

Coping with Calamity

Environmental Change and Peasant Response in Central China, 1736-1949

Jiayan Zhang



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Introduction

An Environmental Approach

Rural China has undergone tremendous changes since the inception of economic reform in the late 1970s, evident in the remarkable growth of the non-agricultural sector and peasant income, the increasing use of modern scientific technologies (involving changes in crop varieties, the application of chemical fertilizers and pesticides, mechanization and electrification, etc.), the escalation of land productivity (higher yields), and the rapid expansion of rural industrialization and the urban employment of peasants (*nongmin gong*). All these changes, however, have taken place at the cost of the rural environment, as seen in deforestation and desertification, the degradation of the quality of farmland, the depletion of underground aquifers, and environmental pollution. Some of these changes have become so serious that some villagers have deserted their land or left their communities for good. Since China is still home to about 900 million peasants (by registration), knowledge of the Chinese rural economy, rural environmental change, and peasant economic behaviour is essential to understanding how the country is being transformed.

In the past six decades, however, Chinese studies of pre-1949 rural China have been dominated by the class-relations (or class-struggle) paradigm, which was orthodox from the 1950s to 1970s, and by the market school, which has become ascendant since the early 1980s. According to the class-relations paradigm, which is based on Marxism and views the traditional rural economy as a feudal economy consisting mainly of an exploiting class (landlords and rich peasants) and an exploited class (peasants and agricultural labourers), China's countryside was filled with peasants driven to rebellion by oppression and exploitation. According to the market school, which is based on Adam Smith's classical notion of economics (division of labour and specialization) and elaborated by Theodore Schultz as a rational peasant theory in which peasants search for maximum profit in response to market incentives and opportunities (Schultz 1964; Smith 1976, 1:7-16), Chinese peasants have always been rational investors motivated by market incentives

and profits. The first interpretation was obviously influenced by the revolutionary ideology of the Chinese Communist Party (CCP), and the second was shaped by the politics and economics of the post-Mao era. Although Chinese history contains both peasant rebellions and vigorous rural commercialization, the rebellious and profit-seeking constituted only a small proportion of all peasants: most were ordinary cultivators trying their best to adapt to the natural environment in order to survive.

Yet earlier Chinese-language studies on environmental change (mostly carried out by scientists or historical geographers) focused solely on alterations in the physical environment, including hydrological change affecting the Yellow River (Tan 1962), climate change in Chinese history (Zhu 1972), historical changes in the landscape, historical changes in the distribution of animals and vegetation, and historical changes in the agro-economic environment (e.g., Chen, Wang, and Yu 1989; Wu 1992; Wen 1995). Environmental history as a subject of study only appeared in China in the 1990s. Since then, some scholars have studied the relationship between economic development and ecological change in Southwest China and the relationship between the natural environment and social control in the Yangzi delta (Lan 1992; Feng 2002). Others have examined historical changes in the Chinese diet and in diseases (e.g., Wang 2000; Cao and Li 2006; Zhou 2007), which also can be considered a part of environmental history. And there is a new and vigorous trend among Chinese scholars today of grappling with the role of the environment in the large historical context of socio-economic changes.¹

In Western-language studies of pre-1949 rural China and Chinese peasants, attention to environmental change emerged fairly early. Philip Huang, for example, devotes a separate chapter to the subject in each of his two books on rural China (Huang 1985, 53-66; Huang 1990, 21-43). He believes that, although studies of court politics, gentry ideology, and urban development may be able to ignore ecological relationships, “a rural social history needs to begin with a consideration of the interrelationships between the natural environment and the sociopolitical economy” (Huang 1985, 53). Huang’s studies, of course, cannot be simply classified as environmental history, but they illustrate the growing tendency among Western scholars to consider the role of the environment in rural studies as well as in the socio-economic history of China in general. Elizabeth Perry (1980), for example, points out that the rise of the Red Spear Association in northern Anhui had close relations with the decay and uncertainty of local ecology. Joseph Esherick (1987), in another instance, argues that it was the ecological deterioration in North China that contributed to the economic decline of that area in the Ming-Qing

era and planted the seeds for the Boxer Uprising. Others have examined various topics – such as water control, the state-peasant relationship, and land reclamation under different environmental settings – in Hunan, the Lower Yangzi region, and the Xiang Lake region of Zhejiang (Perdue 1987; Schoppa 1989; Osborne 1994). However, as in Lingnan, they all “experienced similar problems of land shortage, deforestation, upland erosion, and low-land flooding” in the eighteenth to nineteenth centuries (Marks 1998, 342).

This trend has become even clearer in studies influenced by theories of sustainable development, environmental protection, and economic globalization (Elvin 1993, 2004; Marks 1998; Mazumdar 1998; Isett 2007; Muscolino 2009). Some researchers have even taken the environment (ecology) to be the primary determinant of economic development. Both Kenneth Pomeranz and John Richards, for example, view the environment as a biological variable affecting the traditional Chinese rural economy. According to them, the environmental (ecological) crisis in late nineteenth-century China was a resource or energy crisis. More precisely, it was a crisis precipitated by a shortage of wood (as fuel and as a building material): for example, the peasants of Huang-Yun (on the North China Plain) had a difficult time finding the materials necessary to build dikes and dug out virtually the last blade of grass to fuel their cook stoves (Pomeranz 1993, 120-52), and China as a whole lacked wood for both industrial use and daily consumption (Richards 2003, 112-47).

Recently, proponents of economic globalization have focused their research on comparisons of Western Europe and East Asia – especially, England and the Yangzi delta (Wong 1997; Frank 1998; Pomeranz 2000; Marks 2002). From a Eurasian comparative perspective, Pomeranz constructs an argument that makes ecology a key factor in the development of the early modern economy of England. Agricultural products (particularly cotton) from the North American colonies, which eased the “ecological” pressure on England, and the easy accessibility of coal, he believes, were ecological advantages that were crucial in promoting England’s modern economic growth and contributing to its divergence from an economic pattern like that found in the Yangzi delta (Pomeranz 2000).

To be sure, scholars who emphasize the role of the environment in their research by no means rely on a single approach. Some try to understand changes in the Chinese society and economy by adding the environment to a number of other factors being considered (Li 2007), while others make the environment the centrepiece of their research. But few examine the link between the environment and socio-economic change from the viewpoint

of peasants or agricultural production. In studying the development of a pre-industrial rural economy, however, and especially of traditional agriculture, the natural environment cannot be treated simply as a biological variable or an independent physical entity: the changes it undergoes cannot be separated from related socio-economic structures and human activities, particularly peasant activities.

In this book, I explore the central role of the interactive relationship between environmental changes and peasant responses to these changes in rural China, and I investigate how this relationship unfolded during the Qing and the Republican periods. The focus of my investigation is the Jiangnan Plain, a typical alluvial plain (about the size of the Netherlands) in the Hubei basin, Central China. In the Qing dynasty (1644-1911) and the Republic of China (1912-49), dikes were a necessary and crucial means of protecting farmland from annual high water. As the population grew – which it did throughout these centuries – more and more lakefront wasteland was reclaimed, and more and more dikes were built. But the dike building could not keep up with the incessant demand for more land, with the result that water calamities became increasingly frequent and the local environment suffered greater and greater alteration. In fact, ironically, the dike building itself contributed to the assault on the environment. Environmental change, in turn, influenced peasant behaviour by forcing them to adapt their agricultural practices to their altered environment and, thereby, played a decisive role in the formation and transformation of the local economy and society.

I therefore propose an environmental approach that takes into account not only environmental change and population increase but also state policies, community action, market forces, and peasant behaviour; that considers the interactive relationship between environment and human action and takes into account human-environment interaction not only synchronically but also diachronically, addressing dynamic change over time. I pay special attention to peasant behaviour but by no means suggest that peasants are responsible for all environmental change; rather, I emphasize how they contributed to it, how they reacted to the changed and changing environment, and, finally, how those changes, in turn, influenced their behaviour.

The Jiangnan Plain

The environmental history of China is still an understudied field, but an increasing number of scholars are working on it. In his newest book, Robert Marks (2012) provides a comprehensive survey of Chinese history from an environmental perspective – based mostly on English-language scholarship.

For the purpose of this book, I want to particularly mention three Chinese anthologies.

Examining climate, land reclamation, disease, and government responses to, and elite attitudes towards, environmental changes in areas as diverse as South China, the Yangzi River valley, Tibet, and Taiwan, a group of (mostly Western) scholars has contributed to an anthology that comprehensively surveys Chinese environmental history (Liu and Elvin 1995).² As the title of the book – *Sediments of Time: Environment and Society in Chinese History* – suggests, the essays place the environment within a large social context in order to examine the interaction of human social systems and the natural world. In another anthology, specifically focusing on the role of natural disasters in North China, the Yangzi delta, and the middle Yangzi valley, a second group of scholars (all but one Chinese) focuses on Chinese environmental history, similarly putting natural disasters into their social context (Fudan daxue lishi dili yanjiu zhongxin 2001). A third anthology also examines environmental change in Chinese history from a broad social perspective – it actually has a title very similar to that of the Liu and Elvin volume – *Zhongguo lishi shang de huanjing yu shehui (Environment and Society in Chinese History)* (Wang 2007). The method applied in these three anthologies is very close to my environmental approach, but none of these works offers systematic research or a focused historical investigation into a particular area with sustained attention to peasant responses to the environment. Given the great diversity of the Chinese natural environment and its related socio-economic conditions, such systematic elaboration, based on a detailed examination of a particular area in a specific historical period, is necessary in order to gain an understanding of the interaction of human society with the natural world.

The Jiangnan Plain, an area with severe hydraulic problems, is one of the best sites for exploring such interactive relationships. First, because of the plain's geographical position in the middle Yangzi River valley and its "opening" in late imperial times, studying it involves topics such as immigration; the growth of grain and non-grain cash crops; the enclosure of *yuan* (land encircled by dikes [see the definition and description in Chapter 1]);³ the trade in grains, cotton, and cotton cloth; fisheries; environmental change; and damage caused by water calamities.

Second, compared to the North China Plain and the Yangzi delta, the relatively "late" development of the Jiangnan Plain allows us to see some clear historical continuities into the present. Many characteristics of earlier periods – such as the water-rich environment, the importance of both paddy fields

and dry land, the conflict between water and humans, and the importance of the dike systems – remain relevant today. Thus, studying the agrarian history of the Jiangnan Plain during the Qing and the Republic from an environmental approach can help us to understand its present rural economy. Furthermore, although the Jiangnan Plain is one of the most important agricultural areas of China, its historical development has received far less academic attention than has that of the Yangzi delta and the North China Plain.

Up to now, Chinese and Western scholarship on rural China has dealt primarily with the North China Plain and the Yangzi delta. That is understandable because of the richness of the sources available on those areas, from a range of gazetteers (down even to the town level in the Yangzi delta) and archival records of everyday village disputes (e.g., the Huailu Archives) to modern anthropological surveys (such as the Mantetsu [The South Manchuria Railway Company] surveys of the 1930s).⁴ In recent decades, the Pearl River delta and the larger Lingnan region has also attracted increasing academic attention among scholars. But, geographically speaking, the North China Plain, the Yangzi delta, and the Pearl River delta constitute only a small part of China, and other regions contain completely different ecosystems. One part of China cannot be taken as representative of the whole country.⁵ To take an environmental approach to the differences in the traditional rural economy in various areas and to the changes that have occurred, we must understand the regional environments and the interactive relationships between socio-economic conditions and the environments within those regions.

For the sake of convenience, researchers on China usually focus on one or two provinces. But provinces are administrative creations, encompassing multiple ecosystems; thus, a province-wide study may conceal important environmental differences between, say, plains and mountains. For example, the population-to-cultivated-land ratios in both the plain and mountainous areas of Huguang (Hunan Province and Hubei Province) apparently declined in late imperial times. But that decline was expressed and experienced in very different ways in those two areas (Gong 1993a, 1993c; Zhang Jianmin 1994) and would have had different meanings for the plain and mountain residents because of their different levels of agricultural production and living standards. Anyone who has visited the remote mountains of western Hunan and western Hubei is aware of the harsh environment and poverty that the local people still face. For those mountain peasants, whose staple foods are corn (maize) and potatoes, the plain peasants, whose staple food is rice, appear to be living in paradise, while peasants on the plain are eager to leave what they

consider their poor and backward area and move to towns, cities, and coastal areas. Even the plain itself has diverse natural environments – dryland areas, paddy field areas, lake areas, and hilly land – whose differences are reflected in the varied levels and modes of agricultural production, living standards, and social organization of the local people. I make frequent reference to such differences throughout this study.

I also have some personal reasons for choosing the Jiangnan Plain as the site of a case study, all connected with my own experiences. In this context, the “personal” is also the academic, for researchers working in regional or local studies should have some practical understanding of the area on which they focus. Since I was born in a village in the Jiangnan Plain and was educated there (from elementary school to college) and have visited almost every county in the area, I am familiar with its physical environment and rural society. Moreover, I sometimes worked on farms on the plain, from the time I was in the third grade until after I finished graduate school (from the early 1970s to the early 1990s); thus, I have first-hand knowledge of agricultural production in this area. And because I was trained in agronomy in college and worked after graduation with peasants for three years as a local agro-technician, I understand agriculture and peasants from a technical as well as a practical angle, a combination that is particularly helpful in an environment-based research project that incorporates geography, climatology, agronomy, and epidemiology. My personal experience and technical training always warn me to draw arguments *from* empirical evidence, not to impose arguments on it.

Research in the Jiangnan Plain

In comparison to the voluminous literature on the North China Plain and the Yangzi delta, scholarship on the middle Yangzi River valley, especially the Jiangnan Plain, is relatively sparse. The methods of production and the lifestyles of the people in this “marshy kingdom” still remain mostly unknown. Some works in Chinese, such as publications that appeared during the Republic by Zhong Xin (1936) and Sun Fushi (1939), address the middle Yangzi River plain from the angle of hydraulic technology. But these writings deal briefly and simply with water control for the entire Yangzi River valley, devoting just a few pages to the Jiangnan Plain. Nevertheless, their making water control in this area a subject of analysis is a significant achievement since the altered relation between rivers and lakes and the growth of the dike systems are the most important environmental changes of the Jiangnan Plain in the past several centuries.

Japanese scholars have long researched and published numerous works on water control in Chinese history,⁶ but few have shown interest in Central

China. An exception is Morita Akira, whose comprehensive study of water conservancy in the middle Yangzi River plain in the Qing examines the development of the dike systems and irrigation in Hunan and Hubei (Morita 1960, 1974). The most notable of the few existing English-language publications that deal specifically with hydraulic issues in the Jiangnan Plain during the Qing are those by Liu Ts'ui-jung (1970) and Pierre-Etienne Will (1985). Liu's study, based on a reading of one part of a late Qing gazetteer, offers a general description of dike construction in Jingzhou (which lies in the Jiangnan Plain), in which she makes it clear that, in the late Qing, dike management was supervised by local officials but carried out by the local people. Will (1985) discusses the role of the state apparatus in construction and in administering hydraulic installations in the Hubei basin (i.e., the Jiangnan Plain) during the Qing. He argues that, in the early Qing, the state still functioned as a mediator in local conflicts over water control; however, in the middle and late Qing, as environmental degradation caused by flooding increased, and as the conflicts between the state and local society grew, the state was overcome by these difficulties and finally withdrew from water control.

These pioneering studies have contributed a great deal to our understanding of dike management in the Jiangnan Plain. However, they do not cover broader socio-economic issues that relate to the dike systems in the Jiangnan Plain, such as migration, agricultural growth, rural commercialization, and environmental change.

Since the 1980s, historians in China have begun to extensively explore the development of the Jiangnan Plain in the Ming-Qing period. Their research is based on more detailed, first-hand source materials and covers a wide range of subjects overlooked by non-Chinese scholarship. The various topics they study include the relationships between the dike systems and frequent inundation, between land reclamation and agricultural growth, and between population pressure and environmental deterioration.

According to these scholars, the broad "opening" of the Jiangnan Plain began in the Ming and was primarily characterized by the construction of dikes to reclaim wasteland from lakefronts and marshes, which subsequently led to increased production of cotton and, especially, rice. As early as the late Ming (the mid-sixteenth century), the Jiangnan Plain had become a new centre of rice production. Together with the Lake Dongting Plain (which surrounds Lake Dongting [*Dongting hu*], China's second largest freshwater lake), it replaced the Yangzi delta as the most important rice exporter during the early Qing. In the late Qing, however, the economic situation of Hubei Plain declined. Instead of being a rice exporter, it became a rice importer; it

no longer absorbed immigrants but generated emigrants. This dramatic change was precipitated by population increase and frequent floods (or breaks in the dike systems). According to these Chinese scholars, the major reasons for the frequent inundation include soil erosion on the upstream mountains, which caused silt to build up in the middle Yangzi River valley and the lower Han River valley; the never-ending enclosure of *yuan* in the Jiangnan Plain, which shrank the flood discharge area; and the incompetence of the Qing government with regard to dike management (viz., corruption and lack of cooperation). The first two reasons were, in one way or another, consequences of population pressure (e.g., Zhang Jianmin 1984, 1987a, 1999; Tan 1985; Zhang Guoxiong 1989, 1994a, 1995; Zhang Jiayan 1992b; Peng and Zhang 1993; Mei, Zhang, and Yan 1995; Gong 1996; Yang and Chen 2008; Yin 2008).

Although their studies point out how over-reclamation, which led to environmental deterioration and eventually to economic decline under population pressure, affected the Jiangnan economy, they emphasize changes in the physical environment and its impact on agriculture. In so doing, they pay little attention to some important interactive relationships between human beings and the environment. For example, their simplified model largely overlooks the relationships between the state and local society, environment and management, environmental change and market change, peasant choices under changing environmental and market conditions, and the effects of all these relationships on the rural economy and society. They also do not sufficiently consider tenancy relationships and fisheries, two topics that are important to understanding the rural economy of the Jiangnan Plain. Moreover, they do not pay sufficient attention to the behaviour of the peasants themselves, although, as I demonstrate, the response of the peasants to socio-economic and environmental change is a key factor in the socio-economic-cum-environmental relationship.⁷ Finally, and perhaps most important, because they mostly focus on the Jiangnan Plain or Hunan-Hubei area, their scholarship does not make clear the significance of the history of this region to understanding the history of rural China generally. In this book, I explore each of these subjects.

A Larger Context

The Jiangnan Plain, located in the middle of the Yangzi River valley, is a part of the Hunan-Hubei Plain. Another important part of the Hunan-Hubei Plain is the Lake Dongting Plain. Peter Perdue's research on Hunan is by far the most comprehensive to date. His is also so far the only study in English of the socio-economic changes in Hunan in the Ming-Qing era. Emphasizing state-peasant relations, Perdue (1987) discusses the processes involved in

population growth, the increased area covered by *yuan*, agricultural growth, and environmental deterioration in Hunan, particularly in the Lake Dongting Plain, from the mid-Ming to the mid-nineteenth century.

Although all of these processes also occurred in the Jiangnan Plain during the same time, and both plains are located in the middle Yangzi River valley, they have some major differences. The primary dikes in the Lake Dongting area are *yuan* dikes, while both *yuan* dikes and river dikes are important in the Jiangnan area; the “opening” of the Lake Dongting Plain came later than that of the Jiangnan Plain, with a new tide of reclamation occurring as late as the early twentieth century; and the major crop in the Lake Dongting area is rice, while both rice and dryland crops are important in the Jiangnan Plain.

There are also some differences between Perdue’s research and mine. First, Perdue’s research covers the whole of Hunan Province, including not only the Lake Dongting Plain but also some mountainous areas, while my research covers the Jiangnan Plain and only occasionally refers to the surrounding mountainous regions. Second, in terms of time, his research encompasses the mid-Ming to the middle of the nineteenth century, while my research ranges from the early eighteenth century to 1949, particularly the late Qing and the Republican eras, when the area suffered the most frequent water calamities and the environment was largely unstable. Third, he focuses on the state’s role in the development of agriculture, while I focus on the peasant response to a changing and vulnerable environment.

Like Perdue, Kenneth Pomeranz, in his research on the Huang-Yun area (a part of the North China Plain), examines the role played by the state in the development of agriculture. According to Pomeranz, the late Qing government intentionally “abandoned” Huang-Yun by shifting its focus from inland areas to coastal areas. The result was the decline of Huang-Yun since the withdrawal of government support (hence no more material support from the outside) had a negative impact on the local economy, such as a lack of fuel, the disrepair of water-control projects (particularly the Grand Canal dike), the deterioration of soil quality (because of a lack of fertilizers), and the reduction of agricultural productivity (Pomeranz 1993). In his research, Pomeranz intentionally focuses on the activities of the elite, while in my research, I concentrate on the activities of peasants.

Although Perdue argues that population growth and commercialization gradually transformed Hunan from an inland frontier into an agricultural core region of the empire in the Ming-Qing era, and Pomeranz explains how Huang-Yun changed from an economic core to an economic hinterland (or from a key area to a periphery) from the 1850s to the 1930s, both highlight

the role of state and water-control projects in the traditional Chinese economy.

State and water-control projects played a very important role in the traditional Chinese economy and, indeed, in Chinese history as a whole. Chi Ch'ao-ting (1963 [1936]), for example, explores the importance of water-control projects (particularly irrigation and flood control projects built and maintained by the state) in the formation of key economic areas in different dynasties as well as how the control of these areas became the foundation for the unification of China. According to Dwight Perkins (1969), however, from 1368 to 1968, the return on investment in water-control projects such as irrigation and drainage was low.

Mark Elvin takes a different approach to the analysis of water-control projects in Chinese history. With an eye to environmental change and sustainable development, he argues that the traditional Chinese economy, from the first millennium BCE to the present, has undergone, as his title puts it, "three thousand years of unsustainable growth." As evidence, he points mainly to the harm done to the environment by mountain reclamation and forest clearance under population pressure, and the high cost of maintaining water-control projects, throughout Chinese history, particularly in the past several centuries (Elvin 1993). Elvin is right to point out that people had to carefully maintain water-control projects year after year at a considerable cost in both time and money. But if growth was unsustainable, how could it continue for three thousand years?

To state the obvious, China's history is long and its land is extensive. Undoubtedly, the reclamation of mountains and hillsides has done great harm to the environment throughout Chinese history, as Elvin argues, yet other truths need to be remembered: water-control projects in the mountains differed substantially from those in the plains, those in South China differed from those in North China, and, moreover, throughout Chinese history such projects undeniably contributed enormously to the economy (see, e.g., *Zhongguo shuili shigao* 3 1989; Yao 1987; Vermeer 1988; Wang and Zhang 1990). Given the importance of water-control projects – particularly the myriad dikes – in the Jiangnan Plain in the past several centuries, the rise or fall of its economy has been directly related to the continued protection (or its lack) of the dike systems. Examining the story of the Jiangnan Plain since the Qing dynasty thus provides a good means of testing the arguments of both Perkins and Elvin.

In discussing water control in Chinese history, we should not ignore Karl Wittfogel and his theory of oriental despotism. According to Wittfogel, water

conservancy in ancient China was the main origin of so-called oriental despotism as agriculture relied on large-scale works that were maintained by a despotic and centralized bureaucratic system (Wittfogel 1957). Chinese agrarian historian Wang Yuhu (1981), however, argues that we should not ignore the differences between state-managed water conservancy projects (such as river management and large-scale irrigation works) and household-level irrigation works (such as irrigation channels, ponds, and weirs) and that a nationwide irrigation network never existed in China. In the Jiangnan area, as we will see, the central government did not get involved in the management of most major dikes.

The Jiangnan experience has additional significance in helping us understand the general history of China. A recent study, for example, argues that the best weather conditions in history in the middle and lower Yellow River valley contributed to the prosperity of the local Neolithic culture and eventually, late in the third millennium BCE, to the establishment of the first dynasty in Chinese history, the Xia (Wang Xingguang 2004). From the Later Han to the late Tang, when nomadic people controlled the middle reaches of the Yellow River and turned farmland into pasture, the Yellow River valley enjoyed a relatively stable period without suffering from frequent inundations; however, after the end of the Tang dynasty (618-907), these inundations returned once Han peasants resettled in the area and again began to farm it (Tan 1962). Similarly, according to Lan Yong (2001), the introduction and spread of New World crops in Southwest China, in many respects a notable achievement, in fact contributed to the region's environmental degeneration and "structural poverty."

The environment, needless to say, shapes how peasants engage in agriculture. In the frequently flooded regions of North China, for example, fear of flooding such as had been experienced in the past dissuaded some peasants living along the Yellow River in Chang'an in the Republic from applying fertilizer to their land (Xia 2000, 219-20). In the Jiangnan Plain in the mid-nineteenth century, one break of the Han River dike was not blocked owing to a war, and it continued to overflow other places for eight years. As a result, the residents of Mianyang (now released from possible inundation) did not raise their dikes as they should have done (*Xiangdi cheng'an* 1969, 2: 20ab). Such choices had nothing to do with class exploitation and price fluctuations but, instead, represent some of the simplest forms of environmental adaptation.

Thus the Jiangnan experience can also help us to understand some larger and more general questions regarding the history of rural China, particularly when we compare it with the North China Plain and the Yangzi delta. Because

of China's range of natural conditions and the different agricultural systems that they support, Chinese traditional agriculture is usually divided into two general patterns: the northern pattern, which focuses on dryland farming (in recent centuries, more accurately, wheat-maize farming), and the southern pattern, which focuses on paddy field farming (mainly rice cultivation). This distinction has fundamentally shaped our understanding of the Chinese rural economy. Scholars, particularly Western scholars, have tended to focus on the rural economy of the North China Plain, which is representative of the northern pattern, and the Yangzi delta, which is representative of the southern pattern. In fact, most influential English-language studies on the Chinese rural economy thus far have drawn their conclusions from investigations of these two areas. And they have dominated the Western image of rural China.

Of course, the North China Plain pattern and the Yangzi delta pattern are not the only two forms of rural economy in China. The rural economies of Northeast China, Northwest China, Southwest China, Central China, and South China (or Lingnan) all have their own distinctive characteristics. In this study, undertaken from an environmental perspective, I present a different pattern – the Jiangnan pattern. In some respects, the Jiangnan pattern has much in common with the North China Plain pattern and the Yangzi delta pattern, but in many others it diverged from them during the Qing and the Republic.

From an environmental perspective, the Jiangnan experience can also, in many ways, help us to understand China's environmental history. As Robert Marks (2012, 332-37) highlights in his recent book, land utilization, climatic change, water control, deforestation and land reclamation, the simplification of ecosystems, and agricultural sustainability are some of the main themes in China's environmental history. Throughout this book, I show that the Jiangnan experience touches on almost all of these topics.

A study of the environmental history of the Jiangnan Plain can tell us not only how environmental conditions in this region have changed over the past three centuries but also how the state, rural communities, and peasants have responded to those changes. It can reveal the relationships between the state and local society, between population growth and environmental change, between environmental disaster and environmental management, and between environmental change and economic change. In short, such a study can tell us about the interrelationships among population increase, economic growth, environmental change, state policies, community action, and peasant behaviour. Uncovering these interrelationships, I believe, will contribute to our understanding of environmental change in China and China's

rural history and, indeed, to a more comprehensive interpretation of the history of China in general.

Source Materials and Research Structure

I draw on three basic sets of sources. First are local gazetteers, both the traditional gazetteers compiled in the Qing and the Republic and the new gazetteers compiled after 1949. The traditional gazetteers hold rich local economic information on late imperial times that cannot be obtained anywhere else. In the absence of agricultural treatises and farming diaries, they are the most accessible sources for analyzing the rural economy. In addition, since the 1980s thousands of volumes of newly compiled gazetteers have been published in China, but previous researchers have rarely used them systematically. The Chinese government, at different levels, expended much time and effort to compile these gazetteers; thus, their data are relatively comprehensive and undoubtedly useful. To be sure, they contain obvious ideological biases, but the basic economic information in which I am interested (such as cropping patterns, number of *yuan*, and the water-to-land ratio) is rarely affected by ideology. In fact, I find that the new gazetteers quote many pre-1949 surveys, though the data are presented differently.

My second set of source materials are the memorials written by high-ranking officials in charge of Hubei Province and reports written by local officials in charge of counties (or prefectures or departments) during the Qing (all translations from these memorials are my own). Because they wrote these memorials to report what they saw to the emperor, they by and large avoided exaggerations or omissions (such problems can be found by double-checking different memorials written by two or more officials who had different opinions on the same issue) and, therefore, should be reasonably accurate. Some of those that focused on water control offer a highly detailed description of selected cases as writing such memorials required on-the-spot personal investigation. Many of these famous memorials and reports referring to specific cases that occurred along the Han River valley were selected and compiled by local officials in *Records on the Han River Dikes* (*Xiangdi cheng'an*). Memorials about other cases along both the Yangzi River and the Han River were collected in a series entitled *The Golden Guidance of Inland Navigation* (*Xu xingshui jinjian*, *Zai xu xingshui jinjian*), and more regular memorials regarding water calamities were collected in a huge volume of archival data entitled *Archival Materials on Flooding and Waterlogging of the Yangzi River and the International Rivers in Southwestern China in the Qing Dynasty* (*Qingdai Changjiang liuyu xi'nan guoji heliu honglao dang'an*

shiliao). Although these memorials contain many vivid descriptions of how the local people made their decisions as their environmental situation changed,⁸ most have been neglected in past studies of the Jiangnan Plain.

The third set of source materials I use consists of modern surveys. Research on the Ming-Qing agrarian economy of the Jiangnan Plain is facilitated, in part, by its late “opening” in the Ming-Qing era. Since the Jiangnan Plain lacks detailed modern anthropological surveys like those undertaken by Mantetsu on the Yangzi delta and the North China Plain, I instead rely on county-based Republican surveys. The detailed contemporary surveys in agriculture, geography, water control, and demography also offer a baseline that aids in tracing the historical development of the Jiangnan Plain before 1949.⁹ In addition to this, I used some archival materials of the Republican era and the early stage of the People’s Republic of China (PRC), which have only recently caught the attention of researchers.

Before writing this book, I had already published a series of empirical studies (in Chinese) on the agrarian history of the Jiangnan Plain in the Ming-Qing era, in which I argue that immigrants played an important role in the population increase and that they were also the primary reclaimers of land from lakesides and marshes. Such reclamation was the main means by which cultivated land in the Jiangnan Plain was increased. Furthermore, as the area of land under cultivation – primarily rice – increased, as one would expect, total output also increased, making it possible for the Jiangnan Plain to become an important exporter of rice. An increase in grain production was clearly paralleled by an expansion in the cultivation of non-grain cash crops such as cotton. As the production of rice and cotton grew and greater volumes were exported, trade in local commodities developed and rural towns flourished. But, unlike the Yangzi delta, the Jiangnan Plain did not undergo a transformation from a rice-centred rural economy into one focused on cotton production and the domestic textile industry (Zhang Jiayan 1991, 1992a, 1992b, 1995, 1996). This book goes further than those preliminary discussions of the rural economy, examining environmental change, dike systems, agricultural production, the structure of the rural economy, tenancy relationships, fisheries, the characteristics of a water-rich society, and, particularly, peasant responses in order to elaborate the interactive relationships between environment and people in the Jiangnan Plain in the Qing and the Republic.

The rest of the book is divided into seven chapters, plus a conclusion. Chapter 1 outlines the environment of the Jiangnan Plain and the tremendous changes it underwent in the course of history, particularly from the Ming

dynasty onward. The most important changes include alterations in the relationship between rivers and lakes, the proliferation of dikes, and the increasing number of water calamities.

Chapter 2 discusses water calamities and the dike systems. It examines the relationship between frequent inundation and dike management in the Jiangnan Plain and pays particular attention to the local people, who were in fact responsible for the maintenance of most dikes. It shows how the worsening conditions of the dike systems in the Jiangnan Plain led to more conflicts (and less cooperation) over water control, and it demonstrates how these conflicts contributed to the frequency and severity of water calamities.

Chapter 3 looks at the relationship of the dike systems and the rural economy in the Jiangnan Plain. On the one hand, dikes were the basic means of protecting the local economy; on the other hand, their extensive construction had side effects that harmed local agriculture, and the local people had to spend huge amounts of time, capital, and materials to maintain them. Drawing on post-1949 data, I offer a contemporary interpretation of the heavy monetary burden of dike fees in the Qing and the Republic, explaining how and why such fees were imposed and their effect on the local economy and on the question of whether or not agriculture in the Jiangnan Plain was sustainable.

Chapter 4 investigates the diverse crop choice in an unstable environment. By analyzing both the biological features of the varieties of crop planted and the characteristics of cropping systems in the Jiangnan Plain since the Qing, I examine how the important consideration of environmental adaptability shaped peasant choices. I also explore villagers' reactions to the environmental changes caused by frequent flooding and extensive dike construction in the Jiangnan Plain – specifically, how they contended with the worsening problem of waterlogging. I argue that, under these circumstances, environmental factors outweighed market factors in influencing economic change and peasant responses.

Chapter 5 demonstrates the ways in which the unstable environment had a direct and important effect on how the relations of agricultural production – particularly land distribution and tenancy relationships – were formed and evolved in the Jiangnan Plain in the Qing and the Republic. I conclude that the relations of agricultural production were not simply “feudal” and therefore expressed in the form of class exploitation. In other words, landlord-tenant relations were not simply shaped by economic factors; rather, they were very much shaped by the local environment.

Chapter 6 considers the relative importance of fisheries in the rural economy of the Jiangnan Plain. I show that fishing was in fact more important

than the domestic cotton textile industry in the non-farming production of rural households living along rivers and near lakes, and I point out how the structure of the rural economy of the Jiangnan Plain differed from that of traditional China. I also discuss why and how some peasants were involved in fishing, and how their lifestyle differed from that of other peasants.

Chapter 7 explores the impact of frequent water calamities on local society and economy, the cultivation of famine-relief crops and the growth/collection of aquatic products as substitute foods, the daily life of the local people in a “marshy kingdom,” and the deterioration of human relations and the socio-political features of *yuan*. During the long-term struggle against water and for land reclamation, the Jiangnan people constantly adapted to and modified their environment and, finally, formed a unique dike-*yuan* society. Almost every aspect of their daily life was affected by their water-rich environment and the dike systems.

Though all these chapters, with the exception of Chapter 1, can be read as self-contained essays, they also fall into three thematic clusters: environment and management (Chapters 2 and 3); peasant economic choice within a changing environment (Chapter 4); and tenancy, fisheries, and socio-economic life in a water-rich environment (Chapters 5, 6, and 7). Overall, I argue for the importance of examining the changes in interactive relationships between human beings and the natural world.