

Introduction

Water, Society and Politics

I grew up on the Jiangnan Plain, the alluvial plain at the confluence of the Yangzi River* and its biggest tributary, the Han River. For over twenty-five years, I experienced the subtropical monsoon weather of the plain, with its smothering heat in the summer, chilling cold in the winter, and rather pleasant but short spring and autumn. I grew up in this watery environment, feasting on its variety of fish, aquatic plants, and crops and panicking when the Yangzi and Han Rivers threatened to flood. How, I want to ask, did the ecosystems of the Jiangnan Plain shape people's lives, and how was the natural environment transformed in this reciprocal relationship? With several hydraulic megaprojects on the Yangzi River today concentrated in the Jiangnan region, one wonders, how have the geography and ecology of the plain shaped the historical trajectory of the region, and how have human politics and cultural practice been written on the landscape and waterscape of the plain?

In this book I analyze the interactions between human society and the natural environment that underlay the developmental trajectory of the Jiangnan Plain from the seventeenth to the early twentieth century. To express the central concept employed for interpreting the human-nature relationships of the plain, I use the term "water regime." The water regime here is broadly defined: it includes not only the historical bodies of water (rivers, lakes, and wetlands) on which humans have built structures (dams, dikes, and land enclosures) but also an environmental complex in which various natural elements (including animals, forests, floods and droughts, and diseases) were closely associated with and interacted with bodies of water and the human world. As this book shows, various bodies of water have been a critical part of the transformation of the Jiangnan Plain, from a hydraulic periphery in the early Qing dynasty (late seventeenth century), to a core region of hydroengineering in contemporary China.¹ It also demonstrates how this transformation of the plain affected the political and social tapestry of late imperial and modern China and how the interplay between social and ecological conditions intertwined with the ever-changing relationship between people and water.

* I have used "Yangzi" throughout the book. Occasionally, "Yangtze" or "Yangtse" is used as a variant of "Yangzi," if the word is quoted directly from other sources.

1 What I mean by a "hydraulic periphery" was a region where hydraulic activities were less intervened by the state. It by no means overlooks the scope and vitality of community-based hydraulic activities on the Jiangnan Plain.

This conceptualization of the water regime aims to construct a hydrosocial approach to understanding water and politics. Prior studies on water conservancy (*shui li* 水利) in Chinese history have predominantly focused on human agency, thus reducing water, or nature in general, to merely the background to human politics. A few important studies that emerged over the past decade have successfully reinterpreted the relationship between water and society but an integrated approach that analyzes the social, ecological, and cultural dimensions of water has been absent.² In addition to providing a regional environmental history, this book's hydrosocial approach takes into account the complexity of the water environment as well as of society, exploring the myriad socioecological processes that have transformed and continue to transform the plain.

In this book, I trace the evolution of the water regime from the 1600s to the early 1900s, which could assume a different primacy in different contexts; it could be a regime highlighting the human conquest of land and water or a regime in which the forces of preservation and encroachment fought and negotiated with each other. It could be a military regime in which water was ignored, and an environmental crisis loomed, or a regime in which water was emphasized as a source of energy. In each regime, human and nonhuman actors interacted, developed complex relationships, and induced changes. The shifts in the water regime underlay the long-term social and environmental transformations of the region. I argue that changes in water systems were the result of an intricate interplay among the local politics, cultural practices, hydraulic engineering as well as the hydrogeomorphology of the rivers, and the geography and ecology of the Jiangnan Plain. In this way, the waterscape and landscape of the plain were a kind of "socionature" produced through the interactions between water, state politics, and social powers that acted upon it.³

2 See Ling Zhang, *The River, the Plain and the State: An Environmental Drama of the Northern Song China* (Cambridge: Cambridge University Press, 2016); David Pietz, *The Yellow River: The Problem of Water in Modern China* (Cambridge: Harvard University Press, 2015); Micah Muscolino, *The Ecology of War in China: Henan Province, the Yellow River, and Beyond, 1938–1950* (Cambridge: Cambridge University Press, 2014).

3 The concept of "socionature" emphasizes that natural or ecological conditions and processes do not operate separately from social processes, and that they are simultaneously natural and social. Erik Swyngedouw studies the intertwined relationship between water politics, hydraulic engineering, and modernization of Spain in 1890–1930. He emphasizes the hybrid character of the water landscape, or "waterscape" in "Modernity and Hybridity: Nature, *Regeneracionismo*, and the Production of the Spanish Waterscape, 1890–1930," *Annals of the Association of American Geographers* 89, no. 3 (1999), 443.

This book contributes to the broad discussion of the relationship between the state and society in what has been called “hydraulic societies.” On one side is total state control within a Wittfogelian “hydraulic empire”; on the other side is a Balinese Geertzian or Stephen Lansing-style democratic irrigation model of power resting on local social organizations. By focusing on the massive community-based water management in the Jiangnan Plain, this book reveals the transitional process from local initiative to increasing intervention by state power. As I pointed out earlier, the Jiangnan Plain experienced a shift from hydraulically marginal to a hydraulic powerhouse in about four centuries. Hence, this book is a regional history of social and ecological transformations from a long-term perspective.

Furthermore, the large body of literature on water control has not dealt with many factors in this particular region—for example, the Manchu migrants adapting to the environment in China proper, militarization during the age of the Taiping Rebellion, and the rising hydroenergy regime of the early twentieth century. By conducting a hydrosocial analysis of water and politics, this book offers a fresh perspective on those factors and shows that water is not merely a resource that is exploited but a natural condition that informs human relations.

1 Theorizing Water and Politics

The relationship between hydraulics and politics has been an inseparable part of the discussion on water control in Chinese history, reflecting China’s long history of authoritarian government administrations. Karl Wittfogel’s model of “Oriental despotism” remains an important reference in this respect. In this model, one or a few supreme individuals had absolute control over the common people, just as they did over the rivers that coursed through their territory.⁴ States that were built based on large waterworks developed permanent despotic systems. Furthermore, Wittfogel applied his model to China, India, and other “hydraulic states.”⁵ Many scholars have pointed out two main fallacies, among many, in the theory of hydraulic despotism. First, Wittfogel adopted a totalitarian view of China and emphasized the permanent political

4 Karl A. Wittfogel, *Oriental Despotism: A Comparative Study of Total Power* (New Haven: Yale University Press, 1957).

5 See Karl A. Wittfogel, “Chinese Society: An Historical Survey,” *Journal of Asian Studies* 16, no. 3 (1957). In his article, Wittfogel discussed major dynasties in Chinese history and argued that Chinese society was a typical hydraulic society throughout its history.

consequences of water control; second, he ignored diversity and changes in Chinese society (and many other societies) in his theory. Therefore, his view is static, and his argument is ahistorical.⁶

Before Karl Wittfogel, other social theorists had fundamental ideas that resembled those of Oriental despotism. For example, these ideas formed the basis for G.W.F. Hegel's distinction between East and West, and Karl Marx's concept of the "Asiatic mode of production" elaborating Hegel's abstract scheme prefigured the Wittfogelian hydraulic despotism model. Scholars thus emphasized the lack of political autonomy in Chinese society. For example, Max Weber stressed the dominance of the official class over political and economic life and argued that Chinese cities never achieved the economic centrality and political autonomy found in the medieval West.⁷ Kung-ch'üan Hsiao stated that prevailing incompetence, corruption, favoritism, exploitation, the inertia of the peasants, and stagnation in nineteenth-century rural China reaffirmed the totalism of state power and that thus the weak peasantry had to rely on local gentry, as representatives of the state, for positive leadership.⁸ Joseph Needham, who had been heavily influenced by Wittfogel's idea of a despotic hydraulic society, believed that the expansive bureaucratic system in late imperial China contributed to a rather slow pace of technological innovation, which hindered the onset of a scientific revolution.⁹

6 Theodore Shabad, "Non-Western Views of the 'Hydraulic Society,'" *Annals of the Association of American Geographers* 49, no. 3 (1959): 324–325. See a comprehensive critique of Wittfogel's theory in F.W. Mote, "The Growth of Chinese Despotism: A Critique of Wittfogel's Theory of Oriental Despotism as Applied to China," *Oriens extremus* 8 (1961). Donald Worster, in his famous revisit to Wittfogel's theory to examine the American West, points out that although Wittfogel's theory of Oriental despotism has become "far-fetched and prejudiced," his theory does raise important questions about "the link between water and power, ... in the hope of understanding more fully the consequences of our behavior toward nature"; Donald Worster, *Rivers of Empire: Water, Aridity, and the American West* (New York: Pantheon Books, 1985), 29.

7 Max Weber, *Religions of China* (New York: The Free Press, 1951), 13–20. For an extensive discussion on oriental despotism, limited state power, and the relationships between state and economy, see Peter C. Perdue, *Exhausting the Earth: State and Peasant in Hunan, 1500–1850* (Cambridge: Harvard University Press, 1987), 2–3. In his classic studies on Hankow, William T. Rowe criticized Weber's "treaty-port view" of Chinese cities, and he emphasized the long-term trend towards the privatization in the Chinese economy as well as "the rise of a specifically urban consciousness and the emergence of a true 'urban class.'" William T. Rowe, *Hankow: Commerce and Society in a Chinese City, 1796–1889* (Stanford: Stanford University Press, 1984), 341, 342.

8 See Kung-ch'üan Hsiao, *Rural China: Imperial Control in the Nineteenth Century* (Seattle: University of Washington Press, 1960).

9 Joseph Needham, ed., *Science and Civilization in China*, vol. 4, pt. 2 (Cambridge: Cambridge University Press, 1965). Review articles about Needham's scholarship include Timothy Brook, "In Memoriam: The Sinology of Joseph Needham," *Modern China* 22, no. 3 (1996);

Opponents of the Oriental despotism model criticize the assumption inherent in the theory of a lack of any limitations, legal or customary, on the absolute power of the ruler. They propose the opposing model of local self-governance in water management. Works that are representative of this view include those by the anthropologists Clifford Geertz and Stephen Lansing. Geertz conducted an extensive investigation on the irrigation systems in Bali and Morocco and analyzed two contrasting models of water management: the wet rice paddies in Bali, where the irrigation system is largely managed by local farmers associations called *subaks*, and the drylands irrigation in Morocco, where communities developed an individualistic style of water management and an emphasis on private ownership.¹⁰ Lansing's study further asserted the self-governing water management of Balinese local society, which showed that water management, especially of the irrigation system, was organized by "networks of 'water temples' ... constituted an institutional system separate from the state."¹¹ Both Geertz's and Lansing's arguments assumed a largely decentralized model in hydraulic societies; their studies changed the scholarship dominated by Wittfogel's theory of Oriental despotism and contributed to a profoundly new understanding of the relationships between local control of and state power over water. However, limited by the nature of their anthropological work, they also implied that water temples in Balinese society were permanent, a position that poses an ahistorical view of the society by emphasizing its stability and downplaying the temporal changes in state-society relationships.

In China, each model seemed to fit a different region, such that the Wittfogelian model in the politically important northern China and the Geertzian model the economic powerhouse of Jiangnan (the lower Yangzi valley). Wittfogel and Hsiao describe intensive state control, especially in the management of the Yellow River. A variant of this model noted long-term spatial movement of state water control: Ch'ao-Ting Chi described "key economic areas" that shifted from the loess region and the North China Plain to the Yangzi

Robert Finlay, "China, the West, and World History in Joseph Needham's 'Science and Civilization in China,'" *Journal of World History* 11, no. 2 (2000).

10 Clifford Geertz, "The Wet and the Dry: Traditional Irrigation in Bali and Morocco," *Human Ecology* 1, no. 1 (1972).

11 J. Stephen Lansing discussed it for the first time in his article, "Balinese 'Water Temples' and the Management of Irrigation," *American Anthropologist*, n.s., 89, no. 2 (1987). He elaborated his point later in *Priests and Programmers: Technologies of Power in the Engineered Landscape* (Princeton: Princeton University Press, 2007).

valley in the south during the Tang dynasty (618–907)¹² and underlined the state's increasing reliance on this region throughout the late imperial period.¹³

In contrast, water management in southern China, as examined by Mark Elvin, followed a more self-governing model. In the Sanyuan polderland in late seventeenth-century Guangdong Province, he described “regular annual meetings of publicly selected representative and systematic public selection of hydraulic managers” as a sort of “proto-democracy.”¹⁴ Japanese scholars also found strong democratic elements in the lineage management of hydraulic projects.¹⁵ This local management model is seen in R. Keith Schoppa's nearly nine-hundred-year history of Xiang Lake, an artificial lake constructed for irrigation southwest of Hangzhou in 1112. Over time, private landowners' interests and lineage feuds slowly drained the lake for agricultural cultivation until it completely disappeared under the Communist regime. But countervailing actions by local officials promoting the common good presaged “modern environmental awareness” in premodern Chinese society.¹⁶

Such community-level initiatives for managing the commons are emphasized in some anthropological and historical works on southern China. Kenneth Dean and Zheng Zhenman's study of self-governing hydraulic communities in the alluvial Putian Plain of Fujian identified a kind of “second government” that was generated by village temples and the ritual alliances they have formed, and that addresses certain local concerns more effectively than the state and local government officials.¹⁷ Thus, they traced a shift in control over water on the Putian Plain from the state to the local level. They also found a correlation between village temple construction and the formation of ritual alliances among lineages to manage water resources. The idea of ritual alliances within a common irrigation system resonates with Geertz and Lansing's observation of Balinese self-governing water management.

12 Ch'ao-Ting Chi, *Key Economic Areas in Chinese History: As Revealed in the Development of Public Works for Water-Control* (New York: Paragon Book Reprint, 1963), 39–45.

13 Chi, *Key Economic Areas in Chinese History*.

14 Mark Elvin, *The Retreat of the Elephants: An Environmental History of China* (New Haven: Yale University Press, 2004), 117–118.

15 Mark Elvin, et al., ed., *Japanese Studies on the History of Water Control in China: A Selected Bibliography* (Canberra: Institute of Advanced Studies, Australian National University; Tokyo: Centre for East Asian Cultural Studies for UNESCO, Tokyo Bunko, 1994).

16 See R. Keith Schoppa, *Song Full of Tears—Xiang Lake: Nine Centuries of Chinese Life* (New Haven: Yale University Press, 1989). A later edition of the book includes a new epilogue; see R. Keith Schoppa, *Song Full of Tears: Nine Centuries of Chinese Life around Xiang Lake* (New York: Basic Books, 2002).

17 Kenneth Dean and Zheng Zhenman, *Ritual Alliances of the Putian Plain*, vol. 1: *Historical Introduction to the Return of the Gods* (Leiden: Brill, 2010), 3, 9–10.

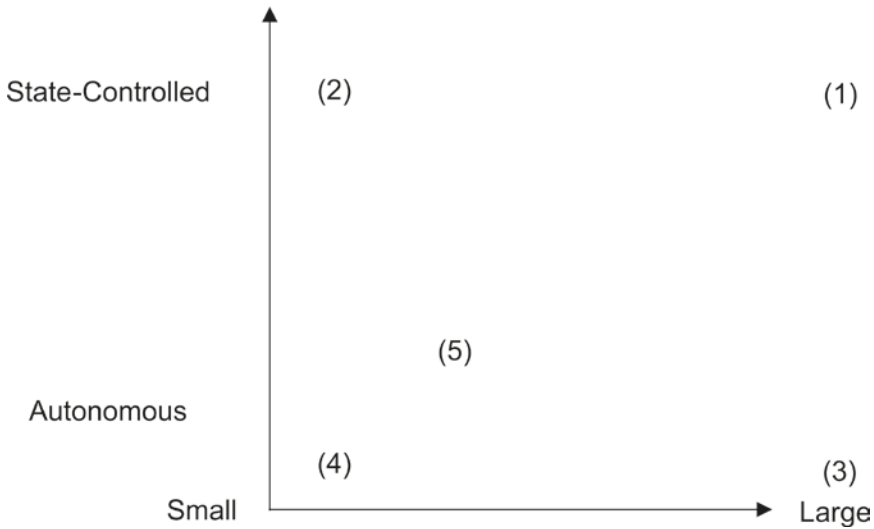


FIGURE 1 Five modes of state control in water management
SOURCE: PERDUE, *EXHAUSTING THE EARTH*, 171.

To evaluate various degrees of state control in water management, in his work on the transformation of the Hunan economy from the sixteenth through the eighteenth centuries, Peter C. Perdue distinguishes five modes of hydraulic organizational structure: “(1) large state-controlled projects like the Yellow River Administration, with its hordes of bureaucrats and military troops responsible for maintenance. (2) smaller state-run projects in nearly every province, like the Jinshazhou works in Wuchang prefecture, Hubei, or the Hucheng stone bank in Jiujiang prefecture, Jiangxi. Relatively autonomous works range from (3) the huge Sanyuan polder [analyzed by Elvin] down to (4) the tiniest irrigation ditch in a peasant’s field.”¹⁸ The hydraulic works, known as the Hunan polder organizations, fell into the fifth mode “between the extremes of autonomy and official control, but nearer the autonomous pole.”¹⁹ The distribution of the five modes indicating the degree of state control is shown in Figure 1.

Perdue went on to discuss the complexity of the polder organizations in the Hunan region. He recognized that “the self-contained geographical units of the enclosures around Dongting Lake must have had a strong shaping effect on the social communities they contained, particularly since the development

¹⁸ Perdue, *Exhausting the Earth*, 171.

¹⁹ Perdue, *Exhausting the Earth*, 171.

of these polder lands made possible the growth of new marketplaces.”²⁰ He detailed suggestive information on how those “self-contained geographical units of the enclosures shaped local society”: in Xiangyin County [Hunan Province] “each polder was dominated by one or two prominent lineages ... identified by the polder with which it was associated.”²¹ Following Perdue’s work, this book further investigates the shaping effects of the “self-contained geographical units of the enclosures,” called *yuan* 垸. The story of the *yuan* in the Jiangnan Plain is another example of Perdue’s fifth autonomous mode of water management in late imperial and modern China.

An analysis of this fifth mode rejects both extremes—the despotic model and the completely self-governing model—and reveals interesting patterns of ebb and flow between the powers of state and society. First, this mode emphasizes the relatively autonomous nature of the hydraulic units in the middle Yangzi. After the Southern Song state initiated the *tuntian* 屯田 (military agro-colonies) in the Jiangnan Plain in the 1200s, the hydraulic construction known as *yuan* was soon adopted by the people as an essential structure for survival in a watery environment. Since the imperial rulers’ attention to water projects focused predominantly on the Yellow River for political stability and on the Jiangnan agriculture for state revenue, the Jiangnan Plain along with the Yangzi River management was then on the margin of imperial rule. Therefore, in its early stage of development from the Southern Song to the early Qing (1200s–1600s), the *yuan* was mostly constructed, financed, and managed by local communities with minimal state intervention. The state presence in the resource management of the Jiangnan Plain increased in the early eighteenth century when the population started to exert greater pressure on the arable land, and the Yongzheng emperor (1723–1735) took a more interventionist, though still limited, approach in this region.

The self-governing hydraulic communities of the Jiangnan Plain never succumbed completely to state power, because of their peculiar nature. Shaped by the flood-prone environment of the plain, the community members were inward looking. They were both inclusive and exclusive, engaging in constant conflict and collaboration with one another and struggling with neighboring *yuan* over waterworks and flood control. Likewise, they were both transient, because the *yuan* flooded easily and dikes broke easily, and permanent, because *yuan* communities persisted even after dike boundaries vanished. Their peculiar nature caused the *yuan* communities to develop their own

20 Perdue, *Exhausting the Earth*, 174.

21 Perdue, *Exhausting the Earth*, 174.

mechanism for discourse with the powers above—they developed a stable managerial system that persisted from the late Ming to the early Republican period (1600s–1900s); they actively collaborated with the government in militarization; and they tried to manipulate the government in controversies over water control projects. What our analysis shows is constant negotiation and competition between the *yuan* communities and the state over land and water resources in the late imperial and modern periods. The self-governing system of the *yuan* communities continued for centuries, though the state encroached on it to various degrees in the process, until the omnipotent regime under Mao Zedong reorganized the entire hydraulic and land system at the local level in the 1950s.

Although the fifth mode emphasizes the semiautonomous nature of those hydraulic communities, it does not reject the role of the state in resource management at the community level in the middle Yangzi region. As Perdue points out, “Studies of the Middle Yangzi must at least consider the role of the ‘hydraulic state,’ even if they ultimately reject its importance.”²² In his probe of global environmental history, Joachim Radkau discusses the prevalent initiatives at the community level in the middle reaches of the Yangzi between the sixteenth and nineteenth centuries, in which “the Chinese state was de facto not a real ‘hydraulic despotism,’ though it operated or let happen hydraulic projects that would have required a more effective centralized power in critical situations.”²³ Perdue shows that more state-sponsored reclamation was required in the mid-Yangzi than in Zhejiang (in the lower Yangzi area), and most of all in the North China Plain, where the Yellow River and the capital were located. Military factors played a strong role. In the Southern Song dynasty (1127–1279), officials built a dike that was 100 miles long on the north bank of the Yangzi River, as a hydraulic *glacis* against the Jin, then the Mongols,²⁴ a defensive move that was the prelude to massive land reclamation. In the early Qing, during

22 Peter C. Perdue, “Lakes of Empire: Man and Water in Chinese History,” review of *Xiang Lake: Nine Centuries of Chinese Life*, by R. Keith Schoppa, *Modern China* 16, no. 1 (1990): 124.

23 Joachim Radkau, *Nature and Power: A Global History of the Environment* (Cambridge: Cambridge University Press, 2008), 110. Radkau points out that the main problem in the mid-Yangzi region was that “landowners diked off some of the river meadows and thus exacerbated the flooding catastrophes” and that “the increasingly dense settlement of ecologically fragile mountain regions and the expansion of rice cultivation requiring water” were the two main factors to drive the hydraulic problem.

24 Pierre-Etienne Will, “State Intervention in the Administration of a Hydraulic Infrastructure: The Example of Hubei Province in Late Imperial Times,” in *The Scope of State Power in China*, ed. Stuart R. Schram (Hong Kong: Chinese University Press, 1985), 300.

the Revolt of the Three Feudatories (1673–1681, also known as the Wu Sangui Revolt)²⁵, the Kangxi emperor (r. 1661–1722) set up a military base in the city of Jingzhou, thereby tightening the Qing state's control of the middle Yangzi region. From the end of the eighteenth century to the mid-nineteenth century, the middle Yangzi again became a major battlefield, where the Qing state army and various groups, including the White Lotus, Taiping, and Nian rebels, fought relentlessly. State military schemes in the middle Yangzi region inevitably put pressure on resource management. Official thinking on military logistics since the first millennium BCE had been preoccupied with the supply of food and its cheap transport by water at the expense of the issue of sustainability.²⁶ As Elvin says, “Short-term rewards from the over-exploitation of resources tended to reduce any inclination of the state to limit exploitation within sustainable limits at a time of crisis (at a given technological level).”²⁷

Although most of these works provide structural analysis, Pierre-Etienne Will's study of the late-imperial water management of the Hubei Plain offers a temporal perspective. In his 1985 article, Will proposes a cyclical pattern of state intervention in the hydraulic system consisting of development—crisis—recession. He argued that the state could successfully mediate local hydraulic projects in the early Qing, but these interventionist approaches receded in the late Qing. However, “the state's efforts at developing large mechanisms for water control did not lead to a stricter control on water and land resources, but favored the hold of private interests over these resources and furthered the development of private ownership even at the expense of what was originally state-owned.”²⁸ While challenging Wittfogel's permanent despotic social structure in a hydraulic society, Will's theory of a hydraulic cycle took a Wittfogelian approach by emphasizing the dialectics between hydraulics and politics and reducing the environment to merely a backdrop for political events. We need to develop new ways to analyze the role of water in shaping society and to

25 The Wu Sangui Revolt was a rebellion led by three warlords in Yunnan, Guangdong and Fujian against the Qing court during the early reign of the Kangxi emperor (also see Chapter 3 n 22). The White Lotus, Taiping, and Nian rebellions were three widespread peasant rebellions in nineteenth century China. See Chapter 4 for discussions on the rebellions and the environmental consequences of military events.

26 Mark Elvin, “The Environmental Legacy of Imperial China,” *China Quarterly* 156 (1998): 755–756; idem, “Three Thousand Years of Unsustainable Growth: China's Environment from Archaic Times to the Present,” *East Asian History* 6, no. 24 (1993). Elvin also mentions a famous case in Chen Shou, *Sanguo zhi* 三國志 [*Records of the Three Kingdoms*] (Beijing: Zhonghua shuju, 1969), 28: 775–776.

27 Elvin, “The Environmental Legacy of Imperial China,” 755–756.

28 Will, “State Intervention,” 298.

understand the complex and everchanging relationship between people and nature in Chinese history.

2 Revisiting the Relationship between Water and Society

As the Norwegian historian and geographer Terje Tvedt has written, “the dominant conceptual and theoretical traditions are still fundamentally water-blind in their analyses and understanding of society, history and climate.”²⁹ Furthermore, although most scholars acknowledge the role of ecology in shaping human history, they do not always agree on what “ecology” means, nor do they agree on whether and how nonhuman elements behaved in the historical process.³⁰ In this book, I emphasize the materiality of water in the transformation of the Jiangnan Plain. Water, with its flowing nature, was an inseparable part of local ecosystems and of a complex environmental network. Human and nonhuman agency were in constant interaction and discourse that ultimately transformed the social, political, economic, and environmental landscape in the plain.³¹ I use the concept of a “water regime” in which all factors, including water, land, animals, plants, and pathogens, interacted and actively participated in the transformation of a plain; the water regime was a hydrosocial complex in which the materiality of water was interwoven with political, social, and cultural practices that controlled its flow. This book shows that the

29 Terje Tvedt, *Water and Society: Changing Perceptions of Societal and Historical Development* (London: I.B. Tauris, 2015), 1.

30 Philip C.C. Huang differentiates ecology from environment in his study on the peasant economy of the North China Plain. He argues that people were part of the ecosystem, and that “ecology” includes human-nature relationships, while “environment” refers to the natural environment. Although he analyzes agricultural production and its role in local peasant households’ changes, his focus is predominantly on the social and economic transformation of the peasant economy and not on local environmental changes. See Philip C.C. Huang, *The Peasant Economy and Social Change in North China* (Stanford: Stanford University Press, 1985).

31 The emphasis on the non-human agency inevitably puts this argument in the actor-network-theory framework. Proposed by French scholars in science and technology studies, the actor-network-theory has sparked widespread discussion, especially on the agency of non-human factors. This book, however, dwells more on its proposition of the “network,” though Bruno Latour clarified that this network had nothing to do with the social network theory (emphasis on institutions, social control, etc.) that has a solid foothold in sociology studies. See Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2007); idem, “On Actor-Network Theory: A Few Clarifications Plus More Than a Few Complications,” *Soziale Welt* 47 (1996). <http://www.bruno-latour.fr/sites/default/files/P-67%20ACTOR-NETWORK.pdf>.

water regime in the plain had a rich cultural layer (i.e., local beliefs, cultural practices) that was derived from and acted upon the natural environment of the plain; it had a predominantly amphibious socioeconomic layer largely rooted in the particular topological and climatic conditions of the plain; and it had a material layer, embracing the historical role of physical factors (“things”) in making the changes. The three layers constituted the water regime in the Jiangnan Plain, constructing a contested domain for state politics, community management, and environmental transformation. In its political and social sense, the water regime here resembled “the second government” in Fujian hydraulic systems examined by Kenneth Dean or, to a lesser extent, the “cultural nexus” in the North China Plain studied by Prasenjit Duara.³² The main difference is that the nonhuman factors in the water regime also acted as the “second government” and were part of the “cultural nexus” in between the state and the local communities.

I emphasize here the material aspect of the water regime and its significance in contextualizing social changes. Many scholars have acknowledged the role of local environments in contextualizing social events. For example, Elizabeth Perry points out that the uncertainty and restraints in the local environment contributed to the peasant uprisings in modern Huai Bei region, though she is careful not to assign a total role to the environment in shaping history.³³ Joseph Esherick argues that the ecological deterioration in northern China eventually led to the outbreak of the Boxer Uprising.³⁴ Their studies treat the local environment as only “the stage” on which politics take place. For the most part, nature has been typically depicted as passive and nonparticipatory.

In his important work on the peasant economy in the Jiangnan Plain, Zhang Jiayan explores the central role of the interactive relationship between environmental changes and peasant responses to these changes in rural China, and he investigates how this relationship unfolded during the Qing and the Republican periods.³⁵ He argues that the local environment in the Jiangnan

32 Dean and Zheng, *Ritual Alliances of the Putian Plain*, vol. 1 (2010); Prasenjit Duara, *Culture, Power, and the State: Rural North China, 1900–1942* (Stanford: Stanford University Press, 1988). In his book, Prasenjit Duara writes that the local powerful lineages served as brokers between the state and society in the Republican North China Plain and formed a “cultural nexus” among the local communities.

33 See Elizabeth J. Perry, *Rebels and Revolutionaries in North China, 1845–1945* (Stanford: Stanford University Press, 1980), 249.

34 See Joseph Esherick, *The Origins of the Boxer Uprising* (Berkeley: University of California Press, 1987).

35 Zhang Jiayan, *Coping with Calamity: Environmental Change and Peasant Response in Central China, 1736–1949* (Vancouver: University of British Columbia Press, 2014), 6.

Plain shaped peasant behaviors, especially their crop choices. In so doing, he argues against the classical economics approach in which the market is the driving force for “rational” peasants.³⁶ He tends to emphasize the social effects on the environment in a less simplistic way and proposes “an environmental approach that takes into account not only environmental change and population increase but also state politics, community action, market forces, and peasant behavior.”³⁷ However, he uses environmental dynamics mainly to make an economic argument. A more in-depth analysis of the shaping role of the environment in the historical process of the Jiangnan Plain is still needed.

Zhang Ling’s book on the Yellow River and the Northern Song state is by far the most ambitious in China studies to call for an “all-encompassing approach that respects non-human environmental entities as fellow players in the historical making of a complex, fluid environmental world.”³⁸ She analyzes the tendency of the Northern Song State to ignore the river’s natural rhythms and to engineer the river course toward northern Hebei, which eventually led to catastrophic floods in the central plain. Zhang makes an important contribution by reorienting the theory of hydraulics and politics from a focus on the mode of production to a hydraulic mode of consumption. Zhang argues that, instead of building centralized power through water management, the Northern Song state vitiated its own power in expansive hydraulic commitments: to sustain its commitments to gigantic hydraulic projects, it had to devote a large labor force, provide monetary support, and transport a large amount of raw materials from other regions in the empire, thereby seriously affecting its financial and political capacity to run the state.³⁹ In stating this, Zhang reemphasized the validity of materialist explanations of state power and water management and effectively argued for a shaping role of water in politics and the transformation of a plain.

Firmly grounded in local sources and emphasizing the historical agency of grassroots movements in interacting with the state and local ecosystems, this book analyzes the materialist aspect of state power through its intervention in or, more precisely, “ordering” of nature. To modify the famous comment on war by the military theorist Carl von Clausewitz, “waging war on nature was the pursuit of politics by other means.”⁴⁰ This book shows that the Chinese

36 This is in Chapter 4 of Zhang’s book *Coping with Calamity*.

37 Zhang, *Coping with Calamity*, 6.

38 Zhang, *The River, the Plain, and the State*, 19.

39 Zhang, *The River, the Plain, and the State*, chap. 5.3.

40 David Blackbourn, *The Conquest of Nature: Water, Landscape, and the Making of Modern Germany* (New York: W. W. Norton, 2007), 45. For more on war and politics by Clausewitz, see Carl von Clausewitz, *On War*, translated by J.J. Graham (London: N. Trübner, 1873),

emperors had ideas about nature similar to those of the eighteenth-century Enlightenment absolutists. At the same time, we should realize that water is unpredictable and creates a counterforce to human intervention. Examining the transformative power of water over the 250 years of German history, the historian David Blackbourn points out that the nature of rivers is separate from human intervention: “Rivers flow and do their work whether or not people are present. That is to say, they do what we call ‘flow’ and ‘work’: the river has no name for these things, which are human constructs every bit as much as saying that the river has been ‘conquered.’”⁴¹

As I show in this book, as with the German practice of “ordering” nature, the Chinese state viewed disorderly waters as dangerous and chaotic, just as it viewed wetlands, forests, fire, sand, and so on, as if they were something that needed to be eliminated or tamed. As the state coped with “disorder,” it reclaimed lands, built dikes, straightened waterways, and constructed dams, which drastically transformed the landscape and waterscape of the plain. However, these “ordering” missions did not always have the expected results; the unpredictability of waters under human intervention had unintended consequences, such as worsening drainage problems, and the continuous sinking of the plain due to increased sedimentation in the rivers resulted from a variety of factors, including excessive land reclamation, deforestation, the state’s geopolitical favoritism, and the hydrogeomorphological movements of the rivers.

This ordering was a form of violence, not only toward humans but even more so toward nature. This form of violence needs to be understood from a materialist perspective. As Chandra Mukerji argues, “the seventeenth-century French state located its power (even its capacity for violence) more in control of the material—in weapons systems, buildings, landmasses, and infrastructural objects such as roads, canals, and drainage systems. ... As a result, the power of the modern state began with intervention into nature through which a political material culture could be built.”⁴² By following her conception,

available at https://books.google.com/books?id=PQY4AQAAMAAJ&printsec=front-cover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false/.

41 Blackbourn, *The Conquest of Nature*, 17. He also points out two different kinds of landscape culture in Germany: “looking closely at what happened when that flow and work were radically altered by human actions is still a very different enterprise from showing how Germans came to view a landscape as harmonious, or ordered, or quintessentially German.”

42 Chandra Mukerji, “The Political Mobilization of Nature in Seventeenth-Century French Formal Gardens,” *Theory and Society* 23, no. 5 (1994): 652.

I show here that the Chinese state effectively turned a hydraulic periphery, the Jiangnan Plain, into a hydropower center, precisely through interacting with the water systems and altering the landscape and waterscape on the plain. In so doing, water was politicized, and politics was naturalized.

3 The *Yuan*

This book has its central focus on the *yuan*— an essential natural and human construction. Looking at the structural and functional changes in the *yuan*, I will reveal how the intricate complexity of three actors—the state, local communities, and the local environment—interacted and evolved in the domain as a hybrid structure. By hybrid hydraulic structure, I mean a structure that is neither completely human nor natural but a hybrid of nature and culture. Based on Richard White’s concept of the organic machine in his 1996 book on the Columbia River, which he argues was hybridized into an essential part of the social infrastructure,⁴³ I emphasize the hybridity of the *yuan*, with its productivity and transient boundaries, in which human life intertwined with its natural systems and nature met culture at the local level of Chinese society.

3.1 What Are Yuan?

A *yuan*, an enclosed agricultural field, was an essential structure for managing the land and water in the Jiangnan Plain (Figure 2).⁴⁴ In general, the major hydraulic solution attempted by those living in the plain was the prevention of damage to the farming zones in the river basin from seasonal floods, by building systems of dikes. The Jiangnan Plain has three flood seasons every year: the

43 See Richard White, *The Organic Machine: The Remaking of the Columbia River* (New York: Hill and Wang, 1996). The most famous conceptualization of a “hybrid” is by Bruno Latour who defines it as some “thing” that represents the way social and cultural elements integrate in the modern world. “Hybrids” are central to Bruno Latour’s theories and they illustrate Latour’s efforts in reconnecting the social and the cultural aspects in understanding of the modern world. They represent a duality that paved the way for Latour’s actor-network theory (ANT) that he is often associated with. See Bruno Latour, *We Have Never Been Modern*, trans. Catherine Porter (Cambridge: Harvard University Press, 1993).

44 *Yuan* was also referred as *weitian* 围田, *weitian* 圩田 or *weiyuan* 圩垸 in various records; though they might vary in sizes, they were similar in having fields enclosed by circular dikes.

peach blossom flooding from March to April, the summer flooding from May to August, and the autumn flooding from September to November. If the basin had been left unprotected, farming fields in the basin would have been flooded annually. At the same time, the outflow of waters from higher river streams was naturally delayed by the flatness of the plain and the very gentle incline of the river between the northwestern access point and its eastern outlet. The rapidly flowing floodwaters slowed and were retained for an extended time in the multitude of lakes, marshes, and floodplains scattered along the river basin.

Under these physiographical conditions, the most common way to enable agriculture was to create a land enclosure with dikes surrounding it. The purpose of the land enclosure was, on the one hand, to prevent flooding of the land and, on the other, to assist drainage. This region had two types of dike systems: official dikes (major river dikes along the Yangzi and Han Rivers), sponsored and supervised by the government, and the people's dikes (the majority of *yuan* dikes), managed mainly by local communities. *Yuan* were constructed as early as the Southern Song period, in the thirteenth century, as an official military *tuntian* scheme in the Jiangnan Plain.⁴⁵ It was soon adopted by civilian peasants as a critical structure in agricultural irrigation and flood control. In the late sixteenth century, a huge influx of migrants moved to the Hunan-Hubei area of wetlands, lakes, and rivers; and *yuan* were constructed in massive numbers to aid in wet-paddy rice cultivation and to fend off floods. In the seventeenth and eighteenth centuries, as the population grew to an unprecedented level in the Jiangnan Plain, local peasants constructed many more *yuan* to meet the need for food production.

Technically, a *yuan* included the surrounding dike (*yuandi* 垸堤), the sluice (*hanzha* 涵閘), and the aqueduct system (*paiguan xitong* 排灌系統). The dikes were usually made of earth and reinforced with stones in some important sections. By the mid-Qing period, a small *yuan* had an average area of 1,000 to 2,000 *mu*; a large *yuan* could include hundreds of small *yuan*; and a *yuan* zone

45 Shi Quan and Zhang Guoxiong, "Jiangnan pingyuan de yuantian xingqiyu heshi 江漢平原的垸田興起於何時 [When Did *Yuan* Fields Start in the Jiangnan Plain?]," *Zhongguo lishi dili luncong* 1 (1988). Brian Lander, based on findings of early texts written between 192 and 121 BCE, pushes back the time of agricultural colonization of the mid-Yangzi wetlands much earlier, to the early Han dynasty. He also points out the "North China bias" that led to an official focus on large-scale hydraulic projects in North China and neglected small-scale waterworks in the south. Brian Lander, "State Management of River Dikes in Early China: New Sources on the Environmental History of the Central Yangzi Region," *T'oung Pao* 100, nos. 4–5 (2014): 329.

(*yuanqu* 垸區) could include several large *yuan*.⁴⁶ The development of agriculture in this region initially required a substantial input of human labor; after continuous settlement by migrants and through natural population growth, population pressures became a strong motive for—and soon a burden on—the agricultural production in this region, which prompted intensive land reclamation and the construction of thousands of *yuan*. The ever-expanding *yuan* required a more efficient maintenance system, which led to changes in its organizational structure and its other functions.

Previous studies on *yuan* have mostly focused on economic considerations—on agricultural productivity per se—but have neglected the effects of those “self-contained geographical units of the enclosures.”⁴⁷ To a large extent, this construction embodied the strategies of the local people to survive in a harsh environment and maximize their production of goods. *Yuan* were usually built in two ways: in an abandoned river tributary or silted river harbor or on land reclaimed from lakes.⁴⁸ The development of *yuan* agriculture was an essential part of the wet rice cultivation in this region. The local belief in water deities also showed the cultural resources that people mobilized in dealing with water disasters.

In addition, this book emphasizes the complex nature of the *yuan* structure, which was built to be between land and water. It was both transient and permanent: in a flood-prone environment, *yuan* were easily inundated, and they quickly disappeared. But in the meantime, people formed a bond associated with a certain community based on *yuan*, and this bond within a *yuan* was exclusive, supported by their rituals centered on water deities. A *yuan* had its own hydraulic interests and, at the same time, had to collaborate with other *yuan* in dike maintenance and flood control. Despite its precariousness, the *yuan* was the basis of a unique culture in the Jiangnan Plain—spontaneous, dispersed, but, at the same, durable enough to negotiate with state authorities.

46 Zhang Jiayan, “Qingdai jiangnan pingyuan yuantian nongye jingji texing fenxi 清代江漢平原垸田農業經濟特性分析 [The Agricultural and Economic Characteristics of the *Yuan* Fields in the Jiangnan Plain during the Qing Dynasty],” *Zhongguoshi yanjiu* 1 (2001).

47 Perdue, *Exhausting the Earth*, 174.

48 For more details, see Mei Li, Zhang Guoxiong, and Yan Changgui, *Lianghu pingyuan kaifa tanyuan 兩湖平原開發探源 [The Origins of Opening the Hunan-Hubei Plain]* (Nanchang: Jiangxi jiaoyu chubanshe, 1995); Zhang Guoxiong, “Jiangnan pingyuan yuantian de tezheng jiqi zai mingqing shiqi de fazhan yanbian 江漢平原垸田的特徵及其在明清時期的發展演變 [The Characteristics of Wet Paddy Rice Fields in the Jiangnan Plain and Their Transformation in the Ming-Qing Period],” *Nongye kaogu* 1–2 (1989); Zhang, “Qingdai jiangnan pingyuan.”

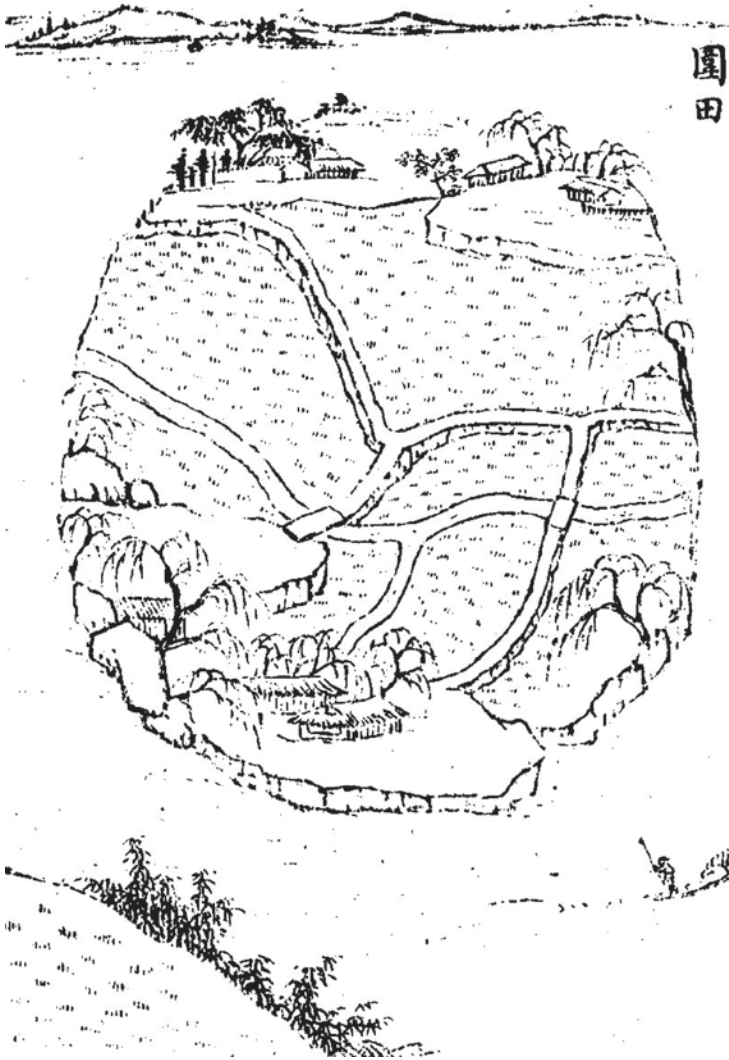


FIGURE 2 A *weitian* 圍田

SOURCE: [YUAN]WANG ZHEN NONGSHU 王禎農書 [THE TREATISES OF AGRICULTURE BY WANG ZHEN] 11: NONGQI TUPU 1: WEITIAN 農器圖譜 1: 圍田.

This book also has a spatial rationale. Previous scholarship on water control has revealed the existence of many different kinds of hydraulic systems: smaller-scale riverine systems in northern China, where water is often scarce; alluvial river systems, such as those in Putian, Fujian, where the seawater backs up into the system at high tide; and delta irrigation systems,

such as that of the Pearl River Delta, where sand and silt deposited in the delta form new lands for reclamation. This book adds one more type of hydraulic system: a large-scale river valley, where wetlands, lakes, and rivers shaped people's everyday lives and were the main sources for land reclamation and economic gain. In this system, excessive water demanded flexibility and a subsistence level of agriculture, and flood control was of great importance for the river basin.

As the local people adapted to their water environment, different hydraulic organizations also developed. In northern and northwestern China, the basic unit of water management was the village (*cun* 村 or *she* /社),⁴⁹ a natural geographic unit, rather than administrative unit, through which people shared water resources. In the lower Yangzi region, the *wei* 圩 was the basic hydraulic unit—the activities involved in agricultural irrigation and rent resistance were organized on the basis of collaboration among *wei*.⁵⁰ In the Jiangnan Plain, the *yuan* was an arena in which the state, society, and the environment encountered one another and interacted. These units differed in their construction, scale, and mechanism. For example, the *yuan* came in various sizes (which could include one or dozens of villages, and the length of its dikes could range from several *li* to tens of thousands of *li*), but the *wei* was confined to the village level, with more autonomous management (operating in mode four in Figure 1).

3.2 *A Long-term View of the Yuan*

Because this book covers the period from roughly the seventeenth century to the first part of the twentieth century, a time frame that might occasionally stretch farther back or forward at either end, I address the need for a long-term view of environmental history.⁵¹ The main source used in this

49 A typical case is discussed by Dong Xiaoping and Christian Lamouroux, *Buguan er zhi—Shanxi sise wucun shuili zuzhiguanli wenxianyuminsu* 不灌而治—山西四社五村水利組織管理文獻與民俗 [Water Management without Irrigation—Hydraulic Organization “Four Communities and Five Villages” in Shanxi Province] (Beijing: Zhonghua shuju, 2003).

50 Bai Shouyi, ed., *Zhongguo tongshi* 中國通史 [A History of China] (Shanghai: Shanghai renmin chubanshe, 1999), 10: 17, 順成之歲，且圖短少。稍涉旱澇，動輒連圩結甲，私議納數。

51 It is true that, compared to social events or political regimes, environmental changes usually occur over a much longer time frame. Environmental historians often talk about the “risk spiral,” which emphasizes the unpredictability of natural systems and indicates that the risks of managing nature become apparent only over the long term. Verena

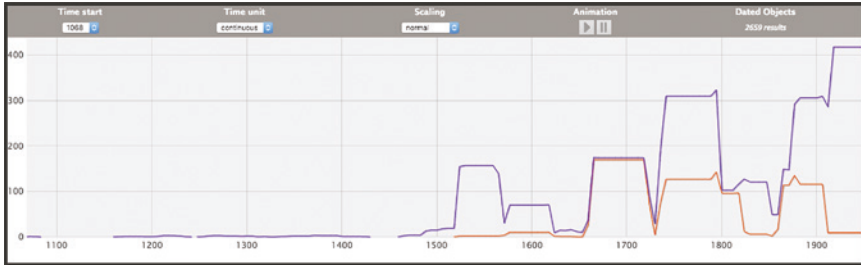


FIGURE 3 Changes in the frequency of *yuan* mentions in local gazetteers
 Blue: number of local gazetteers
 Red: number of times the word *yuan* is found in local gazetteers
 SOURCE: LOGART, LOCAL GAZETTEER RESEARCH TOOLS, MAX PLANCK
 INSTITUTE FOR THE HISTORY OF SCIENCE, BERLIN, FEBRUARY 2017.

research—local gazetteers—has made it possible to study the changes in *yuan* and the Jiangnan Plain over the long term. Reviewing the frequency of the word *yuan* in about four hundred local gazetteers (out of the two thousand gazetteers in the database) in the Hunan and Hubei regions from roughly the Ming dynasty to 1949, I found that the sociopolitical contexts and the construction of waterworks have an apparently positive correlation overall, as shown in Figure 3.

Based on the statistical results, I discern five distinct stages of *yuan* development, which correlate with well-known historical events:

1. Before the mid-1600s, *yuan* construction was the initial stage of development.

Winiwarter shows this by analyzing the Danube River basin from a long-term perspective. For example, the Danube Delta was once considered “one of the few landscapes in the [Danube] basin ... relatively unaffected by human influence”; but after examining the changing land use from circa 1000 CE onward, it is clear that the widespread clearing of forests for agriculture in the upper basin, which changed the sediment load of the river, markedly contributed to the delta in its current form. In addition, the interdisciplinary team at the Centre for Environmental History in Vienna reconstructed the long-term history of human interventions into the Danube in Vienna and showed that “serious attempts to redirect the river flow started as early as the fifteenth century.” See Verena Winiwarter, “The Emerging Long-Term View: Challenges and Opportunities of Writing Environmental Histories in Central Europe,” in *Man, Nature and Environment between the Northern Adriatic and the Eastern Alps in Premodern Times*, ed. Peter Štih and Žiga Zwitter (Ljubljana: Znanstvena založba Filozofske fakultete, 2014), 8–23.

2. From the mid-1600s to the mid-1700s, early Qing reconstruction prompted massive land reclamation, reaching the stage of “peak dike” (or peak *yuan*).⁵²
3. From the mid-1700s to the mid-1800s, debates over the danger of excessive *yuan* construction escalated, but they were ineffective in checking the continuous efforts to build *yuan*, especially private *yuan* (*si yuan*).
4. Throughout the 1800s, the water systems were nearly paralyzed in the region because of extensive warfare and local militarization.
5. After the early 1900s, the minimal appearance of *yuan* in local records signaled a major shift in the water regime.

A closer look in the early to mid-1800s shows a sharp downturn in the frequency of the word *yuan* in local gazetteers, and the availability of local gazetteers also experienced a sudden decline. Not surprisingly, the same pattern existed in the war-torn era in the early to mid-1600s. In addition, the frequency of *yuan* mentions was almost the same in the second half of the 1800s as in the second half of the 1700s. However, the data seem to indicate a terminological or institutional change in the use of *yuan* in the early 1900s, because although more local gazetteers were available, the word *yuan* was nearly absent. This change might indicate a major breakdown in the *yuan* system in the early twentieth century or a major shift in *yuan* construction for technological, social, or institutional reasons. I believe that the premodern water regime centered on the tension between population growth and land usage was shifting to a newly defined water regime that revolved around issues of energy, hydroengineering, and watershed management. I discuss my findings on this trend in Chapter 6.

Looking at the *yuan* from a long-term perspective helps us better understand the relationship between water and society in the Jiangnan Plain. Through the lens of the *yuan*, we not only can see the trend and pattern in the development of *yuan* over a long time frame but also extrapolate them to the political and social contexts of the plain.

52 The concept of “peak dike” was created by John McNeill at Georgetown University. He coined the term in his commentary on a panel of Central Yangzi water management at the annual meeting of the AAS in Washington, DC, 2018. Obviously, the conceptualization of this term derived from the concept of “peak oil,” —a period of maximum rate of oil production is reached and followed by a terminal decline. See Chapter 2 for further discussion.

4 The Jiangnan Plain

Lastly, a few words about the Jiangnan Plain, which is located in the core area of Hubei Province at the confluence of the Yangzi and Han Rivers and encompasses vast wetlands, including rivers, lakes, and floodplains. According to the Qing administrative divisions, it consisted mostly of six large prefectures: Jingzhou, Anlu, Jingmen, Hanyang, Wuchang, and Huangzhou.⁵³ During the Qing era, the names of local administrative divisions underwent occasional minor changes, but these prefectural divisions remained the same. This book focuses mostly but not exclusively on the lower downstream area of the Jiangnan Plain, comprising Jingzhou, Mianyang, Tianmen, Qianjiang, Jianli, Hanchuan, and Hanyang Counties. Their locations on the Jiangnan Plain are shown in Figures 4 and 5. The names of all the counties and prefectures in this book are those used during the Qing dynasty and the Republic, though the names changed frequently after 1949.

A study of the Jiangnan Plain provides an example of G. William Skinner's theory of physiographic macroregions. As Skinner points out, provincial boundaries rarely correspond to the limits of either natural or socioeconomic systems. Therefore, he proposes the watersheds of major rivers as an alternative basis for regionalization—natural resource flows through river systems, and social and economic exchanges across the transportation network (especially that of the waterways), reinforced regionalization.⁵⁴ These processes have produced eight (or nine) macroregions that conditioned the socioeconomic flows

53 Hubei shuilizhi bianzhan weiyuanhui, ed., *Hubei shuili zhi* 湖北水利志 [A History of Water Control in Hubei] (Beijing: Zhongguo shuili shuidian chubanshe, 2000), 1–4. According to this book, Binhu Plain 濱湖平原 is just south of the Jiangnan Plain. The Binhu Plain resembled the Jiangnan Plain in its topology and hydrogeomorphology and has a blurred boundary with the Jiangnan Plain. Usually, historical geographers consider the Binhu Plain to be part of the Jiangnan Plain, together comprising what is called the Four-Lake Region. This book subscribes to this view and considers the Binhu Plain and the Jiangnan Plain as a whole.

54 Skinner extensively discusses the logic and evidence for physiological macroregions, to analyze urbanization in late imperial China; G. William Skinner, ed., *The City in Late Imperial China* (Stanford: Stanford University Press, 1977). For an introductory essay on Skinner's work, see Mark Henderson, "Macroregions," *Oxford Bibliographies*, last modified April 22, 2013, DOI: 10.1093/obo/9780199920082-0055. Other discussions of the conceptualization and applications of the theory include Lloyd E. Eastman, *Family, Fields, and Ancestors: Constancy and Change in China's Social and Economic History, 1550–1949* (New York: Oxford University Press, 1988); Mark Henderson, G. William Skinner, and Lawrence W. Crissman, "A Hierarchical Regional Space Model for Contemporary China: Conceptualizing HRS and Constructing Tabular and Spatial Datafiles" (paper presented at the Geoinformatics conference, University of Michigan, Ann Arbor, MI, June 20, 1999); G. William Skinner, Mark Henderson, and Yuan Jianhua, "China's Fertility

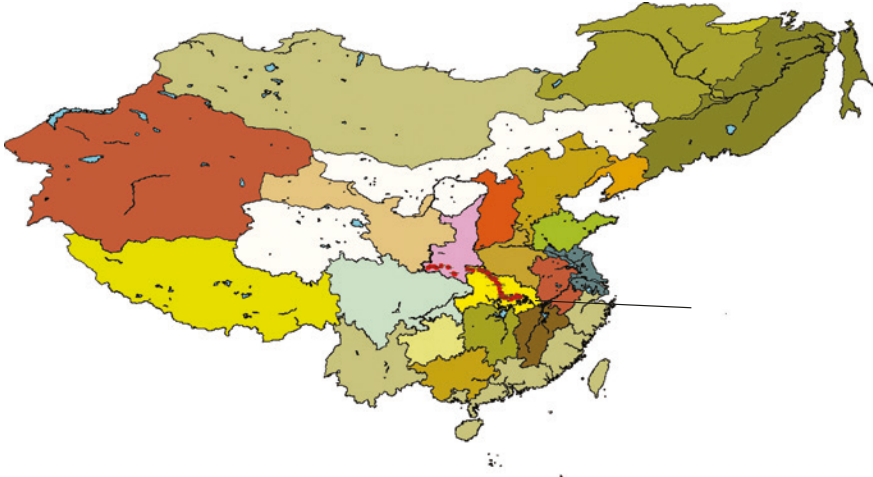


FIGURE 4 Location of Hubei, China, 1820

Note: Polygons in different colors represent different Chinese provinces in 1820. The arrow points to the yellow polygon in central China, Hubei Province. The red line roughly indicates the Han River.

SOURCE: CHINA HISTORICAL GEOGRAPHIC INFORMATION SYSTEM, VERSION 3.0 (CAMBRIDGE: HARVARD YENCHING INSTITUTE, APRIL 2005), [HTTP://WWW.FAS.HARVARD.EDU/~CHGIS](http://www.fas.harvard.edu/~chgis)

and urbanization in late imperial China.⁵⁵ The mid-Yangzi region, bounded by the Yangzi River and the mountain ranges north and northwest of the river valley, had been understudied for decades for various reasons, ranging from low political priority to scarce sources.⁵⁶ This book, by tracing the developmental trajectory of the Jiangnan Plain, the core area of the mid-Yangzi macroregion, reinforces the historical significance of the central Yangzi watershed as a unit of analysis by providing an in-depth analysis of resource flows along the rivers and the transformation of the landscape in the watershed.

Transition through Regional Space: Using GIS and Census Data for a Spatial Analysis of Historical Demography," *Social Science History* 24 (2000): 613–652.

- 55 G. William Skinner, "Regional Urbanization in Nineteenth-Century China," in Skinner, *The City in Late Imperial China*, 211–252.
- 56 Brian Lander points out a "North China bias" in the previous understanding of the history of water works in early China. He asserts that, "Most texts that have survived from early times were edited and preserved in North China by central government officials, whose interest in water works was limited to large-scale flood control or irrigation projects in North China. These works rarely mention the south and do not discuss small-scale dikes and irrigation at all." Lander, "State Management of River Dikes in Early China," 329.



FIGURE 5 Human and water boundaries in Hubei, 1820

Note: If we overlap the GIS maps of 1820 and 1911, we see no significant difference in the administrative boundaries in the two years. I am grateful for assistance in GIS data application from my friend Pradhan Anura. The polygons with different colors are the prefectures (*fu*) in Hubei in 1820. In 1820 the Jiangnan Plain encompassed Jingzhou Fu, Jingmen Zhou, Wuchang Fu, Hanyang Fu, and the lower portion of Anlu Fu.

SOURCE: CHINA HISTORICAL GEOGRAPHIC INFORMATION SYSTEM, VERSION 4.0 (CAMBRIDGE: HARVARD YENCHING INSTITUTE, APRIL 2007), [HTTP://WWW.FAS.HARVARD.EDU/~CHGIS/](http://www.fas.harvard.edu/~chgis/).

I chose the Jiangnan Plain as a focus of study for several reasons. First, it has a strikingly high frequency of disasters and a strikingly robust capacity for community resilience. The high frequency of disaster prompted the formation of cohesive hydraulic communities based on community residents' common experience with confronting natural disasters. Those communities demonstrated a great capacity for negotiating with the state concerning resource management. Second, state-society relations in this region showed an interesting pattern: in an era when the attention of rulers mostly concentrated on the Yellow-Huai River region and Jiangnan, the Jiangnan Plain is an example of how the state managed the resources in the vast hinterland of central Yangzi region, which had a flexible local community. As shown here, the central Yangzi region was transformed from a hydraulic periphery in the early Qing period to a hydraulic center by the mid-twentieth century. A case study of

the region reveals the historical driving forces in the social and environmental transformation of the plain. Finally, this region had a martial tradition, and the interaction between military practice and hydraulic practice was a major socioeconomic activity in the region. An examination of this region undoubtedly offers a kaleidoscopic view of the relationship between military and hydraulic systems in early and mid-nineteenth-century China.

Emphasizing the hydraulic functions of local communities, the historical geographer Lu Xiqi divides the Jiangnan Plain into four zones: (1) the residential zone, the high ground in *yuan*, where people preferred to build their farmsteads; (2) the productive zone, where crops were cultivated; (3) the cooperative zone, where multiple *yuan* were linked; and (4) the survival zone, which was the nearest area encircled by major dikes.⁵⁷ As this shows, the agricultural activities, daily lives, and social connections of the people in Jiangnan revolved around the *yuan* and its hydrosocial relations. A study of the Jiangnan Plain offers a perfect case study of how social and ecological issues were entwined in transforming the plain.⁵⁸

57 Lu Xiqi and Pan Sheng, *Hanshui zhongxiayou hedao bianqian yu difang* 漢水中下游河道變遷與堤防 [*The River Channel Changes and Dike Construction in the Middle and Lower Reaches of the Han River*] (Wuhan: Wuhan daxue chubanshe, 2004).

58 Some important works dealing with hydraulic issues of the Jiangnan Plain include those of Morita Akira, Ts'ui-jung Liu, Pierre-Etienne Will, Zhang Jiayan, Shi Quan and Zhang Guoxiong, Zhang Jianmin, and Lu Xiqi. Morita Akira examines the dike systems in both Hunan and Hubei, especially in the management of the Wancheng dike in the Jingzhou section of the Yangzi River and the Han River section within Hubei territory. He argues that the late nineteenth-century Qing government turned control of hydraulic construction over to local gentry. Ts'ui-jung Liu conducts a thorough examination of the dike construction in Jingzhou in the late Qing and supports Morita's view on water control in the Jiangnan Plain. Pierre-Etienne Will proposes a cyclic model to analyze the ebb and flow of power between the Qing state and local society in the Hubei region. Zhang Jiayan differentiates the dike management of the Yangzi River and that of the Han River, as well as the river dikes and the *yuan* dikes, and argues that although the Qing government officials had the intention of maintaining an orderly system of dike management, the innate structural institutional problems of relying on lower level informal officials (such as *yamen* runners) and of wide-spread corruption among officials precipitated the decline of the whole dike system. See Zhang, *Water Calamity*; Akira Morita, "Shindai Kokō ni okeru chisui kakai no tenkai [The Development of Water Control and Irrigation in Huguang under the Qing]," *Tōhōgaku* 20 (1960); Akira Morita, *Shindai suirishi kenkyū* [*Research on the History of Water Control in the Qing Dynasty*] (Tokyo: Aki shobo, 1974); Ts'ui-jung Liu, "Dike Construction in Ch'ing-chou: A Study Based on the 'Ti-fang chih' Section of the Ch'ing-chou fu-chih," *Papers on China* 23 (1970); Will, "State Intervention."

Studies by scholars at Wuhan University provided a firm foundation for my research, including Shi and Zhang, "Jiangnan pingyuan." For a thorough introduction to Shi Quan's scholarship, see Lu Xiqi, "Shi Quan jiaoshou de daode wenzhang: 'Shi Quan Wenji' bianhou ganyan 石泉教授的道德文章—《石泉文集》編後感言 [The Morals and

In addition to an introduction and a conclusion, this book consists of six chapters. Chapter 1 discusses the natural environment of the Jiangnan Plain and how it shaped people's community life and cultural understanding of disasters due to water. Chapter 2 traces the history of *yuan* construction, local management of *yuan*, and the apex of growth in *yuan* by the eighteenth century. Chapter 3 explores the Qing state's dilemma between preserving horse pastures and massive land reclamation in central China, deliberations over which led to a severe decrease in the number of horses in the plain by the mid-nineteenth century. Chapter 4 discusses the militarization in the mid-nineteenth century and how local militarization exacerbated the environmental crisis in the mid-Yangzi region. Chapter 5 analyzes the responses by

Research of Professor Shi Quan—Postscript to *A Collection of Shi Quan's Writings*,” July 4, 2005. Thanks to Dr. Lu Xiqi for sending me this article. It was also published at <https://site.douban.com/228138/widget/notes/15538304/note/565582902/>. Peng Yuxin and Zhang Jianmin, *Mingqing changjiang lüyu nongtian shuili yanjiu* 明清長江流域農田水利研究 [*Agriculture and Water Conservation in the Yangzi Valley in Ming and Qing Dynasty*] (Wuhani: Wuhan daxue chubanshe, 1992). Zhang Jianmin's other works include *Hubei tongshi* 湖北通史 [*A General History of Hubei: Ming and Qing*] (Wuhan: Huazhong shifan daxue chubanshe, 1999); *Mingqing changjiang lüyu shanqu ziyuan kaifa yu huanjing yanbian: Yi qinling-daba shanqu wei zhongxin* 明清長江流域山區資源開發與環境演變：以秦嶺-大巴山區為中心 [*Resource Exploitation and Environmental Change in the Highlands of Yangzi Valley of the Ming and Qing Periods*] (Wuhan: Wuhan daxue chubanshe, 2007); Lu Xiqi, “Mingqing shiqi jiangnan pingyuan de weiyuan: cong ‘shuili gongcheng’ dao ‘shuili gongtongti’” 明清時期江漢平原的圍垸：從“水利工程”到“水利共同體” [*Yuan in the Jiangnan Plain during the Ming and Qing Periods: From “Hydraulic Construction” to “Hydraulic Collectivity”*], in *Lishi shiqi changjiang zhongyou diqu renlei huodong yu huanjing bianqian zhuanji yanjiu* 歷史時期長江中游人類活動與環境變遷專題研究 [*Human Activities and Environmental Change in Historical Middle Yangzi Region*], ed. Zhang Jianmin and Lu Xiqi (Wuhan: Wuhan daxue chubanshe, 2011), a collection of previously published articles; Chen Xi and Yang Guo, *Jingji kaifa yu huanjing bianqian yanjiu: Song, Yuan, Ming, Qing shiqi de Jiangnan pingyuan* 經濟開發與環境變遷研究：宋元明清時期的江漢平原 [*Economic Development and Environmental Changes: The Jiangnan Plain during the Song, Yuan, Ming and Qing Periods*] (Wuhan: Wuhan daxue chubanshe, 2008); Ren Fang, *Mingqing changjiang zhongyou shizhen jingji yanjiu* 明清長江中游市鎮經濟研究 [*The Cities and Townships in the Middle Yangzi Region in Ming-Qing Periods*] (Wuhan: Wuhan daxue chubanshe, 2003); Yang Guo'an, *Mingqing lianghu diqu jiceng zuzhi yu xiangcun shehui yanjiu* 明清兩湖地區基層組織與鄉村社會研究 [*The Local Social Structure and Rural Society of Hunan-Hubei Region during the Ming and Qing Periods*] (Wuhan: Wuhan daxue chubanshe, 2004); Xu Bin, *Mingqing e'dong zongzu yu difang shehui* 明清鄂東宗族與地方社會 [*The Lineages of Eastern Hubei and Local Society during the Ming and Qing Periods*] (Wuhan: Wuhan daxue chubanshe, 2010); Zhou Rong, *Mingqing shehui baozhang zhidu yu lianghu jiceng shehui* 明清社會保障制度與兩湖基層社會 [*Social Welfare System and the Local Society of Hunan-Hubei Region during the Ming and Qing Periods*] (Wuhan: Wuhan daxue chubanshe, 2006).

statecraft officials, local people, and rivers to the full-fledged environmental crisis at the end of the nineteenth century; it also shows how the landscape and waterscape of the plain were transformed after long-term deliberate government favoritism, continuous land reclamation, and the hydrogeomorphological movements of the rivers. Chapter 6 delineates the shift from decentralized water management to large-scale state watershed management projects, in particular the concept of a hydroenergy regime centered on the Yangzi in the early twentieth century.