

## ***Rice: Global Histories***<sup>1</sup>

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<sup>1</sup> Title currently under negotiation; the 'marketing editors' have to be placated but we don't want to accept a title which they think will sell but that misrepresents the book.

A Desire to Eat Well:  
Rice and the Market in Eighteenth-Century China

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**Introduction**

Although rice is the most important staple food throughout modern China, for centuries? it was grown and consumed only in central and southern China. Agricultural scientist Ding Ying mapped these rice-growing areas according to the twin variables he found most significant -- rice varieties and cropping methods.<sup>1</sup> According to Ding, the Chinese grew two main varieties of rice, *jing* and *xian*, differentiated by the stickiness or starch content of the cooked grain. *Jing* rice was grown in northern China; modern Japanese rice (or Japonica rice), characterized by its unique stickiness and texture, was its offspring. *Xian* rice grew in the hotter climates of central and southern China, contained little starch so was less sticky, and was a relative of the early-ripening Champa rice introduced from Indochina in the eleventh century.<sup>2</sup> It was due to the introduction and development of early-ripening rice that double-cropping (harvesting two crops a year) became feasible in southern China.<sup>3</sup>

[Insert Map 1: Rice Regions]

Many scholars tied population growth in China to rice cultivation. Ping-ti Ho, for instance, argued that the introduction of early-ripening Champa rice brought about an agricultural revolution that resulted in the rise in population between 1000 and 1850. He noted that Champa rice required only 60 to 100 days to reach maturity, unlike local varieties needing 150 days in the paddy field, and that it was this early ripening that made

double-cropping possible, increased the food supply, and ensured population growth. According to Ho the dissemination of early-ripening rice and the spread of double-cropping was necessarily a slow process. Up to the end of the Southern Song (1127-1279) the early-ripening varieties were grown to a significant extent only in Zhejiang, southern Jiangsu, Fujian, and Jiangxi. During the Yuan (1279-1368) and Ming (1368-1644) the cultivation of early-ripening rice became widespread in the southwestern provinces and in Hubei and Hunan as well, the two provinces that have since become China's rice bowl. By the time of Matteo Ricci (1553-1610) double- and sometimes triple-rice cropping was common in Guangdong.<sup>4</sup> In short, Ho argued that China had a sustained population growth and became self-sufficient by growing early-ripening rice.

The first question I want to ask in this paper is "why rice?" It is true that the climate in central and southern China (see Areas A and B respectively on Map 1) was good for growing rice, but rice could not have been the only staple crop that grew well there. Even more peculiarly, as agricultural historians like Winifred Hammond pointed out, rice farming required a huge input of capital and labour. Rice grows in water, and farmers had to inundate their fields to transplant the rice and then drain the fields before harvesting it. Where did all the water come from? Rainfall could provide only part of it; most farmers had to work hard to get enough water for their rice fields. The simplest way, of taking water from a stream in a bucket, was slow, hard work. The Chinese dragon wheel was invented to save farmers from this kind of labour.<sup>5</sup> An even more efficient method, as Hayden Smith demonstrates in this book, was irrigation: farmers built levees and canals to direct the water, sometimes making openings in the dikes or levees so water could flow from one paddy to another. But these tools and construction projects involved a large

capital investment, and even when farmers could afford the cost, rice farming was labour-intensive. Transplanting the rice plants from the seedbed to the paddy field, in particular, was dirty, back-breaking work, bending over all day to plant the rice, up to the knees (and the elbows) in mud and water, with the hot sun beating down. Why, in the face of these difficulties, did traditional Chinese choose to grow rice?

The weakness of Ho's population study was that he neglected to look at the role of the market in food supply and demand. The role of the market also affects the answer to my second question, which is "what kinds of rice?" were consumed and traded. Even in the late imperial period, China was not a single economic unit. Some districts typically consumed more rice than they could produce, and the market became the institution that assured them of a grain supply from other districts. The successful development and dissemination of the new, early-ripening varieties of rice provided the context for China's self-sufficiency, but what drove that development was a market that balanced supply and demand. When the concept of the market is applied, and the market is examined, it becomes clear that rice consumption was based on people's food preferences and on what they could afford. The answers to my two questions, "why rice?" and "what kinds of rice?" will enable us to understand the nature of the long-distance rice trade in late imperial China.

My examination of the long-distance rice trade will not include other countries since, during the eighteenth century, China did not import much rice.<sup>6</sup> Although the southeast coastal province of Fujian did import rice from other Southeast Asian countries, mostly from Siam and sometimes as much as 100,000 *shi*<sup>7</sup> a year,<sup>8</sup> this was not a regular practice. An official 1756 report stated that the Southeast Asian rice import was

particularly high between 1754 and 1758, ranging from 90,000 to 120,000 *shi* annually; but the amount sharply declined after 1758 and by 1765 the amount was insignificant. The report gave two reasons for the decline. First, poor rice harvests in Southeast Asia had led to higher prices. Second, Fujian merchants had been importing grain from abroad in order to get imperial degrees (and raise their status); once the degrees were awarded the merchants had little incentive for further trade.<sup>9</sup>

In this chapter, I shall examine the different strains of rice that were sold on the two major long-distance trade routes – the Yangzi River in central China (see Area A on Map 1) and the West River in southern China (see Area B on Map 1) – with an eye to how they fared in the market. Area A, composed of Jiangsu, Zhejiang, Jiangxi, Hubei, Hunan, and Sichuan provinces, specialized in single- or double-cropping *xian* or *jing* rice; Area B, composed of Guangdong, Guangxi, Fujian, Taiwan, and Hainan, specialized in double-cropping *xian* rice. Together, these two areas formed the most important rice consuming areas in traditional China.

### **A desire to eat well**

During the eighteenth century rice was widely cultivated and eaten as a staple food in central and southern China, but so were wheat, millet, oats, buckwheat, yams, and sweet potatoes.<sup>10</sup> Contemporary Chinese categorized rice as “main food” (*zhuliang*), and the other staples as “coarse food” (*zaliang*). In central China, the most frequently eaten coarse foods were wheat, millet, oats, buckwheat, and yams; in southern China, sweet potatoes were the most prevalent.

Sweet potatoes were the survival crop of the poor.<sup>11</sup> In 1749 Acting Jiangsu Governor Yaerhashan wrote: “With regard to the sweet potatoes in Fujian province, 60 to 70 per cent of the poor people rely on them for food. Each catty costs only 2 to 3 *wen* [of copper cash].” Two years later, Fujian Governor Pan Siju stated that: “The poor families in Zhangzhou and Quanzhou eat many sweet potatoes as their daily staple. Therefore, 60 to 70 per cent of [their] hilly land [is used] to grow sweet potatoes.” In 1752, Chen Hongmou, who had in that year taken over as governor of Fujian, said in his memorial: “Nowadays sweet potatoes and other coarse food are bountifully harvested everywhere. They are cheap and filling. Poor people are glad to buy them for their meal.”<sup>12</sup> In Guangdong, the situation was similar. A 1752 memorial by the Guangdong Governor stressed the importance of promoting sweet potato cultivation in Guangdong: “Poor people [settling] in the mountains and [by] the seas (*shanghai pinmin*) generally rely on [the crop] as their subsistence food.”<sup>13</sup>

At the same time, Qing Chinese considered the sweet potato an inferior food, and better-off families avoided eating it. Although food preference is a complex subject, Tsou and Villareal gave some reasons for the aversion. First, eating sweet potatoes regularly caused flatulence or “gas”. Second, the sweet potato’s high sugar content elevated blood sugar and reduced the appetite, a disadvantage for those who wanted to eat other foods at their meals as well. Third, there was a psychological association of sweet potatoes with poverty. People who had been poor and were no longer seldom ate sweet potatoes, linking the vegetable to memories of suffering and hardship.<sup>14</sup> Another reason for avoiding sweet potatoes was probably the matter of social standing. The connection between poverty and sweet potatoes made them a low-status food, so even if people had

never been poor they would not consider eating them, no matter how the food tasted.

While the idea of “eating well” implies eating food that is healthy and delicious, it also implies eating food that is high status.

During the Great Leap Forward in the late 1950s, the Guangdong government encouraged sweet potato cultivation since it had found that the same acre (*mu*) of land that produced 350 catties of husked rice, could yield as many as 5,000 catties of sweet potatoes. The obstacle to the policy was the age-old prejudice against sweet potatoes. People in Leizhou Peninsula, the southern tip of Guangdong province, even had a saying that eating sweet potatoes made a person stupid. They used the term “big sweet potato” (*da fanshu*) to denote a useless person. This “wrong thought”, according to the Guangdong vice governor, was more entrenched in cities than in villages, where sweet potatoes were a staple food.<sup>15</sup>

In the eighteenth century, rice fetched a higher price than sweet potatoes, and farmers grew it wherever the natural environment allowed. The spread of sweet potato cultivation in southern China was successful mainly because the growing season fit within the rhythms of rice cultivation: sweet potatoes grow at temperatures above 15°C, which made them a good winter crop after double-cropping rice farming.<sup>16</sup> The root plant was less popular in central China because the winter was too cold for it; during the other seasons most farmers preferred planting rice, while in the winter they grew other coarse food like wheat and barley instead.<sup>17</sup>

## **Precious rice**

Rice was the staple of choice in central and southern China. In 1738, when southern Jiangsu Province, the wealthiest district in central China, reaped a poor harvest, the Shandong governor tried to sell the Jiangsu government Shandong millet and beans for reduced-price sales in Jiangsu. Nasutu, the governor-general of Jiangsu, Jiangxi, and Anhui, dismissed this suggestion, saying, “The people in southern Jiangsu are used to eating rice, they do not eat coarse food.”<sup>18</sup> In a memorial to the imperial court a month later, Nasutu added that Shandong millet and beans could be sold only in northern Jiangsu Province, where eating habits were similar to those in Shandong.<sup>19</sup> While Nasutu’s tone revealed a snobbish pride in the wealthier lifestyle of southern Jiangsu, where people could afford to eat rice daily, it also showed that he had no confidence in being able to sell the coarse food within the district, even during a famine.

Central and southern China grew mostly *xian* rice. This variety had an early-season (*zaoji*) strain and a late-season (*wanji*) strain.<sup>20</sup> In Guangdong and Fujian in southern China where the growing season was long, farmers grew two crops of *xian* (early- and late-season strains) in well-watered paddies between March and November, plus a crop of sweet potatoes in the winter. In the Yangzi valley of central China where the growing season was shorter, farmers normally planted either early- or late-season *xian*, and a crop of wheat or barley in the winter.<sup>21</sup>

While most areas in central and southern China produced *xian*, the districts around Lake Tai in the lower Yangzi valley (see the so-called Jiangnan area, Map 2) grew *jing*, the rice from northern China.<sup>22</sup> As mentioned above, cooked *jing* rice was stickier than *xian*, and thus considered superior in smell and taste to *xian*.<sup>23</sup> The scholar Shen Chiran, despite being a native of Jiangnan, criticized people for being so dependent on *jing*.



According to him, despite the high price and limited supply of *jing*, people in Jiangnan prefectures like Suzhou, Jiaxing, and Huzhou considered *xian* to be “inedible” (*bukeshi*). During his eighteen year stay in Xinshi town, Huzhou, he discovered that, local people “alert each other not to eat *xian*” (*xiangjie bushi*). Although he exhorted them repeatedly to change their rice-eating habits, it was like “beating a drum in front of deaf people”.<sup>24</sup>

[Insert Map 2: Jiangnan Area]

*Jing* rice went for high prices not only in Huzhou, but throughout Jiangnan. Akifumi Norimatsu attributed its price to the long growing season and heavy input of water, fertilizers, and labour.<sup>25</sup> In addition to production costs, the high price of *jing* was the result of its limited supply. In Jiangnan, unlike southern China, farmers could normally grow only a single rice crop annually and could not even keep all of it for local consumption because of the rice tribute, which went to Beijing.<sup>26</sup> Local demand for rice was great, but the supply of *jing* was small.

The high price of *jing* made its consumption an index of wealth in Jiangnan. In the seventh lunar month of 1725, the Jiangsu Governor noted in a memorial to the Yongzheng Emperor:

In Suzhou Prefectural City, all better-off families (*youyu zhijia*) ate local late-season rice. For each *shi* [of local *jing* rice], the price was 1.7 to 1.8 taels of silver. Rice for “normal” (*xunchang*) [families] was all “guest rice” (*kemi*) from Jiangxi and Huguang (Hunan and Hubei provinces). Currently the market price for each *shi* was between 1.32 and 1.38 taels.<sup>27</sup>

Though inferior to *jing*, *xian* was the rice most often traded along the Yangzi Valley. Every autumn the *xian* harvested in the provinces of Jiangxi, Hunan, and Hubei was

shipped downriver to the Yangzi Delta. From there the junks sailed southward via the Grand Canal. After paying duties at the Hushu Customs House, merchants unloaded much of their *xian* at Fengqiao, a town 4 kilometers west of Suzhou city. (See Map 2.) A 1743 memorial by Jiangsu Governor Chen Dashou depicted the scene on its riverbanks:

I humbly observe that Suzhou, as the centre of all directions, relies on sojourning merchants for more than half of the rice it consumes.... For this reason, along the riverbanks of Fengqiao town, [the tasks of] unloading rice from junks and putting it into warehouses (*zhan*) are conducted every day.<sup>28</sup>

As the re-distribution centre for *xian* in Jiangnan, Fengqiao town was extremely prosperous, and it was the demand for *xian* in Suzhou and other neighboring cities that made it so.

In summation, two varieties of rice were grown in central China. In the Yangzi Delta, or Jiangnan area, *jing* was grown. *Jing* was precious, but dear. People who could afford to eat rice, but not the local *jing*, ate the *xian* imported from the middle Yangzi provinces. This was the nature of the long-distance rice trade along the Yangzi valley during the eighteenth century. In the next section, we turn to the rice trade on the West River in southern China, a region where *jing* was rarely grown.

### ***Xian* rice on the West River**

Conditions in Guangdong Province were highly favorable to rice farming. With an elevation of 500 to 1,000 meters, Guangdong was relatively flat. Certainly the most fertile area of the province was the Pearl River Delta, which encompassed 10 counties. The abundant water supply was a boon for rice farmers, as was the hot climate. The mean

temperature was 14°C . in February, the coldest month, and 29°C . in July, the hottest.

Humidity was also high, and rainfall well-distributed at about 175 cm annually.<sup>29</sup>

Most of the land in Guangdong grew three crops a year, two of rice, and one of coarse food. Qu Dajun (1630-1696), a famous scholar in the Pearl River delta, noted in his work *New Treatise on Guangdong (Guangdong xinyu)*, that the harvest for the first crop (early-season strain) was between the fifth and sixth lunar months, and the second crop (late-season strain) between the ninth and tenth lunar months. After the autumn rice harvest, some farmers planted winter wheat in the same field. Wheat was never a daily food in Guangdong; people made wheat noodles and buns, but as food for their guests. Also, as Qu pointed out, the wheat grown in Guangdong was much inferior to that in central and northern China, so some farmers simply let their land lie fallow in the winter, which saved them a lot of manure fertilizer for the spring rice crop.<sup>30</sup>

Both the early and late season rice strains were *xian*, but according to Qu Dajun, they were different in yield and quality. Early-season *xian* was higher in yield, but considered “hot” (*re*) in nature and less healthful. The late-season *xian* was “cold” (*liang*) in nature and therefore more healthful; it deserved to be called an “excellent grain” (*jiagu*).<sup>31</sup> While the “hot” and “cold” designations of traditional Chinese medicine may sound strange to modern science, the point is that Guangdong people considered late-season *xian* healthier than, and therefore superior to, early-season *xian*. Consumption preferences for seasonal rice varieties also occurred in other rice-farming societies. As shown in the study by Lauren Minsky in this book, in Punjab and Bengal autumn rice was more valued and more expensive than spring rice.

Even though Guangdong grew two crops of rice a year, it imported a great deal of rice, also *xian*, from its neighboring province Guangxi via the West River (Xi River). Along the river, rice from Guangxi travelled first to Wuzhou Prefecture at the convergence of the Gui River and the Liu River, and then to the big cities of Zhaoqing, Foshan, and Guangzhou. (See Map 3.) Throughout the eighteenth century, the rice trade on the West River was prosperous in the second half of the year, which covered both harvests of early- and late-season rice in Guangxi.

[Insert Map 3: The West River]

Though both were *xian*, to Guangdong people, there was no comparison between Guangxi rice and their local rice. E'erda, the governor of Guangdong, made this point very clearly in his 1732 memorial:

Whenever the [local] rice is dear in Guangdong, merchants from Guangxi can certainly make a profit. However, when the price [of local rice] is low, Guangdong merchants and civilians loathe the thin small grains of Guangxi rice, which are inferior to those big round grains of Guangdong rice, [and under such circumstances] they choose the Guangdong rice, making Guangxi rice un-marketable.... Therefore, whenever the local rice is cheap in Guangdong, Guangxi merchants hesitate.<sup>32</sup>

In other words, Guangxi rice had a share in the grain market of Guangdong not because of its high quality, but because of its low price. Whenever the price of local rice plummeted in Guangdong, as happened in 1732, the rice trade from Guangxi immediately came to a halt.

To sum up, the nature of the long-distance rice trade on the West River echoed that on the Yangzi River. Both the Yangzi Delta and the Pearl River Delta grew large

amounts of rice, and their rice suited the tastes of local people. As local rice was usually more expensive, people who could not afford it would eat rice imported from upriver. The result was a flourishing long-distance rice trade on both rivers.

### **Conclusion: prices and food preferences**

For the last three decades, the study of the long-distance rice trade in China has been dominated by the theory of demographic growth. This theory argued that as a consequence of commercial development the non-agricultural population increased in some southeastern coastal cities, and since the local supply of rice was insufficient to feed them these cities had to import a consistent annual amount of rice from neighboring districts. According to this theory, figuring the annual volume of the rice trade became a matter of simple arithmetic, subtracting the estimated total amount of local rice from the estimated total amount of rice consumption. As a result, we have figures for the average trade volumes of the three major long-distance trade routes: 1 million *shi* from Taiwan to Fujian; 3 million *shi* from Guangxi to Guangdong; 9-14 million *shi* from the middle Yangzi valley to the lower Yangzi delta.<sup>33</sup>

Rice consumption did increase with the growth of maritime trade from 1500 to 1800. In the early sixteenth century, the discovery of silver mines in Japan attracted junks laden with silk and porcelain from the coastal districts of central and southern China. They flocked to Nagasaki to trade for silver bullion. This sudden prosperous trade in silver, accompanied by numerous raids on southeast coastal counties attributed to both Japanese and Chinese pirates, alerted the Ming government to ban all private, foreign maritime trade, calling it piracy. The imperial ban did nothing to terminate this lucrative

trade, but attracted Portuguese merchants, who had colonized Malacca in 1511, to Macau to act as middlemen between China and Japan. In 1565, as soon as Spanish merchants occupied Manila they used the port as a commercial base for selling their silver from the New World.

Maritime trade in silk and porcelain had declined by the eighteenth century, but the southeast coastal provinces trade remained profitable, exporting tea to the British East India Company in exchange for New World silver. Paralleling this commercial development, both the Yangzi Delta and the Pearl River Delta consumed more rice than ever. As Chen Chunsheng found, Guangdong began to import rice from Guangxi via the West River by the late sixteenth century.<sup>34</sup> By the mid-seventeenth century, Fengqiao town near Suzhou had become the biggest wholesale market for *xian* rice from the middle Yangzi Valley.<sup>35</sup>

As this essay has shown, the demand for rice was not a result of population growth, but of the desire and means to eat well. The prosperity of maritime trade raised the living standard in southeast coastal provinces and allowed more people to change their diet from coarse food to rice, hence the increasing demand for rice in those areas. But in Guangdong province, for instance, in the peripheral areas like Gaozhou, Leizhou, and Lianzhou developed as rice-producing prefectures, farmers sold their rice to Guangzhou for cash but continued to eat sweet potatoes for their own subsistence.<sup>36</sup> The ability to afford to eat rice marked the dividing line between rich and poor.

As we have seen, there were many different kinds of rice of varying quality and price. Markets in the Yangzi Delta sold both local *jing* and imported *xian* from the Upper Yangzi Valley, with *jing* being the preferred, usually more expensive rice. Even when

there was no *jing* for sale in southern China, markets provided at least four different types of *xian* rice: local late-season, local early-season, Guangxi late-season, and Guangxi early-season. Among these, the Guangdong late-season *xian* was the favorite grain of Guangdong natives, and the most expensive; the Guangxi early-season *xian*, an inferior grain, was the cheapest.

Between 1500 and 1800, as the standard of living rose and the rice-eating population grew, much of the land connected by rivers to the Yangzi Delta and the Pearl River Delta was converted into rice paddies, and the long-distance rice trade became increasingly prosperous on both the Yangzi and the West River. Consumers on both deltas preferred their own local rice to imported rice, but if they could not afford local rice, they bought the cheaper, imported rice when they could instead of eating coarse food. But if there was a bumper harvest of local rice and its price went down, narrowing the margin between the cost of local and imported rice, consumers might well pay the price difference to enjoy their favorite (local) rice. In other words, price was the major factor in their choice. The size of the rice trade grew or shrank depending upon the price levels of each kind of rice, and these prices were mostly affected by harvest conditions. There could be no “average trade volume” for rice. In the eighteenth century, the rice market was as unpredictable as the weather.

**Map 1: Rice regions**



**Index:**

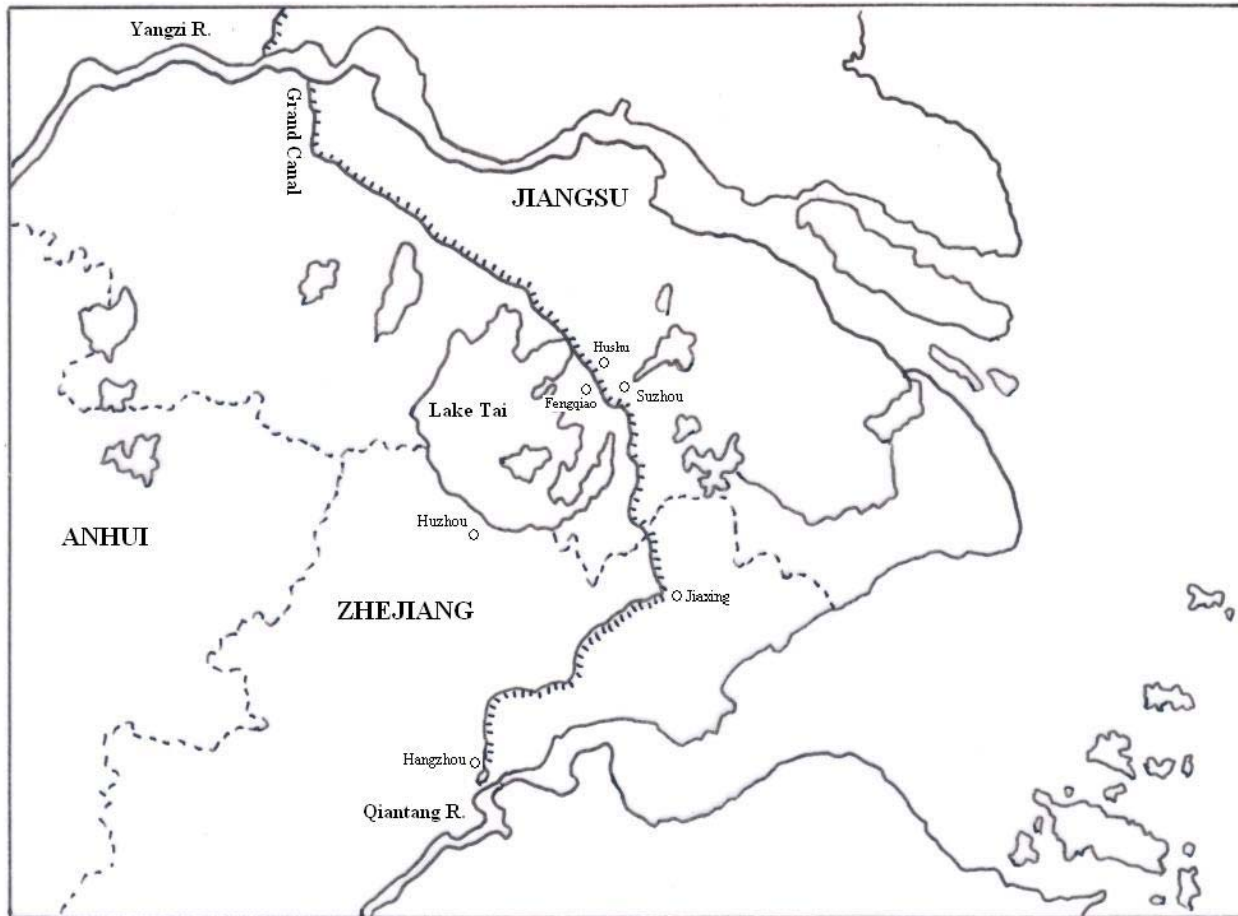
Area A: Single/Double-cropping of *xian/jing* rice

Area B: Double-cropping of *xian* rice

**Source:** Ding Ying, "Woguo dao-zuo quyu de huafen," 1957, repr. *Ding Ying dao-zuo lunwen xuanji*, Beijing: Nongye Chubanshe, 1983, p. 103.



**Map 2: Jiangnan Area**



**Source:** Pamela Kyle Crossley, *Orphan Warriors: Three Manchu Generations and the End of the Qing World*, Princeton, New Jersey: Princeton University Press, 1990, p. xvi

**Map 3: The West River**



**Source:** Robert B. Marks, *Tigers, Rice, Silk and Silt: Environment and Economy in Late Imperial South China*, Cambridge: Cambridge University Press, 1998, pp. 26-27.



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<sup>1</sup> Before Ding Ying, agricultural historian John Lossing Buck divided China into a northern wheat region and a southern rice region, see Buck, John Lossing, *Land Utilization in China: A Study of 16,786 farms in 168 localities, and 38,256 farm families in twenty-two provinces in China, 1929-1933*, 1937, reproduced by New York: The Council on Economic and Cultural Affairs, Inc., 1956, pp. 23-4.

<sup>2</sup> Ding Ying, “Zhongguo gulai jingxian dao zhong zaipai ji fenbu zhi tantao yu xianzai zaipai dao zhong fenleifa yubao,” 1949, repr. *Ding Ying dao zuo lun wen xuan ji*, Beijing: Nongye Chubanshe, 1983, p. 61; “Zhongguo zaipai dao zhong de qiyuan ji qi yanbian,” 1957, repr. *ibid.*, p. 29.

<sup>3</sup> Rawski, Evelyn S., *Agricultural Change and the Peasant Economy of South China*, Cambridge, Massachusetts: Harvard University Press, 1972, p. 52.

<sup>4</sup> Ho, Ping-ti, *Studies on the Population of China, 1368-1953*, Cambridge, Massachusetts: Harvard University Press, 1959, 1974, pp. 169-95.

<sup>5</sup> Hammond, Winifred, *Rice: Food for a Hungry World*, New York: Fawcett Publications, Inc., 1961, pp. 28, 41-43, 58. The dragon’s tail was a long trough with a series of boards fitted crosswise in it. The boards were strung along a revolving rope or chain and followed one another along the trough, bringing the water with them. The body of the dragon was a wheel that the boards went over to turn back in the other direction. The boards were moved by a man pumping with his feet on a wheel fastened to one side. See *ibid.*, p. 43.

<sup>6</sup> China started to rely more on rice from Southeast Asian countries in the nineteenth century. According to the essay by Seung-joon Lee in this book, this change was partly due to the arrival of Western colonists, who had introduced the modern technology of steam-powered milling and improved the quality of the rice.

<sup>7</sup> *Shi* was a measure of volume equal to 103.55 liters. See Chuan, Han-sheng and Richard A. Kraus, *Mid-Ch’ing Rice Markets and Trade: An Essay in Price History*, Cambridge: Harvard University East Asian Monographs, 1975, pp. 79-98.

<sup>8</sup> Qing government documents record that rice imported into Fujian from Southeast Asian countries was approximately 90,000 *shi* in 1752, 80,000 *shi* in 1754, 123,000 *shi* in 1755, and 92,000 *shi* in 1756. See Wang, Yeh-chien, “The Food Supply in Eighteenth-Century Fukien,” *Late Imperial China*, vol. 7, no. 2 (December 1986): 92.

<sup>9</sup> *Gongzhong dang Qianlongchao zouzhe*, edited by Gugong bowuyuan, Taipei: National Palace Museum, 1982-89, vol. 25, pp. 812-4.

<sup>10</sup> According to a report from a high Guangdong official in 1729, apart from rice, wheat, and oats, Guangdong farmers planted millet, yams, and buckwheat. See *Yongzhengchao hanwen zhupi zouzhe huibian*, edited by Zhongguo diyi lishi dang’an guan, Nanjing: Jiangsu chubanshe, 1989-1991, vol. 15, p. 119.

<sup>11</sup> Sweet potatoes were an American tropical crop originally, introduced to China in the sixteenth century. It is believed that a Fujian merchant discovered the sweet potato when he was buying American silver in Manila. He brought the vegetable back to Fujian and recommended it to his provincial governor, who saw the benefit of growing a tropical drought-resistant plant that was also a high-yield crop. A 1604 essay written by a Fujian official stated that every farmer in his province had planted sweet potatoes ten years earlier. See Chen Shiyuan (d. 1785), *Jinshu chuanxi lu*, Qianlong edition, repr. *Zhongguo kexue jishu dianji tonghui (nongxue juan)*, Zhengzhou: Henan jiaoyu chubanshe, vol. 4, pp. 741-43.

<sup>12</sup> *Zhupi zouzhe*, microfilm, Beijing: Zhongguo diyi lishi dang’an guan, reel no. 56, pp. 1809-15; *Gongzhong dang Qianlongchao zouzhe*, vol. 1, p. 743; vol. 4, p. 182. Yeh-chien Wang also observed the widespread consumption of the sweet potato in Fujian. See his “The Food Supply in Eighteenth-Century Fukien,” p. 89.

<sup>13</sup> *Gongzhong dang Qianlongchao zouzhe*, vol. 4, p. 252.

<sup>14</sup> Tsou, S. C. S. and R. L. Villareal, “Resistance to Eating Sweet Potatoes,” *Sweet Potato*. Ed. Ruben L. Villareal and T. D. Griggs. Shanhu: Asian Vegetable Research and Development Center, 1982, pp. 37-42.

<sup>15</sup> An Pingsheng, “Yao shi fanshu cheng jibei de zengchan,” *Liangshi shengchan shudu keyi jiakuai*. Guangzhou: Guangdong renmin chubanshe, 1958, pp. 10, 13.

<sup>16</sup> For the temperature requirements of the sweet potato, see Cai Chenghao & Yang Yunping, *Taiwan fanshu wenhua zhi*, Taipei: Guoshi chuban, 2004, pp. 22, 24.

<sup>17</sup> Buck, *Land Utilization in China*, p. 69.

<sup>18</sup> *Zhupi zouzhe*, microfilm, reel no. 54, pp. 2351-4.

<sup>19</sup> *Zhupi zouzhe*, microfilm, reel no. 54, pp. 2423-30.

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- <sup>20</sup> Ding Ying, “Zhongguo zaifei dao zhong de fenlei,” 1959, in *Ding Ying dao zuo lun wen xuan ji*, p. 78
- <sup>21</sup> Buck, *Land Utilization in China*, p. 69.
- <sup>22</sup> It is still unclear why (or when) people in the Jiangnan area of central China began to consume *jing*. You Xiuling suspected that *jing* was not cultivated in Jiangnan on a large scale until the southern Song period (1127-1279), and attributed this to changes in consumption preferences and climate. In the Southern Song dynasty, many northern nobles and wealthy families, fleeing the invading Jushen tribes, migrated to Jiangnan. Their desire for *jing* rice could be satisfied because the climate of central China had just entered a cooler phase, suitable for the cultivation of *jing*. (See You Xiuling, “Taihu diqu dao zuo qi yuan ji qi chuan bo he fazhan wenti,” *Zhongguo nongshi* 10 (1986): 81-82.)
- <sup>23</sup> Ding, “Zhongguo zaifei dao zhong de fenlei,” p. 82.
- <sup>24</sup> Shen Chiran, *Hanye cong tan* (preface dated 1808; comp. in *Youmanlou congshu*, n.p., 1924; repr. Jiangsu: Guangling guji keyinshe, 1986), 3/5a-b.
- <sup>25</sup> Norimatsu Akifumi, “Yôzeiki ni okeru beikiku ryûtsû to beika hendô: Sôshû to Fukken no kanren o chûshin to shite,” *Kyûshû daigaku tôyôshironshû* 14(1985): 159. According to Evelyn Rawski, the fact that *jing* was more expensive than *xian* was the reason that Suzhou farmers did not cooperate when the Song court enthusiastically promoted the cultivation of Champa rice, a strain of *xian*, in Jiangnan in the twelfth century. The farmers preferred to grow the more expensive rice to sell in local and nearby cities. See Rawski, *Agricultural Change and the Peasant Economy of South China*, p. 52.
- <sup>26</sup> The court in Beijing, in order to pay the wages of officials and soldiers in the metropolitan areas, levied a tax of about 2.4 million *shi* of *jing* rice from the provinces of Jiangsu and Zhejiang annually, and transported it via the Grand Canal to Beijing. See the quota of the grain tribute tax in Table 1.1 in Sui-wai Cheung, *The Price of Rice: Market Integration in Eighteenth-Century China*, Washington: CEAS, Western Washington University, 2008, p. 144.
- <sup>27</sup> *Yongzhengchao hanwen zhupi zouzhe huibian*, vol. 5, p. 496. See also analysis from Norimatsu Akifumi, “Yôzeiki ni okeru beikiku ryûtsû to beika hendô,” p. 160.
- <sup>28</sup> *Lufu zouzhe*, microfilm, Beijing: Zhongguo diyi lishi dang'an guan, reel no. 49, p. 2039.
- <sup>29</sup> Buck, *Land Utilization in China*, pp. 82-83.
- <sup>30</sup> Qu Dajun, *Guangdong xinyu* (n.d.) repr., Zhonghua shuju, 1985, pp. 373-78.
- <sup>31</sup> Qu, *Guangdong xinyu*, p. 373. Qu stated that the yield of late-season rice was only two-thirds that of early-season rice in Guangdong. See *ibid.*, p. 374.
- <sup>32</sup> *Gongzhong dang Yongzhengchao zouzhe*, edited by Gugong bowuyuan, Taipei: National Palace Museum, 1977-79, vol. 19, p. 797.
- <sup>33</sup> See Wang, “Food Supply in Eighteenth-Century Fukien,” *Late Imperial China* 7.2 (December, 1986): 91; Chen Chunsheng, *Shichang jizhi yu shehui bianqian: shiba shiji Guangdong mijia fenxi*, Guangdong: Zhongshan daxue, 1992, pp. 45-46; Chuan and Kraus, *Mid-Ch'ing Rice Markets and Trade*, p. 65.
- <sup>34</sup> Guangdong began to import Guangxi rice during the Wanli reign (1573-1619). See Chen, *Shichang jizhi yu shehui bianqian*, p. 19.
- <sup>35</sup> Wang Xixian, *Fuwu xilue*, preface 1640, 1/70a.
- <sup>36</sup> Chen, *Shichang jizhi yu shehui bianqian*, p. 62.