

Grant Proposal

Challenges in Swedish hydropower - politics, economics and rights

Kristina Ek[‡], Susana Goytia[‡], Carina Lundmark[‡], Soili Nysten-Haarala[‡], Maria Pettersson[‡], Annica Sandström[‡], Johanna Söderasp[‡], Jesper Stage[‡]

[‡] Luleå University of Technology, Luleå, Sweden

Corresponding author: Jesper Stage (jesper.stage@itu.se)

Reviewable

v1

Received: 29 Sep 2017 | Published: 05 Oct 2017

Citation: Ek K, Goytia S, Lundmark C, Nysten-Haarala S, Pettersson M, Sandström A, Söderasp J, Stage J (2017) Challenges in Swedish hydropower – politics, economics and rights. Research Ideas and Outcomes 3: e21305. <https://doi.org/10.3897/rio.3.e21305>

Abstract

Two systems working in parallel have contributed to implementation difficulties in Swedish water governance. While the old system is designed to be predictable and stable over time, the new system is intended to be transparent and holistic, guided by the principles of Integrated Water Resource Management. The paper disentangles the challenges in Swedish water governance and proposes a blueprint for future research. The proposed research project is unique in the sense that it explores the imbalances between the new and the old water governance systems from a multi-disciplinary perspective, elaborating upon the clashes between the traditional, nationally based regulatory system and the new holistic water governance system from legal, political and economic perspectives.

Keywords

hydropower, Sweden, water governance, water management systems

Background

Severe shortcomings in the implementation of both the Water Framework Directive (WFD) and the Floods Directive have been identified in several Member States (EU Commission 2015). In Sweden's case, the main critique is related to the minimal State involvement and lack of formal steering, not least in terms of legal distribution of power and responsibilities between the authorities involved in freshwater governance, causing an insufficient implementation in terms of achieving the environmental objectives (Söderasp 2015). In the most recent proposals for programs of measures and management plans implementing the WFD, the Swedish Water Authorities declared that the ultimate goal of good water status would not be attained in a majority of the country's water bodies by the target year of 2015.

We argue that the above described implementation difficulties are largely due to the fact that two governance systems effectively work in parallel with regard to water. The fundamental differences, or even clashes, between the traditional legal system and the new holistic water governance system are outlined below.

The challenges of two parallel water management systems

Modern water governance has a holistic approach where ecological, political, economic and social perspectives are integrated (Hall 2005). Integrated Water Resource Management (IWRM) proposes ecosystem-based thinking and administrative settings organized along river basin districts. It was introduced by the EU WFD in 2000 and transposed into Swedish legislation in 2004. This holistic view diverges sharply from how the political system and government agencies have traditionally worked with water governance, setting up "silo" policies for one or a few issues at a time, and primarily dealing with individual locations within a single regional or municipal jurisdiction, rather than the full continuum of water governance issues that can arise along a river basin. IWRM also proposes adaptive management, essentially assuming that uses, and trade-offs between different uses, of water can be revised continuously as new knowledge is acquired, and as the needs of society change. Such flexibility is prevented to a significant extent by the many existing permits that govern the Swedish hydropower plants (see Fig. 1).

The EU water regime represents a turning point in the Union's water management, which challenges the institutional systems in the Member States (de Bruin et al. 2005). At the same time, while the clear EU focus on managing at the level of watershed areas and river basins is well in line with IWRM principles, it contrasts with the traditional legal approach in Sweden, which has focused on individual water rights in watershed areas (Figure 1 illustrates some of the key differences between the two approaches in terms of legal frameworks, policy discourses, and actors). Safeguarding and improving e.g. ecological connectivity across a river basin assumes flexible management of different parts of the river basin. However, Swedish legal and administrative practice has concentrated on imposing minimum standards on individual companies (e.g. hydropower companies),

frequently at the expense of achieving overall improvements that would have been cheaper for society as a whole and achieved greater environmental improvements (Johansson and Kriström 2012, Bergsten et al. 2014).

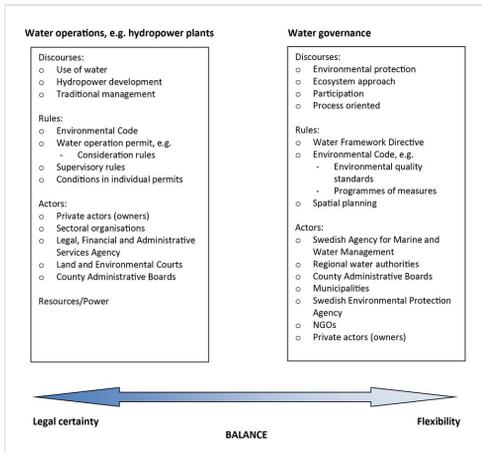


Figure 1. [doi](#)

The challenges of two parallel water management systems.

From an economic perspective, management at the level of individual installations (i.e. hydropower plants) tends to understate both the costs and the potential benefits of the implemented measures compared to what could be achieved through management at the watershed level. Holistic management at the level of entire river systems could make it possible to restore ecosystem connectivity and restore migratory patterns of keystone fish species, potentially generating far greater economic benefits that can be achieved through measures in one installation alone. At the same time, the overall availability of balancing power in the electricity system (which is growing in importance) is barely affected at all by measures in an individual installation. However, if measures are implemented in a large number of installations, based on case-by-case assessments of effects in each individual installation, the overall availability of balancing power could be affected considerably, with huge economic effects. Thus, a more holistic approach would capture both costs and benefits of environmental improvement measures far better than the current approach does.

Although IWRM has the potential to provide greater benefits from water governance than the traditional, piecemeal, governance approaches, applying IWRM in practice has proven difficult, particularly so in rivers with hydropower development where permits remain site-specific. Permits granted under the 1918 Water Act (which is considered an exploitation-minded legislation, Vedung and Brandel 2001), or even before then, remain in force even under the current more environmentally conscious water legislation, as long as they are not reviewed in court. When court reviews do take place, they typically review the individual permit and aim for the maximal environmental benefit that can be achieved through changes in that specific permit, rather than taking into account the entire water body that is

affected by the permit. This procedure is at odds with the holistic approach of the IWRM, which addresses entire river basins and target environmental improvements where they generate the greatest benefit.

In sum, we argue that the two management systems described above, working in parallel, have contributed to implementation difficulties in Swedish water governance. While the old system is designed to be predictable and stable over time, the new system is intended to be transparent and holistic, guided by the principles of Integrated Water Resource Management. In the following, we propose a multi-disciplinary research project to explain to what degree a holistic management approach is adopted and study the costs and benefits associated with the two approaches.

Identified needs for future research

The aim of the proposed research project is to explore the variation in the water governance in relation to hydropower. We will study how the institutional challenges of IWRM play out in Swedish rivers strongly affected by hydropower development, with the overall objective to provide suggestions on how to obtain a more balanced governance system that incorporates the strengths of both the old and the new system in order to maximize overall benefits to society.

Case studies of legal, political and economic aspects reflecting the shift in governance in two water bodies, the Lule and Mörrum Rivers, will be accomplished. The project draws on institutional theory and elaborates on the policy arrangements of the involved actors, resources and rules. We will examine relevant documents on how the clash between the two governance systems is manifested and a mail survey will be sent to the actors involved, to identify their resources as well as their interactions. Survey data will also be used to estimate the economic effects of improved fishing along the two rivers, as well as the environmental values linked to restored ecosystem connectivity in the river systems. The project contributes with knowledge on how a holistic and resource efficient balance between improved water quality and renewable energy production can be achieved.

Institutional clashes and path-dependence

The proposed research project departs from the assumption that the two water governance systems reflect different institutional policy arrangements with different incentives for action. It is further assumed that implementation problems related to Integrated Water Resource Management (IWRM) are caused by clashes between these two systems and the fact that in practice the old system tends to overrule the new holistic approach. The project is based on institutional theory and the idea of path dependence [9,10]. While institutions – understood as the constellation of rules and decision-making procedures – provide stability they do not necessarily provide efficiency, in terms of fulfilling environmental goals and achieving social acceptance (Young 1999). The persistence of inefficient institutions is often explained by systematic path dependence, when past decisions affect future choices

and previous moves in a certain direction will produce further development in that same direction (Pierson 2000, Mahony 2000). Despite this, institutions can be modified, replaced and repealed (North 1990). Path dependence is not only a barrier for change; rather, the concept emphasizes the nature and weight of co-existing institutions, and how (and where) institutional change can be induced. In the context of water governance, it is interesting to note that while the introduction of the river basin approach certainly had political support, the impetus for introducing it in practice was largely exogenous and driven by the adoption of the WFD at the EU level. Without this exogenous impetus, it is highly likely that path dependence would have kept the established regime in place. In practice, because of this path dependence, the established regime and in particular the old permits are effective barriers to the implementation of IWRM. In order to explain why it has been difficult for the new holistic water law system to take hold, and further explore the clash in different cases, it is necessary to disentangle the institutional policy arrangements.

Disentangling the policy arrangements: rules, actors, resources and discourses

We draw on the Policy Arrangements Approach (PAA) to map and analyse the arrangements in which hydropower permit processes take place, focusing on four dimensions: rules, actors, resources/power, and discourses (van Tatenhove et al. 2000). Each dimension give rise to a research question that, when analysed together, will provide an answer to why the holistic approach has not yet reached its full potential in water management in Sweden (see aim).

RQ 1: What rules and decision-making procedures govern the actors and the interactions between different coalitions?

The first dimension – rules – focuses on the formal and informal rules of the policy arrangement. This dimension is strongly connected with the other dimensions since rules assign actors different incentives and power positions and define the procedure for decision-making (Ostrom 2005). It is assumed that the two parallel water governance systems are based on different rules, discourses and logics and therefore create different incentives for the actors involved. This step of the empirical analysis is to define the function of, in particular, legal rules that govern the actors and their interactions in the studied cases of hydropower permit processes.

RQ 2: Who are the involved actors and what coalitions are formed?

The second dimension – actors and coalitions - implies research into the participation, positions, options available to, and interactions of the actors involved. Actors coordinate their actions and form coalitions to improve their stakes in the process. Hydropower is a conflict-ridden issue with many and often conflicting interests, e.g. power companies, environmental interests and sport fishing. Both the type of actors involved in the policy arena as well as the structure of coalitions (i.e. how they interact and the level of conflict between them) can be assumed to influence the hydropower permit processes. Thus, this

step of the empirical analysis is to identify the involved actors and existing coalitions, i.e. collaboration patterns.

RQ 3: What resources do the different coalitions have at their disposal?

The third dimension – resources – captures the distribution of power and influence between the coalitions defined by means of RQ1. Power refers to the deployment of available resources, and influence how policy outcomes are determined. The core idea is that actors in a given policy coalition depend on each other to different degrees for resources, e.g. financial resources, information, or political legitimacy (Bush 1987) and that the distribution of resources among coalitions, and possible changes, defines the policy process and its outcomes. Thus, this step in the empirical analysis is to map the resources held by different coalitions.

RQ 4: What discourses - or views of the policy problem and its solutions - do the different coalitions express?

The fourth dimension - policy discourses – illustrates the views and beliefs of the actors involved in the particular case. Discourses reflect both general ideas about governance and ideas about the concrete policy problem at stake, i.e. water bodies affected by hydropower, addressing the character of the problem, its causes and possible solutions. Discourses at this level tend to hold coalitions together (cf. policy beliefs, Sabatier 1988) which is why this fourth step of the analysis is to map the policy discourses of the competing coalitions in the studied hydropower permit processes.

RQ 5: How large are the economic effects linked to the two policy regimes?

There is a fifth issue which is not linked to the four PAA dimensions but to the choice of policy framework: that of which economic costs and benefits to consider. Many costs and benefits (e.g. production losses and improved fishing linked to a new fish channel) will be the same regardless of the framework used. However, in the traditional framework it is natural to also consider effects on the local economy (linked e.g. to increased fishing tourism) which are less important in the holistic framework where only changes in overall spending in Sweden as a whole will matter. On the other hand, in the holistic framework it is natural to consider effects on the electricity system as a whole, linked to changed water storage in an entire river's hydropower dams, as well as environmental values linked to reestablishing ecological connectivity and fish migration routes in a river system as a whole. Both types of effects can be ignored at the traditional level of individual hydropower plants, but not when decisions are made at the river system level.

Case description

Our empirical cases – Lule River and Mörrum River – illustrate how elements of the old institutional framework remain in place and how the new framework faces difficulties in implementation. However, the two cases diverge in regards to what degree; in Lule River

the old framework dominates almost completely, whereas in Mörrum River important elements of the new framework have begun to affect governance decisions. We believe that these two river systems serve as different, yet typical, examples of Swedish water governance. The Lule River has 15 hydropower plants which account for roughly 25 per cent of Sweden's hydropower. Due to this heavy hydropower regulation, the main river has little value for fishing or water-based ecosystems. Some of the old permits have subsequently been contested, for instance in the Letsi area along the Smaller Lule River, with diverging views on whether the conditions of the permits have actually been met; the ongoing political process linked to demands for changes in the conditions of the permit provides an interesting test case for many of the issues that appear in similar processes surrounding permits for hydropower plants elsewhere in the country; and there have been *ex ante* attempts to value the economic impacts of changes in the permits. With the implementation of the WFD and discussions of further changes in water legislation, a dialogue process on environmental improvement measures in the river is scheduled to begin in 2017 under oversight from national agencies; notably, there is widespread agreement among the key actors that this dialogue process will focus on studying measures at the installation level, in line with the traditional institutional framework. In the Mörrum River, the hydropower plants are far smaller and hence less valuable as components of the electricity system, and the high environmental values in this river, especially from the internationally famous salmon fishing, have ensured that national interest in environmental improvement measures has always been high. There have therefore been a series of environmental improvement measures carried out in different parts of the river system; most recently, there has been a court case affecting three upstream hydropower plants, as well as a voluntary agreement to tear down the hydropower plant closest to the sea where there is an agreement in principle but where the permit processes linked to removing the plant have yet to take place. Discussion of effects in the entire river system (as opposed to merely in the vicinity of each plant) played a key role in these recent policy processes, and this river system can therefore be seen as an example of a river where the more holistic, IWRM-related, institutional framework has begun to matter.

Data collection

Data will be collected and analyzed using both quantitative and qualitative methods. At the beginning of the project, relevant legal and policy documents will be identified to examine how the clashes between the two governance systems are manifested at the different levels of the political and legal system; from bills and legislation at the national level, to river basin management plans, and individual permits for hydropower in our two selected river basins (RQ1). The legal analysis will also include voluntary arrangements that can have a significant and persistent influence on the legal situation. The analysis will be performed by qualitative content analysis using the key features of the two parallel governance systems as our framework for analysis (see Figure 1). To identify who the involved actors are in our two cases, their resources and their views of the policy problem and its solutions, we will use qualitative and quantitative document analysis and a mail-in survey (RQ2-RQ4). We will start by exploring the rich material that is made available at the respective Water

Authorities' websites after the most recent processes of consultation on water management plans and related documents. Prior to adopting these programs for action and administration, consultations about goals and strategies to reach them are always held, inviting various authorities, municipalities, the public and a wide range of stakeholders to voice their opinion (EU 2000). Thus, during the consultation phase, written responses are delivered electronically or by regular mail presenting the views of most actors having an interest in Swedish water management. This material is commonly very comprehensive, often more than 1000 pages in total and can be anticipated to provide a good base for an initial analysis of who the relevant actors are, their interests and positions. A mail-in survey will be sent to the actors involved, identified through the prior document analysis. They can, for instance, encompass lower-level bureaucrats at government institutions involved in water policy, municipalities, power companies and various NGOs. The survey will be used to identify the actors' knowledge network and other resources as well as their interaction with other involved actors. Survey data will also be used to estimate regional economic effects of improved fishing along the two rivers, as well as environmental values linked to restored ecosystem connectivity in the entire river systems (RQ5).

Scientific justification and societal benefits

The proposed research project sets out to explore the governance of two river systems and focuses on the permit processes for hydropower. The aim of the project is to explain the variation in the governance of hydropower plants as regards to what degree holistic and ecosystem-based governance approach is adopted and to study the costs and benefits associated with the older and newer governance approaches. The project draws on institutional theory and elaborates on the policy arrangements of involved actors, their resources and what rules (regulations and decision-making procedures) that govern their actions. The assumption is thus that explanations for lacking implementation of the holistic approach are to be found in these arrangements.

The proposed project is unique in the sense that it explores the imbalances between the new and the old water governance systems from a multi-disciplinary perspective, elaborating upon the clashes between the traditional, nationally based regulatory system and the new holistic water governance system from legal, political and economic perspectives.

In Sweden, strongly path dependent institutional frameworks struggle with opening up to new and growing environmental knowledge and aiming to holistic decisions in the conditions of multilevel governance (Shapiro and Summers 2015), as this can pose a threat e.g. to the coherence of the legal system and existing power structures. Strong path-dependence thus hinders development of water law towards a more flexible and adaptive system, which is open to new developments in the environment and society. The proposed research project addresses how to break this path-dependence.

Acknowledgements

This work was funded by the Renewable Energy Area of Excellence at Luleå University of Technology, Sweden.

References

- Bergsten P, Nicolin S, Frisk A, Rydgren B, Poveda Björklund I, Stage J (2014) Miljöförbättrande åtgärder i Mörrumsån och Ångermanälven, med fokus på havsvandrande arter. ÅF Industry AB 74-74.
- Bush GWA (1987) R. A. W. Rhodes, The National World of Local Government (London: Allen & Unwin, 1986) pp. xviii, 441. \$150.00. Political Science 39 (2): 212-213. <https://doi.org/10.1177/003231878703900220>
- de Bruin EF, Jaspers FG, Gupta J (2005) Institutional implementation of the WFD. In: Vermaat L, Bouwer L, Turner K, Salomons W (Eds) Managing European Coasts, Past, Present and Future. Springer, Berlin, Heidelberg, New York, 1-254 pp.
- EU (2000) Directive 2000/60/EC of the European Parliament and of the Council. Official Journal of the European Union 22.12.2000: 1-72. URL: http://eur-lex.europa.eu/resource.html?uri=cellar:5c835afb-2ec6-4577-bdf8-756d3d694eeb.0004.02/DOC_1&format=pdf
- EU Commission (2015) The Water Framework Directive and the Floods Directive: Actions towards the 'good status' of EU water and to reduce flood risks. http://ec.europa.eu/environment/water/water-framework/pdf/4th_report/COM_2015_120_en.pdf. Accessed on: 2017-9-13.
- Hall A (2005) Water: water and governance. In: Ayre G, Callway R (Eds) Governance for Sustainable Development, A Foundation for the Future. Earthscan, London, 111-128 pp.
- Johansson PO, Kriström B (2012) Omreglering så att (nästan) alla blir vinnare – exemplet vattenkraft. Ekonomisk Debatt 40: 49-60.
- Mahony J (2000) Path dependence in historical sociology. THEOR SOC 29: 507-548. <https://doi.org/10.1023/A:1007113830879>
- North D (1990) An introduction to institutions and institutional change. Institutions, Institutional Change and Economic Performance. Cambridge University Press, Cambridge. <https://doi.org/10.1017/cbo9780511808678.003>
- Ostrom E (2005) Understanding Institutional Diversity. Princeton University Press, Princeton, 376 pp.
- Pierson P (2000) Increasing Returns, Path Dependence, and the Study of Politics. American Political Science Review 94 (02): 251-267. <https://doi.org/10.2307/2586011>
- Sabatier P (1988) An advocacy coalition framework of policy change and the role of policy-oriented learning therein. Policy Sciences 21: 129-168. <https://doi.org/10.1007/bf00136406>
- Shapiro A, Summers R (2015) The evolution of water management in Alberta, Canada: the influence of global management paradigms and path dependency. International Journal of Water Resources Development 31 (4): 732-749. <https://doi.org/10.1080/07900627.2015.1005286>

- Söderasp J (2015) What about State implementation – New Governance and the case of the European Union Water Framework Directive in Sweden. *Europarättslig Tidskrift* 18: 508-524. URL: <http://www.diva-portal.org/smash/get/diva2:977557/FULLTEXT01.pdf>
- van Tatenhove J, Arts B, Leroy P (2000) The Renewal of Environmental Policy Arrangements. In: Dordrecht (Ed.) *Political Modernisation and the Environment*. Kluwer.
- Vedung E, Brandel M (2001) *Vattenkraften, staten och de politiska partierna*. Nya Doxa: Falun, Sweden IX: 482.
- Young O (1999) *Institutional Dimensions of Global Environmental Change*. Public Administration and Public Policy. II.