Conflicts over Water Management and Water Rights from the End of Antiquity to Industrialisation
An Introduction

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Summary: The introduction defines the purpose of the volume, and locates the essays collected here in the different historiographical traditions of disaster studies as well as water management studies. The introduction reviews the different heuristic concepts that have been developed in these historiographical traditions. It analyses how the individual contributions included in the volume engage in dialogue with certain fundamental questions relating to these fields of study.

JEL-Codes: B25, N01, N53, N55

This volume considers the topic of conflicts over water management and water rights from the end of antiquity to industrialization.[1] Recently, the history of water management has become a popular research topic for historians, archaeologists, and cultural anthropologists. The explosion of interest in what has come to be called *Disaster Studies* has recently contributed to an increased focus on the history of water resources.[2] However, recent trends in this field have shown how reflection on catastrophic events cannot be separated from the study of the social and institutional aspects through which a

1 The volume is based on contributions of the 2nd International Symposion, UNESCO Welterbe Kloster Lorsch, 2nd-4th September 2019, on "Contesting Water Management and Water Rights. From the End of Antiquity to Industrialization", organized by Michele Campopiano and Gerrit Jasper Schenk, see the complete programme here: www.hsozkult.de/event/id/event-90680 (accessed 7.4.2023). The conference was the result of a fellowship for experienced researchers of Michele Campopiano at the TU Darmstadt funded by the Alexander von Humboldt Foundation. The editors would like to thank the Alexander von Humboldt Foundation for its substantial financial support of this publication.

2 To name just a few recent works on disasters: Asperen/Jensen (2023); Viceconte/Schiano/Cecere (2023); Riede/Sheets (2020); Bavel et al. (2020); Schenk (2017); on water-related disasters see e. g. Asperen/Eekhout/Jensen (2021); on related water history see e. g. Jensen (2024); Andermann/Schenk (2020), Chiarenza/Haug/Müller (2020); Huber-Rebenich/Rohr/Stolz (2017).

society manages its relationship with the environment.[3] While technical problems such as the use of material infrastructures are often placed at the center of these considerations, and the relationship between social organization and water management is more frequently discussed in academic publications, questions of water rights and their relationship with forms of landholding have been addressed less frequently by historians.

An important contribution, particularly in Germany, to broadening the scope of water research was made by infrastructure studies.[4] Infrastructures are not only material infrastructures. We understand infrastructure as the collective medium of subsistence that interposes itself between people and nature. This includes material phenomena as well as socio-cultural practices and cognitive processes. It is not only wealth or technology that have an impact on the environment as factors of human action but above all infrastructures. By studying them, we can understand how society is more or less vulnerable to environmental risks and responds to them. Infrastructures change throughout history: these changes are often linked to the balance of power among different social and political groups. However, as Gerrit Schenk has shown, the construction of infrastructures cannot only be understood as an expression or sign of a particular social configuration of power.[5] Infrastructures also influence this power configuration. Here, the question arises as to what connection exists between certain social structures and specific infrastructures. For centuries, humans shaped landscapes, resulting in diverse 'cultural landscapes'. This book addresses these questions for the period between c. 600 when the organizational forms of the last ancient empires underwent profound changes as a result of internal and external shocks and Islamic expansion transformed much of Africa, Asia, and Europe, and the 19th century when industrialization and technological progress swept the world.

Infrastructures and societies, as well as the landscapes they form, are the result of slow and long-lasting processes, resulting from complex interactions of natural and social factors. The complex interconnection between hydrology, geology, and society makes it necessary to look at processes across long timespans so that this volume takes a *longue durée* perspective. For this reason, conventional epochal boundaries between antiquity and the beginning of industrialisation do not play a decisive role (and the volume is, therefore, not structured accordingly).

The question of the nature and characteristics of the relationship between social structure, water management, political and legal demands, economic use, and the development of riverscapes is certainly not new but has changed significantly over the last hundred years. The famous study of the Rhine by the French *Annales* historian Lucien

3 See e.g. Hohensinner (2020); Campopiano (2018); Campopiano (2017); Schenk (2012a); Labbé (2011).

4 Förster/Bauch (2015); Reden/Wieland (2015); Engels/Schenk (2015); Schenk/Eifert (2018); Engels (2018).

5 Schenk (2010); Schenk (2012); Schenk (2020).

Febvre in 1935 demystified widespread myths and analysed the river function as a hinge between two nations with a focus on the political and economic history of this waterway in the Rhineland.[6] Marc Cioc's 2022 'eco-biography' of the Rhine, on the other hand, built on suggestions from US environmental historiography to understand rivers as 'organic machines'.[7] Besides humans as the main actors, Cioc included geomorphological and hydrological factors in his narrative of the recent history of Europe's second-longest river. In Britain, questions related to economic history played a decisive role for a long time, as the controversy over the competing uses of watercourses, in particular as transport routes or as an energy source (mill construction), has shown since the late 1980s.[8] There as well as (for example) for the watercourses in Brandenburg[9] it was shown that neither the complex interaction of natural and social factors nor the conflicts of use between boatmen, millers, fishermen and farmers can be reduced to schematic formulas, but rather produced a wide variety of configurations depending on time and space, each of which shaped landscape and society in a unique way.

Case studies on specific river systems or regional studies on certain sections of rivers are therefore an adequate research strategy to be able to analyse qualitatively, and sometimes even quantitatively, the complex interconnection of individual factors, and to determine their spatial impact. The studies of the 'Viennese School' of environmental history on the Danube are exemplary for an approach that includes environmental history, but is not limited to it.[10] More recently, individual river sections, smaller rivers or even streams have finally been addressed in this broader environmental-historical perspective.[11] In this context, different concepts were developed to adequately analyse and describe, methodologically, and conceptually, the mutual shaping of the natural environment and human society. However, Karl August Wittfogel's notion of a 'hydraulic empire', which was much discussed at the time, which draws a connection between (despotic 'oriental') ruling structures and large-scale water regulation, no longer plays a role, or at best just a foil for contrast, in the mostly socio-ecologically based concepts discussed in the history of water management, as in Tilman Frasch's contribution presented below.[12]

6 Demangeon/Febvre (1935), see Vanoncini (2019).
7 Cioc (2002); White (1995).
8 Starting with Edwards (1987), continued between (inter alia) John Langdon and James Frederick Edwards, see e. g. Langdon (1993), Langdon (2000), Edwards/Hindle (1993), Jones (2000). The controversy came to a certain end in an anthology in 2007, see Blair (2007) and Schenk/Eifert (2018), pp. 83 f.
9 Bütow (2015).
10 On the Vienna School of environmental history see Winiwarter/Knoll (2007), pp. 127–130. As examples: Haidvogl et al. (2013); Hohensinner et al. (2013); Schmid/Haidvogel (2008); Schmid/Winiwarter (2010); Sonnlechner/Hohensinner/Haidvogl (2013); Winiwarter/Schmid/Dressel (2013).
11 See Suttor (2006) on a part of the Moselle; Schenk (2018) on the small Ill river in Alsace; on the brook Strunde near Cologne see Meyer-Schlenkrich (2022).
12 See the contribution of Tilman Frasch; on Wittfogel's theory see Obertreis et al. (2016).

The authors of this volume prefer other perspectives, which aim at a small-scale analysis of concrete practical, technical, and legal problems and solution strategies in dealing with water as a resource and take a practical look at actors or groups of actors. Thus, the focus of the reflections and further developments is not on the large theoretical edifices such as Bankoff's 'Cultures of Disaster' or Ulrich Beck's 'Risk Society', but on medium-range concepts.[13] Among others, Christian Rohr's reflections on a specifically pre-modern 'flooding culture' (in German 'Überschwemmungskultur'), should be mentioned here, whose characteristics he attempts to analyse using the example of everyday dealings with 'normal flooding'.[14] Another point of reference is Petra van Dam's notion of an 'amphibious culture', which she developed with a view to the long-term social adaptation of the Dutch to a wetland landscape characterised by regular, sometimes catastrophic, floodings.[15] It includes both infrastructural measures in water management and in dealing with the risk of flooding (organisation of the cultural landscape in compartments; elevated settlements; water-carried transport, especially in the case of evacuation), but also mental structures, providing explanations for specific mentalities and even political structures (organisation of dam-building, of solidary aid or precaution) for a specific, socially shaped natural space. The most recent heuristic concept is that of a 'fluvial anthroposphere', which should help to record and describe a geologically verifiable shaping of fluvial landscapes through human interventions and activities.[16] In this volume, it is concretised by introducing a 'fluvial-social metabolism' for the measurement of human activities, which, at least selectively, could also provide quantitative parameters, for example, for the pollution of watercourses with biologically active pollutants.[17]

The case studies in this volume consequently offer, directly or indirectly, the opportunity to test the analytical added value of these concepts. The focus is on the use of the river as a comprehensively understood resource. When a resource is used for different purposes and in different ways, conflicts may arise, and the conflicting parties may try to secure property rights to achieve their specific goal. As Michele Campopiano has shown in various works, changing forms of economic land use and investment practices can fundamentally alter the relationship between society and water resources and lead to different forms of conflict.[18] There are many examples of conflicts over the use of water resources in different economies and societies: water could be used for drinking, irrigation, providing mechanical energy for production purposes, transportation, fish farming, or defense purposes. The different uses often competed and led to claims

13 See Bankoff (2003) and Bankoff (2017); Beck (1986) and Adam/Beck/Loon (2000).
14 Rohr (2007), pp. 201–398, especially pp. 280–287; Rohr (2004).
15 Dam (2016); these adaptive processes can be linked to the model of ‚resilience', see Clemens (2020).
16 Werther et al. (2021).
17 See the contribution of Schenk in this volume.
18 Campopiano (2013a); Campopiano (2013b); Curtis/Campopiano (2014); Campopiano (2017); Campopiano (2018).

for uses of the same resource for different purposes. Likewise, these claims could conflict with other societal tasks such as flood protection.

The essays collected in this volume offer several examples of the need to study the conflicts between different uses of water resources and their interaction with economic activities, property rights, and forms of political organisation. An example of conflicts between different uses of water resources is given by Raphael Longoni. He analyses a series of court documents of the city council and the building authority of Basel (Switzerland) from the 15th-century documents conflicts between the mill corporation and other users of the Upper Birsig, a canal. Its uses for watering meadows outside the gates, milling in the Steinenvorstadt, and removing refuse in the inner city overlapped and exerted increasing pressure on the canal. The slowly increasing pressure of use apparently impaired the canal as a resource for the subsistence of its users, almost all of whom lived in poor conditions, and reduced the social compatibility of canal use. The Upper Birsig shows a collective water infrastructure that approached its capacity limit in the 1500s, limiting operational possibilities, depriving certain users of their rights, and precarising the conditions of use.

Evelien Timpener's chapter shows that in the Rhine Valley, many conflicts over the rights of dominion and use of river islands made it clear how valuable these riverine and water-rich spaces must have been. The disputes probably also arose because the fluvial dynamics could quickly destroy the old agreements. Ultimately, flood events posed a great risk, because new channels, river bends and arms could form within the widely branched river system and thus cause considerable flooding, as they did through meander breakthroughs. Conflicts could arise concerning dyke-building. It is hardly surprising that the most effective and least conflictual way to build dikes was through cooperative associations. Not only did villagers come together in this, but the principle was also used by political actors in the region to build dykes quite effectively, although not at any price.

The exploitation of water interacts with the use of other natural resources, as Vadas' chapter shows us by analysing the case of mining towns in Hungary. This resource could be used for transportation, but most of all, for waterpower to grind grain, process metal ore, lift material from the mine shafts to the surface, and pump water from the mine shafts. These rights ultimately depended on royal concessions, which often did not consider specific geographical needs, creating further opportunities for conflict.

The study of the relationship between political structures and irrigation has deep roots in historiography. For example, Karl August Wittfogel put forward the famous (and largely criticised) thesis in 1957 that administrative centralisation and political despotism are characteristic of regions where large-scale water resource management measures are necessary. The topic of the relationship between irrigation needs and the construction of state structures is analysed by Tilman Frasch. He points out that some strong theoretical models developed concerning the relationship between the state and the organisation of water resources, and irrigation in particular, have been serious-