

Searching for consensus

A study of hydrosocial relations in the water management of river Eurajoki in southwestern Finland

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Abstract [en]

Water management tackles complexities within the interconnected social, political, economic and ecological systems across scales, while aiming to meet the needs of multiple stakeholders dependent on water. Many tensions and unsolved issues persist in water management regarding socio-political power structures, spatial scale, and relations between stakeholders who have different perceptions on problems and solutions in water management. This study explores the socio-political dimensions of water management and restoration efforts in the case study site of river Eurajoki in southwestern Finland through the lens of political ecology. A hydrosocial analysis is conducted focusing on stakeholder perceptions of water management to understand the current controversies and collaboration. For the purpose of this study, the online public debate regarding river Eurajoki was reviewed, and semi-structured interviews with different stakeholders around river Eurajoki were conducted. The findings indicate that the most contested problematic creating inter-stakeholder controversies concerns industrial and urban wastewater discharges into the river. The key water management conflicts arise from stakeholders' competing perceptions and knowledges, divergent knowledge valuation in the water management, and uneven power relations in the spatial scale of upstream-downstream of the river. Moreover, scattered views of restoration efforts, distrust in other stakeholders' integrity and polarised public debate hinder the process of active stakeholder participation and consensus decision-making. The study argues for comprehensive incorporation of situated knowledge in the decision-making over water management, inclusion of citizens in the planning processes of restoration efforts and acknowledgement of different definitions of what is considered "good" water quality, to improve the equity of and consensus-seeking over the water management and river restoration. Findings from this study contribute to the discussions of water-society interlinkages and are relevant in cases where water management is contested by many involved stakeholders, and where an increased understanding of the complex hydrosocial cycle can lead to more sustainable water management practices.

Tiivistelmä [fi]

Vesienhoito käsittelee komplekseja yhteyksiä toisiinsa kietoutuneissa sosiaalisissa, poliittisissa, taloudellisissa ja ekologisissa systeemeissä, samalla pyrkien vastaamaan useiden vedestä riippuvien sidosryhmien tarpeisiin. Monet jännitteet ja ratkaisemattomat ongelmat ovat edelleen tunnusomaisia vesienhoidon toteutukselle, liittyen etenkin sosio-poliittisiin valtarakenteisiin ja niiden ilmenemiseen eri tasoilla, sekä sidosryhmien välisiin suhteisiin, joita luonnehtivat kiistellyt käsitykset vesienhoidon ongelmista ja ratkaisuista. Tässä tutkimuksessa tarkastellaan vesienhoito- ja kunnostustoimien sosio-poliittisia ulottuvuuksia tapaustutkimuksena Lounais-Suomen Eurajoen vesistön alueella poliittisen ekologian lähestymistapaa ja tutkimuskonsepteja hyödyntäen. Tutkimuksessa hyödynnetty hydrososiaalinen analyysi kohdistuu eri sidosryhmien käsityksiin vesienhoidosta tavoitellen kattavampaa ymmärrystä tapaustutkimuksen alueen tämänhetkisistä ristiriidoista ja yhteistyöstä. Tutkimusmenetelmät koostuivat katsauksesta julkiseen keskusteluun online-median alustoilla, ja puolistrukturoiduista haastatteluista eri sidosryhmien edustajien kanssa. Tutkimustulokset osoittavat, että ristiriitoja sidosryhmien välille muodostavat kiistanalaisimmat ongelmakohdat koskevat joken laskettuja teollisuus- ja yhdyskuntajätevesiä. Keskeiset vesienhoitokonfliktit johtuvat sidosryhmien kilpailevista näkemyksistä, erilaisista tiedoista (asiantuntijatieto vs. paikallinen tieto) ja niiden asemasta vesienhoidossa, sekä toimijoiden eriävistä asemasta ja kontrollista veteen joen ylä- ja alajuoksulla. Lisäksi hajanaiset näkemykset joen kunnostustoimista, epäluottamus sidosryhmien välillä ja polarisoitunut julkinen keskustelu haittaavat aktiivista sidosryhmien osallistumista ja konsensuseseen perustuvaa päätöksentekoa. Tutkimus vetoaa paikallisen, kokemusperäisen tiedon sisällyttämistä

vesienhoitoon liittyvään päätöksentekoon, kansalaisten osallistamista joen kunnostustoimien suunnitteluprosesseihin ja veden laatumääritelmiin liittyvien erilaisten näkemysten tunnustamista oikeudenmukaisen vesienhoidon ja konsensukseen perustuvan päätöksenteon takaamiseksi. Tutkimuksen tulokset edistävät keskustelua veden ja yhteiskunnan vuorovaikutuksesta, ja ovat sovellettavia tapauksissa, joissa vesienhoito on kiisteltyä sidosryhmien välillä, ja joissa monitahoisen hydrososiaalisen syklin ymmärtäminen voi johtaa kestävämpään vesienhoitoon.

Keywords: Hydrosocial cycle, Political ecology, Multi-stakeholder, Water management, River restoration, Sustainability science

Word count: 13 962

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Abbreviations and definitions

| | |
|------------|----------------------------------------------------------------|
| BPA | Bisphenol A |
| CBA | Cost-Benefit Analysis |
| CC | Climate Change |
| CEO | Chief Executive Officer |
| ELY centre | Centre for Economic Development, Transport and the Environment |
| EU | European Union |
| FANC | The Finnish Association for Nature Conservation |
| PE | Political Ecology |
| RQ | Research Question |
| SS | Sustainability Science |
| WPA | Water Protection Association |
| WWTP | Wastewater Treatment Plant |

“We can’t impose our will on a system. We can listen to what the system tells us, and discover how its properties and our values can work together to bring forth something much better than could ever be produced by our will alone.”

– Donella H. Meadows, *Thinking in Systems: A Primer* (2008)

1 Introduction

Water is a vital resource for sustaining life and supporting human societies. It is an essential component for food production, industry and energy production, human settlements, public health, and ecosystem functions (Gleick, 1998; WWAP, 2012). In the 21st century, water resources are characterised by increasing uncertainty regarding water quantity, strongly impacted by anthropogenic climate change (CC), and the degradation of water quality, almost invariably resulting from industrial and agricultural human activities (WWAP, 2012). Thus, water is inseparably intertwined with human society (Linton & Budds, 2014). The mobilisation of water from a shared water body for uses of different stakeholders with different demands is inherently a confrontational process (Swyngedouw, 2009). Efforts to manage the uncertainties of water quantity and quality, while aiming to meet the needs of humans and nature for clean and sufficient water provision, has resulted in water conflicts across the world (WWAP, 2012; Rodríguez-Labajos & Martínez-Alier, 2015). Addressing water use and management practices is thus essential towards a more sustainable, equitable world (WWAP, 2012).

Water management covers a wide spectrum of activities ranging from the protection of water resources through mitigation and restoration efforts to the provision of water-related societal services such as wastewater treatment (WWAP, 2012). In the context of river basins, water management measures are primarily established to restore and protect the river environment, and to support the riverine societies; however, it is yet unclear how a satisfactory environmental state can be achieved through water management, while simultaneously answering to the divergent needs of different stakeholders (Knieper & Pahl-Wostl, 2016). To address this gap between water management practices in the river environment and the divergent positions of its stakeholders, this research examines river Eurajoki in southwestern Finland as a case study. The water management of river Eurajoki is currently characterised by both high levels of collaboration between stakeholders to collectively protect and restore the river; and controversies particularly around the wastewater management recurring since the early 2010s.

Water management practices have traditionally been approached as a technical issue; however, this view has been widely questioned by scholars and in the past decades (WWAP, 2012; Budds, Linton & McDonnell, 2014). A dominant way in which water management has been studied and practiced has regarded water as a merely bio-physical entity (Budds et al., 2014), disregarding the interconnectedness of water and human society, which makes water management an inherently social and political question (Swyngedouw, 2009; Linton & Budds, 2014). Thus, there is a need for new, innovative approaches to water, towards more holistic water research to support sustainable water

management (Budds et al., 2014). Shifting the focus particularly on the socio-political dimensions of water, and considering them as an integral part of the water management practices, can distinctively help to address water conflicts and help in navigating towards sustainable and equitable water management practices (Palomino-Schalscha, Leaman-Constanzo & Bond, 2016; Fox et al., 2017).

Drawing from the concept *hydrosocial cycle*, used in the field of political ecology (PE) as a means of theorising and analysing water-society relations (Linton & Budds, 2014) to address “the relations of social power, and political and economic factors that shape, and are shaped by, water” (Palomino-Schalscha et al., 2016, p. 884), this thesis explores the contesting perceptions of different stakeholders over the issues in the water management of river Eurajoki. Using the hydrosocial cycle as an analytical tool to investigate socio-political relations that affect, and are affected by water, allows to expose complex water-society power relations, while creating space to challenge and transform those relations (Palomino-Schalscha et al., 2016).

1.1 Research aim

By applying the hydrosocial cycle as an analytical lens in water management, the aim of this thesis is to identify barriers and opportunities for sustainable water management and restoration in the case study site of river Eurajoki. By looking at the current conflicts and collaboration linked to current water management, restoration efforts and future aspirations through the different stakeholders’ perceptions, the study examines how different knowledges and inter-stakeholder relations reinforce and/or produce power relations with both material and social implications. Both the *divergent* perceptions that may accumulate into socio-political conflicts between the stakeholder groups (Palomino-Schalscha et al., 2016); and the *shared* perceptions that may advance the implementation of sustainable, equitable alternatives for the river management and restoration (Cradock-Henry, Greenhalgh, Brown & Sinner, 2017) will be highlighted. Ultimately this can help facilitate common ground for stakeholders to advance consensus decision-making in order to avoid future conflicts, increase opportunities for further collaboration and to inform river management and restoration projects in the future.

1.1.1 Research questions

- How is the water management of river Eurajoki perceived by different stakeholders and what interests, demands and knowledges are internalised in these perceptions?
- How do differences and commonalities in stakeholder perceptions translate into conflicts and/or collaboration towards sustainable water management and river restoration?

1.2 Contributions to sustainability science

Sustainability science (SS) emerged in the turn of the 21st century as a response to the growing need to understand the complex sustainability challenges such as CC and water degradation that threaten the future of humankind and the integrity of natural environment (Kates et al., 2001; Jerneck et al., 2011). The new, developing discipline calls for new approaches of doing science through combining different ways of knowing, not only across disciplines, but also across fields outside of academia (Kates et al., 2001; Spangenberg, 2011). Incorporating non-scientific expertise into the process of studying the simultaneous changes in social and environmental systems adds value to single disciplinary assessments and can provide valuable information for policy- and decision-making (Spangenberg, 2011). This thesis contributes to the inquiries of SS, because it complements traditional mono-disciplinary science by bridging information between disciplines of natural sciences and social sciences, and engaging with different stakeholders in the case study site of river Eurajoki, to increase the comprehension of water-society interaction towards sustainability (Jerneck et al., 2011; Spangenberg, 2011). Moreover, this thesis deploys concepts across different fields of research to execute a holistic social-environmental study of a water system that involves many stakeholders, suggesting new approaches to problem-solving in water management (Jerneck et al., 2011).

1.3 Thesis outline

To set the scene, chapter two introduces the case study context of river Eurajoki and its relevant features including stakeholders, water management issues and restoration efforts. Chapter three presents the theoretical approach, describing the ontological-epistemological standpoint of this thesis, along with the theoretical-analytical approach of PE and hydrosocial cycle. The methodological decisions, partly originating from the chosen theoretical approach, are described in chapter four. The chapter includes e.g. a description of the data collection methods, stakeholder selection for the interviews and the way the data was analysed for this thesis. In chapter five, the findings are presented and discussed through the lens of the ontological-epistemological standpoint, PE, and hydrosocial cycle. Finally, chapter six presents the concluding thoughts.

2 Case Study Context: River Eurajoki

2.1 Location and stakeholders

River Eurajoki sources from lake Pyhäjärvi, the largest lake in southwestern Finland, and runs through two municipalities before discharging into the Bothnian Sea on the southwestern coast of Finland (Figure 1). It is officially divided in two sections: upstream part around the municipality of Eura, and downstream part around the municipality of Eurajoki. Occasionally midstream part is also referred to, when discussing the area around two smaller settlement centres Kiukainen and Panelia. The most significant tributary of river Eurajoki is river Köyliönjoki, which sources from the heavily eutrophicated lake Köyliönjärvi (Paloheimo, 2010) and flows into river Eurajoki in its midstream part.

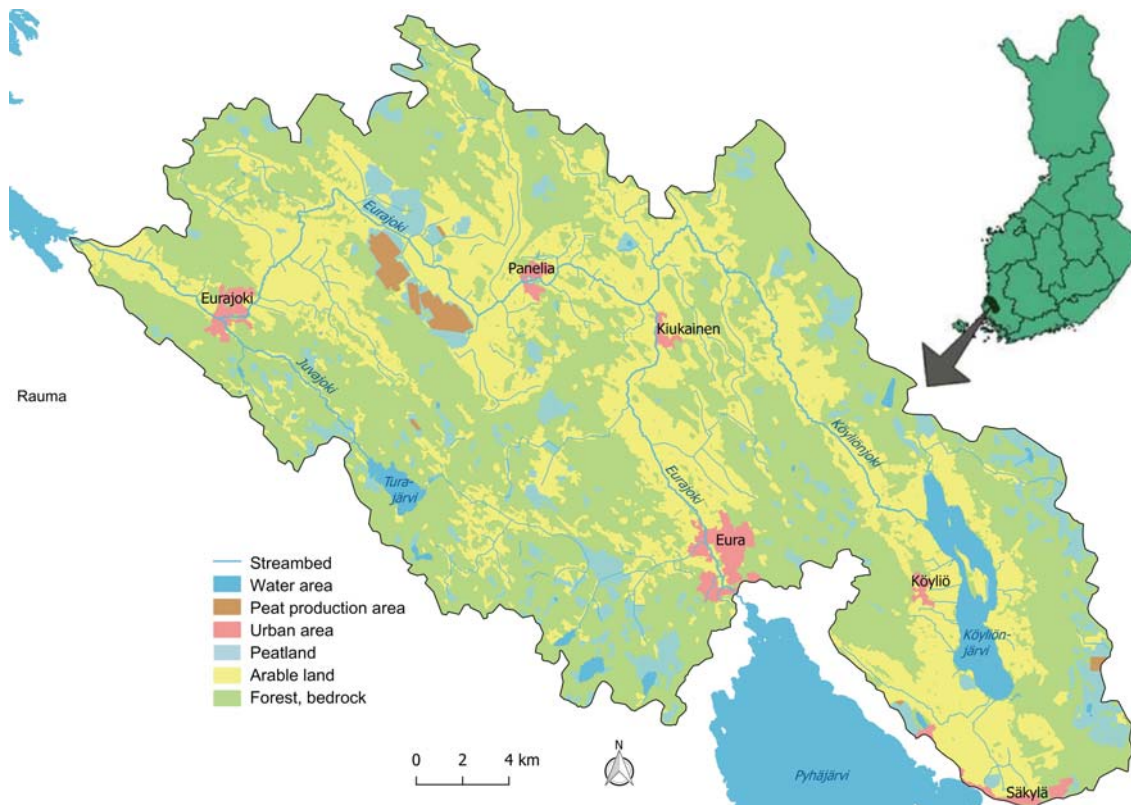


Figure 1. The location of river Eurajoki and its source lake Pyhäjärvi in southwestern Finland; land use in the area. Source: Pyhäjärvi Institute (n.d.c).

The land surrounding river Eurajoki is mainly in agricultural use. Eura, the upstream municipality of 12 000 citizens¹, has traditionally been a significant location for paper industry, with currently one operating paper company. In the downstream municipality Eurajoki, populated by 10 000 people²,

¹ <http://www.eura.fi/fi/aura-info/aura-.html>

² <https://www.eurajoki.fi/hallinto/kuntainfo/>

there is an operating nuclear power plant and approximately 60 000 yearly visitors³. River Eurajoki is also utilised to produce drinking water for the citizens of Rauma, a city of 40 000 people⁴ by the Bothnian Sea. Other significant facilities related to the river are the three wastewater treatment plants (WWTPs) discharging in the upstream of the river: one of which treats the urban and industrial wastewaters of the municipality of Eura, and two of which treat the urban and industrial wastewaters of the municipality of Säskylä further south by lake Pyhäjärvi. There are also three hydropower stations in the mid- and downstream, and a variety of recreational activities related to the river such as fishing, paddling and swimming (Pyhäjärvi Institute, n.d.a).

The river water management relies significantly on the central governance which is implemented through regional centres for economic development, transport and the environment (ELY centres). ELY centres are responsible for regional water monitoring and guiding of water management and restoration efforts, in accordance with the Finnish Water Act, based on the EU Water Framework Directive (Ympäristöministeriö, n.d.). The expertise of ELY centres is supported locally by a regional research institute, i.e. Pyhäjärvi Institute, which has operated since 1989 to protect the waters of lake Pyhäjärvi area. Furthermore, there are citizen associations that actively work on a voluntary basis to protect the river. The figure below summarises the above-mentioned categories of key stakeholders of river Eurajoki and the main interests and/or demands associated with them (Figure 2).

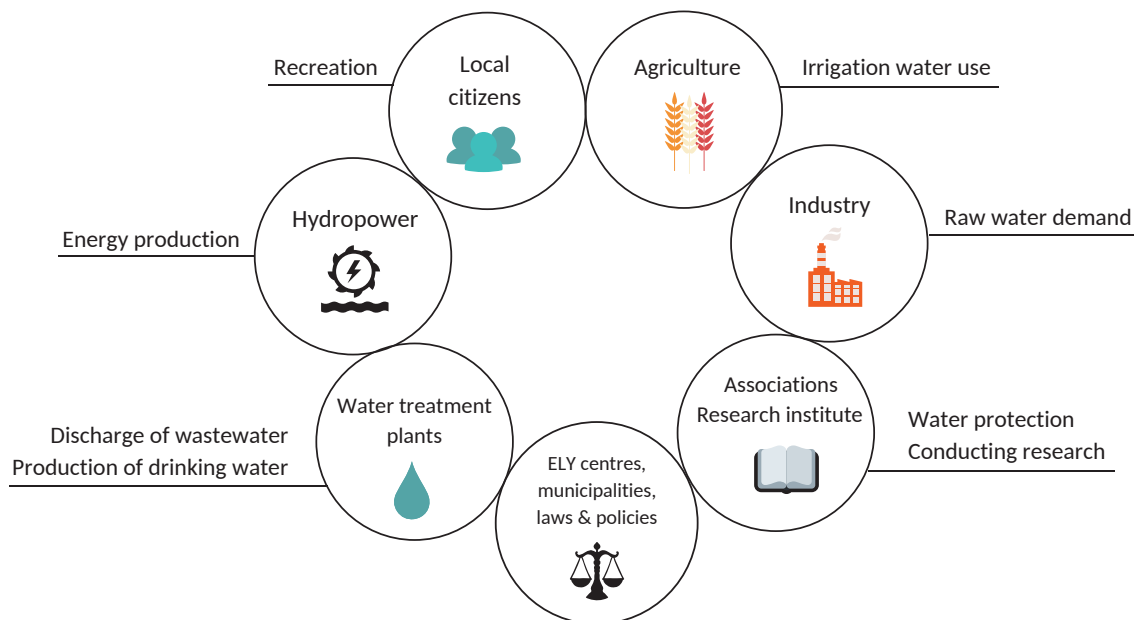


Figure 2. Summary of key stakeholders and their main interests/demands in the water management of river Eurajoki. Author’s own illustration.

³ <https://www.eurajoki.fi/matkailu/>

⁴ <https://www.rauma.fi/kaupunki-ja-hallinto/tietoa-raumasta/avaintiedot/>

2.2 Ecological state

The ecological state of Finnish water bodies is classified into five categories in descending order: high, good, moderate, poor and bad. The classifications consider biological factors such as conditions of fish populations, water quality elements such as total nutrient load and hydromorphological features such as fish migration barriers (Finnish Environment Institute, 2016). The ecological state of freshwater bodies in Finland is overall good, but many of the coastal waters and rivers are still in moderate or poor condition (Finnish Environment Institute, 2014). The main issue is eutrophication caused by nutrient loads, which also further affects the state of the Baltic Sea (Finnish Environment Institute, 2014; HELCOM, 2015). Quantities of nitrogen and phosphorus in rivers, largely due to riverside agricultural fields, have remained almost unchanged from the 1970s (Finnish Environment Institute, 2014). Non-point sources of the nutrient load in river Eurajoki originate from agriculture and in a smaller scale from settlement run-offs. Point sources such as WWTPs account for smaller nitrogen and phosphorus load but do cause hygienic and solid matter load (Kipinä-Salokannel, n.d.). ELY centre for Southwest Finland estimates that agriculture accounts for 57 % of total phosphorus load and 52 % of total nitrogen load in river Eurajoki; in comparison the settlements and industry account for 6 % of both total phosphorus and total nitrogen load (Kipinä-Salokannel, n.d., p. 24). In the assessment term 2006–2011, river Eurajoki was classified to be in moderate ecological condition due to significant bacteria issues (Finnish Environment Institute, 2015; Elinkeino-, liikenne- ja ympäristökeskus, 2019). Now ELY centre however states, that as for the following assessment term 2012–2017, the ecological condition of both upstream and downstream can be classified as good (Elinkeino-, liikenne- ja ympäristökeskus, 2019).



Figure 3 (left). Arable lands in the upstream of river Eurajoki. **Figure 4** (right). Water quality meter installed in 2013 by ELY centre and the Finnish Environment Institute in the upstream of river Eurajoki enables real time water quality monitoring online⁵. Picture credits: Mikko Susi on May 12, 2019.

⁵ <http://www.i2.ymparisto.fi/i2/vesimittari/L3400001/index.html>

2.3 Historical context of current issues

The long tradition of agriculture and paper industry in the river Eurajoki area has altered the water quality of the river for decades. The local communities recall that river Eurajoki was heavily degraded in the 1970s through 1980s, which was realised in the everyday life of the citizens, e.g. swimming in the river was not recommended. The degradation of the water quality was mostly caused by industrial wastewaters and agricultural nutrient loads (Pyhäjärvi Institute, n.d.a). Pyhäjärvi Institute (PJI) recalls that the degraded water quality of the river was reflected in citizens' attitudes still in early 2000s:

Riverside citizens, or citizens living close by the river, shunned and underestimated the river for long. In the early 2000s we started to implement programmes to spark interest and appreciation of the river, and around that time the local citizens' comments were like 'what does it matter, it's a sewer, we planted a fence on the riverbank, so we don't have to watch that stinking river.' (PJI)

Issues with water quality of the river accumulated in the early 2010s, when a chain of industrial and untreated wastewater discharges degraded the river water quality so that the use of the water was repeatedly banned due to health hazards (Laakso, 2013; Saavalainen, 2014b; Aalto, 2016). A bisphenol A (BPA) leak from the upstream paper mill caused first a shorter use ban on the river in May 2011 (Laakso, 2013). The factory leak was reported in the media only a few days after its occurrence. This caused damages to the local livelihoods, as the BPA polluted water was used as irrigation water, ruining e.g. horticultural plantations (Termonen, 2014). In 2012, it was revealed that one of the upstream WWTPs, JVP-Eura Oy, had discharged untreated wastewaters into river Eurajoki during years 2006–2012 due to insufficient capacity (Aalto, 2016). All use of the river water was banned for almost a year in 2012–2013 and use bans have occurred regularly since then, mainly due to temporary faults in the wastewater treatment systems (Saavalainen, 2014b; Laakso, 2017). The use bans have concerned especially riverside citizens and farmers, whose everyday lives and livelihoods have been compromised. The events in the early 2010s, however, provoked a shift in citizens' attitudes towards river Eurajoki:

After the wastewater catastrophes were revealed, that JVP had discharged raw wastewater [to the river], and swimming and usage of the water was banned continuously during the summers, people became aware of the situation. After individuals started addressing the issue, more and more people became aware. Nowadays people defend river Eurajoki very boldly, which is certainly a good thing. (PJI)

The accumulation of problems and their realisation and effects on citizens' everyday life stirred emotions and provoked the willingness to take action. The events in early 2010s embarked the formation of an active, local social movement to protect the river. Concerned citizens gathered together, created forums for discussion and organised public events to raise awareness about the issues. What started as an informal activist group turned into organised action five years later, when the official water protection association (WPA) of river Eurajoki was formed in 2017, local newspaper reporting "people crowding to the board" (Saarinen, 2017). As the WPA tells:

People were really angry, and the willingness to start acting for change started to increase. (WPA)

Since the official formation of the WPA, organised citizens started to demand change in the wastewater system, and to this date, this has become one of the most debated issues in the area, involving stakeholders from local, as well as regional and national levels into the debate. In summary, the WPA demands redirection of the three WWTPs' discharge pipes to a larger water body to avoid further damage to the small river and its citizens (Eurajoen vesiensuojeluyhdistys, 2019a; Eurajoen vesiensuojeluyhdistys, 2019b; Eurajoen vesiensuojeluyhdistys, 2019c). Initiated by the regional state administrative agency, the WWTPs were demanded to conduct an investigation of alternative discharge avenues. In 2017–2018, cost-benefit analyses (CBAs) were conducted to assess the feasibility of alternative discharge avenues for all WWTPs. The CBAs concluded, that the redirection of the WWTP pipes can cost up to 40 million euros, and is thus not feasible "due to technological-economic reasons" (Sweco Ympäristö Oy, 2017a; Sweco Ympäristö Oy 2017b; Sweco Ympäristö Oy 2018). The wastewater debate is now profiled as one of the most contested socio-political conflict between different stakeholders in the area regarding the use and management of river Eurajoki.

2.4 Restoration efforts

Organised cooperation to enhance the water quality of river Eurajoki has characterised the restoration efforts in the area after the industrial discharges. Many of the efforts have been organised and/or coordinated by Pyhäjärvi Institute, incorporating the citizens, farmers, and industries in the restoration processes. Projects have focused e.g. on reducing the inflow of nutrients and on the development of fisheries (Pyhäjärvi Institute, n.d.b). Innovative projects have utilised news ways of bringing together multiple stakeholders (e.g. Jolma, Ventelä, Tarvainen & Kirkkala, 2015). The most recent multi-

stakeholder restoration project *JOKIprogramme*⁶, coordinated by Pyhäjärvi Institute, brings together research, municipalities, industries and citizens. JOKIprogramme runs its first term in 2017–2021 and aims e.g. to protect and improve the water quality of river Eurajoki by focusing on the non-point sources of nutrient load and develop the recreational and fishing opportunities in the area (Pyhäjärvi Institute, n.d.b). In this thesis, discussion will focus on the three restoration efforts mentioned by the stakeholders throughout the interviews as the most important and/or debated ones. These include 1) the fishery restoration projects, some of which are implemented as JOKIprogramme cooperation; 2) the agricultural measures to restore the river, some of which are driven by JOKIprogramme; and 3) the upstream dredging plan.



Figure 5 (left). Kauttuankoski rapids in the upstream of river Eurajoki in the historical ironworks and paper industry area of Kauttua. The rapid area is home for an endangered trout species and has undergone multiple restoration efforts for maintaining the trout population. **Figure 6** (right). Kauttuankoski dam regulates the water flow from lake Pyhäjärvi. Picture credits: Pertti Susi on April 22, 2019.

⁶ JOKIprogramme is financed by the municipalities of Eura, Eurajoki, Säskylä and Rauma, paper company Jujo Thermal Kauttua Oy, paper company UPM Rauma, WWTP JVP-Eura Oy and gardening-specialised company Biolan Oy. <https://www.jokiohjelma.fi/en>

3 Theoretical Approach

3.1 Ontological and epistemological standpoint

The theoretical approach of this thesis is grounded in the ontological and epistemological standpoint of social constructivism, commonly adopted in contemporary PE studies (Robbins, 2012). As opposed to the ontological-epistemological positions of objectivism and positivism, which usually characterise natural sciences research in the pursuit of creating “objective” knowledge about the world through quantitative methods (Bryman, 2012), this thesis argues that social-environmental realities cannot be studied objectively, because the empirical world is filtered through subjective conceptual systems and incomplete or biased understandings of empirical reality (Robbins, 2012). Furthermore, social realities and social phenomena are not occurring independently; but are constructed and re-constructed constantly by actors within them (Bryman, 2012). The interconnectedness of social and natural worlds calls for social research on the relations between them.

Past hydrological research has embraced the ontological position of objectivism to argue that variables such as water quality and quantity can be measured and presented as scientific, undebatable knowledge (Linton & Budds, 2014). However, this study argues that perceptions over water quality and quantity are subjective and the positivist “objective” inquiries are insufficient in investigating those perceptions. Furthermore, the “objective” knowledge produced about the empirical world may be coloured by researchers’ subjectivities and positions. As Robbins (2012) argues, the drivers behind quantitative research are politically and socially biased depending on the knowledge seekers and knowledge producers. Considerations over good water quality and sufficient water quantity diverge depending on specific contexts, needs and perceptions that are internalised in subjective realities of social actors (Fox et al., 2017).

Apart from adopting this epistemological standpoint in the process of doing this research, it should be clarified that epistemological considerations do not only concern the way this research is conducted; but are also an essential component in analysing the results. To understand the origins of the occurring controversies and cooperation in the case study site, this thesis examines the epistemological standpoints of different stakeholders, i.e. how knowledge is produced and what different kinds of knowledges occur and how they are delineated in relation to each other.

3.1.1 *Situated knowledge*

Feminist researchers have for long questioned the objectivity and universality of science (Hesse-Biber, 2012). The concept of *situated knowledge* (Haraway, 1988), a legacy of feminist research, describes

knowledge and truth as “partial, situated, subjective, power imbued, and relational” (Hesse-Biber, 2012, p. 9). Haraway (1988) argues that the common default that science needs to be based on objectivity is problematic, because Western scientific circles have consisted of privileged people throughout time. Thus, objectivity is only an illusion because it still encompasses the presumptions of the privileged in e.g. choosing the research focus, questions and inclusion of people and issues in the research (Hesse-Biber, 2012). Haraway (1988) criticises the whole idea of objectivity as it is practiced, and suggests that situated knowledge, i.e. knowledge based within a certain context, can provide a more coherent understanding of the world. Abandoning the traditional “scientific objectivity” and encouraging people from different cultural and socioeconomic contexts to participate in research with their own experiences and presumptions can promote more veracious scientific outcomes (Haraway, 1988). Situated knowledge is used as an underlying concept in this thesis, feeding into the methodological choices as well as the analysis and discussion of the hydrosocial relations in chapter 5.

3.2 Political ecology

PE is a field of research that seeks to “unravel the political forces at work in environmental access, management, and transformation” (Robbins, 2012, p. 3). PE research seeks to question the apolitical narratives of the environment, which traditionally follow linear thinking and seek simple causal relations in complex sustainability issues (Robbins, 2012). To abolish those simplified and misleading apolitical analyses of the world, PE considers systematic social, economic and political circumstances and changes in societies that lead to environmental issues and vice versa (Robbins, 2012). This specific interest in causes, rather than symptoms of sustainability questions, is what further distinguishes PE research from what is considered traditional environmental research (Robbins, 2012). The body of research in PE can be divided into two general, main approaches: 1) inquiries on how different social actors at different scales have access and control over environmental resources in a specific ecological context, and 2) inquiries on the different interpretations of the state of the environment (Rodríguez-Labajos & Martínez-Alier, 2015). This thesis deploys both of these approaches in the context of water in answering the RQs.

PE research covers a multitude of topics within the social-environmental systems, yet a unitive factor across PE studies is the core question about distribution of power (Robbins, 2012). Political ecologists have explored how political and economic systems are intertwined with the non-human systems, arguing that this makes the material non-human world within human societies also essentially political (Robbins, 2012). PE research addresses the *diversity of environmental perceptions*. Closely linked to the inquiry of divergent perceptions, a PE argument addressing the relationship between *knowledge*

and power highlights the division of power between hegemonic institutions and local communities, as well as the division of power across spatial scales (Robbins, 2012; Ramasar, 2014). PE takes a critical stance on the traditional, “objective” environmental research by acknowledging the inherently political nature of ecology (Robbins, 2012). As Robbins explains, PE research is “addressing not only the practical problems of equity and sustainability, but also basic questions in environmental science” (Robbins, 2012, p. 3), such as who can be a knower, and whose knowledge are taken into account in science and politics of the environment.

These PE topics overlap with each other in PE research. They enable researchers to make connections between the arguments and concepts, bringing coherence to PE research. This thesis bridges the investigation between the abovementioned PE foci on divergent environmental perceptions and knowledge and power, in order to lead the way to a more coherent understanding of complex social-environmental issues in the case study site of river Eurajoki.

3.3 Hydrosocial cycle

Political ecologies of water consider water and human societies as intertwined and not to be regarded as separate from each other (Swyngedouw, 2009). In the past decade, political ecologists have begun to embrace the concept *hydrosocial cycle* as a means to describe this hybrid relationship between water and society (e.g. Swyngedouw, 2009; Budds, Linton & McDonnell, 2014). Hydrosocial cycle opposes the concept of hydrological cycle, which has been widely used in water research to describe the physical aspects and flows of water (Budds et al., 2014). This apolitical and asocial approach to water does not provide tools or concepts for analysing socio-political relations, which is essential when examining water management, conflicts or collaboration (Rodríguez-Labajos & Martínez-Alier, 2015). Recent studies on political ecologies of water indicate high potential for hydrosocial cycle to constitute a theoretical framework for investigating water-society relations (Budds et al., 2014; Linton & Budds, 2014). Contrasting hydrological cycle that focuses on water per se, hydrosocial cycle focuses on hydrosocial relations that constitute both water itself and water management (Budds et al., 2014).

There is a *hydrological cycle*, which would also exist if there were no humans. Driven by sun energy, this cycle has a fundamental importance in the regulation of climate and on life in the planet. Yet human agency has come to shape the circulation of water, through canals and dams, with abstractions for irrigation and drinking water, and modifying the chemical, biological, and morphological properties of the watercourses for the benefit of some sectors of the population, and to the detriment of others. This is the *hydrosocial cycle*. (Rodríguez-Labajos & Martínez-Alier, 2015, p. 537, emphasis added)

Hydrosocial cycle describes the relationship of social power and societal structures, built infrastructure and technologies, and the material water, H₂O, itself. As the water moves and changes its physical form across spatial and temporal scales, it is not merely an object of human use and alteration in society, but it is also an agent of change, as human societies are dependent on it and face challenges during hydrological events, e.g. floods (Linton & Budds, 2014). These entities together form the process in which water and society intertwine – the hydrosocial cycle, illustrated in Figure 3. In the centre of the hydrosocial cycle are the different meanings and interpretations of water, shaped by different knowledges, that reflect the perceptions of both societal order and hydrological facts (Linton & Budds, 2014). This framework assists in investigating 1) how water is “produced” through social and political processes and 2) how, and with what effects, water in turn shapes social structures and relations (Budds et al., 2014).

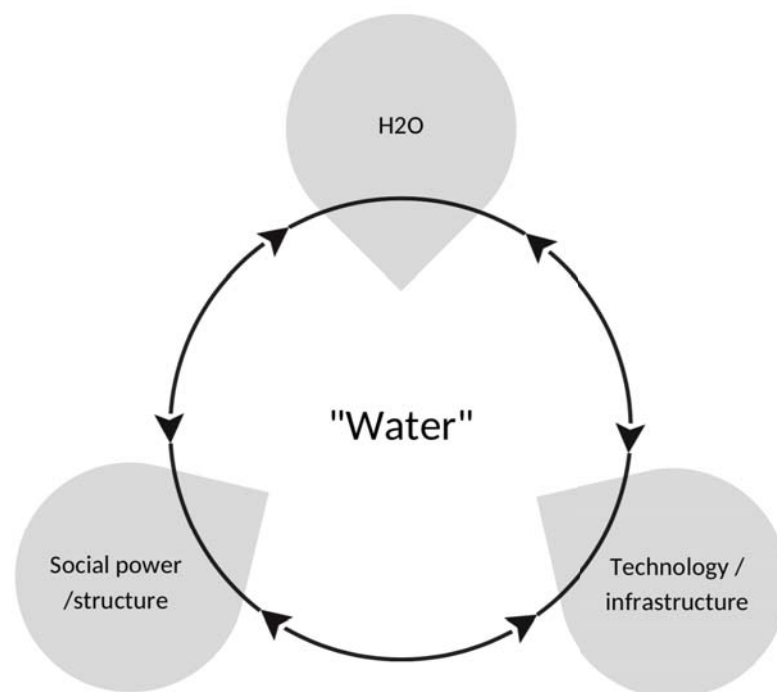


Figure 7. The hydrosocial cycle. Adapted by the author from the original by Linton & Budds (2014).

Hydrosocial cycle has been used in different contexts and from various perspectives to study the water-society relations and to shed light on the inherently political nature of water management (Budds et al., 2014). Previous research on hydrosocial cycle has analysed e.g. conflicts over dam-building (Palomino-Schalscha et al., 2016), water scarcity and conflicts over access to groundwater (Usón, Henríquez & Dame, 2017) and the limitations of using hydrological assessment as the basis of water management policies (Budds, 2009). In this thesis, the concept is deployed for the purpose of investigating water management from the perspective of multiple stakeholders. By analysing

stakeholders' shared and divergent perceptions of the water itself, as well as the interests, concerns and struggles concerning water management and restoration efforts of river Eurajoki, the study aims to reveal how the interplay of hydrosocial relations accumulates into conflicts and collaboration across spatial scales. Focusing on the underlying interests of hydrosocial cycle, the thesis further discusses the inter-stakeholder relations through which the water management occurs, and the barriers and opportunities of which they pose for sustainable river management. As Budds et al. (2014, p. 168) argue, "by making manifest the politicised nature of water and its circulation, the hydrosocial cycle has the potential to engage wider audiences to open up possibilities for democratic and/or emancipatory *change*" (emphasis in original).

4 Methodology

4.1 Research strategy, design and methods

Qualitative, inductive research strategy is employed in this thesis. As Bryman (2012) explains, the aim of inductive research is, rather than testing an existing theory, to generate a new theory from the data that originates in the research process. This usually characterises qualitative research (Bryman, 2012) and is particularly valuable in studying people's perceptions that are context-specific. Inductive approach also allows the researcher to explore unanticipated phenomena emerging from the data. Moreover, the researcher can be inspired by; but not limited to pre-existing concepts, frameworks or theories (Bryman, 2012). Qualitative research strategy fits the aim of this research (chapter 1.1), as it allows the examination of subjective realities and places emphasis on the ways the world is *viewed*, *valued* and *constructed* by individuals (Bryman, 2012). The analysis of these views, values and social constructions is the essential component in answering the RQs.

The research design is a descriptive single case study in the river Eurajoki area in southwestern Finland. Case studies contribute to knowledge on complex social and political phenomena and are specifically applicable when the inquired phenomenon requires holistic, in-depth real-world perspective (Yin, 2014). When RQs focus on contemporary events, case study method is often preferred over other forms of inquiries (Yin, 2014). Descriptive nature of this qualitative case study is manifested in the detailed description of the findings' context-specificity (chapter 5), in which emphasis lays on the relationship of the context and the social and political structures that are investigated. Without contextual understanding, the social phenomena of the case study cannot be understood or interpreted, thus, detailed description is required (Bryman, 2012). The choice of descriptive case study as the overarching method further impacted the choice of the more specific methods of acquiring data.

The research methods to gather the previous research on this topic, and to understand the contextual setting of the case study include literature review and review of online public debate regarding river Eurajoki in Finnish online public media and social media. The purpose of the literature review was not merely to gain an understanding of the knowledge that already exists regarding the research topic; but to develop a deeper insight into how this knowledge can be built up on, and challenged, with this case study (Yin, 2014). The methods to gather primary data from the local stakeholders in the case study site include an informal key informant interview, followed by semi-structured interviews with different stakeholders. The choice of interviewing as a method to gather the primary data was based on the pursuit to get close to the knowledge sourcing from the local people in the case study site.

4.2 Data collection and analysis

The data collection process began with an informal meeting with Pyhäjärvi Institute, which conducts research in the river Eurajoki area. The institute was contacted early in the research planning process to consult its staff as key informants on the research topic and brainstorm on the possible research focuses, methods and stakeholders to be included. Together with representatives of Pyhäjärvi Institute, the key stakeholder groups impacting and/or being impacted by the river were identified (Figure 2, p. 5). After the meeting, the research focus and questions were narrowed down, and methods and the specific stakeholders to include in the interviews were decided upon.

4.2.1 Literature review

A literature review was conducted through the databases Scopus and Google Scholar by using the key words “hydrosocial cycle”⁷, “political ecology”, “water”, “wastewater”, “conflict”, “multi-stakeholder”, and/or “water management”. The key words were alternated in order to find the most relevant literature for this thesis. Snowballing technique was applied in finding the most applicable studies and conceptual discussions on the emergence of hydrosocial cycle. Furthermore, the literature of the LUMES course “Water and Sustainability” was reviewed and utilised as a foundation for understanding the current debates on water and sustainability. The literature review assisted in gaining an understanding of the emergence of hydrosocial cycle and its applicability as an analytical tool through other case studies. The studies found through the literature review assisted in structuring the interviews, analysing the primary data and supporting the findings and discussion on the topic.

4.2.2 Online public debate review

Issues regarding the management of river Eurajoki, as well as its implications for different stakeholders have been widely discussed in the public and social media. For the purpose of understanding the context of the occurring issues and experienced struggles, a review of national and regional newspapers’ articles, columns and opinion writings from the time period 2012–2019 was conducted⁸. Furthermore, two online discussion forums in social media (*Eurajoki-foorumi* and *Elävä Eurajoki*⁹) were reviewed. Due to limited access to newspapers’ content, a choice was made to review articles, columns

⁷ This keyword appears in two forms: “hydrosocial cycle” and “hydro-social cycle”. Both were taken into consideration in the literature review.

⁸ Content reviewed was gathered primarily from the following newspapers and news medias: *Alasatakunta*, *Satakunnan Kansa*, *Länsi-Suomi*, *Yle Uutiset* and *Helsingin Sanomat*.

⁹ *Eurajoki-foorumi* (“River Eurajoki forum”, approx. 800 members as of April 2019) and *Elävä Eurajoki* (“Living river Eurajoki”, approx. 300 members as of April 2019) are founded by the water protection association of river Eurajoki for the purpose of discussing river-related issues.

and opinion writings that 1) were free to access online or 2) were available as a content in the social media forums. The limited access to articles might be a constraining factor in terms of gaining a full, comprehensive picture of the issues. Also, it was evident that not all stakeholders' views were represented in the public debate. The least vocal stakeholder group was the industry, while the most vocal stakeholder represented in the reviewed pieces was citizens. The findings from the review of the online public debate were utilised in the design of the interview questions for the stakeholders. The public debate and its themes were used as a baseline for encouraging all interviewed stakeholders to present their position in the discussions and to unravel their experiences of the pressing issues. The discovered emphasis points in the public debate are also utilised as an underlining factor when analysing the primary data. Issues that were visible in the public debate are emphasised when they occur in the interviews.

4.2.3 Stakeholder interviews

In total 10 interviews with different stakeholders were conducted. The choice of the interviewees was a result from purposive sampling, which was based on the research aim and RQs (chapter 1.1). The aim of purposive sampling was to ensure an adequate variety in samples, i.e. that there was sufficient variation between chosen participants in terms of characteristics that are relevant to the RQs (Bryman, 2012). The sampling approach was maximum variation sampling, i.e. the samples were chosen because they represent a wide variation of interests sought by the RQs (Bryman, 2012). Accordingly, the criteria for purposive sampling was to 1) include stakeholders from as many stakeholder groups (Figure 2, p. 5) as possible, and to 2) include stakeholders from both upstream and downstream of river Eurajoki in order to get the most representative picture possible. Citizen representatives were sampled twice from two different citizen associations to gain a more coherent picture of the most populous stakeholder group. Due to my temporal restraints in the field, an interview with a stakeholder representing the hydropower sector could not be conducted. Table 1 presents the interviewed stakeholders along with a more detailed description of stakeholder position and interests as a justification, and ID-codes, which are used to refer to interviewees in chapter 5.

Table 1. Selected representatives from the interviewed stakeholder groups, their identification code in the study and justification for inclusion.

| Stakeholder group | Representative | ID | Justification |
|-----------------------------|------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Government officials | ELY centre ¹⁰ for Southwest Finland | ELY | Regional implementation of the tasks of the central government. Key responsibility in environment and natural resources; providing expertise in water management. |
| Local governments | Municipality of Eura (upstream) | - | Responsibility in organisation, development and monitoring of water supply and management. |
| | Municipality of Eurajoki (downstream) | DM | |
| Regional research institute | Pyhäjärvi Institute | PJI | Role in providing expertise in regional development projects, carrying out research and implementing water conservation projects in the river Eurajoki area. |
| Agriculture | Riverside farmer | AG | Populous stakeholder group with both demands in water intake and impacts on the river from fields' nutrient load. Role as a farmer and a citizen. |
| Paper industry | Upstream paper company Jujo Thermal Kauttua Oy | - | Raw water demand from the river; long history in operating in the area. |
| Wastewater treatment plants | JVP-Eura Oy ¹¹ | JVP | Treating and discharging settlement and industry wastewaters to the river in the upstream. |
| Public water companies | Downstream water company Rauma Water | RW | Produces drinking water from the downstream of river Eurajoki. |
| Citizen associations | Water protection association of river Eurajoki ¹² | WPA | Citizen association formed to protect river Eurajoki. |
| | Fly fishing association of the lake Pyhäjärvi area ¹³ | FFA | Volunteer-based citizen action in the restoration efforts of river Eurajoki. |

¹⁰ Centre for Economic Development, Transport and the Environment

¹¹ The ownership of JVP-Eura Oy is shared between the municipality of Eura (70 %) and the paper company Jujo Thermal Kauttua Oy (30 %).

¹² *Eurajoen vesiensuojeluyhdistys ry*

¹³ *Pyhäjärvisseudun Perhokalastajat ry*

Given the sensitivity of some aspects of the study, in-depth, semi-structured interviews were considered the most applicable method to gather the primary data. Semi-structured interview setting allowed a flexible interview process. It was possible to provide a frame for the interview situation guided by the research aim and RQs; yet simultaneously allow the interviewee the space to communicate their view on the topics in question as detailedly or narrowly as they wanted, and bring in new perspectives or topics they considered important (Bryman, 2012). For this purpose, an interview guide for each stakeholder (see appendix A) was prepared with guiding, open-ended questions under themes to be covered. The themes were 1) stakeholders' connection (entailing use, interests, demands and experienced challenges) to the river, 2) public debate and perceived challenges and 3) cooperation and decision-making processes. Interviews lasted approximately 40–80 minutes each and were all recorded and transcribed for later analysis.

4.2.4 Interview analysis

The interview data was processed through a thematic analysis by examining the data to identify the core themes apparent both within and between the interviews through looking at e.g. repetitions, similarities and differences in the data (Ryan & Bernard, 2003). The themes and subthemes were produced by thematic coding process in the thorough reading and re-reading of both the interview transcripts and the field notes (Bryman, 2012) that were taken throughout the primary data collection. Furthermore, the review of the online public debate was used in bringing further depth into the interview data, e.g. the repetition of themes across interviews and the reviewed public debate assisted in establishing patterns in the data. Thematic coding entailed an analysis starting from the data; including no pre-decided codes or themes. Rather, open-coding was applied to the segments of data according to what was relevant to the RQs (Maguire & Delahunt, 2017). Drawing purpose from the RQs, the interviews were coded, and the arising themes were further reviewed, organised and defined (Maguire & Delahunt, 2017) into results that are analysed and discussed (chapter 5) through the lens of PE and hydrosocial cycle.

4.3 Ethical considerations and reflexivity

The critical nature of PE research requires thorough consideration of protecting participants from any harmful consequences potentially caused by the outcomes of the study. All interviewees were therefore guaranteed personal anonymity in the research process. Only the participants who so wished, were credited for their direct quotes with their full names in appendix B. However, as the nature of the RQs requires a detailed description of the stakeholders included in this study, and as the case study site comprises of a specific, small area, the anonymity could not be given to institutions,

organisations or industries. The industrial stakeholders, who so requested, were provided with their interview transcripts for a review in case of potential errors. All stakeholders were informed about the purpose of this study, and all stakeholders gave consent to participate in this study. The interview data was analysed and stored confidentially. Translations of the direct quotes were sent to stakeholders for acceptance. This was a way of ensuring that nothing got “lost in translation”, or nothing was re-interpreted by the author.

I entered the field with pre-knowledge and pre-assumptions, being a former resident of the area. I consider this as an advantage, because I had an initial understanding of the case study context and the stakeholders involved in the water management. I also consider that it was easier to access the information, and gain trust of the interviewees due to the fact that I was considered a “local”. To avoid leaning on the pre-knowledge and let the pre-assumptions affect my data collection, I reflected on my work and position as a researcher throughout the process. Reflexivity is a key factor in qualitative studies for ensuring research quality: being reflexive in the process of research means acknowledging the implications of the chosen methods, values and biases of the researcher for the knowledge that is generated (Bryman, 2012). Furthermore, being reflexive entails acknowledging the different kinds of knowledges and their validity, and not valuating scientific knowledge above other knowledges (Spangenberg, 2011).

4.4 Research scope and limitations

The scope of this study is limited to a multi-stakeholder approach on the water *management* of river Eurajoki in southwestern Finland. The decision was based on the research aim and RQs, along with the ontological-epistemological standpoint, which together guided all the methodological decisions. Broader water *governance* components such as laws and policies were omitted due to the study’s main interest in the subjective perceptions of stakeholders on the specific water management practices.

Due to the limited time allocated for the fieldwork, and the limited capacity of this thesis, the general view of the stakeholders in river Eurajoki area is limited. To gain a more thorough understanding of the stakeholder positions, more samples could have been made regarding industries, farmers and citizens especially in the downstream of the river. The stakeholder groups were identified together with the local research institute, which had an impact on the final choice of the interviewees. I consider it to be an advantage rather than a limitation, since I gained access to key insights regarding the stakeholders. However, this may have created a bias in prioritising the inclusion of certain stakeholders beyond others.

5 Findings & Discussion

Water management in the case study site of river Eurajoki is currently characterised by multi-stakeholder collaboration for river restoration; and controversies occurring particularly around the wastewater management. The controversies around wastewater management (described in chapter 2.3) have become prominent in the public debate and were also given significant emphasis in the interviews by the majority of stakeholders. Issues with unprocessed wastewater discharges in the late 2000s and early 2010s are widely recognised, but opinions on the current wastewater management and the perceptions on impacts of wastewater discharges in the river vary significantly. The online public debate review, as well as the interviews, indicated clearly that the citizen associations, agricultural stakeholders and the downstream municipality have for long pursued the redirection of the wastewater pipes from river Eurajoki to a larger water body to avoid the socio-ecological impacts and economic drawbacks that the current situation is considered to cause. The public debate review and the interviews also indicated that the upstream municipality, along with the three WWTPs and ELY centre disagree with this pursuit by arguing mainly for the conducted CBAs' conclusion of technological-economic barriers, and the hydrological information of the improved ecological state of the river.

This chapter examines these divergent perceptions and different orientations in formulating problems and solutions. The first part of the analysis draws from PE and hydrosocial cycle to adopt the lens of knowledge, to discuss how different knowledges are positioned in the wastewater management. Furthermore, discussion concerns politics of scale in the water management by looking at the spatial division of stakeholder positions in the wastewater debate. The second part of the analysis focuses more closely on the socio-political components that impact the hydrosocial relations in the case study site, such as trust, participation and public debate. Lastly, the hydrosocial components of river Eurajoki are illustrated and the pursuit of finding common ground towards consensus decision-making for sustainable and equitable water management practices is discussed.

5.1 Contesting knowledges and scale in the wastewater dilemma

In the process of analysing the data, it was discovered that there is a significant divergency between the descriptions of the state of river Eurajoki. These varying perceptions are exemplified in the interpretations of the ecological state of river Eurajoki. Officially the classification of the ecological state is assessed by the government body ELY centre, yet apart from the official classification, there is a wide spectrum of differing perceptions over the state of the river. Varying from “exceptionally good” to “a vulnerable river in need of urgent protection measures”, river Eurajoki is perceived very

differently by the stakeholders. The main issue regarding the state of the river, communicated by stakeholders who demand the wastewater redirection, i.e. citizen associations, the agricultural stakeholder and the downstream municipality, is the insecurity over water quality. Past use bans on the water are fresh in mind, and any issues discovered through the monitoring of the water cause worry. The downstream municipality indicates that the periodical changes in the aesthetics of the river cause drawbacks for both the municipality and its citizens and industries:

It is important for the municipality, that the river which runs through it is clean. If the colour of the water is sometimes green and sometimes purple, it is not only harmful for the [municipality's] image, but it is also a practical hindrance, for what drawbacks it causes flowing further. (DM)

On the contrary, ELY centre highlights that even though the ecological state of river Eurajoki has been classified as moderate in the last assessment (Elinkeino-, liikenne- ja ympäristökeskus, 2019), during which the industrial spills impacted the water quality, the state of the river has significantly improved, and can now be classified as good (Elinkeino-, liikenne- ja ympäristökeskus, 2019). Due to this, ELY centre's official statement on the wastewater debate opposes the redirection of wastewater pipes to an alternative water body (Elinkeino-, liikenne- ja ympäristökeskus, 2019). This divergency in perceptions over what is considered to be good enough water quality is a common phenomenon in cases of shared water bodies (Boyer, Comby, Flaminio, Le Lay & Cottet, 2019). Different stakeholders attribute different meanings to water, and different criteria for water quality, depending on their interests, demands and positions in the share of power (Boyer et al., 2019; Palomino-Schalscha et al., 2016). Especially in conflict situations, when the water management is contested, the different ways in which water is perceived become evident (Palomino-Schalscha et al., 2016; Budds, 2008).

Political ecologists have pursued the understanding of complex relations between nature and society, and the social-environmental conflicts through analyses of knowledge and power (Robbins, 2012). The first step to acquire these analyses it to acknowledge that there are different kinds of knowledges about the nature, of which relevancy, compared to one another, cannot be hierarchised (Robbins, 2012). They can be compared, and investigated, but there is no knowledge that could be set apart as truer than another, because all knowledges are positioned and thus, subjective (Robbins, 2012; Haraway, 1988). However, the recognition of this diversity of knowledges may get lost in the practices of power. In search for the most accurate and acceptable knowledge, practitioners of power may label some knowledges as more "truthful" as some (Karpouzoglou & Zimmer, 2016). This relationship between knowledge and power is manifested in the practices of modern environmental management. As Robbins (2012) explains, hegemonic institutions such as national ministries of environment have in

recent history gained disproportionate influence in defining and controlling the environment. Relying on institutions to define the state of the environment and the measures taken to improve it, ignores the divergency of individual perceptions and might lead to marginalisation of certain groups of people (Robbins, 2012).

In the case of river Eurajoki, two distinct kinds of knowledges can be distinguished through the debates on wastewater management and restoration efforts. They are referred to as *expert knowledge* and *situated knowledge*, drawing from previous research on different ways of knowing (e.g. Haraway, 1988; Karpouzoglou & Zimmer, 2016; Usón et al., 2017). Expert knowledge refers to the hydrological research and bio-physical assessments of the river, retrieved by the scientific experts of the field, as well as the technological-economic arguments of the CBAs conducted to assess alternative wastewater avenues by a consultancy firm¹⁴. Situated knowledge refers to the localised, subjective knowledges about the water, which reflect the contextual experiences of those who obtain it. The lens of knowledge is adopted to showcase how knowledge produced by scientific expertise is mobilised by those who oppose the wastewater redirection, and how situated knowledge is mobilised by those who support the wastewater redirection. It is acknowledged in this thesis, that these preconceived categories of knowledge can risk the understanding of multiplicity and complexity of different knowledges and their origins (Usón et al., 2017), however, the categories are only mobilised as one piece of a complex toolkit in analysing the tensions within the wastewater debate of river Eurajoki, and the analysis is not merely based on these knowledge categories. This reduces the risk of oversimplifying the examination of emerging controversies in the case study site.

5.1.1 Expert knowledge: focus on materiality?

Throughout the public debate, as well as the interviews, there are two main themes recognised in mobilising the expert knowledge to argue against the redirection of the wastewater pipes: economic arguments and technocratic arguments, originating from the CBAs. The upstream municipality, a part owner of the WWTP responsible for the untreated wastewater discharges in the turn of 2010s, argues for the relatively high costs of building the new discharge pipes compared to the achieved benefits of the procedure. Apart from the high building costs, the redirection model would also increase the use and maintenance costs significantly (Sweco Ympäristö Oy, 2017a; Sweco Ympäristö Oy, 2017b; Sweco Ympäristö Oy, 2018). As was clear in the interviews, stakeholders opposing the redirection of the wastewater pipes consider source control as the most effective measure that should be focused on

¹⁴ Sweco Ympäristö Oy [Sweco Finland]: <https://www.sweco.fi/en/>

rather than the expensive redirection: further technological improvements are suggested as a solution within wastewater facilities. However, as ELY centre states in the interview, technological fix for issues related to improving water quality in WWTPs, such as nitrogen reduction, also require significant investments.

The WWTP JVP-Eura Oy also emphasises wastewater producing industries' responsibility of their own source control and the importance of monitoring the amount and quality of industries' wastewaters that are directed into their plant. Unpredicted chemical emissions from industries can cause issues in the WWTPs and thus further in the river, as was proved in 2011 with the BPA emission (Laakso, 2013). Moreover, the WWTP argues that new pipes would require more maintenance, and yet building new pipes would entail a risk of ecological damage, thus the redirection would in fact be more harmful for the environment than what is generally perceived:

It's not risk-free. [...] It's not environmentally friendly to build a long pipe with multiple pump stations. They can start leaking or break down. It can cause damages. It is always a risk to build something like that. (JVP)

The impact of the redirection of the wastewater pipes is also questioned by the WWTP in relation to the other water bodies that are planned as alternative discharge avenues. The redirection would remove the pressure of wastewater discharge in river Eurajoki, but would it relocate the experienced issues to another discharge avenue? In the interview with the downstream public water company, it was evident that the company criticises industry spills in the past, but does not perceive WWTPs as a threat to the water ecology. Instead, the company argues for shifting the focus from wastewaters on more significant nutrient load sources such as agriculture. The debated wastewater discharges in the 2000s-2010s were not perceived as a significant issue for the company, as it has the capacity and modern-day technologies to produce drinking water from lower-quality resources as well. Moreover, as ELY centre describes in the interview, the issues in the river water quality have been temporary, and the overall ecological state of river Eurajoki can be classified as good, based on the latest hydrological assessments (Elinkeino-, liikenne- ja ympäristökeskus, 2019).

Financial restrictions and reliance on technological solutions in improving the wastewater management are prevalent in the discourses opposing the wastewater redirection. The statements against the redirection reveal trust in expert assessments and a technocratic problem-solution orientation. However, this orientation focuses on 1) the material side of the wastewater management: the H₂O itself and 2) the technological-economic feasibility, thus partially disregarding the socio-political dimensions of the wastewater management. As the potential of hydrological data is limited to

the physical features of water bodies, it has limited applicability to solve conflicts between stakeholders over the water management (Rodríguez-Labajos & Martínez-Alier, 2015). Consequently, a common failure in water management guided by merely hydrological data, is that it inadequately addresses issues of equity amongst stakeholders, i.e. the fair distributions of positive and negative outcomes of water management (Gleick, 1998). Sustainable use of water resources cannot be measured only through biological or physical indicators of water quantity and quality, but the criteria for sustainability of water resources should encompass the socio-political dimensions of water management, including considerations of what guides the water management measures (Gleick, 1998). It is not to say that expert knowledge is inadequate itself, quite the opposite: expert knowledge has an essential role in solving societal and environmental issues (Evans, 2012). However, expert knowledge should not be prioritised over other forms of knowledges, and it should not be considered as the universal truth (Haraway, 1988).

Critique of the CBAs

CBAs have been deployed widely in assessing river management development for decades (Rodríguez-Labajos & Martínez-Alier, 2015). However, CBA assessments of water management tend to ignore the social implications of water management (Rodríguez-Labajos & Martínez-Alier, 2015), and thus their equitability can be questioned. In the case study site of river Eurajoki, the CBAs' technological-economic arguments supporting the status quo wastewater management are widely questioned by citizen associations and the downstream municipality. It was clear in the interview that the downstream municipality does not consider financial arguments relevant in the wastewater debate, stating that the issue is so large and affects so many stakeholders that state funding should be sought for financing the redirection. The Finnish Association for Nature Conservation (FANC) has also made a statement questioning the conducted CBAs for considering only the average values of water quality, and appealing to the unreasonable costs of investments and use. FANC also argues that state financing should be applied to partly cover the investment costs (Suomen luonnonsuojeluliitto, 2019). The WPA of river Eurajoki further questions the short-term thinking behind the economic arguments, arguing that if the redirection would occur, the project would last for years and the current state of municipal economy should not be considered as a factor restricting the project (Eurajoen vesiensuojeluyhdistys 2019a; Eurajoen vesiensuojeluyhdistys 2019b; Eurajoen vesiensuojeluyhdistys 2019c). These concerns reveal the limitations of the CBAs and how they have inadequately addressed the factors outside of the technological-economic discourse of the wastewater management, emphasised by citizen groups. A more comprehensive assessment of the wastewater management would incorporate the social

aspects of wastewater management to the existing material assessments (Rodríguez-Labajos & Martínez-Alier, 2015).

5.1.2 Situated knowledge: overlooked realities?

Interviews with representatives of citizen associations and agricultural sector, as well as the review of the public debate, indicate concerns over wastewater discharges' impacts on citizens' everyday life, farmers' economic drawbacks, and on the sustainability of the river ecosystem. The health and practical concerns of perceived degradation of water quality due to temporal faults in wastewater treatment embody in the hindrances of "normal" use of the water. Recreational activities such as swimming, paddling and fishing have been compromised due to degraded water quality (Saavalainen, 2014a). Citizens are concerned for instance whether the fish and crabs in the river are safe for human consumption, or whether they have been contaminated by the wastewaters discharges. The main argument for the redirection of wastewater discharge pipes, also widely acknowledged by other stakeholders within the wastewater debate, is that river Eurajoki is a small water body and thus the impacts of poor wastewater management accumulate more than they would in larger water bodies. However, the validity of citizens' concerns tied to the wastewater are questioned by ELY centre:

It is said that it [wastewater] hinders the recreational use of the river, swimming and paddling for example. [...] But it does not affect paddling in any way. It is not that the whole river is just wastewater. (ELY)

This statement reflects the gap between expert knowledge and situated knowledge: where citizens worry over the everyday impacts of poor wastewater management locally, the regional governance body questions these concerns in relation to the big picture. These asymmetrical knowledge relations do not reflect any lack of knowledge per se, but show the different entry points of both stakeholder groups: citizens knowledge claims originate from their past experiences, whereas government officials' knowledge claims originate from hydrological assessments (Karpouzoglou & Zimmer, 2016). The interviews with stakeholders who argue for the redirection of wastewater pipes reveal a long-term struggle that is perceived as a conflict situation. The WPA indicates that although the concerns of the citizens have been heard in the wastewater debate, they feel that they have not received adequate responses to their concerns:

This situation has continued for long. People are tired of this situation and urge change. Then again, the opposite side has been rather strict about this issue. There is an almost 60 years old tradition of discharging wastewaters into the river. This is a conflict situation, concerning also big financial sacrifices. (WPA)

Similarly, in agriculture, the effects of poor wastewater management are experienced directly. As indicated in the interview, potential chemical leaks, hygienic load or other issues originating from the WWTPs are of constant concern for the agricultural sector, because disturbances in water quality prevent farmers from using the river water for irrigation. Thus, even short chemical or hygienic disturbances in the water quality may lead to major economic drawbacks for farmers, proved during the BPA leak in 2011 (Termonen, 2014). The past experiences related to the untreated wastewater discharges, and the insecurity over water quality and its direct effect on farmers' livelihoods, further affects farmers' perception of WWTPs as one of the biggest challenges concerning the management of the river. The recognition of citizens' attachment and needs to use the river, as well as farmers' everyday dependence and coexistence with the river, is particularly important for solving conflict situations. As Harrison, Burgess & Clark (1998) note, lay knowledges are often discounted in environmental conflicts. This hinders the establishment of trust between stakeholders, which is the base of all cooperation for sustainable environmental management (Harrison et al., 1998). The recognition of situated knowledge is also important for validity reasons. In the interview, the agricultural stakeholder speculates that one reason for why farmers' voices have been less visible in the public debate is the dominant discourses of scientific legitimacy, which thus hinders participation of farmers in the public debate and the visibility of situated knowledge:

For a farmer, who might have gone to an agricultural school some decades ago, there is a very high threshold to question, or even state their own opinion, against the arguments of someone with university-level education, like a researcher from an environmental institute. (AG)

Citizens' and farmers' situated knowledge about river Eurajoki is valuable, because their everyday lives and livelihoods are intertwined with the river. They hold unique information about the wastewater-related problems in their living environments, which cannot be captured by external stakeholders. Local communities obtain not only deep knowledge about their environment, but also emotional attachment to the place in which they live and work (Evans, 2012; Jacobs & Buijs, 2011). This makes them essential and irreplaceable stakeholders towards sustainable management of their environment (Evans, 2012). If the situated knowledge of local communities is not incorporated into assessments of scientific experts, they easily disappear from the policy- and decision-making bodies across scales

(Karpouzoglou & Zimmer, 2016). This chain effect risks to reduce the sustainability of the environmental management to only consider material realities at the level of the physical attributes of the environment and neglect the social ones (Karpouzoglou & Zimmer, 2016).

5.1.3 Scales dividing control and responsibility of water

Apart from competing knowledges, the water management of river Eurajoki is characterised by issues deriving from the spatial scalar division of the water body into upstream-downstream, both ends governed by a different municipality, and further impacted by other municipalities in the region through the interconnectedness of the river to other water bodies. Scalar inquiries have for long been of central interest in PE, because the environmental policies and politics are bounded in geographical scales (Sayre, 2015). Scales are not to be taken as geographical spatial orders; rather, they are social constructs of humans pursuing to divide space into political units where power can be practiced (Sayre, 2015). The borders between nations, municipalities, upstream-downstream divides are imaginary, and only exist in the shared, social illusion. Moreover, scales do not only concern physical spaces, but are mobilised for instance to divide people into manageable groups according to their societal power (Sayre, 2015). The process of scaling, i.e. determining certain factors into units such as spaces or networks, is a fundamentally political process used to advocate decision-making (Ramasar, 2014). These scalar considerations offer an entry-point into political ecologies of control and responsibility of water management practices in the case of river Eurajoki.

One of the most prominent issues concerning scalar politics is the spatial division of river Eurajoki into upstream and downstream parts. As previously discussed, the downstream municipality is concerned over the quality of water that flows from the upstream, as it influences not only the municipality's image but also the operations of the industries in the downstream area, as well as downstream citizens' and farmers' everyday lives. The upstream-downstream river dynamics is a widely studied topic in hydrological research as well as PE research (e.g. Budds, 2008; Nepal, Flügel & Shrestha, 2014; Ramasar, 2014). There is a consensus that hydrological events in the upstream have an inevitable influence on the water-society nexus downstream, and thus upstream water management practices always affect downstream communities, both in beneficial and detrimental sense (Nepal, Flügel & Shrestha, 2014). As Budds (2008) explains, scalar controversies between the upstream-downstream actors in the hydrosocial cycle of river environments initially occur because the upstream stakeholders gain "a natural advantage" (Budds, 2008, p. 72) of being able to access the water before it flows to the downstream; whereas those downstream are impacted by upstream activities both quality and quantity wise. As the downstream public water company states, the citizens of Rauma, who consume

the downstream-produced drinking water, tend to question the quality of the water especially when media reports faults in the wastewater management in the upstream:

Surely it confuses people, understandably, that we produce drinking water from the river, where upstream communities discharge their wastewaters. But it is a common custom in Central Europe, as well. (RW)

The discrepancy between upstream and downstream water conditions of river Eurajoki is an issue emphasised by the downstream municipality. The interview with the downstream municipality representative reveals a feeling of powerlessness concerning the discharges flowing from the upstream:

We are pretty much powerless here in the downstream for what flows from the upstream. We cannot make it [water flow] stop in the municipality border, but all the impurities flow in the river water all the way to the sea. [...] We cannot affect it [wastewaters discharged in the upstream municipality] in any way. As I said before, there is no dam in the border of the municipalities that would block the impurities from coming to our side. (DM)

These scalar relations are an intrinsic part of the hydrosocial cycle, as they create disproportionate social and ecological implications for stakeholders across spatial scales (Budds et al., 2014). Due to the abovementioned discrepancies across upstream-downstream, and the interlinkages of river Eurajoki to other water bodies such as the eutrophicated tributary Köyliönjoki, and the northern part of the Baltic Sea, scalar issues are inherently power-laden and are not to be treated neutrally as geographical, uncontrollable realities (Ramasar, 2014). The different conditions of control over water in the upstream-downstream scale inevitably create a situation where the needs of one group are more favourably supported than the others (Nepal et al., 2014). In the context of river Eurajoki, scale has further been mobilised by stakeholders to justify their decisions regarding the water management. In 2018, the WWTP JVP-Eura Oy offered nonrecurring compensation money of 50 euros for the upstream riverside households, and 30 euros for the midstream riverside households for the drawbacks caused by the past untreated wastewater discharges (Aluehallintovirasto, 2018). Downstream citizens were not offered compensation money as the WWTP considered that there were no significant drawbacks for the properties downstream (Aluehallintovirasto, 2018). This exemplifies how information regarding water management is selectively scaled and employed to drive stakeholders' interests, in this case compensating for past events, with the result of recognising the demands of some, while marginalising those of others (Usón et al., 2017).

Apart from the spatial scale, scale also applies in the axis of societal actors and citizens in terms of responsibility over water resources. Even though water resources are shared and common, PE research calls for the focus on broader systems and actors to be emphasised over highlighting individual responsibility (Robbins, 2012). The local citizens have, however, felt that in the wastewater debate, focus has sometimes shifted from improving the wastewater management systematically in-facilities, to pressuring individual households outside of common wastewater infrastructure for improvements (Loiskekoski, 2014). Even though the pressure on households aims to the goal of an overall improved wastewater system, it is perceived as unfair, considering the disproportionate effects of individuals compared to the WWTPs, as described by the fly fishing association:

If an individual household resident discharges a hundred litres of faeces water [into the river], they will get fined. But a societal actor gets absolutely nothing from that. (FFA)

These findings show that apart from competing knowledges, discussed in chapters 5.1.1 and 5.1.2, conflicts in the wastewater management of river Eurajoki arise from uneven scalar relations. Bringing these considerations into the sphere of water management practices, often considered as an exclusive field of bio-physical, technological and economic, helps to navigate towards more sustainable practices in water management, in between the material and socio-political dimensions of the hydrosocial cycle (Budds, 2009).

5.2 Towards sustainable water management and restoration

Sustainability entails the integral idea that citizens should be able to influence the environmental management of the place they live in (Evans, 2012). Moreover, inter-stakeholder collaboration in contested water resource management is a widely accepted factor to have an influence towards more equitable and sustainable outcomes of water management (Cradock-Henry et al., 2017). This section takes a turn from the wastewater dilemma to further discuss the socio-political drivers behind the collaborative restoration efforts, and the inter-stakeholder relations in the current hydrosocial cycle of river Eurajoki. Inter-stakeholder trust and stakeholders' conceptions of each other, deriving from past relations; the polarisation of the public debate; as well as varying views over planned and implemented restoration efforts were identified as the most evident components affecting stakeholder collaboration and participation, in the interviews and in the review of the public debate.

5.2.1 Socio-political drivers behind restoration efforts

It was clear in the interviews, that the values regarded important by different stakeholders in the management and restoration of river Eurajoki are very homogeneous. Findings from the interviews

show the shared interest of protecting the river: stakeholders regard water as essential for life, the basis for a functional society in means of livelihoods, jobs and economy. Many stakeholders also emphasise the intrinsic value of the river and the whole ecosystem. Valuation of biodiversity, life in and by the river such as endangered bird species and rare fish populations are mentioned by many as some of the most important drivers behind the will to protect the river. The stakeholders also mutually recognise the value of the river for other stakeholders: all interviewees mention the importance of the river for not only themselves but for other stakeholders, too. Aesthetic and recreational significance is also a major factor for most of the stakeholders: municipalities both downstream and upstream wish that river could be incorporated more into the central parts of the municipalities in the future both for aesthetic and functional purposes.

The shared interest in restoring the river mobilises all stakeholders to actively participate in restoration efforts and is thus a promising factor towards collaborative framing of environmental decisions (Evans, 2012). However, the subjectivity of environmental perceptions tends to hinder collaborative practices (Evans, 2012; Rodríguez-Labajos & Martínez-Alier, 2015). Even though collaboration would be based on shared values, issues of adequate restoration measures are coloured by positionality and subjectivity of each stakeholder (Fox et al., 2017). This means, simply put, that no solution can be entirely right. The question is rather, what is more or less acceptable to different stakeholder groups, and who is given the final say in decision-making in the end (Evans, 2012). JOKIprogramme (introduced in chapter 2.4), a water protection project of river Eurajoki, aims to bridge this gap, by bringing together stakeholders from the river Eurajoki basin and establishing collaborative practices towards restoring of the river (Pyhäjärvi Institute, n.d.b). An overall positive image was communicated by all stakeholders regarding the programme and the collaboration within it. The only concern was communicated by the WPA, as they perceive that citizens should be included already in the planning processes of restoration efforts, not only in the implementation phase. This concern originates from the setting of the JOKIprogramme: the parties contributing economically in the project (i.e. industries and municipalities) have an advantage of being part of the planning processes; citizen representatives are integrated and heard in the programme, just not in planning phases, as stated by the WPA. This limits the full incorporation of citizens' perspective in the restoration efforts and thus weakens the integral idea of participatory spaces in sustainable environmental management (Evans, 2012).

Many of the past restoration efforts of river Eurajoki have concentrated on restoring fisheries. Before the occurrence of the wastewater conflicts, the biological state of the river regarding fish species was reported to be "better than ever" (*"Eurajoen tila parempi kuin aikoihin"*, 2011). In the interviews, as well as in the public debate, measures to maintain, vitalise or plant fish populations are now discussed

widely by all stakeholders: fishery restoration efforts are supported by most of the stakeholders. However, they do serve different purposes for different stakeholders. Some of the fishery restoration efforts are implemented voluntarily to support the fish stocks, e.g. by the fly fishing association; while some serve the purpose of reimbursing the caused damaged to the river in the past, e.g. fishery restoration efforts financed by the WWTP. This exemplifies how the reshaping of hydrosocial cycle through restoration efforts (Wohl, Lane & Wilcox, 2015) is always embedded in historical and socio-political contexts (Rodríguez-Labajos & Martínez-Alier, 2015), and how river restoration may have the potential to not only restore the water quality and water biology, but to repair the human relations in the hydrosocial cycle (Fox et al., 2017).

The rootedness of restoration efforts in socio-political contexts also implies that the outcomes of restoration efforts impacted by political motivations may benefit some stakeholders while causing negative outcomes for some (Rodríguez-Labajos & Martínez-Alier, 2015). This is exemplified in the case of the upstream dredging plan, which showcases the impact of political cycles into restoration efforts. The dredging plan was initiated as a flood control measure in the upstream of river Eurajoki by the previous local government of the upstream municipality (Aluehallintovirasto, 2015), yet now the current government questions the plan, stating in the interview that the benefits of the dredging would be very marginal compared to the ecological damages it would cause. The upstream municipality does consider flood control measures necessary for riverside properties, but argues that in order to avoid ecological damages, the dredging measure must be re-planned. This quest is supported by nearly all stakeholders across the interviews. The fly fishing association states that if the dredging plan is implemented, it ruins all previously implemented fishery restoration efforts further downstream.

Political cycles affect the river restoration measures also at another level. The agricultural emissions, accounting for more than a half of the river's nutrient load (Kipinä-Salokannel, n.d.), are pointed out by all stakeholders as an urgent issue that needs to be addressed with appropriate measures. Mitigating measures for agricultural nutrient load are currently implemented by e.g. through experiments such as liming of the soil (Tuominen, 2019). However, as no major turn in mitigating agricultural emissions has not yet occurred (Finnish Environment Institute, 2014), many stakeholders express a concern that instead of arguing over wastewater management, which accounts for a marginal share of the total nutrient load (Kipinä-Salokannel, n.d.), a major shift in focus towards mitigating agricultural nutrient load should take place. However, the agricultural stakeholder indicates in the interview, that the lack of sufficient measures is not only dependent on farmers and their practices, but rather on the trajectory of recent politics in Finland: the decreased appreciation of science has reduced the amount of state money directed at agricultural research. Both the agricultural

stakeholder and the local research institute state, that there are not yet solutions for agricultural practices, that would similarly mitigate nutrient loads to water bodies and be economically sustainable for farmers to implement.

5.2.2 Inter-stakeholder trust and conceptions

The successful implementation of sustainable environmental management measures highly depends on relations of stakeholders living and operating in the shared environment (Beierle & Konisky, 2000). For example, collaborative practices in water management are ultimately based on inter-stakeholder trust (Evans, 2012; Cradock-Henry et al., 2017). Often an external, impartial stakeholder navigating the stakeholders in the shared environmental setting can help facilitate more successful collaboration (Evans, 2012). In the case of river Eurajoki, the local research institute is positioned in this role. The representative of the local research institute describes the organisation as an impartial stakeholder between science and people, working close to the people and in collaboration with different stakeholder groups. Throughout interviews, it became clear that the local research institute is regarded as a neutral, trustworthy stakeholder, and it is easy for other stakeholder groups to trust their opinions. As the institute indicates:

I think people listen to us better than to the government officials. Our message is received better. [...] Our organisation provides expertise on a voluntary basis, so it is easier to collaborate with us. (PJI)

The trustworthiness of the government officials of ELY centre for Southwest Finland, referred to by the research institute, was compromised during the untreated wastewater discharges in the turn of 2010s due to a suspected double-position held by the head of the ELY centre. When the untreated wastewater discharges were revealed, it was reported that there was a suspected double-position in the wastewater company JVP-Eura Oy and in the monitoring party ELY centre, creating a bias between the two stakeholders: the head of the ELY centre held simultaneously a position as the CEO of the WWTP (Kahila, 2012). The person accused of this biased position, along with the WWTP company itself, were charged for environmental damages, but the charges were later dropped, and instead the WWTP facility manager was convicted of the environmental crime and penalised with a fine (Laakso, 2016). The history of untreated wastewater discharges and the conflicts arising from them still impact widely also the operation of the WWTP today. In the interview, the WWTP explains that it feels like their operation is still widely misunderstood and criticised, even though the facilities and wastewater management practices have improved:

I have noticed, that very often people perceive that we discharge toxins, or produce some sort of pollution. But we are cleaning the water. In fact, that is our main task. (JVP)

Public debate as mobilisation and hindrance for participation

Throughout interviews, it was clear that stakeholders consider societal discussion essential for transparency, accountability and visibility of different perceptions of stakeholders impacting and/or impacted by the river. Many stakeholders also consider, that the public debate over the wastewater management and the restoration efforts, has not only increased the awareness of the environmental issues, but also enabled faster action towards protecting the river. Public debate is seen an essential component in mobilising especially citizens and agricultural stakeholders in the water protection measures. Moreover, intense public debate has required fast action from the government officials to identify and assess the alterations in water quality. Overall, public debate is viewed positively as it is perceived to encourage active participation of different stakeholders for protecting the river. However, almost all interviewees state that the public debate has also a negative side to it. Many feel, that the public debate is polarised, lacks causal chains, and is partly based on false information. The public debate seems to culminate into finding someone who is guilty of the issues regarding the river, and this hinders the participation of certain stakeholders: both the agricultural stakeholder, and the WWTP state in the interviews that the feeling of being blamed has hindered their participation in the public debate. The WWTP indicates that apart from not participating in the online public debate, their participation in public events on issues regarding river Eurajoki has also been compromised:

Well, I have not participated [in the public events], I admit that. It feels a bit like throwing myself to the wolves. The opposition is so intense. (JVP)

The power of media platforms is highly relevant for the issue of collaboration and participation for the protection of the river. At best, it may work as a platform of sharing and discussing different river-related perceptions and increase mutual learning; yet at worst, it may increase the controversies between stakeholders. The interviews indicate that more dialogue is wished across stakeholder groups, as well as redefining the nature of the discussion from blaming to aiming to find consensus. Simplified arguments and speculations over who is guilty, as well as spreading non-factual information, affect the inter-stakeholder conceptions and hinder the establishment of mutual trust towards collaborative processes (Cradock-Henry et al., 2017). A comprehensive case study of Beierle & Konisky (2000) proved that through good quality inter-stakeholder communication, collaboration towards sustainable environmental management is more achievable. This again can lead to increased trust and

conflict-resolution, even in cases where pre-existing inter-stakeholder relations are poor (Beierle & Konisky, 2000).

5.2.3 In search of consensus

Consensus was mentioned as on the one hand, the most challenging aspect, and on the other hand as the most desirable state of water management of river Eurajoki, across interviews by representatives from municipal level, agricultural sector and amongst citizen associations. The consensus-seeking process is regarded challenging, because defining achievable targets for river restoration, and reaching consensus over water management, requires compromises from all stakeholders (Knieper & Pahl-Wostl, 2016). Consensus-seeking process also requires the acknowledgement from all parties, that restoration is a long process (Knieper & Pahl-Wostl, 2016). Considerations of temporal scale are important in collaborative practices: unrealistic expectations of fast results of water protection and restoration efforts may have implications to the dedication of stakeholders (Cradock-Henry et al., 2017).

The hydrosocial approach in this study has aimed to demonstrate how water and society are intertwined, and how they cannot be managed as separate systems (Linton & Budds, 2014). Diverging perceptions between stakeholders varying from the perceptions on the state of the river to the water management practices and restoration efforts, proves that there is such complexity entailed in the hydrosocial relations, that purely material assessments do not create a strong basis for making sustainable environmental decisions (Budds, 2009). Technical, bio-physical assessments are particularly inadequate to resolve situations where conflicting perceptions occur between stakeholders (Budds, 2009). As Budds (2009, p. 428) argues, “ideally, the socio-political dimensions of water issues would be investigated in the same depth as the hydrological dimensions [...] in order to make water assessments more comprehensive and inclusive”. The analysis of the components of hydrosocial cycle of river Eurajoki may contribute to the stakeholders’ desire towards consensus-based decision-making for sustainable water management. In Figure 8, the findings of this study are illustrated by locating the components of the hydrosocial cycle of river Eurajoki in the different dimensions of hydrosocial cycle as described by Linton & Budds (2014).

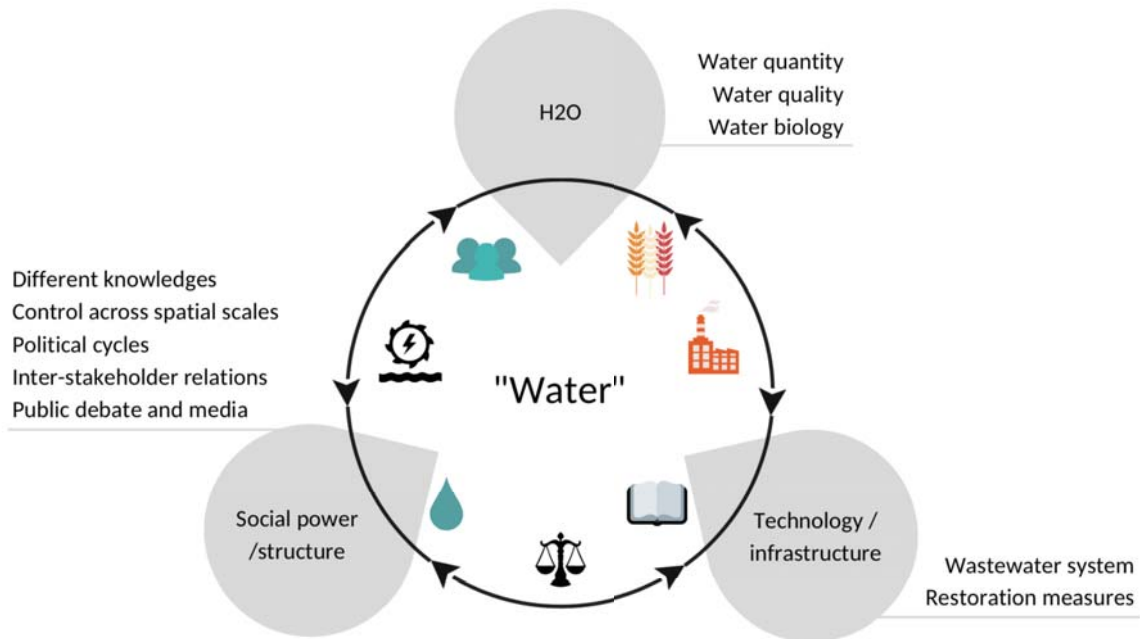


Figure 8. The hydrosocial cycle of river Eurajoki and the stakeholder groups of river Eurajoki. Adapted and elaborated by the author from the original by Linton & Budds (2014).

The cycle illustrated here aims to communicate the findings of this study in an accessible way. Socio-political components found essential in the hydrosocial cycle of river Eurajoki include the contesting knowledges; division of control and responsibility of water over different scales; political cycles' impact on water management and restoration efforts; inter-stakeholder relations including trust; and public debate and media, where the divergent perceptions of stakeholders become visible. These components are essentially impacting, and impacted by, the material aspects of the river (Palomino-Schalscha et al., 2016): the water quantity and quality, and water biology, including e.g. the fish stocks of the river. Furthermore, the hybrid relationship between water and socio-political components is embedded and materialised in the technological and infrastructural aspects of the river (Linton & Budds, 2014), e.g. the wastewater system and restoration measures, which consequently feed back into the other dimensions of the cycle. It is worth noting, that the aspects of the hydrosocial cycle of river Eurajoki are not limited to the components illustrated here. For example, dams in river Eurajoki are a major infrastructural component of its hydrosocial cycle, however, only the aspects occurring in the findings are presented in Figure 8.

In the centre of the hydrosocial cycle in Figure 8, are now represented both "water", which refers to the different understandings and perceptions of water; and the stakeholders (see Figure 2, p. 5 for detailed description) who obtain those perceptions. The distinct inclusion of stakeholders into the hydrosocial cycle aims to communicate the study's recognition of human dependency of water, and

moreover, the inter-dependency of riverine stakeholders of each other. Regardless of the conflicts around wastewater discharges, local communities and industries are essentially dependent on the provision of wastewater treatment service of the WWTPs. Regardless of the eutrophication issues, food production is essentially dependent on the agricultural stakeholders. Regardless of the concerns over industrial emissions, industries provide jobs and contribute to the economy of the area. Acknowledging this inter-dependency between stakeholders, may contribute to the pursuit of searching for consensus.



Figure 9 & Figure 10. Signs of spring. Water flowing through the greening Kauttuankoski rapid area in the upstream of river Eurajoki. Picture credits: Mikko Susi on April 28, 2019.

6 Conclusions

The main inquiry of this thesis was to identify barriers and opportunities for sustainable water management and restoration in the case study site of river Eurajoki, through an analysis of hydrosocial relations. The study investigated different stakeholders' perceptions of the current water management, to provide an understanding of stakeholders' positions in the currently occurring controversies and collaborations. The study focused particularly on stakeholders' perceptions of the wastewater dilemma, which profiled as one of the most contested aspects of the river's water management, and the restoration efforts, to discover how the controversies are originated, and how collaboration patterns may facilitate more sustainable and equitable water management in the area. Both the material and the socially constructed realities were regarded important in this inquiry, following the holistic approach of PE research (Robbins, 2012) and the analytical lens of hydrosocial cycle (Linton & Budds, 2014).

The main findings of this study indicated that the conflicts between stakeholders are rooted in different understandings of the state of the river, as well as different perceptions on wastewater impacts, closely aligned with the stakeholder interests and demands. Competing knowledges, categorised as expert knowledge and situated knowledge, further feed into the conflicts, and hinder the pursuit of finding consensus for implementing sustainable water management practices. Varied perceptions of the same water body are reflected in stakeholders' divergent problem- and solution-formulations. However, stakeholders' interest in protecting the water is shared, and embodies in the established collaborative restoration practices. Based on the findings, the study has argued for the need to incorporate social realities to both current water research and water management in order to enhance equity and sustainability of water management, and to avoid future inter-stakeholder conflicts.

This thesis contributes to the body of research on PE and hydrosocial cycle. As this thesis has shown, waters should be considered as systems, consisting of multiple social actors guided by different values, perceptions and knowledges, as well as the H₂O itself. The interconnectedness of water and human societies calls for these comprehensive investigations to enhance the water management practices as part of a broader societal transformation towards sustainability.

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8 Appendices

8.1 Appendix A: Interview guides

Haastattelurunko (kunnat)

Interview guide (municipalities)

KYTKÖS EURAJOEN VESISTÖÖN

CONNECTION TO RIVER EURAJOKI

Voisitko alkuun kuvailla, millä tavoin kunta ja Eurajoen vesistö ovat kytköksissä toisiinsa? Mikä on kunnan rooli Eurajoen vesistön hoito- ja kunnostustoimenpiteissä?

To start with, can you describe how the municipality and river Eurajoki are connected? What is the role of the municipality in the management and restoration efforts of river Eurajoki?

JULKINEN KESKUSTELU JA KOETUT HAASTEET

PUBLIC DEBATE AND PERCEIVED CHALLENGES

Julkisessa keskustelussa on viime aikoina käyty paljon väittelyä Eurajoen nykyisestä ekologisesta tilasta ja siihen vaikuttavista tekijöistä. Mitä mieltä sinä olet tästä keskustelusta?

There has been a lot of public debate about the current ecological status of river Eurajoki and the different factors impacting it. What do you think about this debate?

Mitkä ovat mielestäsi suurimmat haasteet joen hoito- ja kunnostustoimenpiteisiin liittyen?

What do you consider being the biggest challenges regarding the river management and restoration efforts?

Mitkä näet tulevaisuuden suurimpina uhkina joen ekologisen tilan kannalta? Miten näihin uhkiin pitäisi puuttua, ja kenellä on mielestäsi velvollisuus puuttua niihin?

What do you consider as the biggest future threats regarding the ecological status of the river? How do you think these threats should be addressed and by whom?

YHTEISTYÖKUVIOT JA PÄÄTÖKSENTEKOPROSESSIT

COOPERATION AND DECISION-MAKING PROCESSES

Minkä tyyppistä yhteistyötä kunta tekee muiden toimijoiden kanssa? Millä tavalla kuvailisit yhteistyötä, osallisuutta ja vuorovaikutusta?

In what type of cooperation does the municipality engage with other stakeholders? How would you describe the cooperation, participation and interaction?

Mitä ajattelet Eurajokeen liittyvistä päätöksentekoprosesseista? Kuullaanko kaikkien osapuolten mielipiteitä ja tarpeita päätöksentekoprosesseissa?

What do you think about the decision-making processes regarding river Eurajoki? Do you think all stakeholders are being heard in those processes?

Viimeisenä tahtoisin vielä ihan lyhyesti kuulla, minkä takia sinun mielestäsi Eurajoen vesistö pitää hoitaa ja kunnostaa?

Finally, for what reasons river Eurajoki should be managed and restored in your opinion?

Haastattelurunko (ELY-keskus)
Interview guide (ELY centre)

KYTKÖS EURAJOEN VESISTÖÖN
CONNECTION TO RIVER EURAJOKI

Voisitko alkuun kuvailla, millä tavoin ELY-keskus ja Eurajoen vesistö ovat kytköksissä toisiinsa? Millä tavoin ELY-keskus on mukana Eurajoen hoito- ja kunnostustoimenpiteissä?

To start with, can you describe how the ELY centre and river Eurajoki are connected? In which ways does the ELY centre participate in the management and restoration efforts of river Eurajoki?

JULKINEN KESKUSTELU JA KOETUT HAASTEET
PUBLIC DEBATE AND PERCEIVED CHALLENGES

Julkisessa keskustelussa on viime aikoina käyty paljon väittelyä Eurajoen nykyisestä ekologisesta tilasta ja siihen vaikuttavista tekijöistä. Mitä mieltä sinä olet tästä keskustelusta?

There has been a lot of public debate about the current ecological status of river Eurajoki and the different factors impacting it. What do you think about this debate?

Mitkä ovat mielestäsi suurimmat haasteet joen hoito- ja kunnostustoimenpiteisiin liittyen?

What do you consider being the biggest challenges regarding the river management and restoration efforts?

Mitkä näet tulevaisuuden suurimpina uhkina joen ekologisen tilan kannalta? Miten näihin uhkiin pitäisi puuttua, ja kenellä on mielestäsi velvollisuus puuttua niihin?

What do you consider as the biggest future threats regarding the ecological status of the river? How do you think these threats should be addressed and by whom?

YHTEISTYÖKUVIOT JA PÄÄTÖKSENTEKOPROSESSIT
COOPERATION AND DECISION-MAKING PROCESSES

Minkä tyyppistä yhteistyötä ELY-keskus tekee muiden toimijoiden kanssa? Millä tavalla kuvailisit yhteistyötä, osallisuutta ja vuorovaikutusta?

In what type of cooperation does the ELY centre engage with other stakeholders? How would you describe the cooperation, participation and interaction?

Mitä ajattelet Eurajokeen liittyvistä päätöksentekoprosesseista? Kuullaanko kaikkien osapuolten mielipiteitä ja tarpeita päätöksentekoprosesseissa? Kuullaanko ELY-keskusta?

What do you think about the decision-making processes regarding river Eurajoki? Do you think all stakeholders are being heard in those processes? Is ELY centre being heard?

Viimeisenä tahtoisin vielä ihan lyhyesti kuulla, minkä takia sinun mielestäsi Eurajoen vesistö pitää hoitaa ja kunnostaa?

Finally, for what reasons river Eurajoki should be managed and restored in your opinion?

Haastattelurunko (teollisuus)

Interview guide (industry: JTK, JVP, RW)

KYTKÖS EURAJOEN VESISTÖÖN

CONNECTION TO RIVER EURAJOKI

Voisitko alkuun kuvailla, millä tavoin Eurajoki on osana yrityksenne toimintaa ja miten se vaikuttaa toimintaanne?

To start with, can you describe how river Eurajoki is part of the operation of your company and how does it affect your operation?

Olen ymmärtänyt, että olette mukana Eurajoen hoito- tai kunnostustoimenpiteissä. Voisitko kuvailla, millä tavoin osallistutte näihin hoito- ja kunnostustoimenpiteisiin? Millä tavoin pyritte parantamaan joen tilaa?

I have understood that you participate in the management and restoration efforts of river Eurajoki. Can you describe in which ways do you participate in them? In which ways do you aim to improve the condition of the river?

JULKINEN KESKUSTELU JA KOETUT HAASTEET

PUBLIC DEBATE AND PERCEIVED CHALLENGES

Julkisessa keskustelussa on viime aikoina käyty paljon väittelyä Eurajoen nykyisestä ekologisesta tilasta ja siihen vaikuttavista tekijöistä. Mitä mieltä sinä olet tästä keskustelusta?

There has been a lot of public debate about the current ecological status of river Eurajoki and the different factors impacting it. What do you think about this debate?

Mitkä ovat mielestäsi suurimmat haasteet joen hoito- ja kunnostustoimenpiteisiin liittyen?

What do you consider being the biggest challenges regarding the river management and restoration efforts?

Mitkä näet tulevaisuuden suurimpina uhkina joen ekologisen tilan kannalta? Miten näihin uhkiin pitäisi puuttua, ja kenellä on mielestäsi velvollisuus puuttua niihin?

What do you consider as the biggest future threats regarding the ecological status of the river? How do you think these threats should be addressed and by whom?

YHTEISTYÖKUVIOT JA PÄÄTÖKSENTEKOPROSESSIT

COOPERATION AND DECISION-MAKING PROCESSES

Minkä tyyppistä yhteistyötä teette muiden toimijoiden kanssa? Millä tavalla kuvailisit yhteistyötä, osallisuutta ja vuorovaikutusta?

In what type of cooperation do you engage with other stakeholders? How would you describe the cooperation, participation and interaction?

Mitä ajattelet Eurajokeen liittyvistä päätöksentekoprosesseista? Kuullaanko kaikkien osapuolten mielipiteitä ja tarpeita päätöksentekoprosesseissa? Oletteko te mukana päätöksenteossa, jos, niin miten?

What do you think about the decision-making processes regarding river Eurajoki? Do you think all stakeholders are being heard in those processes? Do you participate in the decision-making, and if, how?

Viimeisenä tahtoisin vielä ihan lyhyesti kuulla, minkä takia sinun mielestäsi Eurajoen vesistö pitää hoitaa ja kunnostaa?

Finally, for what reasons river Eurajoki should be managed and restored in your opinion?

Haastattelurunko (maatalous)
Interview guide (agriculture)

KYTKÖS EURAJOEN VESISTÖÖN
CONNECTION TO RIVER EURAJOKI

Voisitko alkuun kertoa itsestäsi ja siitä, millä tavoin Eurajoki on osallisena maanviljelijöiden työssä ja arjessa?

To start with, can you tell me about yourself and in which ways river Eurajoki is part of the work and everyday life of farmers?

Osallistuvatko maanviljelijät aktiivisesti Eurajoen hoito- ja kunnostustoimenpiteisiin? Voisitko kuvailla, millä tavoilla ja mitkä ovat syyt osallisuuden takana?

Do farmers participate actively in the management and restoration effort of river Eurajoki? Can you describe in which ways and why?

JULKINEN KESKUSTELU JA KOETUT HAASTEET
PUBLIC DEBATE AND PERCEIVED CHALLENGES

Julkisessa keskustelussa on viime aikoina käyty paljon väittelyä Eurajoen nykyisestä ekologisesta tilasta ja siihen vaikuttavista tekijöistä. Mitä mieltä sinä olet tästä keskustelusta?

There has been a lot of public debate about the current ecological status of river Eurajoki and the different factors impacting it. What do you think about this debate?

Mitkä ovat mielestäsi suurimmat haasteet joen hoito- ja kunnostustoimenpiteisiin liittyen?

What do you consider being the biggest challenges regarding the river management and restoration efforts?

Mitkä näet tulevaisuuden suurimpina uhkina joen ekologisen tilan kannalta? Miten näihin uhkiin pitäisi puuttua, ja kenellä on mielestäsi velvollisuus puuttua niihin?

What do you consider as the biggest future threats regarding the ecological status of the river? How do you think these threats should be addressed and by whom?

YHTEISTYÖKUVIOT JA PÄÄTÖKSENTEKOPROSESSIT
COOPERATION AND DECISION-MAKING PROCESSES

Minkä tyyppistä yhteistyötä maanviljelijät tekevät muiden toimijoiden kanssa? Millä tavalla kuvailisit yhteistyötä, osallisuutta ja vuorovaikutusta?

In what type of cooperation do farmers engage with other stakeholders? How would you describe the cooperation, participation and interaction?

Mitä ajattelet Eurajokeen liittyvistä päätöksentekoprosesseista? Kuullaanko kaikkien osapuolten mielipiteitä ja tarpeita päätöksentekoprosesseissa? Kuullaanko maanviljelijöitä?

What do you think about the decision-making processes regarding river Eurajoki? Do you think all stakeholders are being heard in those processes? Are farmers being heard?

Viimeisenä tahtoisin vielä ihan lyhyesti kuulla, minkä takia sinun mielestäsi Eurajoen vesistö pitää hoitaa ja kunnostaa?

Finally, for what reasons river Eurajoki should be managed and restored in your opinion?

Haastattelurunko (kansalaiset/suojeluaktiivit)
Interview guide (citizens/activists)

KYTKÖS EURAJOEN VESISTÖÖN
CONNECTION TO RIVER EURAJOKI

Voisitko alkuun kertoa itsestäsi ja millä tavoin olet (yhdistyksesi kautta) kytköksissä Eurajokeen? Miten kauan olet ollut aktiivinen suojelutoimissa, ja mikä sytytti sinun (yhdistyksesi) kiinnostuksen aktiivisesti osallistua suojelutoimiin?

To start with, can you tell me about yourself and your (association's) connection to river Eurajoki? How long have you been involved and what made you start actively engaging in the restoration efforts?

Mikä on yhdistyksesi rooli Eurajoen vesienhoidossa, -suojelussa, ja kunnostustoimenpiteissä? Voitko kuvailla minulle teidän päätehtäviänne, ja mitä esimerkiksi sinun toimintaasi yhdistyksessä sisältyy?

How is your association involved in the river management, protection and restoration efforts? Can you describe the main tasks of the association and what is your role in there?

JULKINEN KESKUSTELU JA KOETUT HAASTEET
PUBLIC DEBATE AND PERCEIVED CHALLENGES

Julkisessa keskustelussa on viime aikoina käyty paljon väittelyä Eurajoen nykyisestä ekologisesta tilasta ja siihen vaikuttavista tekijöistä. Mitä mieltä sinä olet tästä keskustelusta?

There has been a lot of public debate about the current ecological status of river Eurajoki and the different factors impacting it. What do you think about this debate?

Mitkä ovat mielestäsi suurimmat haasteet joen hoito- ja kunnostustoimenpiteisiin liittyen?

What do you consider being the biggest challenges regarding the river management and restoration efforts?

Mitkä näet tulevaisuuden suurimpina uhkina joen ekologisen tilan kannalta? Miten näihin uhkiin pitäisi puuttua, ja kenellä on mielestäsi velvollisuus puuttua niihin?

What do you consider as the biggest future threats regarding the ecological status of the river? How do you think these threats should be addressed and by whom?

YHTEISTYÖKUVIOT JA PÄÄTÖKSENTEKOPROSESSIT
COOPERATION AND DECISION-MAKING PROCESSES

Minkä tyyppistä yhteistyötä kansalaiset tekevät muiden toimijoiden kanssa? Millä tavalla kuvailisit yhteistyötä, osallisuutta ja vuorovaikutusta?

In what type of cooperation do citizens engage with other stakeholders? How would you describe the cooperation, participation and interaction?

Mitä ajattelet Eurajokeen liittyvistä päätöksentekoprosesseista? Kuullaanko kaikkien osapuolten mielipiteitä ja tarpeita päätöksentekoprosesseissa? Kuullaanko kansalaisia?

What do you think about the decision-making processes regarding river Eurajoki? Do you think all stakeholders are being heard in those processes? Are citizens being heard?

Viimeisenä tahtoisin vielä ihan lyhyesti kuulla, minkä takia sinun mielestäsi Eurajoen vesistö pitää hoitaa ja kunnostaa?

Finally, for what reasons river Eurajoki should be managed and restored in your opinion?

Haastattelurunko (Pyhäjärvi-instituutti)
Interview guide (Pyhäjärvi Institute)

KYTKÖS EURAJOEN VESISTÖÖN
CONNECTION TO RIVER EURAJOKI

Pyhäjärvi-instituutti on ollut toiminnassa alueella jo 30 vuotta. Mikä on teidän käsityksenne Eurajoen merkityksestä alueen toimijoille? Aiemmassa keskustelussamme mainitsit, että Eurajoen merkitys alueen asukkaille on kasvanut tällä vuosikymmenellä. Voisitko kertoa lisää myös tästä?

Pyhäjärvi Institute has been operating in the area for 30 years already. What is your perception of the meaning and significance of river Eurajoki for the stakeholders in the area? In our previous discussion you mentioned, that the appreciation of river Eurajoki has been increasing amongst the citizens in the past decade. Can you tell me more about this, too?

Millä tavoin Pyhäjärvi-instituutti alueen asiantuntijaorganisaationa on mukana Eurajoen hoito- ja kunnostustoimenpiteissä? Missä roolissa?

As the expert organisation of the area, in which ways does Pyhäjärvi Institute participate in the management and restoration efforts of river Eurajoki? What is your role in them?

JULKINEN KESKUSTELU JA KOETUT HAASTEET
PUBLIC DEBATE AND PERCEIVED CHALLENGES

Julkisessa keskustelussa on viime aikoina käyty paljon väittelyä Eurajoen nykyisestä ekologisesta tilasta ja siihen vaikuttavista tekijöistä. Mitä mieltä sinä olet tästä keskustelusta?

There has been a lot of public debate about the current ecological status of river Eurajoki and the different factors impacting it. What do you think about this debate?

Mitkä ovat mielestäsi suurimmat haasteet joen hoito- ja kunnostustoimenpiteisiin liittyen?

What do you consider being the biggest challenges regarding the river management and restoration efforts?

Mitkä näet tulevaisuuden suurimpina uhkina joen ekologisen tilan kannalta? Miten näihin uhkiin pitäisi puuttua, ja kenellä on mielestäsi velvollisuus puuttua niihin?

What do you consider as the biggest future threats regarding the ecological status of the river? How do you think these threats should be addressed and by whom?

YHTEISTYÖKUVIOT JA PÄÄTÖKSENTEKOPROSESSIT
COOPERATION AND DECISION-MAKING PROCESSES

Minkä tyyppistä yhteistyötä Pyhäjärvi-instituutti tekee muiden toimijoiden kanssa? Millä tavalla kuvailisit yhteistyötä, osallisuutta ja vuorovaikutusta?

In what type of cooperation does Pyhäjärvi Institute engage with other stakeholders? How would you describe the cooperation, participation and interaction?

Mitä ajattelet Eurajokeen liittyvistä päätöksentekoprosesseista? Kuullaanko kaikkien osapuolten mielipiteitä ja tarpeita päätöksentekoprosesseissa? Kuullaanko Pyhäjärvi-instituuttia?

What do you think about the decision-making processes regarding river Eurajoki? Do you think all stakeholders are being heard in those processes? Is Pyhäjärvi Institute being heard?

Viimeisenä tahtoisin vielä ihan lyhyesti kuulla, minkä takia sinun mielestäsi Eurajoen vesistö pitää hoitaa ja kunnostaa?

Finally, for what reasons river Eurajoki should be managed and restored in your opinion?

8.2 Appendix B: Original quotations

Listed in the order of their appearance in the text.

“Alueen vakituiset asukkaat joen rannalla, tai sen lähellä asuvat, pitkään sitä [jokea] vieroksuivat, ja ehkä aliarvioivatkin. Aloimme 2000-luvulla toteuttamaan jokiprojekteja, ja ensimmäisissä projekteissa oli nimenomaan tarkoituksena herättää kiinnostusta ja joen arvostusta. Paikallisten kommentit olivat, että “no mitäs sen nyt on väliä, se on tommonen viemäri, et me ollaan istutettu kuusiaita tohon rannalle, ettei tarvi katella sitä haisevaa jokee.” (PJI)

“Sitten kun tuli ilmi jätevesikatastrofit, että oli ohijuoksettu JVP:ltä jätevesiä puhdistamattomina [jokeen], ja joki oli uimakelvoton ja käyttökelvoton kesäisin oikeastaan koko ajan, niin sitten ihmiset heräsivät siihen. Varmaan se lähti liikkeelle yksittäisistä ihmisistä, mutta kun he nostivat asian esille, niin sitten moni muukin havahtui. Ja nythän Eurajokea puolustetaan todella voimakkaasti, mikä on tietysti tosi hyvä asia.” (PJI)

“Ihmiset olivat hyvin vihaisia, ja halu toimia sen puolesta, että siihen [tilanteeseen] saataisiin muutos, alkoi lisääntyä.” (WPA, Seppo Varjonen)

“Kyllä se on tärkeää kunnalle, että kunnan läpi virtaava joki on puhdas ja se vesi on puhdasta. Että kyllähän se semmonen imagohaitta [on] ja ei pelkästään imagohaitta, vaan myös käytännön haitta, että jos veden väri on väliin vihreetä ja väliin violettia, niin mitä haittoja se aiheuttaa siitä eteenpäin.” (DM)

“Se ei ole riskitön. [...] se ei ole mikään ympäristöteko, että tehdään pitkä putki, jossa on monta pumppaamoja. Ne voi alkaa vuotamaan, ne voi rikkoontua. Sieltä voi tulla vahinkoja. Se on aina riski tehdä sellainen.” (JVP)

“Sanotaan että ne [jätevedet] haittaa joen virkistyskäyttöä, muun muassa uimista ja melontaa. [...] Mutta eihän se siihen melomiseen vaikuta mitenkään. Eihän se nyt ole mitään jätevettä se joki.” (ELY)

“Tämä tilannehan on jatkunut pitkään. Ja ihmiset ovat kyllästyneitä tähän tilanteeseen, ja haluaisivat saada siihen muutosta. Ja sit toisaalta vastapuoli on aika jäykkä ollut tässä asiassa. Siellä on se vanha melkein kuudenkymmenen vuoden takainen perinne siihen, että tähän jokeen voidaan jätevesiä laskea. Siinä on semmonen konfliktitilanne. Ja tietysti siinä on suurista taloudellisista uhrauksista myöskin kysymys.” (WPA, Seppo Varjonen)

“Yksittäinen maanviljelijä, joka on käynyt jonkun maatalousoppilaitoksen vuonna 2 ennen suurten tiikusateiden, niin sen kynnys lähteä kyseenalaistamaan, tai kertomaan edes sitä omaa mielipidettään jonkun yliopistotutkijan tai ympäristökeskuksen tutkijan tai vastaavan yliopistokoulutuksen saaneen henkilön argumentteja vastaan, niin se on todella iso.” (AG)

“Toki se ymmärrettävästi ihmetyttää, että me teemme talousvettä joesta, johon yläpuolen yhdyskunta purkaa jätevetensä. Mutta sehän on ihan yleinen tapa tuolla Keski-Euroopassa.” (RW)

“Me olemme aika lailla voimattomia täällä alajuoksulla, että mitä yläjuoksulta tulee. Ei me saada sitä [virtaamaa] tohon kunnan rajalle pysähtymään, vaan se virtaa joen veden mukana ihan mereen saakka kaikki epäpuhtaudet. [...] Me emme voi vaikuttaa siihen [Eurasta laskettuihin jätevesiin] millään tavalla. Kuten sanoin tossa alussa, emme saa patoa tohon kunnan rajalle, että epäpuhtaudet jää toisen kunnan puolelle.” (DM)

“Jos ajattelee sitä suhdetta, että on omakotitaloasuja, ja se laskee sinne [jokeen] sen sata litraa sitä kakkavettä, niin siitä tulee sakot. Mutta yhteiskunnallinen toimija, niin ei se saa siitä yhtään mitään.” (FFA)

“Luulen, että meitä kuunnellaan paremmin kuin viranomaisia. Meidän viesti menee paremmin perille. [...] Me ollaan vapaaehtoisella pohjalla toimiva asiantuntijaorganisaatio, niin meidän kanssa on helpompi tehdä yhteistyötä.” (PJI)

“Olen huomannut, että ihmiset mieltävät hirveän usein, että täältä tulee myrkyjä, tai että me tuotamme jotakin päästöjä. Mutta siis meidän puhdistamme vettä. Että itseasiassa meidän päätehtäväkin on puhdistaa vettä” (JVP)

“No, ei ole tullut mentyä [julkisiin tiedotustilaisuuksiin], kyllä myönnän sen, että kyllähän se tuntuu siltä vähän, kun menisi sinne suden suuhun syötäväksi. Se on niin jyrkkää se vastustus.” (JVP)