Haapala, Juho; Keskinen, Marko

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Exploring 100 Years of Finnish Transboundary Water Interactions With Russia: An Historical Analysis of Diplomacy and Cooperation

Juho Haapala

Aalto University, Espoo, Finland; juho.haapala@aalto.fi

Marko Keskinen

Aalto University, Espoo, Finland; marko.keskinen@aalto.fi

ABSTRACT: This study combines the strengths of historical studies and analytical approaches on transboundary water interactions to establish an historical process perspective on transboundary waters. The study analytically separates transboundary water cooperation, water diplomacy, and their broader political setting, and analyses their interplay over a long period of time. The paper presents a detailed case study on the development and transformation of Finnish-Russian transboundary water interactions over the last 100 years, with an emphasis on Finland and its relationship with the Soviet Union/Russia after World War II. The setting remains relatively understudied despite its intriguing characteristics and its importance to the pioneering of water cooperation arrangements such as reciprocal compensation mechanisms. Using four distinct time periods, the study scrutinises how water diplomacy actors, institutional developments, broader political environs, and historical occurrences have ultimately led to the current cooperative setting. The findings emphasise the role played by societal trends in steering politics and water diplomacy as well as in the crafting of transboundary water cooperation. They also indicate how establishing an institutional basis for cooperation requires both political commitment and technical expertise, often over a very long period of time. The findings demonstrate how the institutions of cooperation, once they emerged, resulted in a rather self-governing operating body for everyday transboundary interaction, replacing water diplomacy as the dominant means of interaction in the studied context. Analysing historical trajectories helps to critically investigate our current discourses and practices and to understand the impact that broader societal trends have on transboundary water interactions.

KEYWORDS: Historical analysis, water diplomacy, transboundary water cooperation, international waters, water history, historical institutionalism, Finland, Russia, the Soviet Union

INTRODUCTION

Much of the world's history is a history of (transboundary) water governance. Since ancient times, civilisations have flourished because they were able to control flows in their major water bodies to their advantage (Tvedt et al., 2006). Ancient civilisations have had to negotiate, and agree on, the use of common water resources at both intranational and international levels. This makes transboundary water interactions one of the oldest diplomatic encounters between realms.[1] Water diplomacy and governance have thus been a part of foreign politics for a very long time, predating modern nation states.

Transboundary waters also play a significant role in foreign relations today. Practically all states that have a land border share transboundary freshwater resources. Currently, there are approximately 310

[1] One of the first known transboundary water agreements is the Mesilim Treaty between the states of Lagash and Umma in Mesopotamia; this treaty dates back to the 25th century BC (Schorr, 2018).

international river basins in the world; they spread over 47% of the global land area and sustain 52% of the population (McCracken and Wolf, 2019). The governance of these waters is often dependent on the actions of the neighbouring states. Transboundary water governance and the related interactions are therefore long-term historical processes; as such, they are essential for joint, peaceful coexistence and potential benefit-sharing between riparian states.

The current narratives on water and related identities, agencies, institutions, organisational structures and their legitimacy are all shaped by the past. Long-term trajectories expose the changing role of water for societies and show how societies have negotiated and agreed on the allocation of water as a common resource. The historical perspective is particularly relevant in the context of transboundary waters, as it captures the changing interests and relations of riparian states over time. Overall, historical analysis can both explain and enable the contemporary formulation of functional and socially fit policies that can help in resolving and preventing water-related conflicts (Musemwa, 2019; Zeitoun et al., 2020).

This study aims to bridge gaps in the existing research literature on transboundary water interactions in two ways. In the first, more practical, approach the study utilises the potential of historical understanding in the analysis of transboundary waters and related interactions. A number of studies describe and conceptualise transboundary water interactions, water diplomacy, and transboundary water cooperation (see next Section); however, only a few studies focus explicitly on transboundary water interactions and view them primarily as historical processes. (Exceptions to this include Rai et al., 2019; Soliev et al., 2015; Turton et al., 2004). Some frameworks do analyse the historical trajectories in transboundary water interactions; this includes, most notably, the Transboundary Waters Interaction NexuS (TWINS) framework (for instance, Zeitoun and Mirumachi, 2008), and different 'cooperation continuum' frameworks (for instance, Sadoff and Grey, 2002). These, however, focus primarily on describing historical trajectories in terms of conflict and cooperation intensities and do not seek an historical understanding of processes such as water diplomacy and transboundary water cooperation.

The second way in which this study aims to bridge gaps in the research literature is more methodological. It aims to combine water governance research with historical analysis, utilising concepts related particularly to historical institutionalism (Fioretos, 2011; Hall and Taylor, 1996; Thelen, 1999). There are a number of water-related history studies, many of which are also on transboundary waters; these provide in-depth descriptions and employ a variety of historical analysis methods (Abdullaev and Rakhmatullaev, 2015; Khaneiki, 2020; Kochetkova, 2018; Schiff, 2017), including a number of studies that are applicable to our case study context of Finnish-Russian transboundary waters (Auer, 1982; Finnish-Russian Transboundary Water Commission, 2014; Kilin et al., 2001; Korjonen-Kuusipuro, 2012; Laakkonen et al., 1999, 2016). While such studies typically provide solid descriptions of the past, their linkage to analytical frameworks of transboundary water interactions and water governance is limited.

This study bridges these gaps by providing an historical description under a relevant analytical framework regarding transboundary water interactions. Such historical analysis must be done in a specific setting, one that offers a substantial historical trajectory over a relatively long period of time. We selected a case study that looks at the transboundary water interactions between Finland and (Soviet) Russia [2] over the last 100 years, with an emphasis on the period following World War II. The transboundary water interaction setting is politically, economically, socially, environmentally, and culturally significant. It demonstrates a particularly interesting transformation, moving from extremely politicised, violent confrontation to what is arguably one of the most successful transboundary water cooperation mechanisms in the world (Belinskij et al., 2018; Strategic Foresight Group, 2015). The setting, furthermore, has remained relatively understudied from a water governance perspective; this is the case despite its international significance in the pioneering of water cooperation arrangements such as

[2] While this article talks generally about Russia, it should be noted that during most of the 20th century Russia was part of the Soviet Union; we therefore also refer to the Soviet Union and to Soviet Russia (as one of its socialist republics that shares a border with Finland).

compensation mechanisms and leasing agreements on significant cross-boundary waterways. The study introduces this long historical trajectory in detail as much as possible.

Our study aims to address the following research questions:

1. How did Finland's transboundary water interactions with (Soviet) Russia emerge and evolve over time in the context of their changing societal and political settings, including the interplay between water diplomacy and transboundary water cooperation?
2. How does the analytical historical process/perspective enrich the understanding of transboundary water interactions?

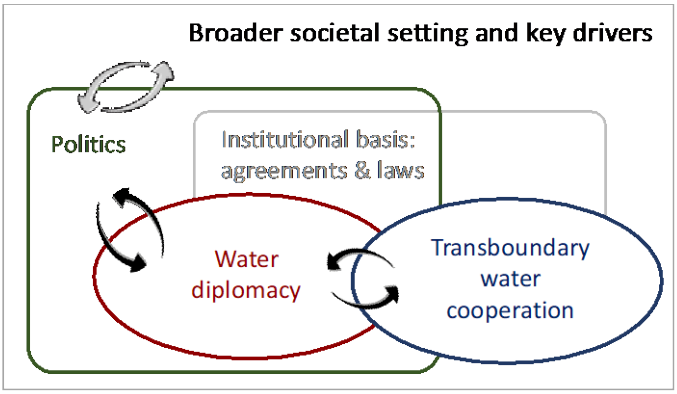
The first question is case specific; it relates to the description of the Finnish-Russian transboundary water interactions over a century and to the interplay between the related concepts of water diplomacy and transboundary water cooperation. The second question is more methodological, focusing on the potential value of historical analysis in the study context.

We aim to answer these two questions with the help of the following structure. The next section sets our theoretical context by briefly introducing the related concepts of transboundary water interactions, water diplomacy, and cooperation; it provides a visualisation of their relationships. The subsequent section describes the research approach, together with the key methods and materials used in our case study; it also sets out the main limitations of the study. The section following that presents the main findings of our study; with the help of a synthesising table, it describes the transboundary water interactions between Finland and Russia over the last 100 years using four distinct periods and their related analyses. The article concludes with a Discussion and Conclusions section; here we answer the research questions above and put our study into a broader context.

THEORETICAL AND THEMATIC CONTEXT

This section describes transboundary water interactions as the theoretical and thematic framework of this study and as the focus of the historical process analysis. It mainly takes a process perspective in describing the transboundary water interactions and their interlinkages. We picture transboundary water interactions as a hypernym that contains, (1) water diplomacy, (2) transboundary water cooperation, and (3) their linkages to broader political environs, societal settings, and the related institutional bases (Figure 1). These concepts are considered to be distinct but interrelated processes that evolve and transform over time, as explained and visualised in Figures 4 to 7.

Figure 1. Theoretical and thematic framework, visualising the key elements of transboundary water interactions



Source: The authors.

Transboundary water interaction can be seen as the dynamic element of transboundary water governance; it emphasises political interaction between relevant parties in a given institutional context. The interactions involve all levels and types of political governance relations over shared waters, including coexisting conflict and cooperation (Zeitoun et al., 2011; Zeitoun and Mirumachi, 2008), contest and compliance (Zeitoun et al., 2020), and both domestic and international domains (Allouche, 2020; Menga, 2016). Both water diplomacy and transboundary water cooperation can be seen as fundamental processes underlying transboundary water interactions, and they both convey much more than an analysis on the coexisting conflict and cooperation.

Water diplomacy: Description and process perspective

Political negotiations over transboundary waters are increasingly referred to as 'water diplomacy'. Water diplomacy starts with an analysis of political realities, national interests, and peace and security standpoints regarding water issues (Klimes et al., 2019; Molnar et al., 2017; Zeitoun et al., 2020). Some documents emphasise water diplomacy as a tool for conflict prevention and mitigation, as well as peace mediation (De Bruyne and Fischhendler, 2013; Molnar et al., 2017; Yildiz et al., 2016).

The literature also emphasises that transboundary water interactions and water diplomacy are inseparable parts of their broader political and institutional environs (for instance, Klimes et al., 2019; Zeitoun et al., 2011); this links the concept with, for example, the ideas of historical institutionalism (see next Section). It is notable that the influence is reciprocal, as water diplomacy may facilitate broader regional interaction (van Genderen and Rood, 2011; Keskinen et al., 2014). Water diplomacy can thus play a significant role in a nation's foreign policy, especially in its interactions with other riparian states.

Water diplomacy can be seen as the historical process that may lead to joint transboundary water cooperation arrangements. Multiple studies consider water diplomacy to be a process that crafts the structures, steers the practice, and mandates transboundary water cooperation institutions; water cooperation is thus seen as the end product of water diplomacy (for instance, Altingoz et al., 2018; Klimes et al., 2019; Schiff, 2017). One example of such evolution will be demonstrated in this article. It is, however, notable that water diplomacy and transboundary water cooperation are not contiguous phases of transboundary water interactions; rather, they are distinct institutional processes that coexist and are interconnected.

Transboundary water cooperation

Transboundary water cooperation works under a mandate given by the relevant parties. The formal mandate contains the very elements that the parties have formally been able to agree upon, typically involving cooperative actions such as joint knowledge production, management, and benefit-sharing (see the assumptions in Table 1). The institutional basis often includes bilateral or multilateral agreements and/or the principles of international water conventions (for instance, Bourne, 1996; UNECE, 1992; United Nations, 1997). The cooperation processes occur in both formal and informal settings that may also involve politically oriented decision-making, depending on the given mandate. The mandate and the resulting contents change over time, along with changes in practices and agreements; transboundary water cooperation is thus an historically evolving process that is inherently connected to the broader institutional setting of transboundary water interactions (see Figure 1).

Transboundary water cooperation is organised in various forms and institutional arrangements, including river basin organisations or other comparable institutions (Altingoz et al., 2018; Schmeier and Shubber, 2018); an example of this is the shared commission in the Finnish-Russian case (Finnish-Russian Transboundary Water Commission, 2014; Jaatinen, 1995). Cooperation organisations are responsible for everyday operations, under a mandate defined by the parties. The transboundary water cooperation process typically generates different kinds of knowledge products to facilitate political and technical

decision-making, including at the level of diplomacy. These may include impact assessment reports, status reports, and joint plans.

Water cooperation, despite its name, involves the possibility of the coexistence of conflict and cooperation, or both coercive and genuine types of cooperation. The cooperation process may enable genuine benefit-sharing (see for instance, Honkonen and Lipponen, 2018; Sadoff and Grey, 2002; Turton, 2008; UNECE, 2015); it may also be described as shallow, token, or even coercive, depending on the political will and goals of the parties involved (Allouche, 2020; Allouche et al., 2015; Zeitoun et al., 2020). Transboundary water cooperation processes are, in this sense, not separate from political disagreements and differing interests; rather, they can be used even as political tools to either mitigate or reproduce conflicts.

Key differences between the water diplomacy and transboundary water cooperation

The description above suggests that water diplomacy and transboundary water cooperation are interlinked processes that have distinct characteristics, as demonstrated by this study among others. Keskinen et al., 2021, argue that the key conceptual differences are related to physical basis, main governance attributes (legal basis, actors and structures, processes), as well as main assumptions: Table 1 summarises these differences with examples from our case study.

METHODOLOGY

Research approach

Our methodological approach to transboundary water interactions draws from historical institutionalism; this is an approach which considers how institutions emerge from, and are embedded in, temporal processes, with an emphasis on formal rules, agreements and organisations (Hall and Taylor, 1996; Steinmo, 2008; Thelen, 1999). Historical institutionalism considers social and political change to be an interplay of institutions in, and with, their historical contexts (Hall and Taylor, 1996; Steinmo, 2008). The approach emphasises temporality, noting how both the timing and the sequence of events shape political processes (Fioretos, 2011; Mahoney et al., 2009). To do this, it divides the flow of historical events into periods of continuity that are punctuated by so-called critical junctures, that is, moments when a substantial institutional (or political) change take place (Hall and Taylor, 1996; Thelen, 1999). Building on these themes, Mahoney et al. (2009) developed their concept of historical explanation, which seeks to identify the causes of certain historical outcomes.

The concept of path dependence is also relevant for this study. Path dependence indicates a process in which the structure that prevails after a specific moment in time (often a critical juncture) shapes the subsequent trajectory in ways that reinforce a particular path and reduce the possibility of alternative institutional designs, thus easily leading to incremental (rather than radical) institutional change (Fioretos, 2011; Thelen, 1999).

Historical institutions are thus seen as processes that evolve over time through both gradual and sudden changes that are triggered by their historical institutional environs; we therefore call our study an historical process analysis. The key in this approach is a consideration of the interplay between the institutions in question and their historical context; this is exactly what we seek to do in our analysis of Finnish-Russian transboundary water interactions.

Table 1. Selected key differences between water diplomacy and transboundary water cooperation, with examples from the Finnish-Russian transboundary water interactions (Fin-Rus).

	Water diplomacy	Transboundary water cooperation
Physical basis	National borders → *Fin-Rus: the changing national borders presented in Figure 2 in next Section*	Basin borders → *Fin-Rus: The basins under transboundary cooperation mechanism presented in Figure 2 in next Section*
Key actors	Actors that hold political power, such as ministries and government-related expert agencies → *Fin-Rus: President, parliament, regional agencies*	River basin commissions and other intergovernmental water-related organisations; national water-related agencies → *Fin-Rus: Watercourses Commission*
Institutional basis: agreements and laws	Either general or water-related bilateral and international political agreements → *Fin-Rus: peace treaties, YYA Treaty and other general bilateral agreements; UN water conventions; EU and national environmental legislation*	Given mandate, based on agreements steering water-related cooperation → *Fin-Rus: bilateral water agreements, steered partly by EU and national environmental legislation and UN water conventions*
Key processes	Political and economic negotiations on (and beyond) shared waters, often with a close link to food and energy security and/or economic cooperation → *Fin-Run: peace negotiations, negotiation on the management of the shared rivers and their hydropower; negotiation on the Saimaa Canal, etc.*	Water resources management activities including (joint) monitoring, data gathering, impact assessment and planning, as well as official meetings → *Fin-Rus: joint annual assemblies, technical work conducted by working groups, negotiations conducted inside the Watercourses Commission*
Assumptions	A compromise between cooperative and anti-cooperative interaction strategies, building on national interests and sovereignty → *Fin-Rus: demonstrated by the key processes discussed in next Section*	Cooperation under a given mandate; focus on joint benefits from shared waterbodies → *Fin-Rus: mandate defined by the 1964 agreement; work conducted via the key processes discussed in next Section*

Note: The table includes examples from Finnish-Russian interactions (for details, see next Section); the categorisation and general differences are modified from Keskinen et al., 2021.

Methods and materials

This study applies a single case study design with multiple embedded units (Yin, 2017), that is, four geographically specific storylines that are briefly referred to in the main text and described in detail in the Annex. Thematically, the case study focuses on the three distinct but interrelated transboundary

water interaction processes described above: (1) water diplomacy, (2) transboundary water cooperation, and (3) their linkages to the broader political environs.

The study applies literary study methodologies to look at changes in the discourses of water diplomacy and cooperation in longitudinal materials and to see how they link with more general historical trajectories within the bilateral relations between Finland and the Soviet Union/Russia. The key research materials can be divided into two main categories: primary documents (bilateral agreements, official meeting minutes and decisions, working team reports, discharge rules, the Watercourses Commission's website, introductory leaflets, and histories); and secondary documents (previous studies, reports, books, and other documentary materials).

The literary material is complemented by a set of recorded interviews with five Finnish experts who are well informed about the case study context at different scales. The interviews were carried out in the spring of 2017 by the second author, with a focus on the recent history and current practices of Finnish-Russian water cooperation. All the interviews were recorded and all were conducted in Finnish. To maintain anonymity, the interviewed experts are referred to by number (Experts 1 to 5). Overall, the different data sources and analysis methods allow us to triangulate the findings by source and method.

The study reinterprets existing material to create a novel perspective on the case and to answer the research questions. This study develops an historical description of different settings in transboundary interactions; this is based on the evidence found in the study context and builds on the theories described above. To facilitate and visualise the historical analysis, we use a map indicating the border changes between the two parties (Figure 2), a contextual figure (Figure 3), and a set of chronological figures (Figures 4 to 7) to illustrate the intensities of water diplomacy and cooperation processes in each setting.

Limitations and scope

The study intentionally focuses on the Finnish viewpoint on transboundary water interactions with Russia. This decision was made for practical reasons involving the suitability of the case as well as the limited availability of relevant Russian materials or informants. Given the focus on transboundary water interactions, the study undertakes only general coverage of the overall bilateral relations between Finland and Russia, as these are covered extensively in several other publications (see, for example, Ruuskanen et al., 2021; Virrankoski, 2012). Most of the information sources used are Finnish or international, though we also used Russian references wherever it was possible and appropriate. Given these limitations, emphasis was placed on maintaining an unbiased interpretation of the research materials.

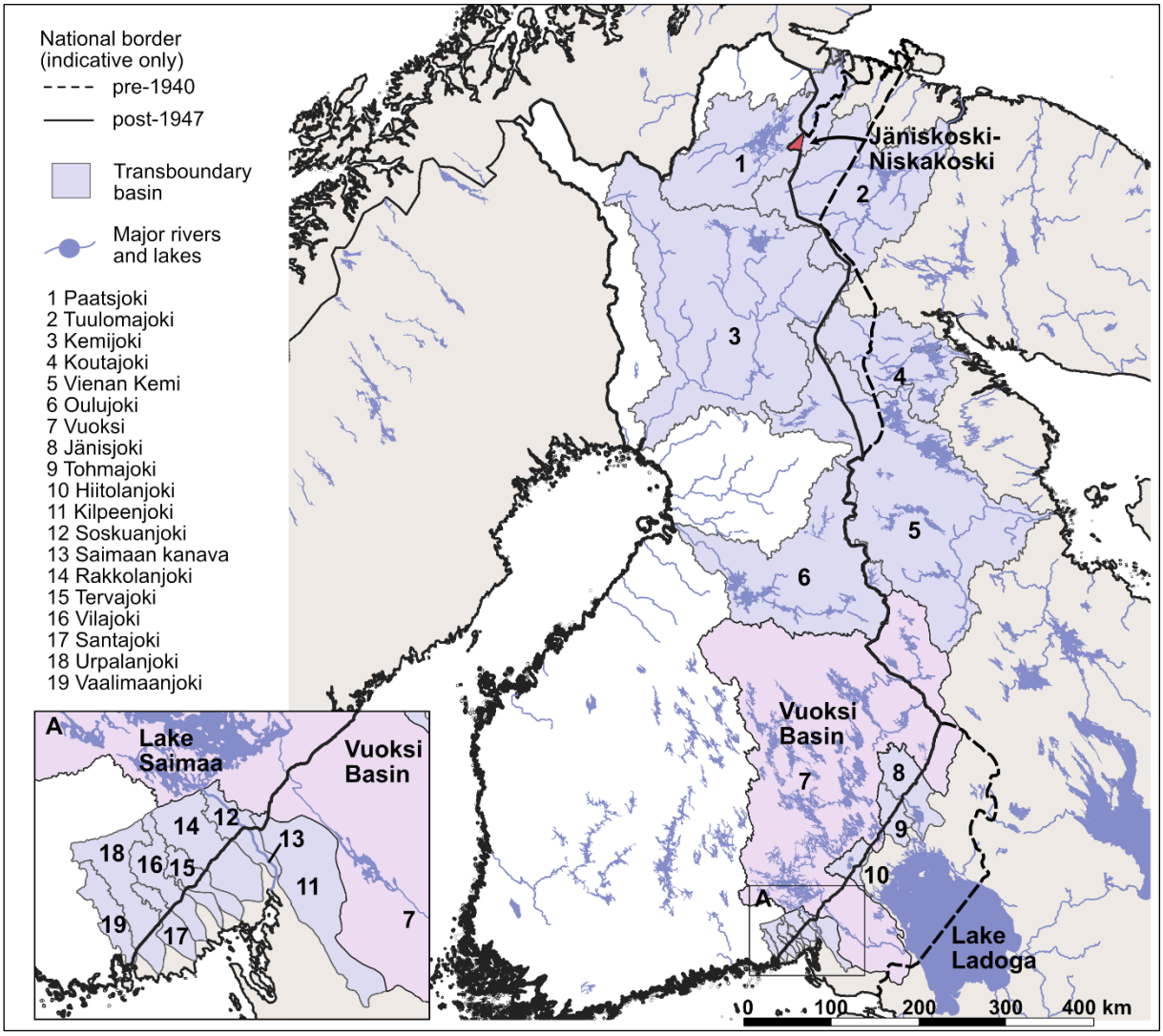
Historical analysis naturally has its constraints, including dependence on existing, available historical materials and their interpretation. For instance, certain informal disagreements inside the bilateral Watercourses Commission (those that have not led to broader political conflicts that would have gained attention), may never have been reported anywhere and hence may remain out of the scope of the study.

The study is based on three literature niches. The first of these is the literature addressing the theoretical context around transboundary interactions and the related water diplomacy, cooperation, and transboundary water governance. The second is the methodological literature which considers historical institutionalism. The third is the literature focused on case studies, which considers all types of materials that are related to Finnish-Russian water interactions over the century, within their broader societal and political environs. These three sets provide a vast body of literature in and of themselves, and the study therefore does not consider further additional literature. The materials and records used in this study often enabled cross-checking of facts; in our view, this provided an adequate picture of the study context.

FINDINGS

This section looks at a 100 year historical trajectory of Finland's transboundary water interactions with Russia. It extends from Finland's independence in 1917 to the 2010s, with an emphasis on the period following World War II. While we generally speak about Russia, it should be noted that during most of the 20th century – essentially from 1922 until 1991 – Russia was part of the Soviet Union (the Union of Soviet Socialist Republics, or USSR). The text thus also refers to the Soviet Union as the official state counterpart to the Republic of Finland, and to Soviet Russia as the Socialist Republic of the USSR which shared a border, and hence transboundary waters, with Finland. Figure 2 shows a map of the major transboundary waters between Finland and (Soviet) Russia; it also includes two country borders, that is, the border that was agreed upon after Finland's independence, and the new border that was drawn up after the peace treaty in 1944 and then slightly changed in 1947 (see below for details).

Figure 2. Borders of Finland prior to, and after, World War II, and the shared Finnish-Russian transboundary river basins post 1947.

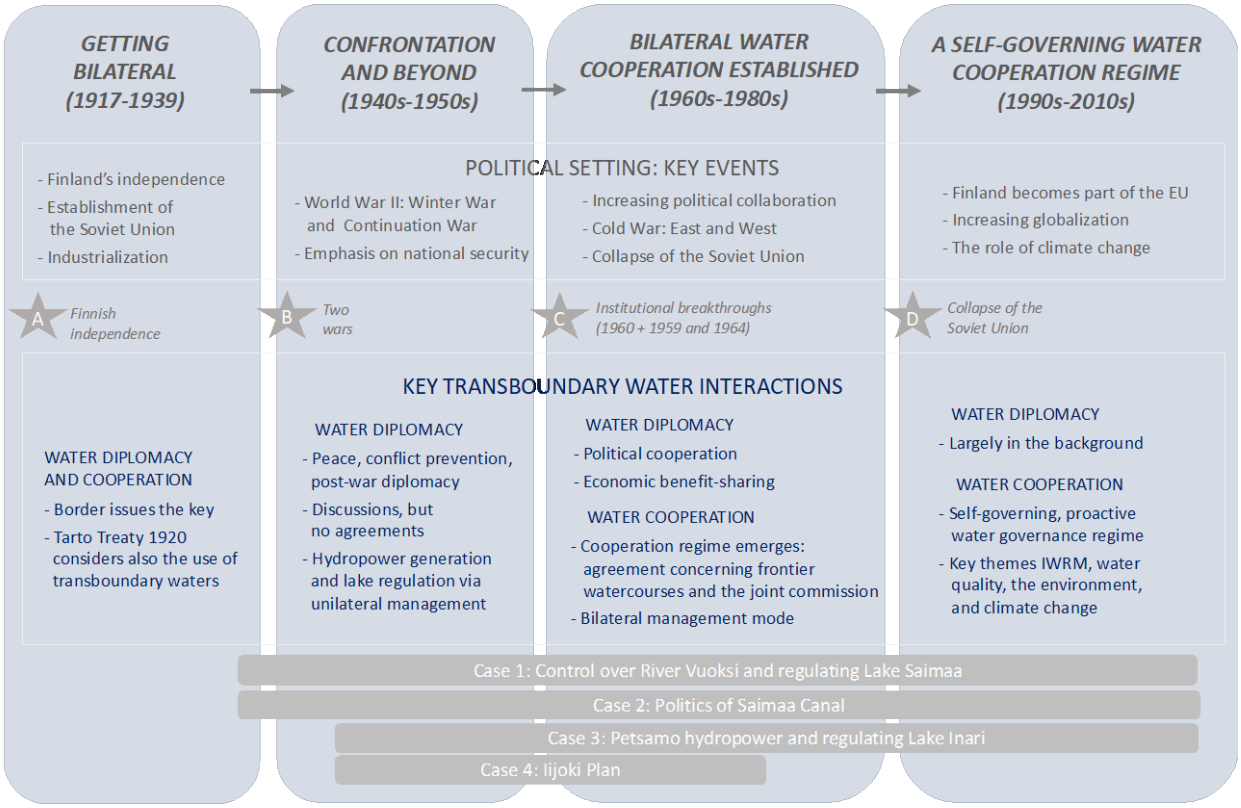


Source: The authors.

To facilitate the analysis and the process-based historical view, the findings are divided into four periods: 1917 to 1939, 1940s and 1950s, 1960s to 1980s, and 1990s to 2010s. These clearly defined periods capture the key phases in the countries' political relations and related transboundary water interactions (see also Belinskij et al., 2018). Building on the concept of critical junctures, the periods were divided according to particularly important political and institutional moments or turning points in time. While each of the periods has its own characteristics, they form a clear sequence with a certain political and institutional continuity, as explained in the subsections below.

The findings are supported by four specific cases that endure through several periods; they provide an additional way to consider political and institutional continuity and historical trajectories. (The four cases are briefly referred to in the main text and are described in more detail in the Annex.) Figure 3 visualises the overall structure of the analysis that guides the reader through the chronologically organised findings in the four ensuing sub-sections.

Figure 3. Finland's key transboundary water interactions with (Soviet) Russia over 100 years.



Source: The authors.

1917-1939: Getting bilateral

Political and societal setting: The emerging state and rapid industrial modernisation

At the beginning of the 20th century, Finland (with a slightly larger area than today) was an autonomous Grand Duchy of the Russian Empire.[3] Finland declared its independence in December 1917, amidst the

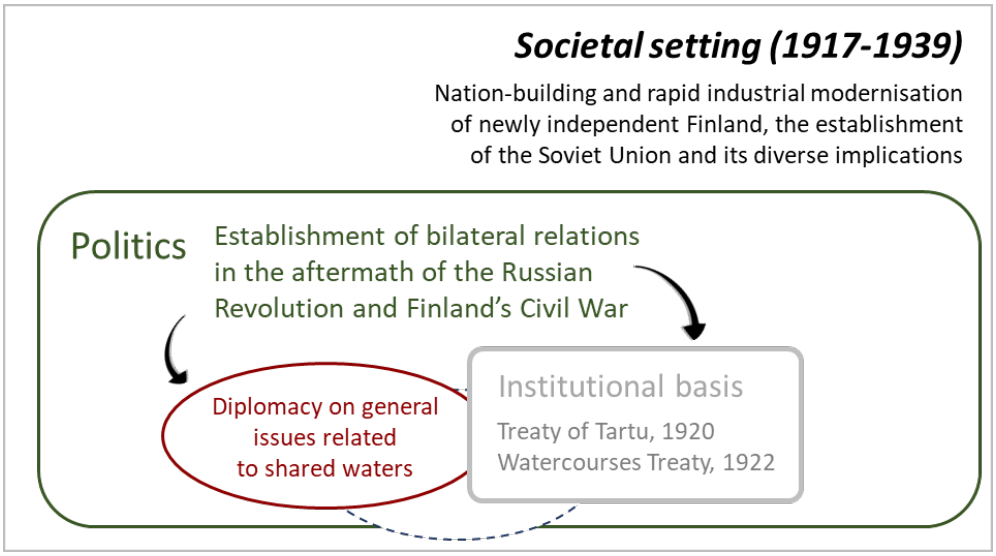
[3] In the Middle Ages, what is now Finland came under the control of the Swedish kings, while the emerging Russian states continued to have a large influence on the eastern parts of the area, namely Karelia and the shores of Lake Ladoga. In 1809, Sweden lost their area of Finland to the Russian Empire. The Grand Duchy of Finland had its own government system, legislation and currency, but no military forces or formal foreign policy.

Russian Revolution and during World War I. Independence was followed by a few years of violent political turmoil and government reformations in both Finland and in the emerging Soviet Russia. Over the next two decades, the relationship between the two emerging modern states remained largely suspicious (Korjonen-Kuusipuro, 2011).

The period from the independence of Finland to World War II was a time of rapid industrial modernisation. Electrification was the main driver of national development in Europe in the early 20th century and hydropower was the most feasible way to generate enough electricity for the emerging modern industries. The importance of hydropower as a strategic resource cannot be overstated; it played a key role in the electricity generation of Finland from the 1920s until the early 1970s. From independence until the beginning of World War II in 1939, hydropower's share in national electricity production varied from 75 to 80% (Suurpadot-Suomen osasto ry, 1991) while, overall, generation capacity soared.

Domestic hydropower resources were largely untapped before Finland's independence in 1917, but by 1939 they had become harnessed for the rapidly industrialising nation. Independence enabled the government to advance hydropower using domestic resources (Korjonen-Kuusipuro, 2007; Myllyntaus, 1991; Ruuskanen et al., 2021; Suurpadot-Suomen osasto ry, 1991).[4] In 1925, Finland's hydropower capacity was approximately 100 MW; by 1940, this had increased fivefold (Myllyntaus, 1991; Suurpadot-Suomen osasto ry, 1991). Similarly, the Soviet Union launched the strategic GOELRO Electrification Programme to electrify the nation; this comprised plans for 10 hydropower stations, which were to be completed with Western technology (Gvozdetsky, 2019; Leversedge, 1977).

Figure 4. Major transboundary water interactions between Finland and the Soviet Union, 1917-1939



Source: The authors.

[4] The importance of hydropower to newly independent Finland is highlighted by the fact that one of the first institutions established by the Finnish government in 1917 was a Hydropower Committee (*Koskivoimakomitea*, later *Koskirakennustoimikunta*), whose role was to plan and implement hydropower development in Finland. Soon the Committee focused its work on the Vuoksi River, and particularly on the construction of the Imatra Dam. This dam, supporting one of the biggest hydropower plants in Europe, was a major undertaking for a young nation; the 150 MW capacity of the generating station exceeded the existing generating capacity of entire Finland. Some of the hydropower projects were directly owned by the state, whereas some were owned or operated by state-owned companies (Korjonen-Kuusipuro, 2007; Myllyntaus, 1991; Suurpadot-Suomen osasto ry, 1991).

Diplomacy on border issues related to shared waters

In October 1920, in the Treaty of Tartu, the national boundary between newly independent Finland and Soviet Russia was formally agreed upon. The established state borders also for the first time enabled formal transboundary water interactions between the two countries (Figure 4). The first water-related actions focused on the maintenance of functional operations at the border; these can thus be regarded as negotiations on border issues concerning water, rather than water diplomacy per se.

The importance of shared waters was recognised in the Treaty of Tartu, however, and some of its articles addressed the use of transboundary waters. The third article considered territorial waters, the seventh fisheries, and the 17th was related to the navigational uses of shared waters. In 1922, the countries formally signed a specific convention on transboundary waters, which included terms on transboundary timber floating, fishing regulations, and maintenance of river channels related to the "watercourses forming part of the frontier between Finland and Russia".[5] These articles reflected the needs at that time, when most rivers remained in their natural state and there were no hydropower plants on the transboundary rivers.

Fishing, timber floating, and keeping the main waterways open comprised the bulk of the formal transboundary water agenda between the countries. The most important transboundary rivers in the south had greater potential for the various uses, but human influence on the majority of waterbodies remained rather limited. Most of the shared water bodies were located in remote, sparsely populated forest wilderness and remained in their natural state, freely crossing borders (Kotkasaari, 2008). One practical issue that hindered joint water governance was the lack of basic knowledge about the transboundary water bodies that ran along the 1300 kilometre border. A joint mission to identify the shared water bodies was accomplished only in 1971; it listed 448 transboundary water bodies (Finnish-Russian Transboundary Water Commission, 2014).

Development along the Vuoksi River in southeast Finland merits special mention. Until 1940, the Vuoksi was a national river situated within Finland's territory; however, the river already had transboundary significance as it flowed into Lake Ladoga, which at the time was a transboundary lake shared by Finland and Soviet Russia.[6] Given Finland's thirst for energy and its remarkable hydropower potential, the Vuoksi became politically and economically critical for the emerging nation (Korjonen-Kuusipuro, 2007). Three significant hydropower dams were completed on it prior to World War II; they provided electricity and served the area's growing pulp and sawmill industry.[7] The expanding industrial

[5] This convention was entitled the Convention Between the Republic of Finland and the Russian Socialist Federal Soviet Republic Concerning the Maintenance of River Channels and the Regulation of Fishing on Watercourses Forming Part of The Frontier Between Finland and Russia (signed on 28 October, 1922).

[6] The Vuoksi River is a 150 km long river that connects two major lakes, Lake Saimaa – which, at 4400 km^2, is the largest lake in Finland – and the 17,700 km^2 Lake Ladoga, the largest natural freshwater lake in Europe. The river is Lake Saimaa's only outlet, and it flows through the Karelian Isthmus, which connects Finland's Lake Saimaa with the St. Petersburg area and with Russia's Lake Ladoga. The river's headwaters are at 75 metres above sea level and the river falls more than 60 metres over the first 25 km. The Vuoksi River basin (also called the Lake Saimaa basin) is approximately 69,500 km^2; it holds thousands of lakes within its catchment area and has major economic and societal significance for eastern Finland. The Vuoksi River has been considered Finland's most important river for reasons which include hydropower, but which also include agriculture, fisheries, and timber-floating for the pulp and sawmill industry. The river valley was predominantly agricultural for centuries, though its farmers suffered from regular floods. The salmon fishery was a significant source of livelihood and income in the area until the early 20th century; at that point, the emerging forestry industries began to utilise the river for timber floating, which required open, free-flowing waterways. (Korjonen-Kuusipuro, 2007, 2011; Myllyntaus, 1991; Ruuskanen et al., 2021).

[7] The first dam built on the Vuoksi River was the small Linnankoski Dam. It was completed in 1900 but became inoperative when the larger Imatra Dam was completed in 1927. Two additional hydropower dams were completed, the Tainionkoski Dam in 1928 and the Rouhiala Dam in 1937. The construction of the fourth large hydropower plant on the Enso-Vallinkoski Dam was delayed due to war. In the early 20th century, electricity could not be transmitted over long distances, which forced industries to be located close to power plants. This led to the development of the pulp and sawmill industry at Enso, near the river and its hydropower stations (Auer, 1982; Korjonen-Kuusipuro, 2011, 2012).

hotspot at Enso, on the banks of the Vuoksi, was considered to be a model area of industrial modernity (Auer, 1982; Korjonen-Kuusipuro, 2011, 2013a). The newly built dams and the industrial waste water, however, caused environmental harm, and the dams also ended timber floating and salmon fishing in the river (Korjonen-Kuusipuro, 2007). While industry developed around the hydropower dams, the Finnish Defence Forces reprimanded the government for taking the risk of locating them close to the Russian border (Korjonen-Kuusipuro, 2013a).

1940s and 1950s: Confrontation and beyond

Political and societal setting: Two wars and their aftermath

Rapid economic development ended with World War II and, in particular, with the two related wars between Finland and the Soviet Union, the Winter War of 1939-1940 and the Continuation War of 1941-1944. The Soviet leader Joseph Stalin urged stronger military control over the Gulf of Finland and the areas surrounding Leningrad (now St. Petersburg) by moving the state boundaries with Finland further to the west and capturing strategic Finnish areas on the shores of the Baltic Sea. While the reasons for the Winter War relate to the broader geopolitical context of World War II – including the 1939 German – Russian Nonaggression Pact that defined Finland to be within the Soviet sphere of influence (Halsall, 2021) – there are also arguments that the Soviet Union was interested in gaining control over the precious hydropower generating capacity of the Vuoksi River as well as over the adjoining forest industries near Leningrad (Androsova, 2011; Kilin et al., 2001; Korjonen-Kuusipuro, 2011, 2013).

Russian negotiations with the Government of Finland on territorial concessions ended without result in 1939, with Finland refusing to cede any land area to the Soviet Union. This led to the 1939-1940 war between the two countries over the course of an unusually cold winter. The Winter War ended in March of 1940 with a peace treaty; this treaty drew new borders between Finland and the Soviet Union. The latter dictated the conditions and Finland lost 10% of its territory; this included the areas closest to Leningrad, that is, the Karelian Isthmus (Paasikivi, 1986). This meant that over 420,000 inhabitants – more than a tenth of the Finnish population – had to be evacuated from the area and resettled in other parts of the country.

With the new borders, the Vuoksi River and other significant rivers in Finland became transboundary (Figure 2). In the process, two of the four newly built hydropower dams on the Vuoksi (with a combined capacity of 200 MW, or around 30% of Finland's total hydropower capacity), and the related hydropower-driven industrial facilities in the Enso area were ceded to the Soviet Union.[8] With the now transboundary Saimaa Canal being closed (see Case 3 in the Annex) and with the cutting off of access to Lake Ladoga, Finland became economically more detached from the economies of the Baltic Sea and Leningrad. Despite the losses, hydropower remained the main source of electricity in Finland, comprising 80 to 90% of the country's electricity production in the 1940s and 1950s (Suurpadot-Suomen osasto ry, 1991). The hydropower dams along the Vuoksi River's banks played a significant role both in the peace negotiations and in the subsequent political interactions (see Case 1 in the Annex for more details).

The political relations between the countries remained strained in 1940 and 1941, a brief peaceful period (Paasikivi, 1986). The bilateral political situation got particularly tense after the summer of 1940, when the three neighbouring Baltic countries of Estonia, Latvia and Lithuania fell under Soviet rule. The Continuation War between Finland and the Soviet Union was fought from 1941 to 1944. The war ended with the signing of the Moscow Armistice in September 1944, with much of the Karelian Isthmus and Lapland (northern Finland) left in ruins. The armistice essentially restored the 1940 Peace Treaty but with

[8] Command over the industrial town of Enso in the Vuoksi River valley was one of the main subjects of the peace negotiations, with Finland ultimately being required to cede the area to the Soviet Union. The industrial facilities in the Enso area included eight pulp factories; this doubled the Soviet pulp production capacity overnight. The ceded Enso and Rouhiala hydropower stations along the Vuoksi River were renamed Svetogorsk and Lesogorsk (Korjonen-Kuusipuro, 2011; Paasikivi, 1986).

a number of modifications; Finland was required to pay considerable war reparations and – in addition to the large areas ceded in 1940 – it also had to cede the Petsamo area and its rich nickel mines in northeastern Finland, although it retained the hydropower stations that served the Petsamo mines.

After the two wars, relations between Finland and the Soviet Union were obviously categorically distrustful. Formal diplomatic relations were only truly re-established in 1948 with the introduction of the *Agreement of Friendship, Cooperation, and Mutual Assistance*, that is, the so-called YYA Treaty. The treaty addressed issues related to national security concerns in both countries (Androsova, 2011) and established a basis for diplomatic relations (Räsänen, 2020). Political relations improved slowly during 1950s, with the positive personal relationships between Finnish president Urho Kekkonen and the new Soviet leader Nikita Khrushchev facilitating rapprochement at the highest political level (Miklóssy and Autio-Sarasmo, 2011).

After World War II, the Cold War between the Soviet-led Eastern bloc (East) and US-led Western bloc (West) complicated the relationship between the Soviet Union and Finland, with the latter seeking to remain neutral and outside both blocs. During the 1950s, when the focus of the Cold War shifted increasingly towards technological competition, Finland sought also to play an intermediary role between East and West; for instance, it established a joint techno-scientific cooperation body with the Soviet Union in order to enhance the transfer of knowledge and technology (Kohvakka, 2011; Räsänen and Laakkonen, 2007).

Water diplomacy as part of post-war diplomatic encounters

The shared waters formed a significant topic in the peace negotiations and in the further diplomatic encounters of the 1940s and 1950s, and this period can therefore be seen as the beginning of true water diplomacy between the two countries. The 1948 YYA Treaty enabled diplomatic communication on transboundary water issues, and the cooperation principles agreed to in the 1920s were basically in force; in practice, however, the unfriendly and distrustful relations that prevailed in the 1940s and 1950s made joint management of shared waters impossible. Both countries were reluctant to cooperate and, instead, they aimed at maximising their own benefits using the national instruments and infrastructure in their possession (Belinskij et al., 2018; Korjonen-Kuusipuro, 2013; Räsänen, 2020).

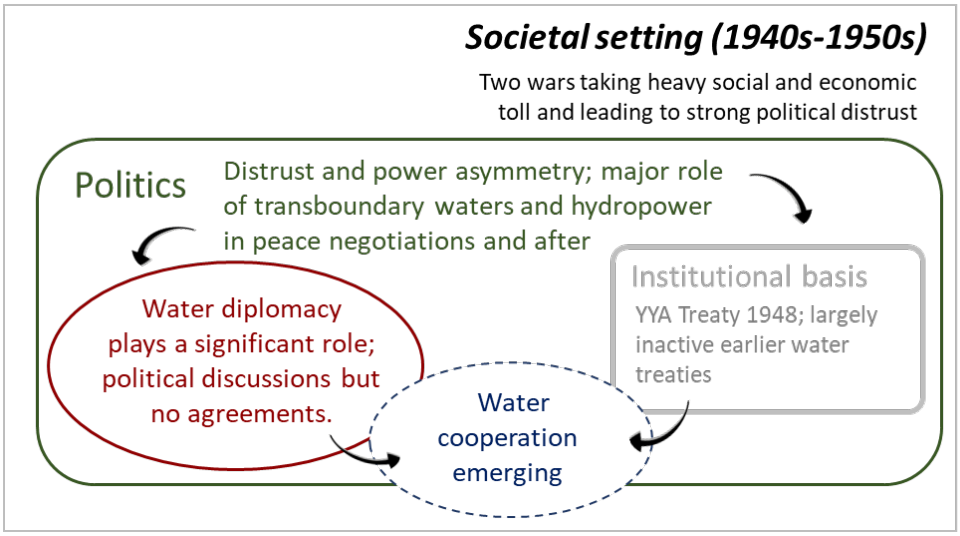
Water diplomacy thus played a significant role at the highest levels of bilateral politics after the wars. The Soviet Union possessed a politically and militarily dominant position and its influence was particularly strong immediately after the war, with the Soviet-led Allied Control Commission being based in Helsinki, Finland between 1944 and 1947. Finland, on the other hand, controlled the upstream areas of practically all significant transboundary basins and thus had a better hydrological position. In practice, however, this translated into Finland being forced to allow significant political, material, and even territorial concessions in the transboundary basins where the Soviet Union possessed a strong political and economic incentive. The benefit for Finland was largely limited to securing peace and preventing the political escalation that could result in an even larger confrontation with its powerful neighbour; however, Finland did utilise its strong upstream position when it came to water bodies that were particularly significant for the country, most notably the Vuoksi River and the related Lake Saimaa. The general setting for the transboundary water interactions during this time is illustrated in Figure 5, while next Section provides practical examples of the diversity of transboundary interactions between Finland and the Soviet Union during this period.

Distrust challenging complex transboundary water interactions

The Soviet Union had a strong political influence over Finland after World War II, and the relations between the two countries can be described as distrustful and even hostile. This had its implications for transboundary water interactions; it even entirely prevented some bilateral water-related discussions, as demonstrated by the case of the Iijoki Plan (see Case 4 in Annex). The 43 km long Saimaa Canal became

transboundary after the losses of land agreed to in the 1940 Peace Treaty. Bilateral negotiations on revitalising navigation on the canal started right after the wars but progressed very slowly (see Case 2 in the Annex).

Figure 5. Major transboundary water interactions between Finland and the Soviet Union, 1940s and 1950s.



Source: The authors.

The Soviet Union was unwilling to make concessions to Finland in terms of shared water bodies; however, the same was not the case for Finland, which made substantial concessions to the Soviet Union on the Niskakoski Dam and the Jäniskoski hydropower plant on the Paatsjoki River in northern Finland (see the respective area in Figure 2, and see Case 3 in the Annex for more details). This case demonstrates Finland's decision to prevent escalation of broader political tensions by giving substantial concessions to the Soviet Union in water-related issues in locales where Soviet interest was high. The rationale was to secure peace and to prevent the political escalation that could have resulted in even larger confrontations. The Niskakoski Dam was constructed in 1942, during the war; its purpose was to regulate Lake Inari, the biggest lake in the Paatsjoki basin in northern Finland. During the war, regulation of the lake's water level supported the generation of hydropower to supply the Finnish nickel mine in Petsamo (Marttunen et al., 1997; Suurpadot-Suomen osasto ry, 1991). In 1947, the Soviet Union demanded that Finland cede supplementary hydropower stations close to the border in order to secure electricity supply to the Petsamo area. Reluctantly, Finland agreed to hand over the land area surrounding the Jäniskoski hydroelectric power station and the Niskakoski control dam, an area of land totalling 176 km^2. The ceded infrastructure had been damaged in the war, the withdrawing German forces destroying the dam in 1944. To rebuild the stations and the regulation dams in the ceded area, the Soviet Union contracted the Finnish hydropower company Imatran Voima, which was also the operator of the Finnish hydropower stations on the Vuoksi River (Suurpadot-Suomen osasto ry, 1991). The interactions related to Lake Inari and the Paatsjoki River –a transboundary river shared by Finland, (Soviet) Russia, and Norway – continued in the 1950s; they culminated in 1959 with the signing of a trilateral treaty between Finland, the Soviet Union and Norway (Belinskij et al., 2018). Subsequently, (Soviet) Russia compensated Finland for the negative impacts of lake regulation on the fisheries (for more details, see Case 3 in the Annex).

Despite its challenging position, Finland did maintain a certain level of control over its transboundary waters; this was possible because of its upstream position in practically all major shared water bodies. This situation was particularly visible with regard to the Vuoksi River and Lake Saimaa (see Case 1 in the

Annex for more details). The Vuoksi River, with its two remaining Finnish hydropower plants, was still the most significant river for hydropower generation in Finland, and the two hydropower plants that were relinquished to the Soviet side were important to the Soviet Union. The four dams on the Vuoksi River formed a cascade that could only be managed efficiently as one system[9] (Korjonen-Kuusipuro, 2013; Myllyntaus, 1991). This unavoidable interdependence became a bilateral issue when the two downstream dams were ceded to the Soviet Union; cooperation was thus required between the two countries and their government-related hydropower plant operators.

Remarkably, the first diplomatic discussions after the wars considered hydropower compensations as a possible tool for solving conflicts between the two countries, with both parties demanding compensation. Finland demanded compensation for the anticipated losses in power generation capacity on the Finnish side of the border; this loss of generating capacity would be caused by rising water levels in a downstream reservoir following the completion of a dam planned by the Soviets (Paasikivi, 1986). The Soviet Union demanded compensation for the hydropower that had been secretly supplied to Finland from the ceded dams after the peace (Korjonen-Kuusipuro, 2011). No agreement was reached on compensation at that time, however these discussions may have paved the way for similar compensation mechanisms that were agreed upon in the 1960s (see more below).

Shortly after the wars, the Soviet Union was determined to dictate stable discharge rules for the Vuoksi for the benefit of their hydropower generation, not taking into consideration the seasonality of the flow or other practical limitations. The Finns, on the other hand, who regulated the upstream flows, ignored the Soviet demands. Rebuilding the destroyed Tainionkoski Dam at the outlet of the Saimaa in 1949 enabled the regulation of the lake's water levels and of the volume of the Vuoksi discharges. Initially, the regulation was directed unilaterally by Finland (Korjonen-Kuusipuro, 2013; Myllyntaus, 1991), who sent only a notice of the regulation decisions to the Soviet Union (Korjonen-Kuusipuro, 2013).

Despite its difficult start, the unavoidable transboundary interdependence in the management of the Vuoksi River made active interactions on sharing water obligatory for both parties. Initial diplomatic negotiations involved discussions on river discharge, compensation, information sharing, and lake regulation. These discussions paved the way for later water cooperation arrangements that built on these elements. Negotiations over shared water occurred at high political levels and the final decisions were made in parliament, reflecting the political importance of water and hydropower. While the countries did not agree during this period on actual joint river management mechanisms, the issues were at least jointly discussed. In 1959, the countries' representatives even developed a joint proposal for managing the Vuoksi discharge, but the Government of Finland ultimately rejected the plan, deeming it harmful (Suurpadot-Suomen osasto ry, 1991). Overall, the Vuoksi River – which became transboundary only after World War II – became the centrepiece of Finnish-Russian transboundary water interactions. Over the years, it would form the backbone of the entire water cooperation programme between the two countries (Belinskij et al., 2018; Expert 1)

1960s to 1980s: Bilateral water cooperation established

Political and societal setting: Rapprochement

Bilateral relations between Finland and the Soviet Union improved in the 1960s, with the good personal relations between the Finnish president Urho Kekkonen and the Soviet leader Nikita Khrushchev driving rapprochement (Miklóssy and Autio-Sarasmo, 2011; Paaskoski, 2002). The rule of Leonid Brezhnev (1964-1982) was signified by unchanging economic, political and social policies in the Soviet Union, and this period was later labelled the "Era of Stagnation". In the 1980s, Mikhail Gorbachev brought in a new era

[9] Optimal hydropower operation requires that dams operate with an approximately consistent amount of discharge. Altering the water level in one reservoir affects the hydraulic head of upstream hydropower plants. The Finnish dams, on the other hand, had a larger maximum flow rate than the two dams downstream in the Soviet Union.

of government reforms, the so-called *perestroika* and *glasnost* policies that took the Soviet Union towards openness and cooperation with the West; it also began to take environmental protection more seriously. The new policies enabled more open transboundary discussion related to water diplomacy and cooperation (Räsänen, 2020).

During this period, Finland played an increasingly important intermediary role between the Soviet-led Eastern bloc and the US-led Western bloc, seeking to establish itself as a neutral party that had good relations with both blocs. In the late 1960s, Finland initiated negotiations on what became the Conference on Security and Cooperation in Europe (CSCE), with the final CSCE summit being held in 1975 in Helsinki.[10] In Finland, the conference was largely seen as a response to Soviet attempts to increase its political influence in the country; the Conference did strengthen Finland's international position and the nation became internationally recognised as a neutral territory (Karamouzi, 2013).

It is noteworthy that during the decades after World War II, Finland took an increasingly active role in promoting international water legislation. Its aim was to establish a more solid basis for equitable management of shared waters. Finland was very active in the work of the International Law Association (ILA) to formulate a new international water law; this culminated in 1966 with the *Helsinki Rules on the Uses of the Waters of International Rivers*[11] (Bourne, 1996; Salman, 2007). In 1970, Finland made a proposal to the UN General Assembly for "progressive development and codification of the rules of international law relating to international watercourses"; this built on the principles of the Helsinki Rules[12] (United Nations, 1970). This process eventually led to the establishment of the 1997 *UN Convention on the Law of the Non-Navigational Uses of International Watercourses*, the so-called New York Convention. Together with the United Nations Economic Commission for Europe (UNECE) 1992 Water Convention, or the so-called Helsinki Convention, it establishes the key principles for transboundary water cooperation globally.

While the immediate post-war decades focused on economic development and reconstruction, in the 1960s and 1970s general environmental awareness gained increasing attention. This affected water resources management, with Finland paying increasing attention to water protection activities in order to combat water pollution (Finnish-Russian Transboundary Water Commission, 2014; Kaatra, 2012). These implications were also visible institutionally, with the 1961 Water Law of Finland calling for more comprehensive water management and adding pressure for more collaborative management of shared waters. Regionally, a landmark environmental agreement for the Baltic Sea region, the *Convention on the Protection of the Marine Environment of the Baltic Sea Area*, was signed in Helsinki in 1974 (Laakkonen et al., 2016). In the 1960s, the government of the Soviet Union took steps to promote transboundary water cooperation, making agreements with China, the Czech Republic, Romania, and Hungary (Räsänen, 2020). These concurrent activities related to water protection and water cooperation, both in Finland and in the Soviet Union, facilitated the negotiations regarding an upcoming Finnish-Russian transboundary water cooperation agreement.

[10] European countries (except for Albania and Andorra), the United States, and Canada attended the summit. The conference provided a setting for the joint acknowledgement of the obvious separation between East and West, and a forum for discussion despite that separation. The summit guaranteed the integrity of the state boundaries of the World War II and 1947 Paris Peace Treaties.

[11] The International Law Association *Helsinki Rules on the Uses of the Waters of International Rivers* can be seen as a direct predecessor of the two current UN conventions on transboundary waters, the 1992 UNECE Water Convention and the 1997 UN Watercourses Convention. It established one of their key principles, the equitable and reasonable use of transboundary water resources and the forbidding of transboundary water pollution (Honkonen and Lipponen, 2018; Salman, 2007).

[12] The Draft Resolution was adopted in the UN General Assembly by 89 votes to 1 (with Brazil voting no and seven countries abstaining); both Finland and the Soviet Union (as well as Sweden and Norway, Finland's other neighbouring countries) voted in favour of the resolution (United Nations, 1970).

Water diplomacy in full action

The period from the 1960s to the 1980s can be seen as the heyday of water diplomacy between Finland and the Soviet Union. The increasingly close political relations and related negotiations resulted in several milestone agreements on transboundary waters, leading ultimately to a strongly institutionalised basis for transboundary water interactions. The milestones in the water diplomacy domain reflected the general changes in the political atmosphere, including increased environmental awareness and the related improvements in national legislation, and the emerging international agreements on shared waters. Economics and energy also played their part, with the decreasing role of hydropower easing the related bilateral discussions. In the 1970s, Finland invested in four nuclear power plants, two of them built in collaboration with the Soviet Union, with major involvement by Imatran Voima, the company operating the hydropower stations on the Vuoksi River (Auer, 1982). Thanks to this expansion of nuclear power production, between the 1960s and the 1980s the share of hydropower in overall electricity generation in Finland decreased dramatically (Suurpadot-Suomen osasto ry, 1991). Hydropower was therefore no longer considered to be either irreplaceable or a strategically critical national resource, even while its development in Finland continued. This shift in Finland's energy portfolio opened up possibilities for a more benefit-sharing orientation with regard to the waters it shared with the Soviet Union.

The 1960s, as a result, saw a clear change in the tone of Finnish-Russian water diplomacy. The parties were ready to admit that an institutionalised transboundary water cooperation regime could bring about genuine, constructive results. The bilateral agreements from 1922 and 1933 were seen as outdated and there was willingness on both sides to reach a more comprehensive, integrated bilateral agreement. This was inspired in part by Finland's new 1961 Water Law, as well as by international examples such as the ILA's Helsinki Rules (Jaatinen, 1995; Räsänen, 2020).

Water diplomacy and broader politics remained closely linked however, and the political leaders of both countries retained much of the practical decision-making power related to transboundary water issues. Diplomatic discussions on significant waterbodies remained at the highest level and continued to be largely centralised. The ultimately successful negotiations related to the Saimaa Canal (see Case 2 in the Annex) reflected the close linkage of water diplomacy and politics at that time and indicated the centralised nature of decision-making power in both countries. High-level negotiations on the joint management of the canal took place between Finnish President Kekkonen and the Soviet leader Nikita Khrushchev, and in 1960 the Soviet Union agreed to lease the canal to Finland for a maximum of 50 years (Paaskoski, 2002; Vesterinen, 2014). Arguably, one rationale for the Soviet Union's concession was the desire of its leadership to support the re-election of President Kekkonen, with whom they had a good personal relationship (Paaskoski, 2002; YLE, 2018).

During this period, high-level political rapprochement and active water diplomacy resulted in an institutionalised transboundary water cooperation regime between Finland and the Soviet Union (Figure 6). The related bilateral agreements form the institutional foundation of Finnish-Russian water cooperation to this day. (They are introduced in more detail below; see also Case 1 in the Annex.)

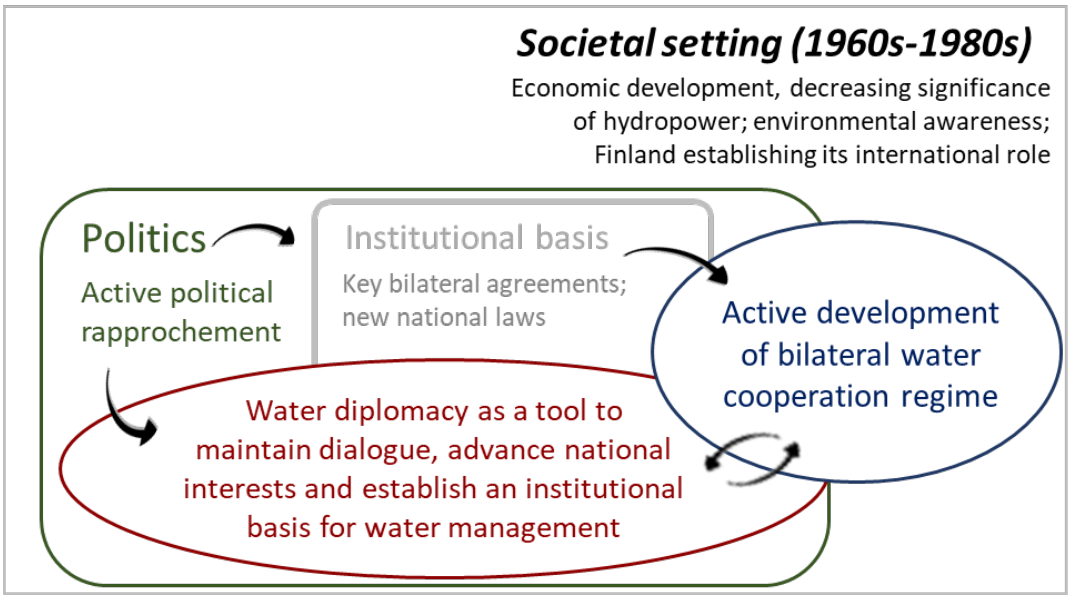
Institutionalised transboundary water cooperation established

The first major step towards institutionalised transboundary water cooperation was taken in 1960, when the two countries signed the *Finnish-Soviet State Frontier Agreement*, the so-called Frontier Treaty.[13] The second part of the agreement addressed frontier watercourses including their navigation, prohibition of pollution and damage, mandatory sharing of hydrologic information, and a do-no-harm principle; notably, it did not directly address the question of hydropower (Räsänen, 2020). The next year, the Ministry of Trade and Industry of Finland started drafting a comprehensive proposal for wide-ranging

[13] This agreement was entitled Agreement concerning the regime of the Finnish–Soviet State Frontier and the procedure for the settlement of frontier incidents (signed at Helsinki, on 23 June 1960).

transboundary water cooperation, applying ideas from international agreements as well as the existing treaties between the Soviet Union and its other neighbours (Jaatinen, 1995; Korjonen-Kuusipuro, 2013; Räsänen, 2020). The Soviet Union accepted the approach, and bilateral negotiations took place in Helsinki from February to April, 1964.

Figure 6. Major transboundary water interactions between Finland and the Soviet Union, 1960s to 1980s



Source: The authors.

The resulting 1964 Watercourses Agreement [14] represented a transformational shift towards joint transboundary water cooperation and integrated modes of water management. The tensions and suspicions that followed World War II were largely left behind with an advanced agreement that involved a strong do-no-harm principle, pollution prevention modalities, an obligation to maintain the main waterways as free-flowing, and adherence to principles of cooperation, information exchange, notification, consultation and dispute resolution (Belinskij, 2015; Kotkasaari, 2008; Rahaman, 2015); significantly, the agreement also set guidelines for the development of compensation mechanisms (Belinskij, 2015; Rahaman, 2015). What is notable and unique in the world is that the agreement covered all transboundary surface waters shared by Finland and the Soviet Union; this enabled more comprehensive governance and broader benefit-sharing (Belinskij et al., 2018). The agreement also incorporated several established principles of water governance, in line with the ILA Helsinki Rules.

Article 6 of the Watercourses Agreement established a joint *Finnish-Soviet Commission on the Utilization of Frontier Watercourses* (hereafter the Commission), notably without a separate secretariat. The Commission started a formal, clearly institutionalised transboundary water cooperation regime between the countries, acting as an official steering and dispute-resolution body; it also had a crucial political function as it maintained dialogue between the countries on shared matters. While the Commission was initially involved in negotiations that could be considered political (see Case 1 in the Annex), it soon became a clearly distinguished body that had a lot of operative power of its own. This moved several issues to the sphere of more technically oriented transboundary water cooperation that

[14] Formally entitled the Agreement between the Republic of Finland and the Union of Soviet Socialist Republics concerning Frontier Watercourses (signed at Helsinki, on 24 April 1964).

had earlier been negotiated in the more political water diplomacy domain. This shift was helped by the fact that political steering from the central level decreased over time, partially due to increasingly well-functioning cooperation and partially due to the diminishing political importance of hydropower. In practice, the water cooperation regime became the most active level of water interactions.

While the 1964 Watercourses Agreement was essentially a top-down agreement between the governments of two riparian countries, several experts as well as (state-owned) hydropower companies were closely engaged in its actual implementation. Hydropower generation on the Vuoksi River again had a special role, with hydropower operators in both countries initiating discussions on the possibility of establishing a mechanism for regulating the Vuoksi in order to optimise hydropower generation and compensate for losses that Soviet hydropower production caused to the Finnish side (Räsänen, 2020). Ultimately, the Commission settled a joint *Imatra-Svetogorsk Hydropower Agreement* in 1972,[15] whereby Finland made a concession by agreeing to joint management of the discharge of Vuoksi River water, while also benefitting from the related compensation mechanism (Belinskij et al., 2018; Finnish-Russian Transboundary Water Commission, 2014; Räsänen, 2020). The agreement also limited the reservoir water levels of the Svetogorsk hydropower station in Soviet Russia to prevent loss of energy production at the Imatra station upstream in Finland (Finnish-Russian Transboundary Water Commission, 2014). Based on the agreement, the Svetogorsk station operator was obliged to compensate the Imatra station operator in Finland annually for 19,900 MWh of lost hydropower generation (Belinskij et al., 2018).

Despite the 1972 agreement, both parties wanted to continue discussions so as to arrive at a joint discharge rule for the Vuoksi River; this was important both for Finland (to prevent flooding of Lake Saimaa) and for Soviet Russia (to ensure optimal hydropower operation) (Belinskij et al., 2018; Kaatra, 2012; Korjonen-Kuusipuro, 2013; Kotkasaari, 2008; Suurpadot-Suomen osasto ry, 1991). Long preparatory work and years of negotiation resulted in the 1989 Discharge Rule of Lake Saimaa and the Vuoksi River; it combined flood and drought protection needs with hydropower requirements[16] (Belinskij et al., 2018; Kaatra, 2012; Korjonen-Kuusipuro, 2012; Kotkasaari, 2008). In practice, the agreement allowed regulation of Lake Saimaa in Finland. In the case of excess discharge, an agreement was reached whereby the Government of Finland would compensate the Russian hydropower plants downstream for possible power generation losses. This prevented damage to livelihoods and properties in Finland, with a trade-off of monetary compensation to (Soviet) Russia. This is a practice that remains rare in the world's transboundary river basin agreements (Belinskij et al., 2018; Korjonen-Kuusipuro, 2012). Overall, the 1989 Vuoksi Discharge Rule marked the end of the era of active political negotiations of transboundary water agreements between Finland and the Soviet Union and the start of a mature water cooperation regime that was sustained even after the sudden dissolution of the Soviet Union.

[15] Formally entitled the Agreement between the Republic of Finland and the Union of Soviet Socialist Republics concerning the production of electric power in the part of the Vuoksi River bounded by the Imatra and Svetogorsk hydro-electric station (signed July 12, 1972, entered into force February 7, 1973).

[16] This is often called the Vuoksi Discharge Rule, but is officially entitled the Agreement between the Republic of Finland and the Union of Soviet Socialist Republics Concerning the Regulations Governing Lake Saimaa and the Vuoksi River; it was signed in October 1989 but only entered into force two years later, in October 1991. The aim of the Discharge Rule is to mimic the so-called natural flow of the Vuoksi so that it would stay within the predefined, seasonally varying "normal zone" (Belinskij et al., 2018; Kaatra, 2012; Kotkasaari, 2008). If the water level in Lake Saimaa was about to rise or drop past the set levels – causing flooding, drought, or difficulties for safe navigation – then the discharge at the lake outlet would be changed accordingly to prevent the problem.

1990s to 2010s: A self-governing water cooperation regime

Political and societal setting: A changing world

The collapse of the Soviet Union in 1991 gave rise to obvious disruptions and irregularities; it marked a major political juncture in the bilateral relationship. While Finland acknowledged the Russian Federation as the successor to the Soviet Union, many bilateral and international agreements came to an end.[17] The end of the communist regime also introduced the question of private ownership of land and other natural resources in Russia, which had an influence on transboundary water interactions.[18] This meant that the extremely centralised governance regime in the Soviet Union gave way to a more pluralistic system (which was later again to become more centralised). The young Russian Federation opened rapidly towards the West in the early 1990s and bilateral relations between Finland and Russia improved.

Internationally, political negotiations on transboundary waters generated two major agreements in the 1990s. The *UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes* (the Helsinki Convention) was agreed to in Helsinki in 1992; it came into effect in 1996, and in 2016 it became applicable internationally, outside the UNECE region. Both Finland and Russia signed the 1992 UNECE Convention,[19] and Finland also signed the 1997 UN Watercourses Convention[20] that it had initiated in 1970.[21] While the two UN conventions were crucial for setting up the global principles on transboundary waters, they had no significant impact on Finnish-Russian transboundary water cooperation, mainly because that cooperation was already well-established and the new UN conventions were building largely on the same principles (Belinskij et al., 2018).

Another significant political change occurred in 1995, when Finland joined the European Union (EU) and the Finnish-Russian border thus became the border of the EU. EU membership spurred an increase in transborder environmental cooperation under, for example, the *Northern Dimension Environmental Partnership* and the EU-funded transboundary water cooperation projects, which benefitted both parties (Korjonen-Kuusipuro, 2013). The institutional setting changed as well, as EU regulations led to new kinds of obligations and related legislative changes in Finland. EU legislation, for example, emphasised the enhancement of water quality and environmental protection measures in Finland, which accelerated bilateral transboundary water protection efforts (Räsänen, 2020).

The current millennium has generally been characterised by globalisation, digitalisation, and growing concern about climate change; all of these have had an influence on Finnish-Russian water cooperation. In the 2010s, political power in Russia became more and more centralised, and the relationship between the EU and Russia became increasingly tense; it was particularly damaged by the Ukrainian crisis that started in 2014. While the political and economic sanctions implemented against the Russian government by the EU countries – including Finland – have had significant political impact, they have not seriously affected bilateral water cooperation.

[17] The 1948 YYA Treaty, for instance, came to an end in 1992, while the Conference on Security and Cooperation in Europe (CSCE) became the Organisation for Security and Cooperation in Europe (OSCE) established as its successor in 1994.

[18] The formerly state-owned Russian dams on the Vuoksi were privatised in 1992 (Korjonen-Kuusipuro, 2013); with that, the organisational culture became more business-oriented (Expert 5). Many private entities built resorts for recreational or holiday business purposes on the Russian banks of the Vuoksi, which increased the risk of flood damage (Expert 4).

[19] This is formally entitled the *Convention on the protection and use of transboundary watercourses and international lakes* (signed March 17, 1992, entered into force October 6, 1996).

[20] Formally entitled *Convention on the law of the non-navigational uses of international watercourses* (signed May 21, 1997, entered into force August 17, 2014).

[21] The existence of two global conventions on transboundary waters indicates the complexities related to such agreements. Overall, the 1997 UN Watercourses Convention and the 1992 UNECE Convention are complementary as they are both based on principles related to the equitable and reasonable use of shared waters and the idea of not causing significant harm.

A mature, proactive cooperation regime

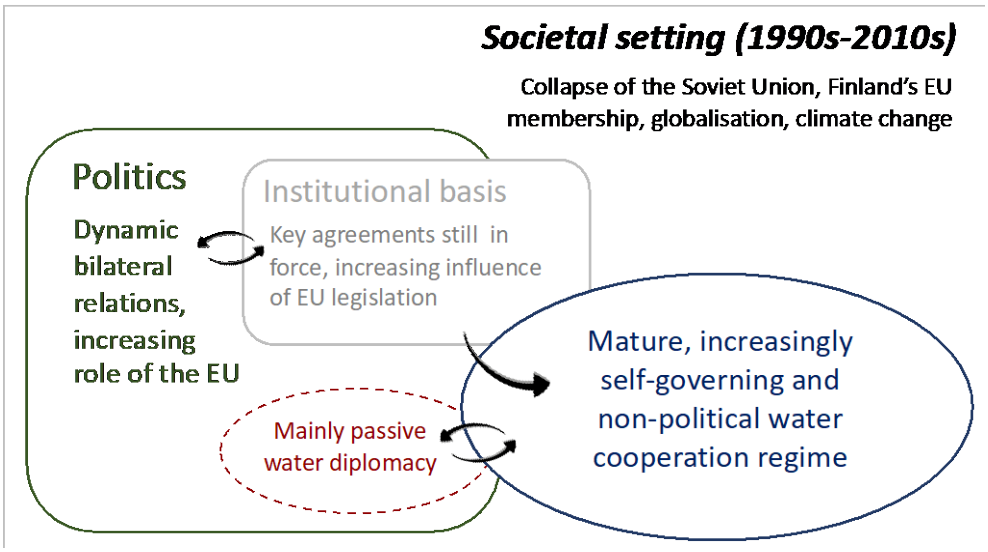
Recent times have exposed distinct trends in bilateral water interactions between Finland and Russia (Figure 7). First, it seems evident that the water cooperation regime has become an increasingly self-governing process with a focus on practical and largely technical water management practices; the more politically oriented water diplomacy activities have moved to the background. The established water cooperation institutions and their operational work continued practically unchanged through major political upheavals in the 1990s (Experts 1 and 5). Even the collapse of the Soviet Union was hardly noted in the Commission's records, with most of the work continuing unchanged (Räsänen, 2020). The water cooperation regime has also remained functional and non-politicised despite the recent EU sanctions over Russia (Experts 1 and 5); this implies a certain level of resilience and maturity as well as a degree of disconnection of cooperation from the broader political setting. At the same time, actual cooperation practices have become increasingly decentralised, with cooperation steered more and more by regional authorities than by central governments (while still being responsive to national and EU-level legislation) (Expert 1).[22]

The second notable element is that, despite decreasing political interest in transboundary water interactions, cooperation between Finland and Russia has not remained stagnant; rather, it seems very responsive to changes in national and EU legislation and even to global trends. Climate change, environmental protection, and digitalisation have had a major influence on cooperation modalities and have enabled their continuous development. The Commission's work in recent decades has increasingly emphasised the environment and climate change; this has included extensive climate change studies and flood management plans that also respond to the requirements of the EU Flood Risk Directive (Finnish-Russian Transboundary Water Commission, 2014; Räsänen, 2020). There has also been an increasing emphasis on restoration of the migrating fish population and its related habitats, as well on protection of the natural habitats of the endangered, Saimaa seal, which is endemic to Lake Saimaa (Finnish-Russian Transboundary Water Commission, 2014; Kotkasaari, 2008; Räsänen, 2020; Expert 4). These changes reflect the growing importance of environmental protection, biodiversity, and recreational uses of the waters.

The third observable trend is the changed dynamic of transboundary water interactions that has followed from Finland's EU membership; this has essentially brought an additional institutional layer – the EU and its legislation – into the cooperation regime. While the water-related EU regulations such as the Water Framework Directive and the *Directive on the Assessment and Management of Floods* have had a direct impact on transboundary water quality monitoring and environmental protection activities, they are naturally binding to Finland but not to Russia. This has resulted in a situation where the Finns have had to explain to their Russian counterparts the necessary modifications in the cooperation caused by the legislative changes at national and EU-level (Belinskij, 2015; Belinskij et al., 2018; Kotkasaari, 2008; Räsänen, 2020; Expert 5). Finland's EU membership, on the other hand, has also opened up opportunities for EU-financed projects related to, for example, collaboration on the Vuoksi River (Korjonen-Kuusipuro, 2013).

[22] In 2010-2011, the Government of Finland delegated power and responsibility to the regions regarding transboundary water management. The state established regional Centres for Economic Development, Transport and the Environment (ELY) and Regional State Administrative Agencies (AVI); these began to manage transboundary water issues in their regions alongside central government administrative bodies.

Figure 7. Transboundary water interactions, 1990s to 2010s.



Source: The authors.

What has enabled such smooth water cooperation, even during major political changes and tensions? According to Belinskij et al. (2018), key reasons for the well-functioning cooperation include a clearly defined, formal mandate that both sides respect; a focus on facts and technical cooperation; and shared pride in, and commitment to, that cooperation. It also seems that personal relations matter. The turnover of experts and chairpersons in the Commission has been slow, which has allowed for long-term relationships; these relationships are increasingly trust-based and this, in turn, has enabled confidential discussions (Räsänen, 2020; Expert 1). Our interviewees also emphasise that the focus on shared benefits and rational water use, and the pragmatic approach to water resource management has facilitated smooth cooperation between the parties (Experts 1 and 5). The economically and politically less important role of hydropower may also partly explain the decreasing politicisation of transboundary water interaction, allowing the Commission to manage its issues internally, without major political interference (Expert 1). The Commission has also stayed within the limits of its defined mandate, focusing on technical cooperation and on the development of working modalities. Technological development has improved collaboration and communication possibilities, harmonised monitoring standards, and automated hydropower plant operations in Finland; it has even enabled the development of shared risk-management planning and a related joint alert system (for instance, Belinskij et al., 2018; Räsänen, 2020; Experts 2, 3 and 5).

Summary of key historical developments

The previous four sections have described the key characteristics of four periods of Finnish-Russian transboundary water interactions over the past 100 years, with a focus on the specific characteristics of each period. In this section, we look at the periods as a whole. We do this by viewing the interplay of transboundary water interactions, related institutions, and their historical and political settings through the perspective of historical institutionalism. As discussed earlier, such a perspective emphasises temporality, indicating both the timing and the sequence of events; it also uses what are called critical junctures to divide the flow of historical events into distinct periods. We then focus on the impact that such critical junctures – as well as more gradual institutional changes – have had on transboundary water interactions across the four periods.

We first note that there are indeed certain historical junctures that can be seen to have had a particular influence on the institutional setting of transboundary water interactions (see also Rai et al., 2019). In our analysis above, we recognised four particularly important political and institutional junctures (Figure 3: Stars A to D); these were seen to mark the beginnings of the four distinct periods due to their visible influence on interactions and related institutions. The influence of these four junctures can be summarised as follows:

- Finland's independence and the subsequent changes in national borders led to cross-border interactions aimed at the management of what had become transboundary waterways (Figure 3: Star A and Period 1);
- World War II and the resulting new borders and shared basins led to a situation that stimulated high-level water diplomacy in order to agree on management of the shared waterbodies (Figure 3: Star B and Period 2);
- The signing of the key bilateral water agreements at the beginning of the 1960s formed an institutional juncture; it established a clearly institutionalised transboundary water cooperation regime that has been actively developed and is still in effect today (Figure 3: Star C and Period 3); and
- The collapse of the USSR marked the last historical juncture to have major political implications. Notably, it had very little impact on transboundary water interactions; these have been increasingly marked by a self-governing and fairly politically detached water cooperation mode (Figure 3: Star D and Period 4).

Second, the analysis also supports the idea that more gradual institutional evolution takes place in between critical junctures; it also affirms the notion of a continuous interplay between the institutions of transboundary water interaction and their broader political and societal context (Figures 4 to 7). This institutional temporality became particularly visible when considering gradually changing historical factors, that is, the societal trajectories and events elaborated in the subsections above which resulted in eventual changes in transboundary water interaction institutions. In particular, the political rapprochement from the 1950s onwards had a clear influence on the institutionalisation of transboundary water cooperation (Case 1 in the Annex) as well as on the agreements regarding, for example, management of the Saimaa Canal (Case 2). Table 2 summarises the main forms of interplay between transboundary water institutions and their historical context over the four analysed periods.

DISCUSSION AND CONCLUSIONS

This study combined detailed historical analysis with an analytical framework on transboundary water interactions; its aim was to study the context of Finnish-Russian transboundary waters over the past 100 years, with a focus on the period since World War II. Utilising the potential of historical institutionalism for the analysis, the study recognised transboundary water interactions as historical processes and sought to elucidate the main historical trajectories and junctures for the identified four periods. In doing so, the study also looked at the emergence of, and changing relationships between, the two distinct – albeit related – concepts of water diplomacy and transboundary water cooperation. The study focused specifically on Finland's transboundary water interactions with (Soviet) Russia, as this provided an opportunity to study a substantial historical trajectory.

Table 2. Interplay of transboundary water institutions with their general historical settings.

Historical period	Significant connections between historical settings and transboundary water interactions
1917 to 1939: Emergence of transboundary water interactions	Agreement on national borders led to a practical need for functional operations at the border concerning shared waters. It was necessary to maintain free-flowing waterways, manage cross-boundary timber floating, and manage border customs on shared waterways.
1940s and 1950s: Emergence of high-level water diplomacy	The focus was on security in Finland. There was a need to maintain diplomatic relations and to avoid political escalation despite hostile relations. Russia was politically and militarily dominant but Finland was in a better position hydrologically.
	There was a striving for control over precious hydropower, and peace negotiations addressed control of the industrial town of Enso and the related hydropower capacity. Negotiations took place on control of the Petsamo mine and the related hydropower supply, and of the transboundary hydropower corridor of the Vuoksi River.
	The economic and political importance to Finland of the transboundary Saimaa Canal encouraged the nation to continue the related negotiations.
1960s to 1980s: Emergence and development of transboundary water cooperation regime	There was increasing willingness in both countries for a more comprehensive bilateral agreement to replace old agreements. In Finland there was also legislative pressure to align with the redesigned 1961 Water Law and with emerging international principles on shared waters.
	Political opportunity presented itself thanks to political rapprochement, with relatively centralised decision-making in both countries enabling swift agreements.
	Economic factors included increased utilisation of the shared waters for various purposes; and the anticipated decrease in the role of hydropower, which opened up new possibilities for cooperation.
	Increasing awareness of environmental problems and related changes in national legislation.
1990s to 2010s: Self-governing water cooperation regime	Legislation – rather than water diplomacy – became the primary political steering tool in Finland; EU and national legislation affect the cooperation modalities without direct diplomatic intervention.
	Decreasing political significance of hydropower and increasing emphasis on environmental aspects and climate change adaptation as well as on digitalisation.

Conclusions about the study context

Two interlinked conclusions can be made regarding the actual study context, that is, the bilateral transboundary water interactions between Finland and (Soviet) Russia; they can help us to answer the first research question. The first conclusion is that the findings related to the four periods show the dynamism that a long-term view brings to transboundary water interaction, with the broader societal and political context strongly influencing water governance. Findings indicate that the main trend of transboundary water interactions between Finland and Russia has been one of gradual but continuous improvement. Such a trend is by no means obvious, given the countries' strongly asymmetric relationship and the major political changes that have occurred over time, most importantly the two wars between Finland and the Soviet Union between 1939 and 1944 and the collapse of the Soviet Union in 1991. The analysis indicates that the foundations of the improving trend can be linked to several key agreements and their related political engagement, particularly in the decades after World War II; this can be coupled with technically oriented and, importantly, largely non-political actual cooperation activities since the 1960s (see also Belinskij et al., 2018). The decreasing role of hydropower in the energy portfolio also played a role in moulding the historical trajectory in that it facilitated possibilities for cooperation by making transboundary water a more negotiable resource. This supports the view that shared waters tend to connect countries rather than separate them, even at times of political tension. It also reminds us that establishing well-functioning transboundary water cooperation with a clear institutional basis takes time and requires both political commitment and technical expertise.

Second, the study context brings together a number of important and hotly debated aspects of transboundary water interactions; these include: significantly asymmetric power relations between riparian countries; the related strong tensions and even war; the process of nation building (and collapse); issues around national sovereignty; and, ultimately, the establishment of an institutional setting for cooperation, including mechanisms to compensate for the negative impacts of one party on another. We argue that these aspects make the Finnish-Russian case exceptional and even unique in the world and suggest that it contains possible lessons for other shared water contexts. The Finnish-Russian experience can also provide a useful precedent in the implementation of the two global conventions on transboundary waters, namely the UNECE Water Convention 1992 and the UN Watercourses Convention 1997 that were both initiated by Finland. It can be said that between the 1960s and the 1990s, Finland established itself as a leading global proponent in transboundary water cooperation. This was undoubtedly inspired by Finland's own experiences in the course of its complex water interactions with the Soviet Union.

Contributions to the understanding of transboundary water interactions

In terms of a more general understanding of transboundary water interactions and the interplay between water diplomacy and water cooperation, we find four conclusions particularly relevant. First, the study strengthened the ideas presented in the methodology Section and also those presented by, for instance, Keskinen et al., 2021, that transboundary water interactions involve distinct but interconnected water diplomacy and cooperation processes. The study demonstrated how transboundary water cooperation institutions are established by water diplomacy and how these two processes thereafter coexist as distinct but interrelated processes that have their own institutional evolutionary directions. Such a finding enriches the perception of the two concepts and their interactions, building on and extending previous studies (for instance, Altingoz et al., 2018; Klimes et al., 2019; McCracken and Wolf, 2019). Our results support the idea that water diplomacy is inherently interlinked with its broader societal and political setting. They also indicate, however, that the broader setting may guide water cooperation directly, without water diplomacy playing an intermediate role; this is a notion that is relevant to understanding the characteristics and interrelations of these processes.

The second conclusion supported by the study is that broad environmental trends, social needs, and economic realities drive the agenda of both general politics and transboundary water interactions. This implies that societal trends and development trajectories are among the main drivers of transboundary water interactions (as shown in Figures 4 to 7 and in related subsections). In our case study context, among such key trajectories were the critical role of hydropower for electrification and modernisation, and later its decreasing significance; the striving for national security; and the increasing emphasis on the environment and on climate change adaptation. The existing literature emphasises that transboundary water interactions are inseparable from their broader political milieu (for instance, Klimes et al., 2019; Molnar et al., 2017; Zeitoun et al., 2011). The results of this study suggest, however, that the politics of water translate and filter existing societal trends and technological progress rather than themselves originating separate 'political' trends. In this sense, we should consider not only the broader political milieu of transboundary water interactions, but also – and even primarily – the surrounding societal trends that largely drive the politics.

The third conclusion supported by the study is that water diplomacy is a political process that is able to craft structures, steer practices, and give mandates to transboundary water cooperation (Altingoz et al., 2018; Klimes et al., 2019; McCracken and Wolf, 2019; Schiff, 2017). Cooperation can thus go only as far as the parties allow, outlining the possible operating space for joint actions. The results, however, convey that water cooperation cannot be seen merely as a product of diplomacy; once it has emerged, water cooperation is a distinct process that has a capacity for self-organisation and self-governance and can potentially even be somewhat detached from the broader political setting. The results highlight not only the interplay of the institutional setting with its historical institutional surroundings; they also reveal the internal interactions within the institutional setting, in this case between and inside the institutions of water diplomacy and transboundary water cooperation.

Fourth, the study findings suggested that water diplomacy was also used as a political tool to maintain or gain unilateral national advantage, and that this sometimes resulted in tensions being upheld rather than alleviated. The study supports the idea that water diplomacy can be regarded as a form of preventive diplomacy (De Bruyne and Fischhendler, 2013; Molnar et al., 2017; Yildiz et al., 2016); however, this is not the whole truth. While water diplomacy was used to alleviate political tensions in Finland's post-war relationship with the Soviet Union, our results suggest that the main driver behind water diplomacy actions was usually not conflict prevention as such, but rather the striving for national security.

Methodological conclusions: The value of historical process analysis

The study has demonstrated the value of the selected historical process analysis approach in general, and the framework of historical institutionalism in particular, in studying transboundary water interactions. It thus provides an answer to our second research question, as presented in the Introduction. The value comes from the consideration of institutions as historically embedded organic processes that change over time, sometimes gradually and at times more suddenly. Historical institutionalism helps analyse how both consistent historical trajectories and more sudden turning points influence the institutional setting in question (Hall and Taylor, 1996; Thelen, 1999); this is based on analysing the interplay of institutions in, and with, their historical institutional and political surroundings (Hall and Taylor, 1996; Steinmo, 2008).

The historical analysis underlines how the present state of natural resource governance results from past societal political power struggles and contingent historical occurrences. The resulting comprehension of institutional evolution over time helps understand the identities, agencies, institutional characteristics, organisational structures, and their legitimacy in a way that cannot be achieved without a systematic historical analysis. We see that the historical analysis is particularly relevant in the context of transboundary waters, as it helps to understand how past political power struggles, differing interests, and changing relative positions have resulted in the current institutional arrangements with regard to the allocation and use of shared water. This comprehension, in turn, is

important for a contemporary formulation of functional and socially fit policies that can help in mitigating water-related tensions (also noted by Musemwa, 2019, and Zeitoun et al., 2020).

The study indicates how systematically analysing historical trajectories helps understand and critically investigate our current practices; in the process, we can better understand the characteristics of power and knowledge in a particular setting and then ponder alternative ways of thinking and doing so as to improve the current state. This opens up an entirely new, pragmatic, solution-oriented field of knowledge production and governance. We believe that transboundary water interactions are too seldom studied from this perspective and we therefore call for more analytical studies of historical institutional processes in the field of water governance.

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ANNEX: CASE DESCRIPTIONS

Case 1: Control over the Vuoksi River and Lake Saimaa

Control over the Vuoksi River and Lake Saimaa, 1939 to the 1950s

After the wars, one area where Finland was able to keep control of the upstream was the Vuoksi River. It was the most significant river for hydropower generation, and hydropower was the most important critical strategic resource for both countries. The first diplomatic negotiations that involved discussions on the river's discharge, compensation, information-sharing, and lake regulation paved the way for much later water cooperation arrangements. Since then, these topics have been at the core of transboundary water interactions.

The wars and the related peace negotiations revealed the critical role of hydropower as a significant, negotiable transboundary commons. The corridor of the four dams on the Vuoksi River could only be managed together as one system. Dams must discharge an approximately consistent volume of water at all times, therefore altering the water level in one reservoir affects the hydraulic head of the upstream dams. This unavoidable interdependence became a transboundary concern when the two downstream dams were ceded to the Soviet Union. The outlet of Lake Saimaa, which delineated the beginning of the Vuoksi River, remained on Finnish soil, giving Finland the option of controlling the river's flow.

Immediately after the wars, the Soviet Union aimed to dictate stable river discharge rules for the benefit of their hydropower generation, thus not accounting for the seasonality of the flow or other practical limitations; the Finns, who managed the upstream flows, ignored the Soviet claims. Despite this difficult starting point, the transboundary interdependence became visible and made active interaction on shared waters essential for both parties, paving the way towards the later development of transboundary cooperation.

The ability to control hydropower infrastructure played a significant role in the peace negotiations. Diplomatic negotiations were driven by state representatives, but hydropower companies also played their part. The Finns (including the Enso-Gutzeit hydropower company) had removed the machinery, equipment, plant blueprints, and hydrological and hydraulic information from the ceded hydropower plants during the war (Korjonen-Kuusipuro, 2011). The Soviet Union thus did not have the expertise, hydrological knowledge, or technology to run the ceded hydropower plants (ibid). The issue of missing equipment and materials was raised in the peace negotiations as a serious violation of the spirit of the negotiations (Paasikivi, 1986). The equipment and materials were eventually returned to the hydropower stations and the necessary information was handed over, bit by bit, during the negotiations (Korjonen-Kuusipuro, 2011; Paasikivi, 1986).

Remarkably, the first diplomatic discussions after the wars considered hydropower compensation as a possible tool for solving contradictions. Both parties demanded compensation from lost hydropower after the war. Finland demanded compensation for the power generation capacity that they expected to lose once a planned Soviet dam construction was completed and water levels in a downstream reservoir rose (Paasikivi, 1986). The Soviet Union, on the other hand, demanded compensation for the hydropower that was secretly supplied to Finland from the ceded dams after the peace (Korjonen-Kuusipuro, 2011). No agreement was reached on the compensations, but these discussions can be seen to have paved the way for similar compensation mechanisms that were formulated in the 1960s.

In the 1950s, the importance of the shared hydropower cascade on the Vuoksi obliged both parties to continue discussions about joint river management (Korjonen-Kuusipuro, 2013a). The Soviet power company improved the power generation of the Svetogorsk plant by raising the water level of its cascade, which in turn reduced the power generation capacity of the Finnish Imatra plant just upstream (Korjonen-Kuusipuro, 2013; Myllyntaus, 1991). Because their goals differed, the countries could not agree on the river discharge rule or on suitable compensation mechanisms. Both nations continued to govern their

water flows for their own national benefit, using the tools and infrastructure that they respectively possessed.

A related case where Finland was able to hold its controlling position despite diplomatic pressure was the regulation of Lake Saimaa. Already in the 1930s, the regulation of Lake Saimaa for flood and drought management had emerged as a realistic possibility for the Government of Finland; however, the wars had postponed its realisation (Räsänen, 2020). The lake's water level had been measured daily since 1847 (Kaatra, 2012), providing a rich cache of information for the regulation plans. The idea of the regulation was to prevent serious floods in the lake and to increase the hydropower output of the Vuoksi. Lake Saimaa had faced a severe flood in 1924, which was followed by complaints from local residents. This pushed the Government of Finland to begin water level regulation in the lake. The concept of water level regulation was introduced into Finnish legislation in 1934, reflecting the increasing prospect of having truly state-controlled water bodies (Suurpadot-Suomen osasto ry, 1991).

Rebuilding the destroyed Tainionkoski Dam at the outlet of the Saimaa in 1949 enabled the regulation of its water levels and of the Vuoksi's discharges. The regulation was at first directed unilaterally by Finland (Korjonen-Kuusipuro, 2013; Myllyntaus, 1991), with Finland only sending a notice on the regulation decisions to the Soviet Union (Korjonen-Kuusipuro, 2013). In practice, Lake Saimaa discharges were nevertheless optimised for hydropower generation; this in itself was extremely crucial for the nation, but the plans also accounted for flood risk management (Korjonen-Kuusipuro, 2013; Myllyntaus, 1991; Suurpadot-Suomen osasto ry, 1991). Regulation of the Saimaa water level functioned well; it is believed to have prevented damage in the next great flood, which occurred in 1955 (Suurpadot-Suomen osasto ry, 1991).

In 1959, the countries returned to the same table regarding the management of discharges. The negotiations occurred at high political levels and the final decisions were made in parliament, reflecting the political importance of hydropower. An emerging political rapprochement of the countries was visible; the countries' representatives even developed a joint proposal for managing the Vuoksi discharge for optimal hydropower generation in both countries, but the Government of Finland finally rejected the plan as "harmful" (Suurpadot-Suomen osasto ry, 1991).

Negotiating discharge rules for the Vuoksi River and Lake Saimaa, 1960s to 1980s

Joint regulation of Lake Saimaa and the related regulation of the Vuoksi River discharge were among the main topics on the Commission's table since its establishment in 1964. Potential benefits included more optimal overall hydropower generation, and flood and drought protection. Additional potential benefits included timber floating, forestry, fisheries and recreational uses of the water bodies. The Commission, its thematic working groups (TWGs), and the rules for the establishment of the TWGs are stated in the Working Order of the Commission (Belinskij et al., 2018; Experts 2 and 3).

The Finnish and Soviet hydropower companies initiated discussions on the possibility of establishing a mechanism for regulating the Vuoksi River in order to optimise hydropower generation and compensate for losses in hydropower production on the Finnish side (Räsänen, 2020). The resulting *Imatra – Svetogorsk Hydropower Agreement* was concluded in 1972.[23] In this agreement, Finland made a concession to their Soviet counterparts by agreeing to start a joint management regime for managing river discharges; Finland benefitted from the related compensation mechanism.

The Hydropower Agreement set rules for the regulation of the Vuoksi discharge to maximise efficient, concurrent hydropower generation in both countries (Belinskij et al., 2018; Finnish-Russian Transboundary Water Commission, 2014). It also limited the water levels of the reservoir supplying the

[23] The formal title is, *Agreement between the Republic of Finland and the Union of Soviet Socialist Republics Concerning the Production of Electric Power in the Part of the Vuoksi River Bounded by the Imatra and Svetogorsk Hydro-electric Station* (signed July 12, 1972, entered into force February 7, 1973).

Svetogorsk hydropower station so as to prevent loss of energy production at the upstream Imatra station (Finnish-Russian Transboundary Water Commission, 2014). Based on this agreement, the Svetogorsk station operator was obliged to compensate the Imatra station operator for 19,900 MWh of lost hydropower generation per year on a permanent basis (Belinskij et al., 2018). The agreement delegated the operational flow management to hydropower companies, within the limits of the given framework (ibid).

In 1972-1973, the question of developing more unambiguous rules for regulating the Vuoksi River discharge was again on the table (Korjonen-Kuusipuro, 2013; Suurpadot-Suomen osasto ry, 1991). Despite the new agreement, the discharge issue remained particularly problematic for the Soviet dam operators due to the different maximum capacities of the power plants. If the discharge in the Vuoksi exceeded 800 m^3/s, the two Soviet

hydropower stations would start to experience overflow and loss of hydropower; this put the Finnish and Soviet dams in a very different position at high discharge levels. In low discharge occurrences, the resulting harm remains similar in both countries, in that less than 300 m^3/s would cause problems for hydropower, livelihoods and navigation in both countries (Belinskij et al., 2018; Expert 4). Finland, in turn, required the establishment of a discharge regime that would be able to prevent flooding of Lake Saimaa. Both parties thus had a clear incentive to continue developing a discharge regulation regime. Long preparatory work and years of negotiations to solve this issue resulted in a 1989 agreement, which came into effect in 1991.[24]

The 1989 *Discharge Rule of Lake Saimaa and the Vuoksi River* (hereafter referred to as the Discharge Rule) aimed at combining flood and drought protection needs and hydropower requirements. The Discharge Rule is based on the 1964 Watercourses Agreement. The aim was to mimic the so-called natural flow of the Vuoksi; the flow was to stay within the predefined, seasonally varying "normal zone" (Belinskij et al., 2018; Kaatra, 2012; Kotkasaari, 2008). If the water level in Lake Saimaa was about to rise or drop past the set levels and causing, for example, flooding, drought, or difficulties for safe navigation, the discharge at the lake outlet would be changed accordingly to prevent problems. In the case of excess discharge, a practice emerged whereby the Government of Finland would compensate the possible power generation losses for the Soviet hydropower plants downstream. In practice, the agreement allowed regulation of Lake Saimaa and was able to prevent considerable damage to livelihoods and properties in Finland, with the trade-off being monetary compensation (Korjonen-Kuusipuro, 2013). The agreement protected the vulnerable banks of the Vuoksi from the peak discharges of an unregulated lake (Kotkasaari, 2008); however, even controlled maximum discharges may cause erosion of downstream river banks (Expert 4). A 100 m^3/s additional river discharge causes a 40 cm increment in the river's downstream water level; properties can thus flood if the discharge exceeds 1000 m^3/s (Expert 4). Overall, the agreement on Vuoksi Discharge Rule marks the end of the era of active political negotiations and the start of a mature water cooperation regime between Finland and Russia.

Case 2: Politics of the Saimaa Canal

Negotiations on the Saimaa Canal in the 1950s

The Saimaa Canal provides an example where Finland proposed an agreement that would have enabled navigation on the nationally significant waterway, but where the Soviet Union's interest remained low and the country was thus reluctant to give any concessions. The Saimaa Canal is a 43 km long waterway; it is suitable for transportation and connects Lake Saimaa with the Gulf of Finland at a location that is close to Viipuri, a town that was built between 1845 and 1856. The canal was the backbone of the Saimaa

[24] The official title of the agreement is, *Agreement between the Republic of Finland and the Union of Soviet Socialist Republics Concerning the Regulations Governing Lake Saimaa and the Vuoksi River* (signed October 26, 1989, entered into force October 9, 1991).

basin economy as it provided a waterway to the Baltic Sea and St. Petersburg's markets. In 1917, at independence, it became Finnish national property. In the 1920s, the canal's capacity became insufficient for the growing traffic; in 1923, the canal carried 13,000 ships and over a million tons of freight (Vesterinen, 2014). Canal enlargement started that year, but the start of the Winter War in 1939 ended the ongoing project halfway to completion (ibid).

With the 1940 peace treaty, the Saimaa Canal became cross-boundary, with 24 km of its length remaining on the Finnish side. The Saimaa Canal infrastructure was damaged during the wars and the Soviet Union were not willing to maintain or reconstruct the portion of it that lay in their territory (YLE, 2018). In the post-war peace negotiations, the Government of Finland unsuccessfully proposed leasing the canal (Vesterinen, 2014). Control of the canal was thus divided and, as a result, traffic on it all but ended (ibid). In the following years, the unusable canal played a part in the economic depression in southeast Finland, as it had previously been the main gateway for exports for the Saimaa basin (Paaskoski, 2002; Vesterinen, 2014).

Water diplomacy and politics of the Saimaa Canal in the 1960s

The case of the Saimaa Canal provides a good example of how water diplomacy and broader politics were linked at the time, and how much practical decision-making power was centralised to the presidents in both countries. Bilateral relations had a great impact on the diplomatic negotiations and political agreements on the use of the Saimaa Canal; negotiations on revitalising canal navigation started almost immediately after the wars (Paaskoski, 2002). The YYA Treaty in 1948 and the slowly warming relations thereafter enabled more genuine negotiations to take place on the canal tenure and its navigation (ibid).

In the late 1950s, the Foreign Ministry of the Soviet Union was reluctant to participate in negotiations; the negotiations thus continued at the highest level between the Finnish President Kekkonen and the Soviet leader Nikita Khrushchev (ibid). In 1960, after years of political warm-up, a breakthrough was achieved when the President of Finland stated that the Soviet Union would be willing to lease the canal for a maximum of 50 years (Paaskoski, 2002; Vesterinen, 2014). The final agreement was negotiated by representatives that were accountable to their respective presidents (Paaskoski, 2002). The agreement was signed in 1962 and approved by the Finnish parliament in 1963 (Vesterinen, 2014). In that year, Finland started its 50-year rental of the Soviet side of the Saimaa Canal; this was extended by 50 years in 2010, with a new start date of 2013. The original agreement did not consider international passenger cruising, but in 1968 this was enabled for Finnish and Soviet residents (ibid). After reopening the canal, its freight trade soared, but trade exceeded the previous peak of one million tons a year only in 1979 and involved mainly wood products (ibid). Finland renovated and enlarged the canal in the 1960s, and again in 2017-2019. Such a bilateral leasing agreement is rather unique and may not exist anywhere else today (YLE, 2018).

It has been argued that one rationale for the concession of allowing the canal lease was the desire to support the re-election of President Kekkonen, who had a good reputation in Russia and a good personal relationship with the political elite of the Soviet Union (Paaskoski, 2002; YLE, 2018). It has also been suggested that this concession and the related override of the Soviet government in that matter further undermined the already unstable standing of Nikita Khrushchev and was therefore one reason for his fall in 1964 (Paaskoski, 2002). In Finland, like in Russia, many politicians complained about the way the president had overridden parliament in the negotiations on the Saimaa Canal, but President Kekkonen's standing nevertheless remained strong (ibid).

Case 3: Petsamo hydropower and Lake Inari

The case of the Niskakoski Dam and the Jäniskoski hydroelectric plant demonstrates how Finland, in order to prevent escalation of conflict, had to give substantial concessions to the Soviet Union, particularly in

areas where Soviet interest was high and Finnish interest remained relatively low. The rationale was to secure peace and to prevent the political escalation that could have led to an even larger confrontation.

The Niskakoski Dam was constructed in 1942, during the war, in order to regulate the water levels of Lake Inari, which is the biggest lake in the Paatsjoki basin in the far north of Finland. With the construction of the dam, the waters of Lake Inari began to support the generation of hydropower for the Finnish nickel mine in Petsamo. The dam was destroyed in 1944, at the end of the Continuation War, by withdrawing German forces (Marttunen et al., 1997; Suurpadot-Suomen osasto ry, 1991). In 1947, the Soviet Union demanded that Finland cede supplementary hydropower stations close to the border in northern Finland in order to secure an electricity supply to the now Soviet Petsamo mine. Reluctantly, Finland agreed to hand over the destroyed Jäniskoski hydroelectric power station and the war-damaged Niskakoski control dam, including a total of 176 km^2 of land. The Finnish hydropower company Imatran Voima – the operator of the Finnish hydropower stations on the Vuoksi River – was contracted to rebuild the stations and the regulation dams in the ceded area. The contract gave rise to further work, as the company was later selected to construct another noteworthy Soviet hydropower dam project in Ylä-Tuloma, near the White Sea (Suurpadot-Suomen osasto ry, 1991).

The parties conducted a related Agreement on the Regulation of Lake Inari that was replaced by a trilateral treaty between Finland, the Soviet Union, and Norway in 1959[25] (Belinskij et al., 2018). The objective of the regulation was to increase the potential of the existing hydropower stations on the Paatsjoki River, which was the outlet channel of the lake (Marttunen et al., 1997). Seven hydropower stations were constructed on the river after the wars; these involved five Soviet and two Norwegian dams. The regulation rule mainly benefitted the hydropower plants in the Soviet Union and Norway, whereas the lake's ecosystem, fisheries, and local residents in Finland experienced negative consequences (Marttunen et al., 1997).

In short, the positive impacts from hydropower were enjoyed elsewhere while Finland suffered the negative effects. To compensate for this imbalance, Annex 3 of the 1959 Agreement specifies an obligation for the Soviet Union to take part in compensatory maintenance of fish culture in Lake Inari. Nonrecurrent cash compensations have been paid by (Soviet) Russia (based on the 1947 agreement) and by Norway (not based on the agreement *per se*, but on separate bilateral diplomatic negotiations in the 1990s, which were paid once in 1994). The lump sums that were paid, however, did not fully compensate for the recurrent costs of the harm to local inhabitants and the damage to the lake environment that was being caused by the regulation (ibid). The Government of Finland has therefore been obliged to maintain the lake environment and to compensate for local damages, with funds coming mainly from its own budget (ibid).

Issues remain unresolved with regard to the Paatsjoki basin and the regulation of Lake Inari. The regulation rule still mainly benefits the hydropower plants in Russia and Norway, whereas the negative consequences are mainly borne by the lake's ecosystem and by local Finnish residents (ibid). The Soviet Union, however, is obliged to take part in the maintenance of the fish culture in Lake Inari (ibid). In 1995, Russia agreed to compensate for the harm done by providing 10 GWh of hydropower annually to Finland at no cost from 1996 to 2005; this was worth approximately one-third of the recurrent cost of lake maintenance (ibid). Russia unilaterally stopped the compensations in 2005, however, stating that there was no more need for fish culture maintenance activities in Lake Inari. Finland has kept the matter on the table, but negotiations have not led to a result.

[25] The agreement is formally entitled the Agreement between the Government of the Union of Soviet Socialist Republics, the Government of Norway and the Government of Finland Concerning the Regulation of Lake Inari by means of the Kaitakoski Hydro-Electric Power Station and Dam (signed and entered into force April 29, 1959).

Case 4: Iijoki Plan

The fourth case, which is related to the so-called Iijoki Plan, indicates how tense political relations and the emergent difficulties with transboundary water interactions entirely prevented official discussion of some possible opportunities in transboundary water management. From 1943 onwards, Finland considered redirecting the water of two important northern lakes – namely Lake Kotajärvi and Lake Kuusamojärvi in the Vienan Kemi basin – to the neighbouring Iijoki and Kuusinjoki Rivers in the Iijoki basin. This redirection would have enabled discharge sufficient for the development of large hydropower facilities (Suurpadot-Suomen osasto ry, 1991). The problem was that the two lakes drained into the White Sea via the Soviet Union, whereas the Iijoki and Kuusinjoki Rivers drained into the Bay of Bothnia through Finland. This complicated the plans as, according to the 1944 Peace Treaty, transboundary watercourses could not be redirected without a specific bilateral agreement. This made the plan politically impossible, though the project would have anyway faced other dramatic complications.

The retreat of the Finnish government from the plan did not stop two major Finnish hydropower companies from fighting over the land tenure of the potential rapids; nor did it prevent them from further developing the so-called Iijoki Plan in the 1950s and 1960s (Käsmä, 2015). The Finnish government did not proceed with this politically and environmentally risky plan, but it did develop water level regulation and smaller-scale hydropower in the area from 1959 onwards. The government preferred the environment, agriculture and tourism over hydropower, and recommended the establishment of a new nature reserve at the Jyrävä rapids. The new reserve was annexed to the famous Oulanka National Park which had been established in 1956 (ibid). In the 1960s, the decreasing importance of (additional) hydropower for energy security and increased environmental awareness ultimately caused hydropower companies to withdraw from large-scale hydropower development in the area (ibid).