

A global comparison of pre-modern institutions for water management

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Our relationship with water is one of the major themes in environmental history. Water is both a crucial resource and a threat to human society. This is particularly true of the fertile, densely populated coastal and river plains, where water can bring life but also death in the form of devastating floods. In this Special Issue, we take an institutional approach to water history. How can the history of humans and water be framed in the larger environmental history debate, and why do we focus on institutions?

In the 1990s, environmental historians were concerned with dispelling the dichotomy between culture and nature. In *Uncommon Ground: Rethinking the Human Place in Nature*, William Cronon wrote that nature is a profoundly human construction. One of his main questions was, what would a more historically and culturally-minded way of understanding

nature look like? Among the studies on water, the most important response to this question was perhaps to be found in Richard White's *The Organic Machine: The Remaking of the Columbia River*. White argued that nature is simultaneously a cultural construction and something beyond human agency. Canals and dams form part of the Columbia River, meaning that there is no longer a border between humans and nature. The river is altered by human action, but it retains its natural qualities.¹ Some historians call such an object a hybrid.

For Europeans, this turn in environmental history perhaps came as less of a surprise than for Americans. For the latter, environmental history had started from a perception of nature as wilderness. As a discipline, its roots lay in environmental activism and the founding of the National Parks. In Europe, by contrast, very little wild nature existed; most nature was to be found in a landscape that had been influenced by humans for hundreds if not thousands of years, be it in the form of forests, the Alps, or the Rhine and Danube rivers.

According to Joachim Radkau in *Nature and Power: A Global History of the Environment*, the European experience is very useful when investigating ancient cultural landscapes from an environmental perspective. The same applies to Asia; prize-winning water studies have been written on hybrids, including an industrialising valley in 19th-century Italy and the delta of the Mekong River in Vietnam. These water dominated landscapes are also examples of hybrids.²

Richard Hoffman and Bruce Campbell, who published great studies on medieval Europe in 2014 and 2016, reformulated the 1990s approach to the nature-culture dichotomy and proposed complex models that acknowledge the reality, autonomy and interaction of both nature and culture.³ Whilst nature as a historical agent gets somewhat lost in the endeavour to study hybrid model such as these, the same applies to institutions.

¹ Willam, Cronon (ed.), *Uncommon Ground. Rethinking the Human Place in Nature* (New York/London: Norton & Company, 1995) 25; Richard White, *The Organic Machine: The Remaking of the Columbia River* (Hill and Wang: New York, 1995).

² Joachim Radkau, *Nature and Power. A Global History of the Environment* (Washington: German Historical Institute and Cambridge: Cambridge University Press, 2002) XII; Stefania Barca, *Enclosing Water. Nature and Political Economy in a Mediterranean Valley 1796-1916* (Cambridge, UK: White Horse Press, 2010); David Biggs, *Quagmire: Nation-Building and Nature in the Mekong Delta* (Washington: University of Washington, 2011).

³ Richard C. Hoffmann, *An Environmental History of Medieval Europe* (Cambridge: Cambridge University Press, 2014) 7-11; Bruce M.S. Campbell, *The Great Transition. Climate, Disease and Society in the Late-medieval World* (Cambridge: Cambridge University Press, 2016) 20-24, 397.

For this issue, we decided to study the human aspect of our interaction with water, while fully acknowledging the hybrid nature of the subject. We focus on institutions, defined as (formal) laws, rules and organisations, but also as (less formal) traditions, preferences, practices, norms and values.⁴

Institutions are important, because when creating a water infrastructure, being able to control water requires coordination. The fluidity of water means that its use has to be coordinated. Measures for protecting a community from floods or providing it with water for irrigation have consequences for other parts of the watershed in question. Building a dike on one side of the river may increase the likelihood of land on the other side flooding when the water level is high. Irrigating fields inevitably reduces the amount of water available for communities downstream. Institutions for controlling water are concerned with the construction of infrastructure and the maintenance and, in irrigated areas, distribution of water. For this issue, we wanted to focus on institutions, not the water system, as our central concept. We aimed to cover a broader array of human behaviour and mentalities, and we wanted to distance ourselves somewhat from the technological connotations of the concept of a water system.

The institutional approach to water history connects environmental history to recent trends in social and economic history.⁵ It asks questions about the form that water organisations have taken over time, varying from highly centralised, state-dependent organisations to private enterprises, and voluntary associations. Other questions concern power relations, both political and economic. How did power constellations influence the functioning of water institutions and what role, in particular, did elites play?

In the North Sea region, the current generation of historians is seeking to revise the history of water management. These historians have moved away from the former legal approach, which was formal and rule-oriented, towards an environmental, social and

⁴ S. Ogilvie, “‘Whatever is, is right’? Economic Institutions in Pre-industrial Europe”, *Economic History Review* 60 (2007) 649-684.

⁵ S. Ogilvie, “‘Whatever is, is right’?”; B. van Bavel, ‘History as a Laboratory to Better Understand the Formation of Institutions’, *Journal of Institutional Economics* 11 (2015) 69-91; S.R. Epstein, *Freedom and Growth: The Rise of States and Markets in Europe, 1300-1750* (London and New York: Routledge, 2000); Petra J.E.M. van Dam and Milja van Tielhof, ‘Losing Land, Gaining Water. Ecological and Dinancial Aspects of Regional Water Management in Rijnland, 1200-1800,’ in: Hilde Greefs and Marjolein ‘t Hart (eds), *Jaarboek voor Ecologische Geschiedenis 2005/2006: Water Management, Communities, and Environment. The Low Countries in Comparative Perspective, c. 1000 - c. 1800* (Gent: Academia Press, 2006): 63-94.

institutional approach. In doing so, they have by-passed earlier questions about the character of institutions (top-down versus bottom-up). They also apply comparative methods to the local, regional and supra-regional levels.⁶ Important research topics for this new approach include the participation of local ‘grassroots’ groups, such as peasants, in the decisions of the local and regional water authorities, and the interaction between water authorities and the state. Another theme that looms large concerns the roles played by socio-economic elites such as the nobility and urban landowners. How did they interact with the state and how did they invest capital in wetland drainage?

In March 2015, a workshop on water management was held in The Hague.⁷ Specialists in the history of water management presented their most recent research on local and regional institutions in the pre-modern period. Pre-modern is a complex and broad term, but perhaps it represents the best ‘fit’ for a wide-ranging comparison of cases in the period before the introduction of fossil fuel. The workshop’s objective was to compare the studies on the Low Countries to other areas in the world. Six of the papers that were presented in the workshop have been published in this Special Issue.

This Special Issue focuses on two sets of questions. The first set concerns the political and socio-economic conditions for long-term institutional change. The relationship between water institutions and the state is examined, along with the extent to which the functioning of these institutions was dependent on socio-economic elites.

Rafaël Morera investigates institutional change as a consequence of major changes in the political framework, in this case the French conquest of Maritime Flanders (now part of Belgium) in the mid-seventeenth century. The management styles of local elites and local

⁶ Daniel R. Curtis, ‘Danger and displacement in the Dollard: The 1509 flooding of the Dollard Sea (Groningen) and its impact on long-term inequality in the distribution of property,’ *Environment and History* 22/1 (2016): 103-135; Milja van Tielhof, ‘Forced solidarity. Maintenance of coastal defences along the North Sea coast in the Early Modern Period,’ *Environment and History* 21/3 (2015): 319-350; Piet van Cruyningen, ‘Dealing with drainage: State regulation of drainage projects in the Dutch Republic, France, and England during the sixteenth and seventeenth centuries,’ *Economic History Review* 68 (2015): 420-440; Greg Bankoff, ‘The “English Lowlands” and the North Sea basin system: A history of shared risk,’ *Environment and History* 19/1 (2013): 3-37; Tim Soens, ‘Flood security in the Medieval and Early Modern area: A question of entitlement?’ *Environment and History* 19/2 (2013): 209-232.

⁷ The workshop was organised as part of the project ‘In Search of the Poldermodel: Participation and Representation in Dutch Water Boards in the Pre-democratic Era’ (coordinator Milja van Tielhof), and sponsored by the Netherlands Organisation for Scientific Research (NWO), which also sponsored the maps in this issue and language editing.

authorities such as city governments and water boards (*wateringen*) were absorbed into the French administrative machinery. As a result of the management style imported by the French, state-directed engineers made deep modifications to the hydraulic network in order to defend the strategic harbour town of Dunkirk. The water boards were still allowed to raise levies for their own local infrastructure (local drainage), but they also had to raise levies for the infrastructure of the king (defence and regional drainage). Eventually, local water units became an element in the operation of the monarchical administration. The state thus created a confrontation with landowning organisations, by eliminating any intermediary power that was likely to intervene. In order to achieve its objectives, the French government used the notion of the public interest and relied upon the circulation of high-quality information.

Piet van Cruyningen also examines institutional change, this time in relation to the role of socio-economic elites. His case concerns the distribution of the cost of maintaining flood defences. He compares the policies of three provincial governments in the southwestern Netherlands. In Zeeland, the representatives of cities with entrenched economic interests managed to delay the introduction of a more equitable distribution of costs for seventy years. This ‘institutional failure’ was reflected in the term used for the endangered water units along the sea coast, the ‘calamitous polders’, where the risk of flooding was very high. By contrast, in Holland and Zeeland-Flanders, local governments ‘nationalised’ dike maintenance relatively early and all stakeholders were made to contribute, since there was a clear separation between economic and political power and no political resistance based on vested interests.

In a similar way, Michele Campopiano focuses on the role played by elites in institutional change, and he compares Iraqi society in two different time periods. In late antique Iraq, the organisation of water management initially depended on complex, but apparently effective interaction between local communities, an aristocratic elite and imperial officers. This interaction enabled the government to gather information from different regions of the empire and to understand the needs of the various stakeholders. The system was overhauled in early medieval Iraq, in the eighth and ninth centuries, when anew, more commercially orientated elite of landholders, tax farmers and merchant bankers emerged. They came to control the water management system, subjugating it to their short-term, more profit-orientated interests. In due course, this contributed to erosion, siltation and the destruction of ecosystems.

The second set of questions focuses on cultural aspects of long-term institutional change. More specifically, the papers dealing with this issue, look at how the state used the codification of water institutions and formalised information-gathering on water management in decision-making; how this affected the influence of stakeholders; and how the state used the normative concept of the public interest in its dealings with water institutions and individual stakeholders.

Morgan investigates cultural practices at the Courts of Sewers in England in the early and later seventeenth century. The jurors in the courts were drawn from the more successful yeomen farming class, who had an intimate knowledge of local environmental and social conditions. In the sixteenth century, the codification of customs started to transform what were previously malleable, relatively accessible oral customs into written legal texts with a fixed content. Jurors' reliance on codified customs came to limit their effectiveness as representatives of local interests. Stakeholders without access to texts, because they could not read the written vernacular, or because official documents were not accessible to the public, were gradually excluded from decision-making. By the seventeenth century, this process removed a degree of agency from local stakeholders, as well as an element of the live ecological responsiveness that communities could use in their 'negotiation' of customary knowledge.

Milja van Tielhof considers the administrative culture of the imperial Habsburg government in sixteenth-century Holland, focusing on regional water management. The Habsburg government had to deal with communities that enjoyed strong self-governance. The government used four administrative practices when negotiating new drainage schemes with local stakeholders: a broad consultation process, by which opponents of a scheme were also heard; landowners giving their explicit consent to the plans and their costs; the proportional division of the costs; and the use of compensation for damage suffered. During a consultation, reliable, relevant and detailed local-level information was collected in so-called 'enquestes' (inquiries), led by a few powerful, high-ranking imperial officials. This technique originated in medieval legal proceedings, but became more elaborate and formal in the period concerned, as an expression of the ongoing state formation process. The effectiveness of such practices heavily depended on the involvement of regional elites, however, especially the imperial officials, who had a major personal interest in the water system.

In the final paper, Wenkai He discusses one particular aspect of the administrative culture of the state, the normative concept of the public interest in China. During the period between 1720 and 1850 (Qing dynasty), the Chinese state attempted to find solutions that would satisfy the interests of various competing parties. Local representatives, mostly the gentry, requested the state's participation in the financing of local water control projects by means of loans. In addition, in cases of cross-regional conflicts, the Qing state sent out officials to conduct field investigations and make inquiries. This reflected its intention of behaving as an 'impartial' guardian of the public interest in both financing and settling cross-regional conflicts of interest over water, a role which was recognised by the water authorities at the local level.

Together, the papers illustrate the great opportunities presented by taking an institutional approach to researching pre-modern water management, and the benefits of applying a comparative, global perspective. The papers show that societies in wetland areas worldwide responded to water challenges with a finely tuned mix of institutional solutions. Everywhere, water was managed by bottom-up private enterprises and voluntary cooperation at the local or regional level, combined with top-down intervention by the state. Institutional change, expressed in terms of competence and power, could be triggered by several forces. The major political changes in Maritime Flanders could be seen as an exogenous process, the role of urban elites in the southwest of the Republic of the Netherlands and that of new elites in Iraq as an indigenous force. In the North Sea region, where the organisation of water management has often been described as democratic and bottom-up, participation in decision-taking was often limited to elites, and was thus more top-down than we might expect. Even powerful and absolutist states, however, had to take influential local groups and water authorities into account, as the French and Chinese examples show. In all of the cases, the government respected the interests of local stakeholders, and in some cases this was expressed through participatory information-gathering procedures.

The current prospect of climate change means that water management is an increasingly pressing issue across the world. Today's solutions may not work in the future. This statement made in 2006 by water history specialists Terje Tvedt and Eva Jakobsson in the first volume of the UNESCO-sponsored book series *A History of Water* has only gained

more urgency in the light of recent developments.⁸ We therefore hope that this Special Issue contributes to the knowledge base that will inspire future decision-makers on water policies.

⁸ Terje Tvedt and Eva Jakobsson (eds.), *A History of Water. Water Control and River Biographies* (I.B. Tauris London/New York 2006) XII.