency and ties are not systematically formed outside of networks. Actors remain mainly in their networks. This reinforces unilateral relational approaches and expands policy complexity and incoherency, making policy coordination challenging. In a DL learning setting network relational ties are driven by the opportunity for innovative, adaptive approaches that reframe assumptions of traditional policymaking. Boundary information and knowledge spanners are key in linking internal relational ties with external actors outside the network. These collect new ideas and are search of advice, opinion and tacit knowledge of actors outside the realm of the established network. Boundary spanners are also key vis-à-vis the expansion of relation ties that connect different networks.

Network interaction patterns within the different learning settings also differ. Network collaboration patterns provide an indication of the ingrained learning capacity and output of each learning setting. This refers to that interaction arrangements provide the scope and the reach of learning processes; who are involved, how and when are these involved. Normative factors shape these interaction patterns. In a SL setting, interaction and collaboration adhere to established patterns, which are steered by a top-down uni-directional formal interaction. The flow of interaction and collaboration is guided by formal regulation from central levels, restricting network interaction to established paths. Any interaction outside established patterns are guided by a hierarchical premise. This restrains and delimits the scope and reach of the learning processes.

Interaction patterns in a DL setting are formed by informal surroundings, which seeks to reinterpret established collaboration routines. The result is an array of informal collaborative knowledge exchanges between and across levels. From a learning scope, this supports a broad and unrestricted access to tacit information emerging from informal interaction. This has the potential to link networks and foster knowledge synthesis of different authorities, experts, interests' groups across horizontal and vertical levels. However, as interaction patterns are formed by informally guided assertions any attempts to coordinate the interaction is refrained by the informality of these attempts. The role of boundary spanners in this collaboration setting is further emphasized.

Premise of policy learning paradigms

The learning paradigm is different in a SL setting as oppose to a DL setting. The premise of learning in a SL setting is imitation through exchanges of policy experiences, generally without consideration of contextual differences. Actors study other's policy experiences and imitate best practices. Learning tools by which learning is pursued are designed to let participants in policy processes learn from each other through benchmarking approaches. The premise to learn by comparing, with the expectation of gaining knowledge from experiences which have emerged under completely different societal policy conditions, imply that learning is restricted to general formalized and incremental learning. Learning by comparing is bound by path dependency. Path dependence makes it difficult to dispose of prior commitments and actors in policy processes tend to carry on as before. Effective imitation of best practices entails learning contextual intelligence of policy process actors. To stimulate learning, participants need to have access to information on the units of comparison. Effective implementation and integration of benchmarking results are constrained and framed by the fluctuating societal conditions of participating actors.

In a DL setting, learning is shaped by the notion of exchange and cooperative development of tacit knowledge elements. Learning outcomes does not necessarily need to be quantified, measurable or tangible. Attainment is viewed as emerging from providing a platform for contextual understanding of the viewpoints of others, possibly reconciling differences as participating actors are characterized by differences in goals and interests playing out at different levels. These learning elements emerge under deliberate learning conditions. Distinctive for these is a transparent informal knowledge production, with the sharing of norms, values and ideas.

General view of policy uncertainty

The capabilities to govern policy uncertainty are fundamentally different in a SL respective a DL setting. The design of policy routines in dealing and coping with policy uncertainty are framed by different operational principles. In a SL setting, uncertainty is framed by hierarchical preferences, where policy routines are developed with the objective of quantifying and framing policy uncertainty. Technical science approaches are justified as a rational choice, as these improve the predictive capabilities for finding a solution that reduces policy uncertainty. Discourses focus on measurable policy action, as opposite to non-measurable, non-linear action. If uncertainty cannot be framed, it is used to justify non-action.

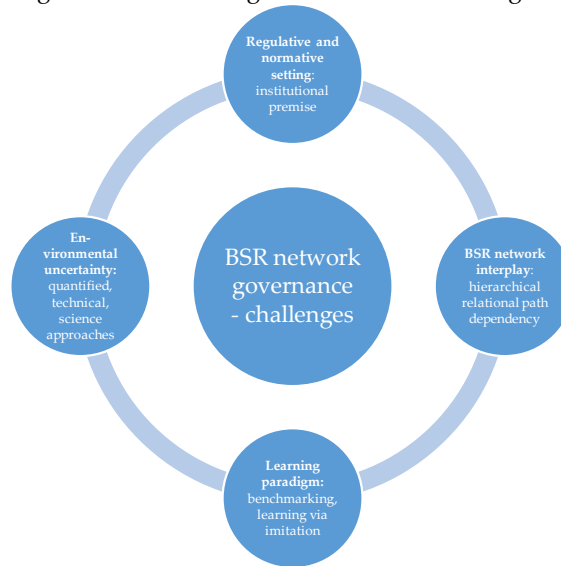
A DL setting has a holistic, admmissive and accepting approach towards policy uncertainty. This is linked to the expectations of policy outcomes, the inbuilt demands for developing measures to govern social-ecological system changes. The dominant view is that regulative norms are rigid structures that are unsuitable for contemporary policy processes and policymaking. Established approaches to govern policy uncertainty and risks are called into question. Uncertainty is viewed as a chance to reframe and adjust policy processes and policymaking.

8.3. Baltic Sea region network governance – a functional governance the Baltic Sea?

From a normative viewpoint the BSR network governance does not adhere to the theoretical demands sustaining a functional governance of the Baltic Sea. BSR operational procedures are shaped by an ever-evolving dynamic setting, which forms and shapes interaction patterns and relational ties in the region. There are endeavors for aligning the operative procedures of BSR network governance to pursue a holistic, inclusive and transformative governance of the Baltic Sea. This is reflected in how certain elements of the BSR network interaction patterns are challenging the established relational patterns in the region. However, the BSR network governance is still characterized and underpinned by reinforcing internal hierarchical features that impairs and suppresses the BSR governance latent potential from emerging.

There are EU endeavors in place that aspire to elevate the underlying capacity of BSR network governance. The most notable example being the EUSBSR. However, these EU aspirations and efforts have inadvertent consequences. These contributes towards increasing the temporal policy dimension, therefore extending an already complex network governance operational reality. Even though EU has managed to reorient the scope of many networks, aligning their activities with overarching EU policy documents, these activities are far from ideal. BSR policy activities are often uncoordinated and decreasing the general transparency of policymaking progress, causing friction in relation to the stability and coherency of policy activities in the region. For operational procedures and the policymaking setting of the BSR network governance to become operationally feasible, fundamental challenges lay ahead. Figure 2 condenses the main challenges. Each challenge is separately discussed and explained.

Figure 2. BSR network governance challenges relative a functional governance of the Baltic Sea



BSR regulative and normative setting

The regulative and normative setting of the BSR is vital in relation a functional governance of the Baltic Sea. It sets the boundaries of the operative network governance mode of the BSR and defines the conditions for BSR policymaking processes. The BSR regulative and normative setting is based on an institutional premise, where established norms are accentuated and not necessarily questioned. Most BSR networks are steered through formal and hierarchical principles. The institutional structures of most BSR networks do not align with the conceptual fundamentals synonymous with network governance (article 1).

BSR network governance actors are committed to the institutions they represent. Actors gain legitimization, capabilities, resources and societal preferences from their institutional background. Behavior learned in hierarchical institutions is restricted to promote incremental learning. BSR network members are influenced by bureaucratic routines and settings. This constitute a barrier for comprehensive social learning processes in the BSR. BSR actors are not accustomed to policy processes and policy-making procedures that are driven by changing policy demands. Adaptability and flexibility do not resonate with a hierarchical operative setting, where BSR actors mainly engage in bargaining rather than open innovative discourse.

BSR network governance is at a crossroad. The changing policy orientation, the expectation of policy linked to social-ecological system BSR changes and the demands for effective measures to govern these changes is impaired by internal deficiencies rooted in a complex BSR network governance reality. The operational routines of BSR network governance are grounded in hierarchically fortified socio-cultural and behavioral aspects. This does not imply that network actors are hesitant or resist measures aimed at introducing aspects that facilitates a functional governance of the Baltic Sea. On the contrary, policy development and policy-making practices are often guided by a holistic approach in the governance of the Baltic Sea or aspects of

surrounding ecosystems. This is demonstrated by the case studies of this thesis (article 2 and article 3).

Learning as a notion that builds governance capacity is acknowledged in BSR policy-making procedures. However, in the implementation phase, which transpires in national environments, path and routine dependency dominates. This is not necessarily intentional resistance to disregard new modes of governance. However, it displays the supremacy of restricting hierarchical operating procedures. Traditional national hierarchical settings are prone to institutional inertia and less likely to produce integrated process-oriented participatory implementation measures aimed at improving the state of the Baltic Sea.

BSR network interplay

The relational setting of the BSR is restricted by the institutional roles and identities of network members. The embedded hierarchical relational path dependency discourages members from systematically forming extensive relational ties outside their own network. BSR network actors mostly form relations within their network. This reinforces unilateral and isolated relational approaches in the region, attempting to coordinate integrated policy activities across different sectors and levels challenging (article 1 and article 4).

BSR interaction is driven by established relational patterns. The flow of interaction is guided by formal normative regulation from central levels, restricting network interaction to predictable paths. Interaction outside the network is suppressed by top-down autocratic unidirectional efforts. Although BSR network interplay is geared towards internal interaction with hierarchical relational tendencies, there are underlying endeavors and efforts to break this dominance. Two driving forces are here at play. One is national environmental awareness and enlightenment. Innovative governance initiatives within BSR NS are emerging. These are driven by opportunities for adaptive approaches with the notion of reframing norms of traditional policymaking. These initiatives are also gaining traction in BSR networks. However, these are non-systematic and uncoordinated efforts. The reforming of relational ties is subject to societal preference and contextual dependency. The capacity to embrace new relational modes is diverse in the region. For example, Nordic countries are regarded as societal examples for aspirations to embrace new modes of environmental governance. Other BSR NS do not hold necessary the same capacity, due to different levels of economic, administrative and political development.

The other force that is reforming BSR relational ties is EU. EU is the prime enabler and driver of shaping BSR relational ties outside and across networks. EU implicitly reinterprets and re-orientates established collaboration routines in the BSR. EU increases the informal collaboration and subsequent knowledge exchange between BSR levels and scales. At the same time, EU aspire to coordinate the external informal interaction with the help of the EUSBSR. The EU with EUSBSR as a facilitator, seek to link internal network relational ties with external actors outside the network. Tacitly, the ambition of the EUSBSR is to reform the overall BSR collaboration and relation ties of the region. The intent is to improve and integrate knowledge exchange, ultimately refining and elevating policy-making processes in the region.

However, the efforts by the EU to elevate the relational capacity of BSR network governance has inadvertent detrimental consequences in relation to a functional governance of the Baltic Sea and its ecosystems. EU efforts advance the temporal dimension of BSR relational ties and interaction. This is not favorable or provide a constructive learning environment for governing the Baltic Sea. EU promotes external relation and interaction ties mostly via temporal and non-permanent tools. This places an explicit timeframe for external network relational ties (article 4). The result is an array of uncoordinated informal interaction knowledge exchanges between and across levels. The EUSBSR is structurally and operationally inadequate to mitigate the 'short-termism', promoted by the non-permanent policy features and temporal policy differentiation in the region. The EUSBSR is an extension of BSR network governance. It is a BSR network governance paradigm, adhering to the informal assertions, norms and rules that defines the network governance concept. As a result, the EUSBSR is refrained from any meaningful attempts to address these difficulties.

BSR policy learning paradigm

The influential role of the EU in shaping the BSR network governance is visualized in how policy is developed in the region. The EU not only reforms relational ties in the BSR through projects, it also steers the policy-learning premise of the region with the help of widespread project proliferation. The designated EU learning paradigm and format impairs the BSR policy learning capacity. Projects enforce a learning approach that is not well aligned or suited with normative demands to functionally govern the Baltic Sea. EU advocates policy learning by imitation, usually without reflection of contextual differences. Learning by imitation is associated with critical environmental policy learning shortages. There is no assurance that learning working in one area can work in another area, as not all environmental governance proficiencies are transferrable, as learning is place and time-specific particularly in complex social-ecological systems.

EU is influential in advocating imitation through exchanges of policy experiences. BSR project proliferation builds on the notion as serving the demands and the needs for adaptive, rapid policy responses to complex, cross-sectorial policy contexts. Projects are viewed as providing flexible problem-solving intervention options to traditional hierarchical methods. However, project learning is distinctive. It is non-repetitive, time-bound and lacks group-building effects, via continued and sustained actor interaction. The short project cycles do not leave time for project participants to develop personalized trust. Generally, projects deliver inadequate consideration to contextual, tacit knowledge and understanding that is needed to foster suitable learning outcomes relative to the environmental challenges of the Baltic Sea.

The EU policy-learning paradigm is developed to provide tangible outcomes. Benchmarking outcomes that can be quantified and showcased to a larger audience, e.g. project funding schemes. The EU policy-learning premise and the BSR policy-making learning conditions are formed by an overarching notion of producing measurable result. These do not align with a policy-learning paradigm, where attainment is possibly emerging from non-quantified and non-measurable results. Policy performance may arise from non-tangible elements, such as sources of trust, deriving generalized trust in actors, or from interpersonal relations. The potential to enhance the BSR learning capacity and alter the current dominate policy learning premise is achievable. As the EUSBSR case study demonstrates, the strategy with the help of

the designated SGs could act as multi-actor learning platforms. These could facilitate broad BSR face-to-face deliberation and trust, through sustained relation ties and multi-actor interaction. However, to fulfil the learning potential the inbuilt structural and relational limitations of the EUSBSR need to be addressed (article 4).

BSR general view of uncertainty

The design of BSR environmental policy goals and ambitions is usually framed by hierarchical regulations and norms. BSR environmental uncertainty is quantified, with the help of technical, science-based approaches. These are viewed as improving the predictive capabilities for finding a solution that reduces policy uncertainty, through measurable policy action. Uncertainty is approached based on an instrumentalist approach, in which complexity and ambivalence are eliminated (article 3). Problem solving is specific and straightforward.

However, traditional framing of BSR environmental policy goals are challenged in the region by holistic perceptions of uncertainty. These do not necessary frame BSR environmental policy goals based on tangible measurements, but also allows policy action that is of non-measurable and non-linear nature. These have an admmissive and an accepting approach towards uncertainty. Uncertainty is viewed as an opportunity to reframe and adjust policy processes and policymaking. Uncertainty and problems cannot be solved, only handled via reflexive and informing feedback loops (article 3). Still, there is a shortage of reframing policy goals and ambitions based on participatory approaches, which emphasize the social and inclusive dimensions of the environmental challenges of the Baltic Sea.

9. Baltic Sea region network governance – future considerations

The BSR is regarded a pioneer in the introduction of new modes of governance (Joas et al., 2008). The BSR is a laboratory for experimental governance, as the demand of transformative modes of governance is continuous. BSR governance arrangements need endless reforms to adapt to the challenges of the Baltic Sea ecosystems (Gilek and Karlsson, 2016). The Baltic Sea governance is horizontally complex and vertically incomplete. The governance of the Sea is a result of continuous divergent processes, rather than intentionally designed environmental policy arrangements (Gilek et al., 2016). These have developed throughout time in an intricate framework of hierarchical institutional structures and procedures, power relations, cultures and varying policy styles in the different BSR NS.

The transformation of the BSR network governance to adhere with the principles that define a functional governance of the Baltic Sea requires a fundamental shift in the interpretation of the normative value setting that determine the scope and form of policy development in the region. This transformation needs to navigate the institutionalization of the BSR network governance by reinterpreting the inherent societal and cultural value-based reasoning of national level governance actors. National level governance logic determines the form and function of policy processes and subsequent policy-making relative to the Baltic Sea. Even if the positional power of governments is undergoing change, governments still establish the basic rules for governing the Baltic Sea (Joas et al., 2008).

The transformation of the contemporary BSR network governance is shaped by a continued Europeanisation. This transpires through the enlargement and increased activities of the EU in the region. Most BSR network actors orientate themselves towards the EU instead of only acting within their own network (Joas et al., 2008; Kern and Löffelsend, 2008). EU creates legislation through various frameworks and norms. EU has exclusive capacity to legislate and set supranational demands in the field of BSR environmental protection that are often binding for EU MS (Karlsson et al., 2016). This is most evident in the area of fisheries, as witnessed by the dominance of the EU Common Fisheries Policy (Linke et al., 2014; Gilek et al., 2016).

The strong Europeanisation is reflective of the ever-present evolution of BSR governance. BSR networks that have been operative for decades are forced to adapt to this reality. Nationally defined interests in BSR networks are changing and transforming networks. BSR networks are subject to increased national level scrutiny in terms of their current added value. Some BSR networks existence is under threat as they are viewed as relics, which were formed under different societal and governance conditions. A future path for national actors to pursue and develop policy in a BSR transnational context are framed by the fact that most BSR NS are EU members. This alters national interests in BSR networks. National level interest relative to the BSR governance is undergoing a shift. BSR networks role as a venue for policy development in the region is not self-evident anymore. National level focus relative to the BSR is driven more frequently by broader EU policy ambitions relative to the region, as oppose to policy desires by individual BSR networks. The future of BSR networks is conditional and they must therefore prove their existing value in a transnational policy setting.

The role of the EU in governing the Baltic Sea is shaped by European environmental policy, which has undergone profound change (Kern and Löffelsend, 2008). The traditional view of managing natural resources, which has been characterized by a command and control

paradigm, is interlinked with inclusive and holistic governance approaches. A proliferating body of EU legislation affecting various aspects of the marine environment of the Baltic Sea are under the guidance of an EAM (Gilek et al., 2016). However, there are challenges in the BSR in relation to an expansive implementation of a learning and knowledge-based governance approach. Most of these are of structural nature. The most difficulties relate to the efforts to establish BSR cross-sectoral collaboration, because of existing institutional arrangements and procedures (Gilek et al., 2016). This makes policy coordination of the many governmental bodies and regulatory frameworks at EU, Baltic Sea and national levels a problem (Karlsson et al., 2016).

The core functions and key aspects of an EAM approach have hardly been implemented in environmental governance of the Baltic Sea (Karlsson et al., 2016; Linke et al., 2016; Smolarz et al., 2016). Multi-sector cooperation, participatory participation approaches and adaptive governance have generally been given limited attention in BSR governance environmental frameworks (Jönsson et al., 2016). For example, the inclusion of non-state actors into processes of policymaking with regard to eutrophication in the Baltic Sea is undeveloped (Jönsson et al., 2016). Despite the ambitions to increase actor participation in environmental governance, supporting structures and processes enabling broader inclusion and deliberation are often missing (Gilek and Karlsson, 2016). When participation in policy processes is enlarged, actor participation and interaction are framed institutionally.

The problem of a lack of broader actor inclusion, values and critique and the absence of broad public communication and discourse is non-adaptive BSR governance structures (Gilek and Karlsson, 2016). The instrumental framing of actor participation in environmental policy processes is a result of insufficient flexibility and adaptability of the governance framework of the Baltic Sea. This originates from lock-in effects and path dependency (Gilek and Karlsson, 2016). Structural constraints inherent in the legacy of an environmental governance tradition based on a command and control standard provide major barriers of change. Important barriers of change lie in inertia of institutions, resistance to change and costs to be associated with transformation (Pahl-Wostl, 2007; 2009). A command and control-based governance, with rigid regulations, large-scale technology, expert knowledge, technical approaches, where uncertainties can be quantified by probability distributions, is not suitable with challenges of the present and the future (Pahl-Wostl, 2009).

It is difficult to characterize the current BSR governance as a success from an environmental point of view (Ringbom and Joas, 2018). A future re-orientation of the BSR network governance is inevitable and a stepwise governance transformation is widely acknowledged. Key BSR actors, policymakers, scientists and civil society networks generally agree that for societies to be able to govern large-scale environmental risks and challenges there is a need for transnational interaction and multi-actor participation. There is a demand for increased involvement of actors with diverse backgrounds through various processes of deliberation (Gilek et al., 2016).

A distancing of BSR governance from a traditional hierarchical command and control regiment is underway. Contemporary environmental network governance of the Baltic Sea is based on scientific reasoning, enhancing BSR policy-makers capacity to conduct informed and cognizant decisions. Natural scientific based knowledge is accepted as a basis for navigating technical actions in the protection of the Baltic Sea. This has gradually expanded the

inclusiveness of BSR environmental policy development. Processes of science-policy relations have increased, and this has reshaped BSR actor participation and communication arrangements. However, BSR science-policy interactions are framed by hierarchical relations defining traditional government. Governments establish the basic interaction rules. The science community's participation in BSR policy arrangements are based on conditions set by top-down guided relational provisions. Even if the positional and the relational power of governments is challenged by a Europeanisation of the region, and by sub-national actor environmental awareness and actions, BSR policy relational patterns are slow to adapt and change.

A path towards a future functional network governance of the Baltic Sea needs to consider augmenting the scope of policy interaction arrangements in the region. Science alone cannot produce optimal solutions to BSR environmental problems. Science is invaluable, but scientific reasoning has to be complemented with tacit knowledge about socio-cultural settings. There is enormous heterogeneity in factors that define different types of environmental problems in the BSR (Haila, 2008). Problems are framed and reframed in different ways and from different perspectives. BSR environmental challenges have specific populations and problem closure is achievable only if the affiliated actor population is systematically ingrained in policy problem processes, presuming coordinated action by several actors (Haila, 2008).

To improve the network governance of the Baltic Sea, a diversity of knowledge perspectives is needed. A starting point is to mix natural science-dominated processes and procedures, with more precautionary and participatory governance approaches that take account of social dimensions and various actor knowledge contributions (Linke and Jentoft, 2014; Jönsson et al., 2016). This could reposition BSR policy development and policy interaction over time to adhere with EAM logic.

In relation to a future functional path for BSR network governance, more scholarly emphasis must be given to network governance and social learning (e.g. Folke et al., 2005; Armitage et al., 2008; Pahl-Wostl, 2009). This thesis contributes to the research on the concept of network governance by interlinking network governance with social learning. It illustrates how network governance functions in practice in order to reflect on the positive normative premise defining the concept of network governance. However, added scholarly focus is required, especially regarding the operational functionality of network governance. More research insights are merited as to what is required from a functional network governance and how this possibly may be achieved.

For instance, Huppe and Creech (2012) demand a certain level of social capital for optimizing the underlying capacity of network governance. This originate in that the effectiveness of network governance is a matter of improving the relational capacities of networks. Creating shared values elevates collaborative policy processes, integrates the distributed capacities of the system towards the creation of innovative solutions. In and across networks, dialogue and interactions are dependent upon a certain level of social capital and in turn, the enhancement of social capital in the network depend upon a certain level of interaction across these actors (Huppe and Creech, 2012). Mutually reinforcing multilevel relationships have the potential to address some embedded limitations of network governance. Self-regulation, coordination, observance and compliance of policy processes (Dedeurwaerdere 2005) may succeed better in a context where efficient communication and social control is a possibility. This could serve

demands for improved efforts of coordinated implementation and facilitate adjusting policy schemes so that they address gaps and ineffective overlaps.

The EUSBSR is in a key position to improve the relational capacity of BSR network governance. Therefore, the EUSBSR deserves more in-depth scholarly attention, especially compared to its actual ability: the potential to serve as an interlinking relational instrument in the region. The role of the EUSBSR is immense in relation to developing a future path for sustained relational network governance interactions. The strategy's latent possibility to link the formal and the informal policy endeavors is unmatched in the region. The EUSBSR is the foremost relational conveyer; it brings together all relevant BSR network governance actors. These actors carry out countless projects, which creates a vast number of possible interactions both horizontally and vertically. However, the premise of these projects needs to be re-aligned with the focus and orientation of the strategy. Projects need to cater more sufficiently to the long-term focus of the EUSBSR and this requires a restructuring of the projects. A restructuring that makes the usage of projects more effective. This notion builds on a broad knowledge-based evaluation of projects that have displayed their effectiveness, from a science and societal perspective. These contextually evaluated projects should serve as basis for generating follow-up projects. This is to create processes that focuses on sustained actor interaction, to safeguard policy development. This opens up the possibilities for adequate collaboration and learning.

The basis for augmenting a future BSR network governance is to improve and broaden the scope of BSR policy development by integrating a diversity of knowledge perspectives through processes of social learning. The value of learning as a normative goal and as a process is recognized in environmental theories. However, attention to learning as an explicit strategy in the design and operation of collaborative natural resource governance is still at an initial stage (Armitage et al., 2008). Hitherto, there has been an absence of examination of the factors that determine if, who, how and what type of learning actually occurs in collaborative resource natural governance contexts (Armitage et al., 2008).

This thesis expands the knowledge base of the learning determinants in a complex natural governance context. It identifies what type of learning is likely to arise in this context and what type of learning is actually required to functionally govern natural resources, such as the Baltic Sea. The thesis contextualizes general challenges associated with contemporary transnational learning efforts. For example, in the governance of the Baltic Sea learning is being approached as non-systematic, uncoordinated experiential and learning-by-doing processes. BSR policy learning efforts and outcomes are shaped by EU recommended and imposed learning beliefs. The shortcomings of this, lie in the rigorous institutional processes, where learning outcomes abides by the rule of measurable results and proliferation of best practices. These learning outcomes are difficult to generalize beyond the case. This undermines the capacity of BSR system to explore viable governance alternatives advocated by an EAM.

What this thesis calls for is broader recognition of the embedded challenges associated with learning in complex social-ecological systems involving adaptive and collaborative governance efforts. The rise of adaptive governance models, endorsed by an EAM, calls for greater specificity and clarity concerning the outcomes ascribed to learning. In particular, regarding the underlying premise and rationale of learning as to its orientation and fit with large-scale ecological challenges. An extensive reflection is vital as to the selection of appropriate learning tools for augmenting BSR network governance. Key BSR actors need to

comprehend and reflect upon the causal logic and ingrained learning limitation attached to different learning tools. The widespread project proliferation in the region, by which policy development is often pursued, restricts BSR learning capacity and potential to incremental learning. However, it is up for debate if learning at all is able to enter the stage of DL, enabled by deliberative learning processes in environmental governance (Pahl-Wostl, 2009). Even so, the articulation of policy development strategy goals is shaped by the underlying capacity of the tools by which policy learning is pursued.

This thesis has provided insights of the suitability and comparability of different BSR network modes' structural and relational properties vis-à-vis social learning parameters. This is to make better use of the potential of a social learning induced network governance. The horizontal and vertical linking of relational functions of BSR network governance is critical for social learning in the region, as the interaction space needs to be congruent with the problem space. The main obstacle regarding transforming BSR environmental network governance with social learning reasoning is that learning is a long-term process.

BSR environmental network governance needs to be long-term and adaptive, yet short-term and lock-in effects are more the rule than the exception. A gradual BSR network governance transformation could be linked with the long-term policy orientations of the region. The orientation of policy development needs to transgress hierarchical borders. Policy development needs to remain open, geared towards continued social learning to ensure that BSR has capacity to respond to unexpected policy effects and developments. The extent to which social learning shapes policy will vary with the strategies or approaches employed, setting of goals and expected outcomes, as well as societal context. However, only by further developing and applying shared and inclusive policy processes that considers the intricacy of governance regimes dealt with governing large-scale ecosystems, can we build and maintain a knowledge base needed to advance the understanding to a state that we can give meaningful policy advice.

References

- Adger, W. Arnell, N Tompkins, E. (2005). Successful adaptation to climate change across scales. *Global Environmental Change*. Vol. 15 (2): 77-86.
- Agranoff, R. McGuire, M. (2001). Big Questions in Public Network Management Research. *Journal of Public Administration Research and Theory*. 11(3): 295–326.
- Agranoff, R. (2007). *Managing within networks: Adding value to public organizations*. Washington, DC: Georgetown University Press.
- Allan, C. (2008). Can adaptive management help us embrace the Murray-Darling basin's wicked problems? In C. Pahl-Wostl, P. Kabat, J. Moltgen, (eds.) 2008. *Adaptive and integrated water management: coping with complexity and uncertainty*. 61–73. Springer, Berlin
- Ansell, C. (2008). The Governance Dilemma. *European Political Science*, 7 (4): 460–471.
- Argyris, C. (1977). Double loop learning in organizations. *Harvard Business Review*, 55, 115–125.
- Argyris, C. (1982). The executive mind and double-loop learning. *Organizational Dynamics* 11(2):5– 22.
- Argyris, C. (1992). *On organizational learning*. Oxford: Blackwell.
- Armitage, D, Berkes, F., Doubleday, N. (2007). *Adaptive Co-Management: Collaboration, Learning, and Multi-Level Governance*. UBC Press. Vancouver.
<https://www.ubcpress.ca/asset/9067/1/9780774813839.pdf>.
- Armitage D., Marschke M., Plummer R. (2008). Adaptive Co-Management and the Paradox of Learning. *Global Environmental Change* 18 (1): 86–98.
- Armitage, D., Plummer, R, Berkes, F., Arthur, R, Charles, A., Davidson-Hunt, I., Diduck, A., Doubleday, N., Johnson, D., Marschke, M. (2009). Adaptive co-management for social-ecological complexity. *Frontiers in Ecology and Environment*. Vol. 7 (2): 95-102
- Armitage, D., Plummer, R. (eds.) (2010). *Adaptive capacity and environmental governance*. Springer-Verlag, Berlin Heidelberg
- Armitage, D., Berkes, F., Dale, A., Kocho-Schellenberg, E., Patton, E. (2011). Co-management and the co-production of knowledge: learning to adapt in Canada's Arctic. *Glob Environ Change* 21, 995–1004.
- Armitage, D. de Loe, R., Plummer, R. (2012). Environmental governance and its implications for conservation practice. *Conservation Letters* 5: 245–255
- Bache, I., Flinders, M. (2004). *Multi-Level Governance*, Oxford: Oxford University Press.
- Bakker, R., Cambre, B., Korlaar, L., Raab, J (2011). Managing the project learning paradox: A set-theoretic approach towards project knowledge transfer. *International Journal of Project Management* 29: 494-503

- Barrett, C, Brandon, K., Gibson, C., Gjertsen, H. (2001). Conserving biodiversity amid weak institutions. *BioScience*, 51 (6) (2001), pp. 497-502
- Beers, P.J., F Hermans, T Veldkamp, Hinssen, J. (2014). Social learning inside and outside transition projects: Playing Free Jazz for a Heavy Metal Audience. *Wageningen Journal of Life Sciences*. Vol 69, 5-13
- Bennett C.J, Howlett, M. (1992). The lessons of learning: Reconciling theories of policy learning and policy change. *Policy Sciences* 25: 275-294, 1992.
- Benz, A. (1996) 'Regionalpolitik zwischen Netzwerkbildung und Institutionalisierung – Zur Funktionalität paradoxer Strukturen', *Staatswissenschaften und Staatspraxis* 7 (1): 23–42
- Benz, A, Furst, D. (2002). Policy Learning in Regional Networks. *European Urban and Regional Studies* 9(1): 21
- Berkes, F. (1999). *Sacred ecology: Traditional ecological knowledge and resource management*. Philadelphia: Taylor & Francis.
- Berkes, F., Folke, C., Colding, J. (Eds.) (2003). *Navigating Social Ecological Systems: Building Resilience for Complexity and Change*. Cambridge University Press, Cambridge.
- Berkes, F. (2009). Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management* Vol 90 (5): 1692-1702
- Besussi, E. (2006). *Policy Networks: Conceptual Developments and their European Applications*. Working Paper Series. Paper No. 102. Centre for Advanced Spatial Analysis, University College London.
- Betsill, M., Bulkeley, H., (2004). Transnational Networks and Global Environmental Governance: The Cities for Climate Protection Program. *International Studies Quarterly*. 48 (2): 471-493
- Bevir, M. (2010). *Democratic Governance*. Princeton University Press, Princeton NJ.
- Biermann, F. (2007). Earth system governance as a crosscutting theme of global change research. *Global Environmental Change. Human and Policy Dimensions*, 17(3–4), 326–337.
- Blanco, I, Lowndes, V, Pratchett, L. (2011). Policy Networks and Governance Networks: Towards Greater Conceptual Clarity. *Political Studies Review* 9: 297 – 308.
- Bodin, Ö, Crona, BI. (2009). The role of social networks in natural resource governance: what relational patterns make a difference? *Global Environmental Change* 19(3): 366–374.
- Bodin, Ö, Prell, C. (2011). *Social Networks and Natural Resource Management: Uncovering the Social Fabric of Environmental Governance*. Cambridge University Press: Cambridge, UK
- Bomberg, E. (2004). Regions, multi-level governance and sustainable development: reflections and strategies. (Paper presented at REGIONET Workshop 4: Regional sustainable development—cross fertilization and integration of results of REGIONET, Brussels).

- Borrás, S. (2011). Policy learning and organizational capacities in innovation policies. *Science and Public Policy*, 38(9): 725–734
- Bouwen, R., Taillieu, T. (2004). Multi-party collaboration as social learning for inter-dependence: developing relational knowing for sustainable natural resource management. *Journal of Community & Applied Social Psychology* 14: 137–153.
- Brady, T, Davies, A. (2004). Building Project Capabilities: From Exploratory to Exploitative Learning. *Organization Studies* 25(9): 1601–1621.
- Braun, V, Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology* 3 (2): 77-101.
- Browne, J., Sackett, P., Wortmann, J. (1995) The extended enterprise. A context for benchmarking, in A. Rolstadas (Eds.) *Benchmarking – Theory and Practice*, pp. 11–21. Chapman & Hall, London
- Brummel, R., Nelson, K., Grayzeck Souter, S., Jakes, P., Williams, D. (2010). Social learning in a policy-mandated collaboration: community wildfire protection planning in the eastern United States, *Journal of Environmental Planning and Management*, 53:6, 681-699
- Brunner, R. D., Steelman T. A., Coe-Juell L., Cromley C. M., Edwards C. M., Tucker D. W. (2005). *Adaptive Governance. Integrating Science, Policy and Decision-Making*. Columbia University Press. New York.
- Busenberg, G.J. (2001). Learning in organizations and public policy. *Journal of Public Policy*, 21, 173–189.
- Börzel, T. (1998). Different Conceptions of Policy Networks. *Public Administration*, 76: 253–273.
- Börzel, T. (2011). Networks: Reified Metaphor or Governance Panacea? *Public Administration* 89 (1): 49–63
- Cacciatori, E. (2008). Memory objects in project environments: storing, retrieving and adapting learning in project-based firms. *Research Policy* 37: 1591-1601
- Carlsson, L., Berkes F. (2005). Co-management: concepts and methodological implications. *Journal of Environmental Management* 75(1): 65–76.
- Christensen, K. (1999). *Cities and Complexity: Making Intergovernmental Decisions*. Sage, London.
- Clarke, M., Stewart, J. (1997). *Handling the Wicked Issues: A Challenge for Government*. Birmingham: Institute of Local Government Studies.
- Coombs, R., Hull, R. (1997). Knowledge management practices and path-dependency in innovation. CRIC Discussion Paper No. 2, Manchester.
- Craps, M. (ed.) (2003). Social learning in river basin management. Report of work package 2 of the HarmoniCOP project. http://www.harmonicop.info/_files/_down/SocialLearning.pdf.

- Creech, H., Vetter, T., Matus, K., Seymour, I.R. (2008). The governance of non-legal entities: An exploration into the challenges facing collaborative, multi-stakeholder enterprises that are hosted by institutions. Winnipeg: IISD. <http://www.iisd.org/publications/pub.aspx?id=1044>
- Crona, B., Bodin, O (2006). What you know is who you know? Communication patterns among resource users as a prerequisite for co-management. *Ecology and Society* 11(2): 7.
- Cross, R., Borgatti, S., Parker, A. (2001). Beyond answers: dimensions of the advice network. *Social Networks* 23: 215–235.
- Cundill, G., Cumming, G., Biggs, S., Fabricius, C. (2011). Soft Systems Thinking and Social Learning for Adaptive Management. *Conservation Biology*, Volume 26, No. 1, 13–20
- Cundill, G., Rodela, R. (2012). A review of assertions about the processes and outcomes of social learning in natural resource management. *Journal of Environmental Management* 113
- Daniels, S., Walker, G. (2001). Working through environmental conflict: the collaborative learning approach. Paeger, Westport, Connecticut
- Davidson-Hunt, I., O'Flaherty, R. (2007). Researchers, indigenous peoples, and place-based learning communities. *Soc Nat Resources* 20(4), 291–305.
- Dedeurwaerdere T. (2005). The Contribution of Network Governance to Sustainability Impact Assessment. In Thoyer S., Martimort-Asso B., (eds.) (2005). *Participation for Sustainability in Trade*. Ashgate, Surrey, UK, pp. 209–228.
- Diduck, A. (2004). Incorporating participatory approaches and social learning. In: Mitchell, B. (Ed.), *Resource and Environmental Management in Canada*, third ed. Oxford University Press, Don Mills, Ont, pp. 497–527.
- Diduck, A., Bankes, N., Clark, D., Armitage, D. (2005). Unpacking social learning in social-ecological systems: case studies of polar bear and narwhal management in northern Canada. In: Berkes, F., Huebert, R., Fast, H., Manseau, M., Diduck, A. (Eds.), *Breaking Ice: Renewable Resource and Ocean Management in the Canadian North*. Arctic Institute of North America and University of Calgary Press, Calgary, pp. 269–290
- Dietz, T.E, Ostrom, E, Stern, P.C. (2003). The struggle to govern the commons. *Science* 302 Nr. 5652: 1907–1912.
- Edelenbos, J, Klijn, E. (2007). Trust in complex decision-making networks: A theoretical and empirical explanation. *Administration & Society* 39:25–50
- Faerman, S, McCaffrey, D, van Slyke, D. (2001). Understanding inter-organizational cooperation: Public-private collaboration in regulating financial market innovation. *Organization Science* 12:372–88.
- Farkas, A. (1998). *State Learning and International Change*. Ann Arbor: University of Michigan Press.
- Fazey, I., Fazey, A., Fazey, D. (2005). Learning more effectively from experience. *Ecology and Society* 10(2): 4.

- Fazey, I., Evely, Reed, M., Stringer, L., Kruijssen, J., White, P., Newsham, A., Jin, L., Cortazzi, M., Phillipson, J., Blackstock, K., Entwistle, N., Sheate, W., Armstrong, F., Blackmore, C., Fazey, A., Ingram, J., Gregson, J., Lowe, P., Morton, S., Trevitt C. (2013). Knowledge Exchange: a review and research agenda for environmental management. *Environ. Conserv.*, 40 (2013), p. 1
- Filténborg, M., Gänzle, S., Johannsson, E. (2002). An Alternative Theoretical Approach to EU Foreign Policy. Network Governance and the Case of the Northern Dimension Initiative. *Journal of the Nordic International Studies Association*. 37(4): 387–407.
- Fiorino, D. (2001). Environmental policy as learning: A new view of an old landscape. *Public Administration Review*, 61, 322–334.
- Folke, C., Hahn, T., Olsson, P., Norberg, J. (2005). Adaptive Governance of Social-ecological Systems. *Annual Review of Environment and Resources* 30(1): 441–473.
- Forbes, B., Bölter, M., Muller-Wille, L. (eds.) (2006). Reindeer management in northernmost Europe: linking practical and scientific knowledge in social-ecological systems. *Ecological studies* 184. Springer, Berlin.
- Forester, J. (1999). *The deliberative practitioner*. Cambridge, MA: MIT Press.
- Gargiulo, M., Benassi, M. (2000). Trapped in your own net? Network cohesion, structural holes, and the adaptation of social capital. *Organization Science* 11:183–196.
- Gilek, M., Hassler, B., Jentoft, S. (2015) Marine governance in Europe: problems and opportunities. In: Gilek M, Kern K (eds.) *Governing Europe’s marine environment. Europeanization of regional seas or regionalization of EU policies?* Ashgate Publishing, Farnham
- Gilek, M., Karlsson, M., Linke, S., Smolarz, K. (2016). Environmental Governance of the Baltic Sea: Identifying Key Challenges, Research Topics and Analytical Approaches. In Gilek, M., Karlsson, M., Linke, S., Smolarz, K. (eds.) (2016). *Environmental Governance of the Baltic Sea*. MARE Publications Series 10. Springer.
- Gilek, M, Karlsson, M. (2016). Seeking Pathways Towards Improved Environmental Governance of the Baltic Sea. In Gilek M., Karlsson M., Linke S., Smolarz K. (eds.) (2016). *Environmental Governance of the Baltic Sea*. MARE Publications Series 10. Springer.
- Giuliani, E., Bell, M. (2005) The micro-determinants of meso-learning and innovation: evidence from a Chilean wine cluster, *Research Policy* 34: 47–68.
- Gherardi, S., Nicolini, D., Odella, F. (1998). Toward a social understanding of how people learn in organizations. *Management Learning* 29 (3): 273–293.
- Gleick, P. (2003). Global freshwater resources: soft-path solutions for the 21st century. *Science* 302: 1524-1528
- Golafshani, N. (2003). Understanding Reliability and Validity in Qualitative Research. *The Qualitative Report* 8 (4): 597-606

- Grabher, G. (2004). Temporary Architectures of Learning: Knowledge Governance in Project Ecologies. *Organization Studies* 25(9): 1491–1514.
- Grin, J., van de Graaf, H. (1996). Implementation as communicative action. An interpretive understanding of interactions between policy actors and target groups. *Policy Sciences*, 29(4): 291–319.
- Grin, J, Loeber, A. (2006). 15 Theories of Policy Learning: Agency, Structure and Change. *Handbook of public policy analysis*, 2006. In F. Fischer, G.J. Miller, M. Sidney (eds.) 2006. CRC Press. Taylor & Francis Press
- Grönholm, S. (2018). A Tangled Web. *Baltic Sea Region Governance through Networks. Marine Policy*. Vol. 98: 201-210
- Haas, P. (2004). When does power listen to truth? A constructivist approach to the policy process. *Journal of European Public Policy*, 11: 569–592
- Hahn, T., Olsson, P., Folke, C., Johansson, K. (2006). Trust-building, knowledge generation and organizational innovations: the role of a bridging organization for adaptive co-management of a wetland landscape around Kristianstad, Sweden. *Human Ecology*, 34, 573–592.
- Haila, Y. (2008). Unity versus Disunity of Environmental Governance in the Baltic Sea Region. In *Governing a common sea. Environmental policies in the Baltic Sea Region*, eds. M. Joas, D. Jahn and K. Kern, 193–212. London: Earthscan.
- Hajer, M., Versteeg, W. (2005). Performing governance through networks. *European Political Science* 4 (3): 340–347
- Hall, P.A. (1993). Policy paradigms, social learning, and the state: The case of economic policy making in Britain. *Comparative Politics*, 25, 275–296.
- Hall, C.M. (2011). Policy learning and policy failure in sustainable tourism governance: from first- and second-order to third-order change?, *Journal of Sustainable Tourism*, 19:4-5, 649-671
- Hassink, R., Lagendijk, A., (2001). The dilemmas of interregional institutional learning. *Environment and Planning C: Government and Policy*, 19 (1): 65-84
- Haughton, G. Allmendinger, P. Counsell, D. Vigar, G. (2009). *The New Spatial Planning: Territorial Management with Soft Spaces and Fuzzy Boundaries*. Routledge, London
- Healey, P. (1997). *Collaborative planning: shaping places in fragmented societies*. MacMillan, London
- Hisschemöller M, Hoppe R. (2001). Coping with intractable controversies: the case for problem structuring in policy design and analysis. In *Knowledge, Power, and Participation in Environmental Policy Analysis*, Hisschemöller M, Hoppe R, Dunn WN, Ravetz JR (eds.) Transaction: New Brunswick; 47–72.

- Hix, S. (1998). The Study of the European Union II: the “New Governance” Agenda and its Rival. *Journal of European Public Policy* 5(1): 38–65.
- Holling, C. (ed.) (1978). *Adaptive environmental assessment and management*. Wiley, London, UK.
- Hoppe, R. (1999) Policy analysis, science and politics, from speaking truth to power to making sense together, *Science and Public Policy*, (26)3: 201–210.
- Hoppe, R. (2011) *The Governance of Problems: Puzzling, powering and participation*, Bristol: The Policy Press.
- Howlett, M, I. Mukherjee, Koppenjan, J. (2015) *Policy Learning and Policy Networks in Theory and Practice: The Case of Indonesian Biodiesel Policy Network*. ICPP conference, Milan , 1-4 July 2015
- Huitema D., Mostert, E., Egas W., Moellenkamp, S., Pahl-Wostl, C., Yalcin, R. (2009). Adaptive water governance: assessing the institutional prescriptions of adaptive (co)management from a governance perspective and defining a research agenda. *Ecology and Society* 14: 1.
- Huppé, G, Creech, H. (2012). *Developing Social Capital in Networked Governance Initiatives: A lock-step approach*. The International Institute for Sustainable Development https://www.iisd.org/pdf/2012/developing_social_capital_network_gov.pdf
- Huppé, G, H. Creech, Knoblauch, D. (2012). *The Frontiers of Networked Governance*. The International Institute for Sustainable Development https://www.iisd.org/sites/default/files/publications/frontiers_networked_gov.pdf
- Ibert, O. (2004). Projects and firms as discordant complements: organizational learning in the Munich software ecology. *Research Policy* 33: 1529-1546
- Ison, R, Roling, N, Watson, D. (2007). Challenges to science and society in the sustainable management and use of water: investigating the role of social learning. *Environ Sci Policy* 10(6): 499–511
- Jachtenfuchs, M. (2001). The Governance Approach to European Integration. *Journal of Common Market Studies* 39(2):245–64.
- Jessop, B. (2000). *The network society –New forms of governance and democratic renewal*. Unpublished paper, MODINET, University of Copenhagen.
- Jessop, B. (2002). *The future of the capitalist state*. Cambridge, MA: Polity
- Jiggins, J., Röling, N. (2002). Adaptive management: Potential and limitations for ecological governance of forests in a context of normative pluriformity. In *Adaptive management: from theory to practice*, ed. J. A. E. Oglethorpe, 93–104. Gland, Switzerland: IUCN.
- Joas, M., Jahn, D., Kern, K. (2008). Governance in the Baltic Sea region: Balancing states, cities and people. In *Governing a common sea. Environmental policies in the Baltic Sea region*, eds. M. Joas, D. Jahn, and K. Kern. London: Earthscan.

- Johannessen, Å., Hahn, T. (2012). Social learning towards a more adaptive paradigm? Reducing flood risk in Kristianstad municipality, Sweden. *Global Environmental Change*. Vol 23 (1): 372-382
- Jonas, C., Lichtenstein, B., (2008). Temporary inter-organizational projects: how temporal and social embeddedness enhance coordination and manage uncertainty. In: Copper, S, Eberts M, Huxham, C and P. Smith Ring (eds.). *The Oxford Handbook of Inter-Organizational Relations*. Oxford University Press. UK. 231 – 255.
- Jones, C., Hesterley, W, Borgatti, S (1997). A General Theory of Network Governance: Exchange Conditions and Social Mechanisms. *Academy of Management Review*, 22 (4): 911–945
- Jönsson, A., Boström, M., Dreyer, M., Söderström, S. (2016). Risk Communication and the Role of the Public: Towards Inclusive Environmental Governance of the Baltic Sea? In Gilek M., Karlsson M., Linke S., Smolarz K. (eds.) (2016). *Environmental Governance of the Baltic Sea*. MARE Publications Series 10. Springer.
- Kaiser, W. (2009). Introduction: Networks in European Union Governance. *Journal of Public Policy*, 29 (2): 131–133.
- Karlsson, M., Gilek, M., Lundberg, C. (2016). Eutrophication and the Ecosystem Approach to Management: A Case Study of Baltic Sea Environmental Governance. In Gilek M., Karlsson M., Linke S., Smolarz K. (eds.) (2016). *Environmental Governance of the Baltic Sea*. MARE Publications Series 10. Springer.
- Keen, M., Brown, V., Dybal, R. (2005). *Social Learning in Environmental Management*. Earthscan, London, UK
- Keen, M., Mahanty, S. (2006). Learning in sustainable natural resource management: challenges and opportunities in the Pacific. *Society and Natural Resources* 19: 497–513.
- Kern, K, Löffelsend, T. (2008). Governance beyond the Nation State: Transnationalization and Europeanization of the Baltic Sea Region. In *Governing a common sea. Environmental policies in the Baltic Sea region*, eds. M. Joas, D. Jahn, and K. Kern. London: Earthscan.
- Kickert, W., Klijn, E., Koppenjan, J. (Eds.) (1997). *Managing complex networks*. London: Sage.
- Klijn, E. (2008). Governance and Governance Networks in Europe. *Public Management Review*, 10 (4): 505-525
- Klijn, E. Koppenjan, J. (2000). Public Management and Policy Networks. *Public Management: An International Journal of Research and Theory*, 2:2, 135-158
- Klijn, E., Koppenjan, J. (2006). Institutional design: changing institutional features of networks. *Public Management Review* 8:141-160.
- Klijn, E., Koppenjan, J. (2012). Governance network theory: past, present and future. *Policy & Politics* vol. 40 no 4: 587–606

- Klijin, E., Koppenjan, J. (2015). *Governance networks in the public sector*, Oxon: Routledge
- Koehly, L., Pattison, P. (2005). Random graph models for social networks: multiple relations or multiple raters. Pages 162–191 in P. J. Carrington, J. Scott, and S. Wasserman, editors. *Models and methods in social network analysis*. Cambridge University Press, Cambridge, UK
- Kooiman, J. (ed.) (1993). *Modern Governance. New Government – Society Interactions*. London: Sage
- Kooiman, J. (2003). *Governing as governance*. London: Sage.
- Kooiman, J., Bavinck M., Jentoft S., Pullin R. (2005). *Fish for Life: Interactive Governance of Fisheries*. Amsterdam University Press.
- Kooiman, J, Jentoft, S. (2009). Meta-Governance: Values, Norms and Principles and the making of hard choices. *Public Administration* Vol. 87, No. 4 (818–836)
- Koppenjan, J. (2008). Creating a playing field for assessing the effectiveness of network collaboration by performance measures. *Public Management Review* 10: 699–714
- Koppenjan, J., Klijin, E. (2004). *Managing Uncertainties in Networks: A Network Approach to Problem Solving and Decision Making*, London: Routledge.
- Koppenjan J, Klijin, E. (2016). The Shift towards Network Governance. In *Theory and Practice of Public Sector Reform*. Eds. Van de Walle and Groenevelt 2016. Routledge
- Krackhardt, D., Stern, R. (1988). Informal networks and organizational crises—an experimental simulation. *Social Psychology Quarterly* 51:123– 140.
- Kriesi H., Adam S., Jochum M. (2006). Comparative Analysis of Policy Networks in Western Europe. *Journal of European Public Policy*, 13 (3): 341–361.
- Leach, W., Pelkey, N. (2001). Making watershed partnerships work: a review of the empirical literature. *Journal of Water Resources Planning and Management* 127: 378-385
- Lebel, L., Grothman, T., Siebenhuner, B. (2010). The role of social learning in adaptiveness: insights from water management. *Int. Environ Agree: Polit, Law Econ* 10(4), 333–353
- Lee, K.N., (1993). *Compass and Gyroscope: Integrating Science and Politics for the Environment*. Island Press, Washington, DC.
- Lee, T., van de Meene, S. (2012). Who teaches and who learns? Policy learning through the C40 cities climate network *Policy Sci.* 45:199–220
- Lewis, J. (2005). *Health Policy and Politics: Networks, Ideas and Power*. Melbourne: IP Communications.
- Lewis, J. (2011). The Future of Network Governance Research: Strength and Diversity and Synthesis. *Public Administration* 89 (4): 1221–1234
- Linke, S., Gilek, M., Karlsson, M., Udovyk, O. (2014) Unravelling science-policy interactions in environmental risk governance of the Baltic Sea: comparing fisheries and eutrophication.

Linke, S., Jentoft, S (2014) Exploring the phronetic dimension of stakeholders knowledge in EU fisheries governance. *Mar Policy* 47:153–161

Linke, S., Gilek, M., Karlsson, M. (2016). Science-Policy Interfaces in Baltic Sea Environmental Governance: Towards Regional Cooperation and Management of Uncertainty? In Gilek M., Karlsson M., Linke S., Smolarz K. (eds.) (2016). *Environmental Governance of the Baltic Sea*. MARE Publications Series 10. Springer.

Lundvall, B-Å., Tomlinson, M. (2002). International Benchmarking as a Policy Tool. In the New Knowledge Economy in Europe: a strategy for international competitiveness and social cohesion. Ed. M.J. Rodrigues. Cheltenham: Edward Elgar Publishing

Löfgren, K., Godenhjelm, S. Sjöblom, S. (2013). Projectified Politics: Temporary Organisations in a Public Context. Introduction to the special issue. *Scandinavian Journal of Public Administration*, 17(2), 3-12.

Mahoney, J. (2000). Path dependence in historical sociology. *Theory and Society* 29 (4): 507–548

Malik, K., Cunningham, P. (2006). Transnational policy learning in Europe: attempts to transfer innovation policy practices. *Innovation: Management, Policy and Practice*, 8(3), 262–272.

Marcussen, M, Torfing, J. (Eds.) (2007). *Democratic network governance in Europe*. Basingstoke, UK: Palgrave Macmillan.

Marks, G, Hooghe, G. L. (2004). *Contrasting Views of Multi-level Governance in I. Bache and M. Flinders (eds.) Multi-level Governance*, Oxford: Oxford University Press.

Maurel, P. (2003). Public participation and the European Water Framework Directive. Role of Information and Communication Tools, WP3 report of the HarmoniCOP project, 94p.

May, P.J. (1992). Policy learning and failure. *Journal of Public Policy*, 12, 331–354

Mayntz, R. (1991). Modernization and the logic of inter-organizational networks', Discussion Paper 91/8, Cologne: Max-Planck-Institut für Gesellschaftsforschung

Measham, T. (2009). Social learning through evaluation: a case study of overcoming constraints for management of dryland salinity. *Journal of Environmental Management* 43:1096–1107

Medema, W, Wals, A. Adamowoski, J. (2014). Multi-Loop Social Learning for Sustainable Land and Water Governance: Towards a Research Agenda on the Potential of Virtual Learning Platforms. *Wageningen Journal of Life Sciences*. Vol 69, 6: 23-38

Meinzen-Dick, R. (1997). Farmer participation in irrigation—20 years of experience and lessons for the future. *Irrigation and Drainage Systems* 11:103-118.

- Milward, H.B. Provan, K. (2000). How Networks are Governed, in C.J. Heinrich and L.E. Lynn (eds.) *Governance and Performance: New Perspectives*, Washington DC: Georgetown University Press, pp. 238–262.
- Mostert, E., Pahl-Wostl, C., Rees, Y., Searle, B., Tàbara, D., Tippett, J. (2007). Social Learning in European River-Basin Management: Barriers and Fostering Mechanisms from 10 River Basins. *Ecology and Society* 12(1): 19
- Muro, M., Jeffrey, P. (2008). A critical review of the theory and application of social learning in participatory natural resource management processes, *Journal of Environmental Planning and Management*, 51:3, 325-344
- Myint, T. (2002). Managing Complexities in Global Environmental Governance: Issues-Interests-Actors Network Model for the Transnational Environmental Governance in the Mekong River Commission and the International Commission for the Protection of the Rhine. 106–116. In F. Biermann, R. Brohm and K. Dingwerth (eds.): *Proceedings of the 2001 Berlin Conference on the Human Dimensions of Global Environmental Change Global Environmental Change and the Nation State*. Potsdam: Potsdam Institute for Climate Impact Research.
- Nauwelaers, C., Wintjes, R. (2008). Innovation policy, innovation in policy: policy learning within and across systems and clusters. In *Innovation Policy in Europe. Measurement and Strategy*, (eds.) C Nauwelaers and R Wintjes. Cheltenham: Edward Elgar.
- Newig, J., Pahl-Wostl, C., Sigel, K. (2005). The role of public participation in managing uncertainty in the implementation of the Water Framework Directive. *European Environment*, 15: 333–343.
- Newig J., Günther, D. (2005). Network Governance, Social Learning and Sustainability Transitions. In *Workshop on German-Dutch-Perspectives on Current Issues of Environmental Social Sciences*, Münster, 17–18 November 2005. URL: <http://www.swome.nl/archive.htm> 2005 Nov.
- Newig, J., Fritsch, O. (2009). Environmental governance: participatory, multi-level—and effective? *Environmental Policy and Governance* 19:197– 214.
- Newig, J, Gunther, D, Pahl-Wostl, C. (2010). Synapses in the network: learning in governance networks in the context of environmental management. *Ecology and Society* vol. 15(4): 24.
- Newig, J, Kochskämper, E, Challies, E, Jager, N. (2016). Exploring governance learning: How policymakers draw on evidence, experience and intuition in designing participatory flood risk planning. *Environmental Science and Policy* 55(2): 353- 360.
- Newig J, E. Kochskämper, E. Challies, N Jager (2016). Exploring governance learning: How policymakers draw on evidence, experience and intuition in designing participatory flood risk planning. *Environmental Science and Policy* 55 (2) 353- 360.
- Nielsen, K. Pedersen, O.K. (1988). The negotiated economy: ideal and history, *Scandinavian Political Studies* 11(2): 79–101

- Nilsson, M. (2005). Learning, frames, and environmental policy integration: The case of Swedish energy policy. *Environment and Planning C: Government & Policy*, 23, 207–226.
- North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge University Press, Cambridge.
- Olsson, P, Folke, C, Berkes, F. (2004). Adaptive co-management for building resilience in social-ecological systems. *Environmental Management* 34(1): 75–90.
- Olsson, P., Gunderson, L., Carpenter, S., Ryan, P., Lebel, L., Folke, C., Holling, C. (2006). Shooting The rapids: navigating transitions to adaptive governance of social–ecological systems. *Ecology and Society* 11, 18.
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge: Cambridge University Press.
- Pahl-Wostl, C. (2002). Towards sustainability in the water sector: the importance of human actors and processes of social learning. *Aquatic Sciences* 64:394–411.
- Pahl-Wostl, C., Hare, M. (2004). Processes of social learning in integrated resources management. *Journal of Community & Applied Social Psychology*, 14: 193–206.
- Pahl-Wostl, C., Craps, M., Dewulf, A., Mostert, E., Tabara, D., Taillieu, T. (2007). Social learning and water resources management. *Ecology and Society* 12(1)
- Pahl-Wostl C., Tabara, D., Bouwen, R., Craps, M., Dewulf, A., Mostert, E., Ridder, D. (2008). The importance of social learning and culture for sustainable water management. *Ecol Econ* 64(3):484–495
- Pahl-Wostl, C. (2009). A conceptual framework for analyzing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change*. 19 (1): 354-365
- Pahl-Wostl, C., Sendzimir, J., Jeffrey, P (2009). Resources management in transition. *Ecology and Society* 14: <http://www.ecologyandsociety.org/vol14/iss1/art46/>.
- Parker, R. (2007). Networked Governance or Just Networks? Local Governance of the Knowledge Economy in Limerick (Ireland) and Karlskrona (Sweden). *Political Studies*, vol. 55; 113-132
- Pemberton, H. (2000). Policy networks and policy learning UK economic policy in the 1960s and 1970s. *Public Administration*, 78(4), 771-792.
- Perri, 6., Leat, D., Seltzer, K., Stoker, G. (2002). *Towards Holistic Governance: The New Reform Agenda*. New York: Palgrave.
- Piattoni, S. (2009). Multi-level Governance in the EU. Does it work? *Globalization and Politics*. A conference in honor of Suzanne Berger. MIT. 2009.

- Pohl, C., Rist, S., Zimmermann, A. (2010). Researcher's roles in knowledge co-production: experience from sustainability research in Kenya, Switzerland, Bolivia and Nepal. *Sci Public Policy* 37(4), 267–281
- Powell, W. (1990). Neither market nor hierarchy: network forms of organization. *Research in Organizational Behavior* 12:295–336.
- Pretty, J. (1995). Participatory learning for sustainable agriculture. *World Development* 23:1247–1263
- Pretty, J., Ward, H. (2001). Social capital and the environment. *World Development* 29:209–227.
- Provan, K., Milward, H. (1995). A preliminary theory of network effectiveness: A comparative study of four community mental health systems. *Administrative Science Quarterly* 40:1–33.
- Provan, K., Kenis, P. (2007). Modes of Network Governance: Structure, Management, and Effectiveness. *Journal of Public Administration Research and Theory*, Vol. 18 (2): 229–252
- Provan K., Fish A., Sydow J. (2007). Inter-organizational Networks at the Network Level: A Review of the Empirical Literature on Whole Networks. *Journal of Management*, Vol. 33(3): 479–516.
- Reed, M., Evely, A., Cundill, G., Fazey, I., Glass, J., Laing, A., Newig, J., Parrish, B., Prell, C., Raymond, C., Stringer, L. (2010). What is social learning? *Ecol Soc* 15(4):r1
- Ridder, D., Mostert, E., Wolters, H. (eds.) (2005). *Learning together to manage together: improving participation in water management*. University of Osnabrück, Osnabrück, Germany. <http://www.harmonicop.info/HarmoniCOPHandbook.pdf>.
- Rijke, J., Brown, B., Zevenbergen, C., Richard A., Farrelly, M., Morison, P., van Herk, S. (2012). Fit-for-purpose governance: A framework to make adaptive governance operational. *Environmental Science and Policy*, 22: 73–84.
- Ringbom, H., Joas, M. (2018). Introduction: Multi-level regulation in the Baltic Sea region. *Marine Policy*. Vol. 98: 187–190
- Rhodes, R. A. W. (1990). Policy networks: A British perspective. *Journal of Theoretical Politics*, 2: 293–317
- Rhodes, R.A.W. (1997). *Understanding governance*. Buckingham, UK: Open University Press.
- Robins, G., Bates, R., Pattison, P. (2011). Network Governance Environmental Management: Conflict and Cooperation. *Public Administration* Vol. 89 (4): 1293–1313
- Rogers, E. (1995). *Diffusion of Innovations*. New York: The Free Press
- Romina, R. (2014). Social Learning, Natural Resource Management, and Participatory Activities: A Reflection on construct development and testing. *Wageningen Journal of Life Sciences* 69: 15–22

Rosenschöld, af Munch, J. (2017). Projectified Environmental Governance and Challenges of Institutional Change Towards Sustainability. Department of Social Research University of Helsinki Finland

Ruitenbeek, J., Cartier, C. (2001). Adaptive Co-Management: Collaboration, Learning and Multi-Level Governance. University of British Columbia Press The invisible wand: adaptive co-management as an emergent strategy. Occasional Paper. Society and Natural Resources: 309-326

Rämö, H., (2002). Doing things right and doing the right things. Time and timing in projects. *International Journal of Project Management*, 20(7): 569–574.

Sabatier, P. (1988). An advocacy coalition framework of policy change and the role of policy-oriented learning therein. *Policy Sciences*, 21, 129–168

Sbarcea, K., Martins, R. (2003). The Temporary Knowledge Organization in Rao, Madanmohan (eds.) *Leading with Knowledge*. Tata McGraw-Hill.

Scarborough, H., Swan, J., Laurent, S., Bresnen, M., Edelman, L., Newell, S. (2005). Project-Based Learning and the Role of Learning Boundaries. *Organization Studies* 25(9): 1579–1600

Scharpf, F. (1994). Games real actors could play: Positive and negative coordination in embedded negotiations. *Journal of Theoretical Politics* 6(1), 27–53.

Scharpf, F. (1999). *Governing in Europe – Effective and Democratic?* Oxford: Oxford University Press

Scheff, J. (1999). *Lernende Regionen. Regionale Netzwerke als Antwort auf globale Herausforderungen*. Wien: Linde

Scholz, G., Dewulf, A., Pahl-Wostl, C. (2014). An Analytical Framework of Social Learning Facilitated by Participatory Methods Syst. *Pract. Action Res.* 27:575–591

Scott, J. 2000. *Social network analysis: a handbook*. Sage Publications, London, UK

Schout, A., Jordan, A. (2003). Coordinated European governance: Self-organizing or centrally steered? CSERGE working paper, EDM 03-14, 25 pp.

Schusler, T., Decker, D., Pfeffer, M. (2003). Social Learning for Collaborative Natural Resource Management, *Society & Natural Resources*, 16:4: 309-326.

Siebenhuner, B., Suplie, J. (2005). Implementing the access and benefit-sharing provisions of the CBD: A case for institutional learning. *Ecological Economics* 53 pp. 507–522

Siebenhuner, B. (2008). Learning in international organizations in global environmental governance. *Global Environmental Politics*, 8: 92–116.

Sjöblom, S. (2009). Administrative Short-termism - A Non-Issue in Environmental and Regional Governance. *Journal of Environmental Policy and Planning*. Vol 11. No 3, 166-168

Sjöblom, S, Godenhjelm, S. (2009). Project Proliferation and Governance—Implications for Environmental Management, *Journal of Environmental Policy & Planning*, 11:3, 169-185

- Smith, A., Stirling, A. (2007). Moving outside or inside? Objectification and reflexivity in the governance of sociotechnical systems. *Journal of Environmental Policy and Planning*, 9(3-4), 351–373.
- Smolarz, K., Biskup, P., Zgrundo, A. (2016). Biological Invasions: A Case Study of Baltic Sea Environmental Governance. In Gilek M., Karlsson M., Linke S., Smolarz K. (eds.) (2016). *Environmental Governance of the Baltic Sea*. MARE Publications Series 10. Springer.
- Steiner, M., Hartmann, C. (2006). Organizational learning in clusters: a case study on material and immaterial dimensions of cooperation, *Regional Studies* 40, 493–506.
- Sober, E. (2013). *Core Questions in Philosophy: A Text with Readings* (6th ed.). Boston: Pearson Education.
- Sydow, J., Staber, U (2002). The institutional embeddedness of project networks: The case of content production in German television. *Regional Studies* 36 (3): 215–228
- Sørensen, E, Torfing, J. (2005). Network Governance and Post-Liberal Democracy, *Administrative Theory & Praxis*, 27:2: 197-237
- Sørensen, E., Torfing, J. (eds.) (2007). *Theories of Democratic Network Governance*. Basingstoke: Palgrave Macmillan.
- Sørensen E., Torfing J. (2009). Making Governance Networks Effective and Democratic through Metagovernance. *Public Administration*. 87(2): 234–258.
- Sørensen, E., Torfing, J. (2011). Enhancing collaborative innovation in the public sector. *Administration and Society*, 43(8): 842–868
- Thatcher, M. (1998). The Development of Policy Network Analyses: From Modest Origins to Overarching Frameworks. *Journal of Theoretical Politics*, 10(4): 389–416.
- Torfing, J. (2005). Governance network theory: towards a second generation. *European Political Science* 4: 305–315.
- Torfing, J, Sørensen, E. (2014). The European debate on governance networks: Towards a new and viable paradigm?, *Policy and Society*, 33(4): 329-344
- Valente, T. W. (2005). Network models and methods for studying the diffusion of innovations. Pages 98– 116 in P. J. Carrington, J. Scott, and S. Wasserman, editors. *Models and methods in social network analysis*. Cambridge University Press, Cambridge, UK.
- Valve, H. (2006). Evaluating Social Learning Potentials Generated By EU Structural Funding Programs. *Innovation: The European Journal of Social Science Research*, 19(2): 171–187.
- Van Bommel, S., Röling, N., Aarts, N., Turnhout, E. (2009). Social Learning for Solving Complex Problems: a Promising Solution or Wishful Thinking? A Case Study of Multi-Actor Negotiation for the Integrated Management and Sustainable Use of the Drentsche Aa Area in the Netherlands. *Environmental Policy and Governance Env. Pol. Gov.* 19: 400–412

Van Bortel, G, Mullins, D. (2009). Critical perspectives on network governance in urban regeneration, community involvement and integration. *Journal of Housing and the Built Environment* 24:203–219.

Voß, J., Newig, J., Kastens, B., Monstadt, J., Nölting, B., (2007). Steering for sustainable development: a typology of problems and strategies with respect to ambivalence, uncertainty and distributed power. *Journal of Environmental Policy and Planning* 9: 193–212

Walker, B, Carpenter, S., Anderies, J., Abel, N., Cumming, G., Janssen, M., Lebel, L., Norberg, J., Peterson, G., Pritchard, R. (2002). Resilience Management in Social-ecological Systems: a Working Hypothesis for a Participatory Approach. *Conservation Ecology* 6(1):14.

Warner, J. F. (2006). More sustainable participation? Multi-stakeholder platforms for integrated catchment management. *International Journal of Water Resources Development* 22:15-35.

Wink, R. (2010) Trans-regional Institutional Learning in Europe: Prerequisites, Actors and Limitations, *Regional Studies*, 44:4, 499-511

Woodhill, A. (2004). Dialogue and transboundary water resources management: towards a framework for facilitating social learning. In: S. Langaas and J.G. Timmerman, (eds.) *The role and use of information in European transboundary river basin management*. London: IWA Publishing.

