

The Principle of Benefit: Ethical Aspect of Hydrological Policy and Its Practice in the Mid and Late Ming

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This paper focuses on the evolution of the “principle of benefit” in hydrological discourses and how it was put into practice in the mid and late Ming dynasty. This principle was simply one of the ways of mobilizing labor and used by local officials at their discretion in the early Ming. It gained more currency in the sixteenth century in discourse and practice. This paper is going to analyze how local elites produced a variety of ethical discourses based on the principle of benefit and how officials incorporated it into practice. The main purpose of this paper is to demonstrate the ethical aspect of hydrological management that is rarely studied.¹ The

¹ Domination is an issue that western and Japanese scholars are mainly concerned about when they discuss hydrological management in the Ming dynasty. From this perspective, who held the control over the use of water resources, who regulated the way in which labor and money were mobilized, and who took the initiative are the questions constantly analyzed. See, for example, Hamashima Atsutoshi 濱島敦俊, 《明代江南農村社会の研究》(東京: 東京大学出版会, 1982), Kawakatsu Mamoru 川勝守, 《明清江南農業經濟史研究》(東京: 東京大学出版会, 1992), Peter Perdue, “Official goals and local interests: Water control in the Dongting Lake region during the Ming and Qing periods,” *Journal of Asian Studies* 41.4 (Aug. 1982), 747-65, Keith Schoppa, *Song Full of Tears: Nine Centuries of Chinese Life at Xiang Lake* (Boulder, CO.: Westview Press, 2002), 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 Schram (London and Hong Kong: School of Oriental and African Studies and Chinese University of Hong Kong, 1985), 265-347. In Mark Elvin’s review of Morita Akira’s book, he asks similar questions. See his, “On Water Control and Management during the Ming and Ch’ing Periods: A Review Article,” *Ch’ing-shi wen-ti* 3:3 (1975): 82-103. Chinese scholars are also interested in these questions. The best example can be found in an excellent research by 冯贤亮. See his 《明清江南地区的环境变动与社会控制》(上海: 上海人民出版社, 2002). Hydrological technology and the relationship between hydrological management and economic development attract some scholars’ attention too. See, for example, 洪焕椿, “明代治理苏松农田水利的基本经验,” 《中国农史》 1987:4 (Dec. 1987): 35-42, and his “明代治理苏松农田水利的基本经验(续完),” 《中国农史》 1988:1 (Feb. 1988): 22-32, Joseph Needham, *Science and Civilization in China, Volume 4: Physics and Physical Technology, Part 3: Civil Engineering and Nautics* (Cambridge: Cambridge University Press, 1971), 潘清, “明代江南水利治理述论,” *殷都学刊* 2004:4 (2004): 39-45, his “明代太湖流域水利建设的阶段及其特点,” 《中国农史》 16:2 (1997): 29-35, and 彭雨新 and 张建民, 《明代长江流域农业水利研究》(武汉: 武汉大学出版社, 1992). Also, 《苏州地区社会经济史(明清卷)》, edited by 范金民 and 夏维中(南京: 南京大学出版社, 1993), 《太湖水利技术史》, edited by 郑肇经(北京: 农业出版社, 1987), 《太湖水利史论文集》, edited by 中国水利学会水利史研究会-江苏省水利史志编纂委员会(1986), 汪家伦, “淺談農田水利史的幾個問題,” 《中國農史》 1986:1 (1986): 107-109, 王社教, 《苏皖浙赣地区明代农业地理研究》(西安: 陕西师范大学出版社, 1999), 王双怀, 《明代华南农业地理研究》(北京: 中华书局, 2002), 鄭肇經,

other purpose is to account for a unique combination of private benefit and public good in the field of hydrological management in the late Ming.

The Situation up to the Early Sixteenth Century

Inefficient Local Mechanism and the Solution Proposed by Local Elites

Although it has been argued that in the early Ming hydrological condition was well maintained,² evidence shows that since the early Ming inefficient local mechanism had been a problem troubling the poor and requiring official's efforts to fix. In Vice Minister of Works Zhou Chen's memorial of 1434, one of the issues he identified was:

People are always short of food during the farming season and when building dikes, dredging waterway, and pedaling floodwater out of fields... They had to borrow money from wealthy and powerful families by promising to pay interest twice as much as usual... Consequently, those who already had large lands got even richer and those who farmed [their own lands] became poorer...

From this passage, it is clear that there was no local mechanism that brought the well-to-do and the poor to work together in hydrological management. Worse than that, no local mechanism could prevent the well-to-do from taking advantage of this situation for their own gain. Zhou Chen saw the necessity of state's intervention. He implemented his Jinong Granary project to protect the poor and to ensure regular hydrological work.³ After Zhou Chen left, various

《中國水利史》 [1939] (上海: 上海書店, 1984), and 《中國農田水利史》, edited by 汪家倫 and 張芳 (北京: 農業出版社, 1990).

² Western and Japanese scholars agree at this point, though they provide different explanations. While western scholars consider the state's regulatory power was crucial in keeping the situation on the right track, Japanese scholars attribute good hydrological condition to local elites' active role. For Japanese scholarship, see Hamashima Atsutoshi, 《明代江南農村社会の研究》 (東京: 東京大学出版会, 1982), and Kawakatsu Mamoru, 《明清江南農業經濟史研究》 (東京: 東京大学出版会, 1992). For western scholarship, see, for instance, Peter Perdue, "Official goals and local interests: Water control in the Dongting Lake region during the Ming and Qing periods," *Journal of Asian Studies* 41.4 (Aug. 1982), 747-65. In his book, Perdue reiterated Hamashima's argument about the lower Yangzi area (Jiangnan) as reference point for his own research on the Hunan, middle Yangzi area. See his *Exhausting the Earth: State and Peasant in Hunan, 1500-1850* (Cambridge, MA.: Council on East Asian Studies, Harvard University, 1987), 178-82. Keith Schoppa, *Song Full of Tears: Nine Centuries of Chinese Life at Xiang Lake* (Boulder, CO.: Westview Press, 2002). 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 Schram (London and Hong Kong: School of Oriental and African Studies and Chinese University of Hong Kong, 1985), 265-347.

³ After the quoted passage, Zhou continued and said, "I hope to build Jinong Granaries in all the counties of the three prefectures in my jurisdiction to store the compensation grain [that had been saved since the location of ration dispensation changed]. In the future, when old grain is used up before harvest [i.e. farming season] and when floodwater is pedaled out of fields, the stored grain will be distributed to relieve

institutions he established stopped functioning. Toward the end of the fifteenth century, Songjiang student Jin Zao observed that the rich and powerful did not contribute to hydrological work and only the poor and weak came to provide labor. He hence appealed to officials to reform the corvee system.⁴ Similar problem was noted by Secretary of Justice Zhang Kan in the early sixteenth century: “Today branch waterways are occupied by the wealthy to plant [reeds and so on] for profit... Their lands are located close to waterway outlets and it is easy to pump out floodwater [from their lands]. [But] it is to ladle out floodwater from common people’s lands that are located in the center [of a polder].” In his view, it was also necessary to have the state set regulations to proscribe the occupation of waterways by wealthy families.⁵

From the above records, it is obvious that local elites did not play a positive role in local water management. However, evidence also shows that there were elites who voluntarily participated in hydrological work. An epitaph dedicated to an early fifteenth-century Kunshan tax captain, Mr. Gong, records that he would “provide as much as he could to those who had no seeds to sow and no food to eat in the spring” and would “not ask for money in return when he lent pumps to people to get irrigation water during drought.”⁶ In the late fifteenth and early sixteenth centuries, there were also local elites who voluntarily organized neighbors for flood abatement. Mr. Pan in the late fifteenth century led local flood-abatement team and showed his fellows how to use pumps and where dikes needed to be repaired. In the early sixteenth century, Wei Xiao’s brother discussed emergent situation and worked out solutions with local elders. He volunteered to be the first one who shouldered the responsibility.⁷

The contradictory pictures signifies the fact that up to the early sixteenth century local mechanism could not play the function that necessitated local elites’ participation in hydrological work or effectively prohibited their monopolization of water resources. Zhou Fengming, Kunshan metropolitan graduate of 1514, offered his view of four causes of bad maintenance of polder dike in his memorial of 1523:

people’s shortage of food... In the cases of repairing dikes and dredging waterways, Jinong Granaries will provide each worker a certain amount of grain.” 《周文襄公年譜》，26b-27a. This memorial is also included in 《古今圖書集成》 684:46a-b. The exact date of its submission was February 27. See 《周文襄公年譜》，26a. His memorial was reviewed by the Ministry of Revenue. See Wang Zhi, “蘇州濟農倉記,” 2:8a. Later Zhou’s idea was approved.

⁴ 顧炎武, 《天下郡國利病書》 4:27a.

⁵ 《吳中水利全書》，22:23a.

⁶ 楊榮, 《文敏集》 20:6b-7a.

⁷ For Mr. Pan’s virtuous deeds, see 祝允明, 《懷星堂集》，23:4a-5a. For Wei Xiao’s brother’s actions, see 魏校, 《莊渠遺書》，8:21a.

Poor people have difficulties in continuing their work [on dyking] once they are affected by floods. Wealthy families possess too vast lands crossing farmland paths to thoroughly maintain [them]. And, [in the case that] poor people farm lands for wealthy families, poor people do not consider the lands as their own, and wealthy families only care about rents.⁸

Although there were indeed wealthy families who were unwilling to get involved, Zhou indicated that complicated landownership actually generated more challenges. Tenants did not want to pay attention to the lands they farmed, because it was not their own business. Even if landowners were willing to take up their duty, they were unable to do so for two reasons: in the case of large landowners, they had too many lands to handle, and in the case of small landowners they could not afford to do the work. In other words, unwillingness and inability were two equally important issues. Zhou Fengming continued to present his solution:

If apportionment of labor service is unfair, it will cause more trouble to the people. Why not maintain polder dikes—for the easy ones—by recruiting people [in the following way]? Landowners of a polder, who benefit [from hydrological constructions], should be generally mobilized based on landownership without considering whether they were gentry or commoners.⁹

In the sense that this solution required the state's intervention, it was in line with Zhou Chen's efforts and Jin Zao's and Zhang Kan's advice. It furthermore emphasized three essential points in order to ensure it a successful solution. The first is the principle of benefit. He argued that benefit was what the state could justifiably mobilize people to work on hydrological project. Secondly, he specifically connected benefit with landownership such that how much one benefited from a hydrological construction and how much one was responsible for it could be both calculated on the basis of landholding. It was a method of "mobilization based on landownership." And, thirdly, he insisted that the conversion from benefit to responsibility in terms of the area of owned lands was applicable to gentry and non-gentry landowners. His solution was hence to address the issue of unwillingness by an ethical argument: hydrological work would benefit everyone who possessed lands regardless of one's social status; therefore, all landowners were responsible without exception. It also addressed the issue of inability: the more lands one owned, the more labor one should provide; and, the state would have enough workers to launch a project that could cover a large area and would not burden small landowners disproportionately.

⁸ 《吳江水考》，5:9a-b.

⁹ Ibid.

It should be particularly noted that Zhou had just been promoted Left Assistant Minister of Judicial Review in 1530.¹⁰ Though it was a middle-ranking position, it already granted him certain exemption privileges. His argument hence signified that some local elites were willing to forgo their privilege in order to have current hydrological condition improved. This was a decision that included both ethical stance and practical concern. With respect to his ethical stance, he saw that the benefits produced by hydrological works did not differ by official status, but did increase according to landownership. As such, the principle of benefit legitimately trumped exemption in determining responsibility in hydrological management. Gentry landowners were hence integrated into their communities by the measure that was equally applied to non-gentry landowners. With respect to his practical concern, he saw that, without stable and sufficient labor supply, hydrological condition would only worsen. Gentry landowners' status could help them get away with its consequences. Therefore, to offer resources from gentry's side was his strategy to assure officials that to get involved in local hydrological work would not require them to worry about the shortage of labor.

The lack of confidence in existing social mechanisms and the emphasis on the appropriateness of justifying “mobilization based on landownership” by the principle of benefit also appeared in an earlier memorial of Wu Yan. In Wu's words of 1518, he maintained that

Hydrological management has to cost money, and the money must come from people... In my view, since the purpose of hydrological management is for field farming, the money should be collected according to the area of fields. All landowners, no matter whether they are gentry or commoners, will pay one wen for every mou of owned lands... The dues will be converted into silver, collected in fall, and sent to prefectural treasury.¹¹

Wu's strategy made four points on the application of the principle of benefit. First, just like Zhou Fengming, he asserted that the principle of benefit was supposed to be used to define responsibility. He defended his view by positing an investment-profit relationship between hydrological management and agricultural production: since it was landowners who would reap benefits from hydrological works, it should be them who paid for these works, and the state would only play a supervisory, not financial, role in most cases. Second, Wu applied the principle of benefit to fundraising. In doing so, Wu showed his awareness of the financial challenges in hydrological management to the extent that he proposed to stabilize the fund by annual fees. The third feature of Wu's advice was to apply the principle of benefit without

¹⁰ 《世宗實錄》，109:2a. This position was ranked 5a.

¹¹ 《吳中水利全書》，14:27a.

granting any exemption privilege to the gentry. This point is significant, not only because Wu shared a similar view with Zhou Fengming, but also because he came from a noted family. His father, Wu Hong, was a metropolitan graduate of 1475, and by then had retired as the Nanjing Minister of Justice. His brother, Wu Shan, was a metropolitan graduate of 1508, and a Director of Justice in 1518. Wu Yan himself was also a degree-holder and an official.¹² With their gentry family background, they all enjoyed exemption privileges. Given that, Wu's advice demonstrated some local elites' willingness to make fair financial contribution for the purpose of hydrological management. The reasoning behind this attitude was fundamentally different from that behind the attitude held by some landowners who saw that the best way to maximize their interest was to reduce their expenditure on hydrological management and to increase their rent income.¹³ In Wu's view, good hydrological management was in the landowners' best interest, but without sufficient funds it would not happen. By this logic, local elites' exemption privilege, which made raising sufficient funds difficult, had to be revoked in order to "accumulate a huge sum by a vast number of small amounts" and to "easily achieve [proper hydrological management] at minimum cost to the people."¹⁴ Finally, like Zhou Fengming, Wu Yan did not see it possible that existing social mechanism could bring about necessary changes in apportioning responsibility. His argument sent a clear message to officials that the state had to be involved to apply the principle of benefit more generally and improve the situation.

Methods and Principles of Mobilizing People: Available Options

The significance of Zhou Fengming's and Wu Yan's views can be better appreciated if putting them in the context in which "mobilization based on landownership" had been developed in the fifteenth century. This method of mobilization was first used no later than the second half of the fifteenth century. Prior to the Hongzhi reign (1488-1505), it had been applied to flood abatement. As Shen Qi noted,

Whenever it heavily rains and water rises, a good number of pumps must be put in place to pump the water [out of polders]... It usually needs hundreds [of pumps]. It is to

¹² 《乾隆吳江縣志》, 27:10a, and 16b. Wu Hong was forced to retire by Liu Jin in 1510. Since he did not retire because of criminal deeds, he was not deprived of exemption privileges. For the year of his retirement, see 談遷, 《國權》 (台北: 鼎文書局, 1978), 189. For the exemption regulations at that time, see 申時行, 《明會典》 (北京: 中華書局, 1989), 20:6b.

¹³ Hamashima's study well analyzed how these landowners avoid their responsibilities. See his 《明代江南農村社会の研究》, 90-106, and 225-45.

¹⁴ 《吳中水利全書》, 14:27a.

mobilize people according to their owned lands... Before the Hongzhi reign, this practice was followed and there were no abandoned lands in the county.¹⁵

Flood abatement, according to local hydrological specialist Shi Jian, had been directed by officials before the 1490s:

[To handle] stagnant water, if people do not devotedly pump it out, how can it be reduced? However, poor people can not manage to do it, and powerful people, holding tough attitude, refuse to do it... It depends on officials to call upon and organize them to [achieve the goal]. In the past, when floods struck, the top officials of a county—i.e. magistrate and vice magistrate—and low officials—i.e. assistant magistrate and others—would supervise [flood abatement] in person...¹⁶

This method was hence originally used in a specific hydrological action under official supervision. When officials became less involved in the 1490s, local elites who were willing to take up flood abatement still used the same method to organize their neighbors. For instance, one of the principles adopted by Wei Xiao's brother was "to mobilize people by considering the areas of their owned lands."¹⁷ This method was also applied in some local projects. Suzhou Assistant Prefect Zhang Min supervised the dredging of the Yantie Channel in 1489. He "calculated the area [of lands] and [the length of] the channel to mobilize people."¹⁸ It was again employed by Suzhou Assistant Prefect Ying Neng in 1493, and Secretary of Works Yao Wenhao in 1496.¹⁹

Co-existing with the method of mobilization based on landownership, mobilization based on the community-tithing system was also a method used in the fifteenth century. It was recorded that before the 1490s, for dredging project the state would demand each community to provide twenty-five workers.²⁰ Vice Minister of Works Xu Guan made certain adjustments to corvee

¹⁵ See 《吳江水考》, 2:26a-b. The use of pedal pumps, an instrument for flood abatement, attracted Japanese scholars' attention, but they splited on how to make sense of it in relation to the roles played by the state and local well-to-do families. For a brief summary, see Hamashima, 《明代江南農村社会の研究》 (東京:東京大学出版会, 1982), 9-18. Hamashima explained that it demonstrated the existence of self-regulating local community under well-to-do families' leadership. Hamashima's point basically followed Oyama Masaaki's 小山正明. For Oyama's point, see his 《明清社会經濟史研究》 (東京:東京大学出版会, 1992), 222-4. Okuzaki Hiroshi 奥崎祐司 contended that it showed the impossibility of establishing an institution in community by state's instatement, if it had not been already working at the community level. See his 《中国郷紳地主の研究》 (東京:汲古書院, 1978), 528-30.

¹⁶ See 《西村集》, 6:13a-b. Shi Jian died in 1496. See *ibid.* 卷首: 2a. Therefore, what he described has to be what had been practiced before the 1490s.

¹⁷ 《莊渠遺書》, 8:21a.

¹⁸ 《吳中水利全書》, 10:34a.

¹⁹ 《吳中水利全書》, 14:4a, and 三吳水考, 14:26b.

²⁰ 《天下郡國利病書》, 4:27a.

system, but he still relied on the community-tithing system to secure labor.²¹ The third method that had been experimented with was the “head-land” method, which was first proposed by Jin Zao in the early 1490s.²² Secretary of Works Yao Wenhao put it into practice in the 1496 as an alternative to the method of mobilization based on landownership.²³ By this method, the responsibilities of dike-building were distributed to each landowner according to his frontage on the ditches. Put another way, any section of a polder dike would be the responsibility of the landowner whose lands were immediately adjacent to it.²⁴

Before the early sixteenth century, there were thus at least three methods had been developed to mobilize people. There were also three principles that were considered applicable. In addition to the principle of benefit, the principle of “work for relief” and the principle of location were two grounds based on which mobilization was justified. Regarding the principle of “work for relief,” Zhou Chen’s providing the poor grain for their work in difficult times was an example. In 1458, Grand Coordinator Cui Gong “relieved [people by paying them] money and grain.”²⁵ Xu Guan was criticized for not incorporating relief into his project, and he eventually accommodated this concern.²⁶ With respect of the principle of location, the “Comprehensive Outline,” issued in the early Ming, stipulated that people working on hydrological management projects be recruited either from the locality in which the problems were present, or from other counties and neighboring prefectures.²⁷ By this principle, the larger a project was, the broader the area from which people would be recruited to work. It did not take into consideration whether they could benefit from the project, or whether they were victims of natural catastrophes.

With the principles and methods developed in the fifteenth century, Zhou Fengming’s effort in the early sixteenth century was on the way to broaden the scope of the application of the method of mobilization based on landownership and to justify it by the principle of benefit. It

²¹ 《浙西水利書》，卷下 15a.

²² 《浙西水利書》，卷下 21a-b, and 28a-29a.

²³ 《三吳水考》，14:26a.

²⁴ Hamashima had a long discussion of this “head-land” method. His view is that this was a working method in the early Ming, by which landowners had maintained good local hydrological condition. See his 《明代江南農村社会の研究》，67-90.

²⁵ 《吳中水利全書》，25:6a.

²⁶ Xu was challenged by Chief Supervising Secretary of War Yang Ying. See 《孝宗實錄》，92:7a. Though in the report of his work he separated the costs of construction from relief, the fact that he could not just ignore Yang’s criticism indicated that the method of “work for relief” was expected to be used in hydrological project, especially when people were suffering from natural disaster. For Xu’s report, see 《孝宗實錄》，99:1a-2b, esp. 2a.

²⁷ 《諸司職掌》，5:104a-105a. According to two Ming sources, it was issued in 1392. This dating was endorsed by three Qing sources. See unknown author, 《翰林記》13:8a; 章潢, 《圖書編》83:12a; 孫承澤, 《春明夢餘錄》12:4b; 《欽定續文獻通考》51:19b, and 明會典四庫全書提要.

was not limited to flood abatement or one-time local project. Wu Yan's effort was made in a similar vein, but its purpose was to work out a financial solution.²⁸ In combining a method and a principle that had been used separately in the fifteenth century, both Zhou and Wu not only provided a solution to the problems of recruiting people and raising funds, but also pointed to a clear direction for officials in which legitimate mobilization of resources—be they labor or money—could be done.

The Principle of Benefit in Action:
Li Chongsi's Project in the Early Sixteenth Century

Wu Yan's advice was submitted in 1518 which was just a year before Minister of Works Li Chongsi was appointed as regional hydrological official. Wu's concern about financial shortage was also a challenge that Li Chongsi had to take up without a set manual. He first tried a strategy suggested by Xie Chen and Yu Jian, appealing to the central government for the permission to use the transit taxes at the Hushu Customs and salt taxes at two salt distribution commissions.²⁹ In his estimation, a broad dredging and dam- and lock-building project needed to recruit tens of thousands of people and cost thousands of taels of silver. On this point, he did not follow Chai Qi and Wu Yan—either to reinstall the dredging fee or to impose a one-wen-per-mou fee on landowners.³⁰ His explanation was that people could not stand further financial burdens. He asked for an amount “roughly more than one hundred thousand taels” with a note that, if not enough, he would make up the difference by a variety of ways, including money from prefectural and county treasuries, levying additional equal corvee fees, and collecting dredging fees based on landownership.³¹

²⁸ In the late fifteenth century, Yao Wenhao established the “dredging fees” institution to deal with financial challenge. Yao relied on the community-tithing system to collect fees. Wu was different from him. Yao's institution did not take into consideration the difference between the wealthy and the poor. Wu's advice, by apportioning responsibility according to landholding, took the difference as crucial component of a new institution. In my dissertation, I have one chapter dedicated to Yao Wenhao's administration and its relationship with the levy reform in the late fifteenth century. For existing literature in this subject, please also see the works cited in my dissertation.

²⁹ Xie Chen's advice was presented in his memorial. See 《吳中水利全書》，14:17b-18a. Yu Jian had a similar view in his memorial too. See 《吳中水利全書》，14:21b-23a.

³⁰ For Chai Qi's idea, see 《黼菴遺稿》 8: 4b.

³¹ 《吳江水考》，4:43a-44b. Two things should be noted here. First, Li's priority was the reverse of Wu Yan's. While Wu intended to have people be the main payers, Li's idea was to get people involved as the last resort. Second, when people were involved, in Li's idea, the ways to involve them were what Wu and Chai had proposed.

Li's proposal was not approved. As the result, he turned to the prefectures and counties to secure sufficient funds within his jurisdiction.³² His first tactic was to cut the scope of funded works. His original plan was to cover the expenditure for large-scale projects. However, lacking full financial backing, he decided to fund primarily the dredging of the Wusong and the Baimao, the two major waterways in this area. This decision significantly cut the cost.³³ The principle of benefit was quoted to justify the cut in cost. Based on an account by Gu Dingcheng, a Kunshan metropolitan graduate of 1505, the reason why the government did not pay for the work unrelated to the Wusong and Baimao projects was because the work was done to serve local interests.³⁴

Li's second strategy was to leave room for his two assistants, Yan Ruhuan and Lin Yingxun, to work out a way to fund their assigned work.³⁵ For Yan's project, Li applied the principle of benefit and set a single rule for funding: the burden should be shared by Suzhou and Songjiang, and their subordinate counties and subprefecture.³⁶ In formulating funding policies, Yan asked prefects and magistrates for advice. He gave them three options to consider, two were precedents, and one was a revision of both precedents. The first precedent was to mobilize people based on landownership: for every twenty mou of land, landowner had to provide one worker. But he pointed out that this principle would have made large landowners provide hundreds and even thousands workers, which, in his view, was unrealistic. The second precedent was to recruit people on the basis of community: each community would have provided thirty to sixty workers. He noted that the usual consequence of this principle was that landowners managed to evade doing labor service and landless people were called on for work instead. His

³² 《吳中水利全書》，14:34b. In his itemized report of the completion of the work, he listed no fund from the Customs or salt distribution commissioners. This is evidence to show that he did not get financial supports from the central government.

³³ Li Chongsi had two assistants: Vice Director of Works Yan Ruhuan and Director of Works Lin Wenpei. According to Yan's report, the Wusong project cost 14895.9 taels, and, according to Lin's report, the Baimao project cost 29935.1 taels. The total came to 50323.9 taels when adding the costs of office, lock, and dam building at 5492.9 taels. It was, the most, a half of what he asked for. 《吳中水利全書》，15:52a, 55a, and 56a. The fact that dikes and minor waterways were excluded from the list of funded works was best shown in the difference between Lin's plan of the Baimao project and report of its completion. In his plan, it was said that the government would "consider how much it could reasonably pay" for the work on dikes and minor waterways. But in his report, there was nothing about payment, though the number and lengths of the dikes and minor waterways that had been dealt with were recorded in detail. See *ibid.* 15:46a-b and 56a-b. It indicated that in policymaking Lin's original idea had been dismissed.

³⁴ 顧鼎臣，《顧文康三集》，3:11b.

³⁵ Yan was in charge of Songjiang, Hangzhou, Jiaxing, and Huzhou Prefectures, and Jiading County in Suzhou. Lin was in control of Changzhou and Zhenjiang Prefectures and Changshu, Changzhou, and Wu Counties in Suzhou. And, there was an area of shared responsibility, consisting of Taicang Subprefecture, Kunshan, and Wujiang Counties. See 《吳中水利全書》，15:51a-b, 54a, and 12:7b.

³⁶ 《吳中水利全書》，15:34b. He justified his decision by saying that these two prefectures enjoyed the benefits generated by the Wusong.

own idea was, with respect to labor, to secure it through the community, because it would apportion “light” burden to a “great number” of people, which could have made the goal “easy to achieve.” As for funding, he proposed, for every shi of tax grain, collecting a certain amount of additional tax, and for every mou of owned land, collecting a certain fee. Yan explained the advantages of his revisionist measure: “Poor people would come to work without worrying about getting food by themselves. Wealthy families would pay the money without the trouble of carrying shovels.”³⁷

The novelty of Yan’s measure was not the emergence of the method of “mobilization based on landownership,” because, as shown above, this was a method already used in the fifteenth century. What was crucial about Yan’s measure was that, instead, it put Wu Yan’s advice on “collecting fees based on landownership” into practice. Moreover, given that Li Chongsi justified transferring the financial burden to Suzhou and Songjiang on the basis of the principle of benefit, Yan’s transferring of the burdens to landowners defined benefit in terms of landownership.³⁸ This explicitly institutionalized the combination of the method of collecting fees on landownership and the principle of benefit. On the issue of mobilization of people, it was unclear whether Yan’s preference for community-based recruitment was carried out. If it had been the case, the relationship between landowners and landless people would have been arranged as he planned.³⁹ If it had gone the other way, landowners would have needed to pay the

³⁷ 《吳中水利全書》，15:42b-43a. There are two points to be noted about Yan’s method. First point was about his financial sources. He mentioned nothing about prefectural or county treasuries. He only discussed the options of collecting fees from people. This showed that, after Li’s request for money from Customs and Salt Commissioners was rejected, Yan went right to people to raise the fund without putting his hands in local government’s pockets. Second point was about the way in which the fees were collected. To collect the fees according to area of owned lands was certainly a landownership-related mechanism. To collect the fees by additional tax was also the case. The reason was that landowners paid taxes on the basis of their owned lands as well. For instance, in the Zhengde reign (1506-21) the landowners of Wu County were responsible to pay 34.4 shi of grain as tax for every mou of owned lands. See 《正德姑蘇志》，15:9b. In the end, the foundation on which the fees would have been collected was area of lands too. The difference between the two options and their respective advantage has been analyzed by Liang Fangzhong when he discussed cases of later times. See his, 《梁方仲經濟史論文集》，62-5.

³⁸ Yan, in fact, made a contrast between landless people and landowners by referring to the latter as “those who enjoyed the benefit.” See 《吳中水利全書》，15:42b. This is another indication that in his view landownership was exchangeable with benefit in hydrological management.

³⁹ The cost of this project was 13395.9 taels. The area of lands in Suzhou and Songjiang was 13315371 mou in total: Suzhou had 9478500 mou and Songjiang had 3836871 mou. See 《正德姑蘇志》，15:4a-b and 《正德松江府志》，7:29a-b. The average was 0.001 taels per mou. Landowners’ burden can be calculated in the following way. According to Yan’s criticism of one precedent, if landowners had to provide one worker for every twenty mou of lands, they would have provided 100 to 1000 workers. It meant that landowners at that time usually had 2000 to 20000 mou of lands. Then a landowner would have paid 2 taels to 20 taels. Even if some lands were exempted and some landowners might have more lands, the burdens in general could not have been too much to stand.

fees and provide workers according to their land area at the same time.⁴⁰ Either way, it did not change the fact that landowners were the payers of the Wusong project due to the benefits they enjoyed through landownership.

Lin Wenpei's plan to dredging the Baimao Channel was different. Since the Baimao flowed through only one county of Suzhou, it was hard to justify mobilizing people and collecting fees from other prefectures by the principle of benefit. Yet, the scale of this project was too overwhelming to solely rely on one county (Changshu) or one prefect (Suzhou).⁴¹ In Li Chongsi's words, "the Baimao project was labor intensive." To meet the need for labor, it was decided that "Suzhou took up two [fifths], Changzhou and Songjiang shouldered one [fifth] respectively, and Jiaxing and Huzhou were collaboratively responsible for one [fifth]. Since Changshu County was close to [the Baimao], it did half [of Suzhou's assignment]."⁴² With respect to fundraising, the institution of dredging fees was put back in place.⁴³ In doing so, like

⁴⁰ Evidence showed that it had been at least discussed if the government should have used the "mobilization based on landownership" method. Gu Qing, a Huating metropolitan graduate of 1493 and the one of the authors of a sixteenth-century Songjiang gazetteer, had a letter to Li Chongsi. He expressed his concern regarding the ratio of workers that landowners had to provide to the area of their lands. The ratio that was being discussed was one worker for every thirty mou. His argument was that, by this measure, more than 100,000 workers would have been recruited. He did not think the dredging projects would have needed so many workers. 顧清, 《東江家藏集》, 39:5a-b. Since Yan's note to prefects and magistrates did not mention this ratio—his ratio was "one worker for every twenty mou," it was likely that in policymaking a lighter ratio was brought up for discussion. If eventually Yan adopted this method, he must have taken Gu's concern into consideration. The number of workers mobilized for the Wusong project was 43078. As shown above, the area of lands in Suzhou and Songjiang was 13315371. Even if some lands were exempted from corvee, it should be reasonable to conclude that the ratio would not be heavier than one worker to two hundreds mou. It was then a tenth of the precedent Yan referred to and a seventh of the alternative discussed in policymaking. This reduction of landowners' burden was a remarkable compromise. It should be noted that Hamashima read Gu's text as a large landowner's resistance to the "mobilization based on landownership" method. See Hamashima, 《明代江南農村社会の研究》, 145. Hamashima's research in the resistance of large landowners to this method is convincing, but I think Gu Qing's text signified the existence of a positive view of this method held by large landowners. In my reading, Gu did not say he had a problem with the method. What he was reluctant to agree was the ratio (照田起夫之“數”). It was hence a local elite's advice that intended to make the application of this method realistic.

⁴¹ The costs of the Baimao project were at least twice as much as that of the Wusong project in every respect—taels: 2.23 times, grain: 2.29 times, and materials and payment for locks on the Baimao: 2.94 times. Its number of mobilized people was twenty-two times, and its duration was four times. Its length was about triple, its width was eighty percent larger, and it was 0.3 zhang deeper. See 《吳中水利全書》, 15:51b-52a and 54b-55a.

⁴² 《吳中水利全書》, 14:34b. It was noted that about 9000 people were mobilized from Shanghai county. See 《嘉靖上海縣》, 1:10a. Extant evidence did not specify whether the labor was mobilized by community or by area of owned lands.

⁴³ The evidence could be found in Lin's plan on using the dredging fees. See 《吳中水利全書》, 15:46b. Since the institution had been abolished, he could not have had this fund at his disposal unless it had been previously reinstated. Another piece of evidence was in a report of 1526 by Cai Qian, then a hydrological assistant surveillance commissioner. He recorded that from 1520 to 1526 dredging fees had been collected from Suzhou and Changzhou Prefectures. These two prefectures were almost congruent with Lin's area of

the Wusong project, the Baimao project was conducted by transferring financial burdens to the people without governmental funds.⁴⁴ However, because dredging fees were collected on the basis of community, Lin did not put financial duty particularly on landowners like Yan did. Lin's not using the principle of benefit showed a crucial limit of its application: the lands had to be connected to a waterway directly or indirectly to be counted as gaining benefits from the work on this waterway, and their landowners could be hence considered as responsible for its cost and labor supply. In this sense, the principle of benefit was significantly different from the principle behind the practice that demanded contributions from people through the community-tithing system, because the latter did not see the relationship between a land and a waterway as a factor in determining one's responsibility.

Below the level of the two major waterways, Yan's and Lin's regulations differed only in their wording. The principle of benefit consistently appeared. In Yan's area of responsibility, dikes and all waterways were to be maintained by "those who benefited from them" and "they should prepare their own food."⁴⁵ In Lin's area of responsibility, all waterways were also to be dredged by "those who benefited from them."⁴⁶ Dikes were repaired by "landowners who benefited from [those dikes]," and they were mobilized "according to the area of their lands."⁴⁷ On a close analysis, it is obvious that none of these mobilizations were cross-prefectural—the largest ones recruited people from three counties. This fact, and the consistent reference to the principle of benefit in Li's administration, showed that in the early sixteenth century this principle was used to generally define people's responsibility in hydrological management at the

responsibility. The time of the reinstatement of this institution was right after Li's proposal had been rejected. It is thus reasonable to conclude that it was an action mainly for the dredging of the Baimao. For Cai's report, see 《吳江水考》, 5:10b-13b. It should be noted that the dating of this report is incorrect in this book. It is dated as in 1525, but the text actually mentioned 1526 and said it was "more than three years after Li's" project, which ended in 1523. So, it could not have been earlier than 1526. It should be also noted that the fees collected from Suzhou—excluding Chongming and Jiading Counties—would amount to 17868 taels, because in the Zhengde reign there were 2978 communities in the six counties. See 《正德姑蘇志》, 7:6a-8b. The number of communities in Changzhou Prefecture was unclear. But as long as there were 2000 communities in Changzhou, the fees from there could make the total. Furthermore, even if there were fewer communities, according to Chai's advice, the gap could have been filled by advance collection of fees of next one or two years. See 《吳江水考》, 4:44a.

⁴⁴ It should be noted that, in Yan's and Lin's reports, both stated that the payments were from the government. See 《吳中水利全書》, 15:52a, and 55a. As discussed above, however, both actually developed an approach to raise funds by collecting fees from people. Their statements hence referred to the funds that were not there at the beginning of their appointment but now at their disposal.

⁴⁵ 《吳中水利全書》, 15:53a-b. In this context, to prepare one's own food meant that they would not be paid by the government.

⁴⁶ 《吳中水利全書》, 15:55b-56b.

⁴⁷ 《吳中水利全書》, 15:46b. It should be noted that, even though Lin had planned on using dredging fees and certain amount of governmental budget for dike building, he eventually did not do so according to his report of the completion of his project. See *ibid.* 15:57a.

prefectural, county, and community levels. Moreover, in terms of the application of the principle of benefit, by using it in dike building, Lin brought it one step further by adopting it to justify “mobilization based on landownership”.⁴⁸

The Principle of Benefit in Action and in Discourse after Li Chongsi

Continued Application in Local Projects and Voice in Discourse

The principle of benefit and the method of mobilization based on landownership repeatedly appeared in hydrological projects after Li Chongsi’s administration in local projects. For instance, in 1525 Assistant Surveillance Commissioner Cai Qian ordered that small channels, ditches, and polder dikes be maintained by “mobilizing those who were benefited.” Director of Works Zhu Gun set rules in 1530: people were to be mobilized based on landownership for regular maintenance of small waterways and polder dikes.⁴⁹ Taicang Vice Magistrate Wang Pin had the Yanglin Channel dredged in the mid-1530s by mobilizing people based on landownership.⁵⁰ And, Salt-control Censor Wei Yuankang combined the principle of benefit and the method of “mobilization based on landownership” in his dredging project in 1567.⁵¹ What is worth analysis was Wei Yuankang’s project. While other projects were small-scale, Wei’s was

⁴⁸ Yu Jian was actually the first official who tried to combine the principle of benefit and the principle of mobilization based on landownership at local level. See 《吳江水考》, 4:33b-44a. However, his idea was not put into practice, because his proposal was disapproved.

⁴⁹ 《吳中水利全書》, 15:61a, 63b-64a.

⁵⁰ 《吳中水利全書》, 22:67b-68a. I follow Hamashima’s dating of this event. See his 《明代江南農村社会の研究》, 148-9. I am convinced that Wang’s had been put into practice, even though no evidence in local gazetteers indicated its implementation. My judgment is based on the following reasons. First, there is neither obvious reason to dismiss the validity of this text that referred to Wang’s project. Second, the author of this text, Mao Jieqing, offered some details of this project. See 《吳中水利全書》, 22:70a.

⁵¹ 《吳中水利全書》, 25:68b-69a. The repetitive applications of the principle of benefit and the method of mobilization based on landownership did not mean that they had become accepted without exception. Circuit Vice Commissioner Xiong Fu decided to mobilize people based on community-tithing system due to strong resistance of wealthy landowners. See *ibid.* 22:68a-b. This case indicated that landowners considered the Community-tithing System a better way to avoid their due responsibility. Why did Xiong chose this method was unclear, but two administrative factors could play a certain role. Local hydrological officials were abolished around this time due to the wokou disturbance, and Xiong, as circuit vice commissioner, was busy with military actions during this period. These two factors made investigation of hydrological conditions and review of landownership difficult. When resistance to mobilization based on landownership emerged, there were no administrative means to refute it. The Community-tithing System became the most convenient way to achieve the goal, because it only needed to apportion the work to each community and tithing to get sufficient workers without worrying about whether it was fair or not. For the recent abolishment of local hydrological officials, see 《吳中水利全書》, 14:57a. For Xiong’s military commitments, see 《江南經略》 3B:43a, 44b, 82b, and 4B:44a. From 1555 to 1557, he at least led four military operations as Taicang vice magistrate and Suzhou vice prefect. Even though there was no account of his military actions as circuit vice commissioner in 1557, this position must have kept him on guard, because the wokou disturbance did not cease in this area.

not. His project covered three major waterways in Taicang Subprefecture. It cost 12,172 taels of silver and recruited 668,171 workers.⁵² The most important reason that he could achieve this was because he did not include a great number of waterways and he did not include any work that needed cross-county or cross-prefectural coordination. As such, he made his project labor-wisely feasible and financially manageable.

The limited application of the principle of benefit and the method of mobilization based on landownership to local project did not seem to satisfy some local elites. The concern of labor and financial supply behind Zhou Fengming's and Wu Yan's argument was shared by other local hydrological specialists. With certain adjustments, they echoed Zhou and Wu by voicing their opinion that it was legitimate to calculate one's responsibility based on one's landholding.

In the 1550s, Xue Shangzhi discussed financial concerns in his *Essays on the Waterways in Changshu County*. He recommended that the state “collect fees based on mou [i.e. area of lands]” at an annual rate of “one hundredth per mou.” His idea for the mobilization of workers, however, followed a different track. He still used the community-tithing system as the basic unit. Yet, he did not simply return to the old way of recruiting all people, which would have ignored the difference between the wealthy and the poor. Rather, the poor should be the ones to be mobilized, because they could work for pay. In his view, it was a fair division of responsibility among local people: the wealthy contributed their money and the poor contributed their labor. He estimated that this plan could raise sufficient funds and recruit enough workers for difficult projects.⁵³ Xue's advice was thus a combination of the “work for relief” method and the method of collecting fees based on landownership. From a financial perspective, this combination reduced state's expenditures. It transferred financial burdens to wealthy so that the state did not have to set aside special funds for hydrological management. It also saved the state burdens of famine relief. This combination thus enhanced the financial viability of hydrological management.

Ling Yunyi held a slightly different view of division of labor. In his memorial of 1566, he suggested that the state have “rich landowners make financial contributions and poor [landowners] provide labor services.”⁵⁴ The responsibility fell entirely on landowners, and the difference only existed in how they fulfilled their responsibility. Though he did not specify the rate of fees and labor service, he confirmed the appropriateness of using landownership to

⁵² 《吳中水利全書》，25:68b-69a. He did not specify where the money from, but the project was definitely conducted on governmental budget, because he said the government should not have been stingy about hydrological management. See *ibid.* 25:68b.

⁵³ 《常熟水論》，16b-18b.

⁵⁴ 《吳中水利全書》，14:61b.

determine one's contributions to hydrological management. In offering his advice, Ling cast himself as a member of the local elite.⁵⁵ Although he was not as radical as Wu Yan and Zhou Fengming, who insisted on revoking exemption privileges when hydrological management was concerned, there are two reasons to conclude that it was unlikely that Ling would endorse some gentry landowners' actions that stretched exemption privileges to avoid contributing. First, when Ling discussed levying taxes on sandbank lands to raise more money for hydrological management, he included gentry and non-gentry owners equally.⁵⁶ Second, disregarding the existence of the landowners who would do whatever to evade their duty, Ling portrayed the contemporary situation as if all landowners were "happy to make financial contributions and physically participate" in hydrological works as long as there was good official leadership. Landowners took this attitude, as he explained, because "the benefits and damages were close to themselves."⁵⁷ His selective representation of landowners' attitudes implied a perspective close to Wu Yan's: both saw that the consequences of hydrological management would affect all landowners without exception. Gentry landowners, therefore, should take part in hydrological works. Ling Yunyi, as a local elite who would involve the state in ensuring good hydrological management, showed the state that, since it was reasonable to look to landowners for financial and labor sources, hydrological management was feasible.

In the late 1560s, Taicang hydrological specialist Mao Jieqing took a strong stance on the issues of mobilization of people and collecting fees. He maintained that mobilization based on landownership was a "perfect measure" that could be "equally applied to large and small projects."⁵⁸ He found legal exemption privileges acceptable, but he dismissed the objection, raised by wealthy landowners, that they could not provide workers even though they did possess vast amounts of land. Mao's counter-argument was based on his observation that to farm one thousand mou of lands, a landowner needed to hire one hundred tenants. Since Mao recommended that one worker be provided for every thirty mou of land, he maintained that it was

⁵⁵ 《吳中水利全書》，14:58b. He was indeed from an elite family. Ling Yunyi and his brother, Ling Ruzhi, were both provincial graduate of 1543. His brother became a metropolitan graduate in 1544 three years prior to him. See 《宣統太倉州志》，18:42a-b. By this time, he had been an administration vice commissioner, ranking 3b. See 《吳中水利全書》，14:58b.

⁵⁶ 《吳中水利全書》，14:62a-b.

⁵⁷ 《吳中水利全書》，14:61a.

⁵⁸ 《吳中水利全書》，22:67b and 69a. Mao mentioned Jiajing Emperor's posthumous title. See *ibid.* 22:66a. But he did not touch upon Hai Rui's 1570 project. Therefore, his work must have been done between 1567 and 1569. Mao was most likely a Taicang native, because he discussed a number of Taicang waterways. Furthermore, he was recognized a hydrological specialist as early as in the 1520s. When Li Chongsi was in charge, Suzhou Prefect Liang Gu had consulted with Mao on hydrological matters in order to respond to Li's inquiry into the situation. See *ibid.* 22:71a-b.

an affordable burden.⁵⁹ As for fundraising, although Mao agreed that governmental budgets should have been used for large projects, he insisted that for small projects “landowners should pay tenants for their labor service.”⁶⁰ Landowners became the financial source and the providers of workers for the benefits they enjoyed from hydrological works.

Despite their differences, the local elites above shared two positions: (1) the principle of benefit was a legitimate justification for mobilization of the people and collecting fees, and (2) landownership was a legitimate basis on which people were mobilized and fees were collected. In doing so, they defined hydrological management as landowners’ ethical responsibility that should have been fulfilled in a calculable way and in material forms—that is, money and labor. As for the role of the state, they not only presented clear guidelines to involve the state in institutionalizing fair apportionment of responsibility, but also made local resources visible to the state such that it could be more active without being burdened by higher expenditure.

The Limits to the Application of the Principle of Benefit Shown in Lu Guangxun’s and Lin Yingxun’s Projects

Lu Guangxun followed the path and applied the principle of benefit to his project in the mid-1540s. He relied on local hydrological officials to oversee the maintenance of local and small-scale projects. Those who benefited would be mobilized.⁶¹ As for larger projects, the principle of benefit was used to determine how broad an area from which people were to be recruited: “people are to be called on to work if a waterway benefited their place.”⁶² This reiterated the limit that had been shown in Li Chongsi’s project: only those who directly or indirectly benefited from a waterway would be considered responsible for its construction.

Yet, Lu Guangxun did not use the principle of mobilization based on landownership to secure labor. Instead, he employed the principle of work for relief. This decision also led him to raise funds in a different way than Li Chongsi. He explained in two memorials that his decision was made in a context that (1) “famine struck and public and private financial sources were deficient—that is, it was not possible to levy extra taxes or to expect grants from the central

⁵⁹ 《吳中水利全書》，22:68a-b. He presented a complicated apportionment of responsibility. Those who benefited from and were closest to a waterway would provide one worker for every thirty mou of owned lands. Those who were farther away from a waterway would provide one worker for every fifty mou of owned lands. And, the farthest would provide one worker for every one hundred mou of owned lands. Only for the largest project, people who did not benefit from the work would be ordered to provide one worker for every one hundred and fifty mou of lands.

⁶⁰ 《吳中水利全書》，22:67a-b.

⁶¹ 《三吳水利圖考》，2:1a.

⁶² 《三吳水利圖考》，2:10a. It is a longer sentence in Chinese original: 其所役之人，各因其水之所利，隨地而用之。

government,”⁶³ and (2) “famine was so severe that people were poor.” Therefore, to “use the governmental budget to hire those who had no food to dredge branch rivers was to incorporate relief efforts” in dredging projects.⁶⁴ Apparently, famine played a crucial part in formulating his policy. On close analysis, a lack of administrative authority actually played a more important role, because famine did not always entail “work for relief”. For instance, Yan Ruhuan collected fees based on landownership and Lin Wenpei reinstated the dredging fees despite floods between 1518 and 1522.⁶⁵ Precedents were available to solve the problem, but without the full administrative authorization that Yan and Lin enjoyed, Lu did not find those strategies plausible.⁶⁶ Under the circumstances, he could only rely on prefectural and county budgets. The issue now became how to justify the use of money for hydrological projects when people needed relief and the budgets were tight. In his words:

I heard that those who are good at healing diseases attack the root [of the disease] and those who know how to solve problems seek the cause [of the problem]. Good and bad hydrological managements are the causes of benefits and harms to the Wu people. Generous famine relief without good hydrological management is same as to heal a disease by only abbreviating its superficial [symptoms] without attacking its root. That is

⁶³ 《三吳水利圖考》，2:6a.

⁶⁴ 《三吳水利圖考》，2:10a. Apparently, famine played an important part in formulating his policy. On close analysis, financial shortfalls and a lack of administrative authority actually played a more important role, because famine did not always entail “work for relief”. For instance, Yan Ruhuan collected fees based on landownership and Lin Wenpei reinstated the dredging fees despite floods between 1518 and 1522. During Yan’s and Lin’s tenures, only 1521 was a flood-free year. The floods of 1518 and 1519 were described as “destroying houses, killing people, and significantly shrinking population.” See 《常熟水論》，4a-b. See also, 《嘉靖常熟志》，10:39b, and 《吳中水利全書》，8:17a. The floods of 1519 “inundated rice plants.” 《吳中水利全書》，8:17a. The floods of 1522 were serious. It was described as “paddy lands became large ponds and fields of the Wu area were all submerged.” And “when the lake spilled, the vast area outside the Wujiang county city and Jian Village were all inundated.” See 《吳中水利全書》，8:17b. With precedents set by Yan and Lin available, Lu’s lack of the full administrative authorization that Yan and Lin enjoyed was actually a crucial factor that made those strategies not plausible to him.

⁶⁵ During this period, only 1521 was a flood-free year. The floods of 1518 and 1519 were described as “destroying houses, killing people, and significantly shrinking population.” See 《常熟水》，4a-b. See also, 《嘉靖常熟志》，10:39b, and 《吳中水利全書》，8:17a. The floods of 1519 “inundated rice plants.” 《吳中水利全書》，8:17a. The floods of 1522 were serious. It was described as “paddy lands became large ponds and fields of the Wu area were all submerged.” And “when the lake spilled, the vast area outside the Wujiang county city and Jian Village were all inundated.” See 《吳中水利全書》，8:17b.

⁶⁶ He was hesitant to mobilize people based on landownership or by community-tithing system. His concerns were what Yan Ruhuan was aware of and had solved thirty years ago. See 《三吳水利圖考》，3:3b. He once mentioned dredging fees, but he only complained that this institution had been abolished and recommended that the state put it back in place in the future. See *ibid.* 3:9a. Neither Yan’s nor Lin’s strategies seemed doable to him. The most potential reason of his not following Yan’s precedent was not his unwillingness but the inherent inability of his appointment. That is, he had to cover a larger area—four prefectures instead of two, but he was appointed to take full charge of hydrological matters.

not going to save one's life. My humble opinion is to produce two kinds of benefits simultaneously. That is to cure both symptom and root.⁶⁷

After subordinating famine relief to hydrological management, Lu proceeded with his five-point advice. One of the points was to emphasize that to hire people to work for hydrological projects and to provide them food were to “produce two kinds of benefits” in one action.⁶⁸ By this argument, Lu made a case for his hydrological project and secured a certain amount of money from prefectural and county treasuries.⁶⁹ Lu's administration hence showed another limit of the application of the principle of benefit: an official without full authorization could not put it into practice for large projects in the aftermath of natural catastrophes.

With the precious funds at his disposal, Lu went on to formulate a detailed plan. At the core of this plan was to control spending. Lu developed a set of technical-budgetary methods to keep his project economical. First, he adopted a precedent to calculate the expenditure.⁷⁰ The basic unit was a cubic zhang. In order to cut the expenses, he took as his point of reference how private projects paid the workers. He showed that private projects counted a cubic zhang as eight units of work. Then, he argued that, given public projects were usually more difficult than private projects, it would be appropriate that a cubic equaled sixteen units of work in public projects. This consideration was a criticism of the precedent that took one cubic zhang as twenty units of work. By doing so, the cost immediately became eighty percent of what it could have been. And, he argued that a cubic zhang in a public project was worth four qian—twice as much as that was in private project. He hence came up with a formula as follows: 1 cubic zhang = 16 units of work = 4 qian.⁷¹ Second, all the waterways that needed to be dredged were measured by his method. Then he classified the waterways into three categories. For the ones that local people could manage, he demanded that “people themselves dredge” those waterways (民自修濬). He took the most difficult one as state's responsibility and said that “the government should conduct the dredging” (官爲修濬). For the waterways in the intermediate category, he ordered

⁶⁷ 《三吳水利圖考》，2:2b.

⁶⁸ 《三吳水利圖考》，2:6a-b. Here he once more stressed his point by comparing the cost of hydrological management and that of famine relief.

⁶⁹ Lu's request for permission to use prefectural and county budgets was approved. An imperial edict showed that his funds included remaining dredging fees, reserved silver and grain, and fines and some other money that could be transferred for this purpose. See 《三吳水考》，1:4b. He actually wanted to have the transit taxes from the Beixin and other customs—which were controlled by the Ministry of Revenue—for him. See 《三吳水利圖考》，3:9a-b. But, none of transit taxes were listed in the imperial edict. It was obvious that this idea was disapproved.

⁷⁰ I agreed with Hamashima that this precedent referred to Yan Ruhuan's project. See his 《明代江南農村社会の研究》，139.

⁷¹ 《三吳水利圖考》，3:1a-b.

that “the government should considered assisting the dredging” (官量助修濬).⁷² Classifying waterways into different categories was certainly not Lu’s invention. Yan Ruhuan also had a three-category classification. Lu’s definition of the state’s role in the intermediate category did not change Yan’s definition, because Lu did not characterize the waterways in this category as the state’s responsibility. He only said that the state could fund their dredging sometimes. What distinguished Lu’s classification from Yan’s was its handling the waterways in the intermediate category: Lu recorded their lengths, widths, depths, cubic zhang of earth to be removed, number of needed workers, and amount of needed silver, but Yan did not pay attention to this information.⁷³ This difference showed that Lu intended to have solid control over the dredging these waterways. Even if they were just potential objects of state’s investment, he still tried to get a clear view of their conditions and costs to ensure effective maintenance. Given that his policy would have all works, except for the project of large waterways, done by mobilizing people by the principle of benefit, Lu’s technical-budgetary methods gave the application of this principle a set of clear measures not only to distinguish large waterways from others, but also to define the responsibility of the state and people.

In 1576, when Investigating Censor Lin Yingxun was appointed regional hydrological official, he stated that the principle of benefit was what he generally applied to all projects except for those of the major and difficult waterways.⁷⁴ In practice, he used this principle to justify mobilizing people based on landownership for the Wu Channel and Gu Channel projects in 1578.⁷⁵ In his Puhui Channel project, he adopted Lu Guangxun’s precedent to ensure it feasible. Originally, he planned to completely fund the Puhui Channel project. After his request for support at the amount of 30610 taels was turned down by the central government, he worked with his assistants to make adjustments to his original plan and find other sources.⁷⁶ He eventually secured about 18810 taels from two sources: the fines and income from selling confiscated lands for 14,200 taels (46.39%) and the governmental funds for 4,607 taels (15.05%). This only added up to about seventy percent of what originally proposed. He then decided that the state did not

⁷² See, for example, 《三吳水利圖考》, 1:16a-17a.

⁷³ For Lu’s case, see, for example, 《三吳水利圖考》, 1:16a-b, and for Yan’s case, see 《吳中水利全書》, 15:51b-52a.

⁷⁴ 《三吳水考》, 11:10b and 12b. The principle of benefit did not apply to difficult projects such as the Wusong and Baimao projects. These projects also used different methods to mobilize people. The community-tithing system was used to recruit people—every community had to provide twenty to thirty workers—in the Wusong project. The Registration of Households was used to determine people’s responsibility—top, middle and bottom classes of households were responsible to dredge 27, 18, and 9 zhang of waterways. See 《三吳水考》, 11:80a and 13:72a-b.

⁷⁵ 《三吳水考》, 12:4b.

⁷⁶ 《三吳水考》, 11:24a-b, 25a, and 28b.

have to worry about the difference. He adopted the principle of “mobilization based on landownership” to recruit people from several counties, and explained that this mobilization was “to use people’s services for the people’s benefits.”⁷⁷ By doing so, he defined this project as a project of intermediate level: on the one hand, it was not fully funded by the state like the Wusong project, and, on the other hand, it did not demand people’s completely free labor service like local small projects. This division—the state paid seventy percent and people worked free for thirty percent—made the Puhui project a case that showed Lu Guangxun’s three-category division of responsibility was implicitly working in Lin Yingxun’s administration.⁷⁸

Even though Lin Yingxun had made it clear that his policy was to mobilize people by the principle of benefit, the difficulties that he encountered in employing it illustrated the limits of its application. In his Sangzhang Channel, Dawa Channel, and Heng Channel projects in 1579, he did not use the principle of benefit, but adopted the “work for relief” method.⁷⁹ The choice was not arbitrary. What happened between this set of projects and the set of projects in 1578, which included the Wu Channel and Gu Channel projects, were several floods occurring in early 1579. In aftermath of the floods, Lin submitted a series of memorials for famine relief.⁸⁰ The dredging of the Sangzhang, Dawa, and Heng Channels was part of his flood abatement efforts. He thus argued that it was reasonable to have people work for relief in these projects. As Lu Guangxun’s case has shown, when the principle of “work for relief” was adopted, hydrological management would work in a different way. Money came from the state, and the method of mobilizing people would not be based on landownership. Lin hence sought financial sources mostly within prefectural and county treasuries, and partly from the central government. He also recruited starving people regardless of landownership.⁸¹ It should be noted, however, his decision was not made solely because of floods. Timing was a decisive factor, too. The Sangzhang, Dawa, and Heng projects came after he had done with the Puhui project in the previous year and the Baimao project early this year. For the Puhui project, people had been mobilized based on landownership,

⁷⁷ 《三吳水考》，11:36b-37a.

⁷⁸ Lin noted in his other smaller projects that “the state should have taken seventy percent responsibility and people should have taken thirty percent responsibility.” He also noted that large project should have been state’s responsibility.” See 《三吳水考》，12:68b.

⁷⁹ There seemed a consulting process among these counties and “people did not have complaint.” For the Sangzhang Channel, Dawa Channel, and Heng Channel projects, see 《三吳水考》，12:59b and 71a-b. Hamashima mentioned that the method of mobilization of the Meng Channel project, which was conducted in 1577, was also “work for relief.” See his, 《明代江南農村社会の研究》，152. Yet, according to 《三吳水考》，the method at work was that the government hired people to work without consideration of famine relief. See, 11:46a.

⁸⁰ 《三吳水考》，12:38a-57b.

⁸¹ 《三吳水考》，12:58b-59b and 71b-72a. It was unclear whether his request for financial supports from the central government was approved.

and for the Baimao projects, sandbank lands had been taxed.⁸² If applying the principle of benefit and adopting the method of mobilization based on landownership, he would have doubly burdened the people. That would have been considered maladministration. His use of the principle of “work for relief” was hence a decision made when his other options had been exhausted by the earlier projects. This decision distinguished Lin from Lu Guangxun, despite their apparent similarity, because Lu simply employed the principle of “work for relief” without seeking alternatives first. In other words, Lin’s administration did not change the crucial place of the principle of benefit and the method of mobilization based on landownership in the field of hydrological management.

At local level, Lin also applied the principle of benefit and intended to use the method of mobilization based on landownership. Yet, he encountered a problem that had not been addressed by previous administrations. That was the issue of gentry landowner’s exemption privilege. Local elites like Wu Yan and Zhou Fengming maintained that the principle of benefit should be generally employed in hydrological management and that all people, regardless of their social status, must contribute according to their landownership. Yet, Li Chongsi, Yan Ruhuan, Lin Wenpei, Lu Guangxun, and other hydrological officials were all silent on this issue. They must have accepted existing rules and they did not think it necessary to take a stand. As such, the gentry landowners who did not share the same view with Wu Yan and Zhou Fengming could manage to escape from Yan Ruhuan’s rule that combined the principle of benefit and the method of collecting fees based on landownership. They could also find a way to avoid their dues at local level, even though the principle of benefit had been adopted in Li Chongsi’s administration and repeatedly emphasized by some local elites. One of the consequences of gentry landowner’s exemption privilege was the shrinkage of corvee and tax bases, because non-gentry landowners would collaborate with gentry landowners to get away from their responsibility.⁸³ The Ming state

⁸² The Puhui project was done in 1578. See 《三吳水考》, 11:36a. And he did mention that it would be difficult to mobilize people from Songjiang based on landownership because they had been exhausted by the Puhui project. See *ibid.* 12:69a. His concern was not pointless, because the areas from which people were to be mobilized in the Puhui project and the Dawa and Heng project remarkably overlapped—that included Shanghai, Huating, and Qingpu counties. See *ibid.* 11:24b and 12:68b. The Baimao project was done in 1579. See *ibid.* 12:38b. For this project, sandbank lands had been taxed. See *ibid.* 13:62a. It should be also noted that the Baimao and the Sanzhang Channels were both located in Changshu County such that if taxing sandbank lands for the Sanzhang project, same objects would have been taxed twice in the same year.

⁸³ The way in which gentry landowners and non-gentry landowners conspired together to avoid their responsibility was “forged ownership” 詭寄. Secretary of Justice Liu Qiao 劉喬 pointed out that the “evil and clever [i.e. non-gentry landowners]” had collaborated with the “powerful and influential [i.e. gentry-landowner]” by nominally attaching some of their lands to gentry landowners such that non-gentry landowners could also indirectly enjoy the exemption privileges. See 《孝宗實錄》, 200:3a. For definition of the forged ownership in the Ming, see Tang Long’s 唐龍 memorial of 1521 in 《御選明臣奏

issued a new set of restrictions on gentry's exemption privileges in 1545.⁸⁴ While the preceding efforts were only to define proper restrictions, Lin had a different view. In his "Six Rules on Managing the Fields," one rule drove the point home:

Although the lengths and widths of ditches, creeks, and dikes vary from one village to another, it is certain that all of them are set for the lands in polders... The water [brought by the ditches and creeks] benefits the lands of a polder; therefore, [the work of ditches and creeks of this polder] should be demanded from landowners. Every county should immediately order administrators of channels to report the length of dikes and surrounding ditches, area of land inside each polder, the number of mou owned by each landowner, and the length of dikes for which each landowner is responsible. It should not be taken into consideration whether one is the gentry or commoners. All of them have to provide labor services based on landownership. If their lands border dikes for one zhang, they have to repair one zhang of dike... Same is in the dredging of waterway. The households on each side of the waterway should be responsible for half of the work. In case of the dikes along the outlet of a waterway, which are [too difficult] for one household to take care of, people should cooperatively provide labor according to actual land... In case of the lands of gentry landowners, it requires that gentry landowners provide food and tenants provide labor service. [Tenants] should be paid by unit of work...⁸⁵

議》, 16:26b-28b and Xu Shizeng's 徐師曾 essay in the late 1540s in 《明文海》, 95:7a-10a. For modern scholars' discussions, see Liang Fangzhong, 《梁方仲經濟史論文集》, 252-4, Hamashima, 《明代江南農村社会の研究》, 225-45, and Kawakatsu, 《中国封建国家の支配構造》, 436-47 and 463-70, and Wada Masahiro 和田正広, "徭役優免条例の展開と明末挙人の法的地位—免役基準額の検討を通じて," 《東洋学報》 60:1-2 (1978): 93-131. For the relationships between the efforts of restricting gentry's exemption privileges and the Single-Whip System, the most recent and comprehensive research is done by Wei Qingyuan 韦庆远 in his 《张居正和明代中后期政局》(廣州: 廣州高等教育出版社, 1999), esp. chapter 13.

⁸⁴ 《明會典》, 20:7a.

⁸⁵ 《三吳水考》, 14:32b-33b. Hamashima offered his explanation of this rule. His point is that Lin was probably faced with the gentry's resistance such that he had to adopt the head-land method to ease the pressure. I agree that Lin chose this approach as a compromise with the gentry. See his 《明代江南農村社会の研究》, 46-53. Yet, I think it is necessary to think of the function of the head-land method and the historical situation in which Lin made his decision. If the Zhengde and Jiajing reigns (1506-66) had witnessed the decline of the community-tithing system, to which the head-land system corresponded, then it did not seem reasonable to think that landowners would stick to the head-land method for their dominance over local society and for their private gain. (For the discussion of the connections between the community-tithing system, head-land method, and landowners' dominance, see Hamashima, "明代前半の江南デルタの水利慣行—田頭制再考," 《史潮》 New 3 (1978): 87-104 and 《明代江南農村社会の研究》, 9-65, esp. 42-7, 67-90, and 142-59, esp.144-7.) Therefore, the reason that the head-land method

Lin Yingxun evidently reiterated Wu Yan's point when he made a connection between the benefit that landowners enjoyed and the obligation they had to provide labor. Guided by the principle of benefit, he decided landownership was the appropriate basis to mobilize people. Up to this point, he was actually similar to Yan Ruhuan, who combined the principle of benefit and the method of collecting fees based on landownership in apportioning people's responsibility in hydrological management. However, Lin Yingxun took one step forward after this point. He incorporated Wu Yan's and Zhou Fengming's ideas, and planned on completely revoking the gentry landowner's exemption privileges.⁸⁶ His decision received so much opposition that he eventually compromised and returned to the "head land system".⁸⁷ He now only required that those whose lands were adjacent to dikes and ditches provide labor service. His compromise revealed a fact: although there existed local elites like Wu Yan and Zhou Fengming who were willing to forgo their privileges, the majority gentry landowners did not conceive participation in hydrological management at equal rate as their obligation. Yet, Lin Yingxun's compromise was not an entire retreat from his attempt at revoking gentry landowners' exemption privilege. He still managed to redefine the place of gentry landowner's place in hydrological management. Lin's original plan, as discussed, would have invited the collective resistance of landowners. The head-land system, however, would help him significantly reduce the opposition, because it only affected certain landowners. Furthermore, those whose lands bordered on dikes now had no excuse to evade their responsibility. Lin specifically pointed out that gentry landowners had to participate without exception as long as their lands were located where people were supposed to be recruited. Their official status was irrelevant and they were to be held accountable in the same way as non-gentry landowners were. The only difference between gentry and non-gentry landowners was that the former were allowed to not physically provide labor service. They could pay their tenants to work on their behalf. By doing so, Lin succeeded in codifying the way in which gentry

could serve as common ground for Lin Yingxun and gentry landowners needs to be reconsidered. I would provide my explanation below.

⁸⁵ Because of the aforementioned textual ambiguity, I here keep the two methods that Lin Yingxun might possibly adopt. These two methods are different. The former was to demand a fixed number of workers for certain mou of owned land. The latter was to divide the number of length of dikes with the number of area of land in a polder.

⁸⁶ It should be noted that an imperial edict issued to him did state that corvee should have been levied based on landownership. But the edict did not specify whether this order applied to gentry landowners. For this edict, see 《吳中水利全書》, 12:11b.

⁸⁷ The turn was abrupt enough to attract not only the attention of modern scholars like Hamashima, but also that of scholars in the Ming dynasty like Xu Guangqi 徐光啓. See 徐光啓, 《農政全書》, 14:16a. Xu, Shanghai metropolitan graduate of 1604, was a scholar of later generation. He lay criticisms on Lin's decision. Xu contended that the proper way to levy corvee was to apportion dikes to landowners according to the area of their lands; otherwise, it would unfairly burden those whose lands were located along the waterways.

landowner took part in hydrological management. This was a skillful way to hold his stance on the principle of benefit.

Above all, the principle of benefit was usually put into practice in this period at local level and in small-scale projects. Landownership was often considered a legitimate method to raise funds and mobilize people. The situation to which these principle and methods were difficult to apply demonstrated that administrative authority was a significant factor in determining whether they could be used at the regional level and in large-scale projects. Yet, administrative authority was not the only factor. Hydrological officials had to work within the limits set by the gentry's exemption privilege and timing, as Lin Yingxun's case showed.

Localized Hydrological Management and the Principle of Benefit

The Principle of Benefit and the Redefinition of the Role of Gentry Landowners

Toward the end of the sixteenth century, a series changes first took place within the boundaries of several counties, and then became a set of generally applied regulations. The first locality in which certain changes took place was Taicang Subprefecture at the turn of the seventeenth century. Around the same time, Wuxi County in Changzhou Prefecture tried a new manner to have dikes repaired. Jiading, Changshu, and Huating were the other three counties that developed their own way to handle hydrological matters. These changes, justified by the principle of benefit, enabled local officials to achieve their goals without support from above.

Taicang gentry-landowners played a significant role in setting an example for change. Wang Xijue “promoted the idea of the people, be they gentry or non-gentry, working together” in hydrological projects.⁸⁸ Wang's action addressed the issue of gentry's exemption privileges. His

⁸⁸ 耿橘,《常熟縣水利全書》,附錄上 10b. Hamashima argued that the revocation of gentry's exemption privileges was a result of voluntary actions by the Donglin scholars and legislative actions of the Donglin-affiliated officials. He maintained that the Donglin scholars were willing to forgo their privileges because they had the right view of what public good was. See his《明代江南農村社会の研究》, esp. 366-370, 432-435, and 459-466. Wang Xijue's role in promoting the principle of benefit and the revocation of gentry landowners' privileges, however, shows that this view did not exclusively belong to the Donglin scholars. Wang's action could not be downplayed as simply individual behavior, because it was in line with the efforts made by bureaucrats and local elites—for instance, Wu Yan, Zhou Fengming, and Lin Yingxun. These efforts did not reflect the view of one group of scholars. They instead revealed a view that did not conceive benefit and relations between the gentry and their non-gentry fellows from the perspective of maximizing one's interests by avoiding obligations as much as possible. The other factor that Hamashima identified as helping revoke gentry's exemption privileges was the rebellious pressure from tenants and small landowners. It may be true in implication. However, the fact that the attempt to revoke these privileges failed in Jiading county indicated that this pressure was either not so high or not so general. My own explanation that follows will take contingency more seriously. That is to say, I will discuss the

attitude was that the gentry should not have enjoyed special privileges. In his letter to Taicang Magistrate Zhou Yipeng in the early 1580s, he explained his view in two ways: (1) it was inappropriate that gentry benefited without making contributions, and (2) it gave rise to a cluster of problems like “forged landownership.”⁸⁹ His idea eventually became a hydrological policy implemented in Taicang.⁹⁰

A Wuxi magistrate also tried to address similar issue when handling hydrological matters in his jurisdiction.⁹¹ He submitted a construction proposal to Suzhou Prefecture to have some embankments and polder dikes repaired in Wuxi. For small constructions, he ordered landowners, including those who collected rents from tenants and those who physically farmed their own lands, to do the work “based on landownership.” As for the constructions beyond what people could afford, he requested financial support from prefectures and regional agencies, including Su-Song Circuit and the Grand Coordinator’s Office. His idea was to have the people and the state each shoulder half of the expenditures. The Su-Song Circuit Intendant, grand coordinator, and regional inspector reviewed and approved his proposal. They furthermore sent his proposal with their comments to all prefectures and counties in this area as a model to follow.⁹² What was important about the Wuxi magistrate’s proposal was his application of a convention that had been established in the sixteenth century. He defined one’s responsibility for hydrological work in terms of landownership, and that was confirmed by his superiors as a generally applicable method. Nevertheless, he did not go so far as Wang Xijue to touch upon the issue of the gentry’s exemption privileges.⁹³

On the issue of gentry’s exemption privileges, Magistrate Han Jun took a stronger stance when he expected no funding from his superiors and he realized that the available dredging fees were only three hundred taels. Under the circumstances, he decided to transfer the financial burdens to people in a particular way: “the exemption privileges should not have been applied,

concrete concerns that local gentry landowners expressed in their negotiation with magistrate and the way in which the magistrate reached compromise with them.

⁸⁹ 王錫爵,《王文肅公牘草》(濟南:齊魯書社,1997),2:21b-22a. Wang at that time was at home in Taicang after he resigned as the Head of the Hanlin Academy.

⁹⁰ This fact was inferred from Changshu Magistrate Geng Ju’s account. When he tried to persuade the gentry in his jurisdiction to adopt this approach, he showed what had been done in Taicang. Wang Xijue was the person he particularly mentioned. See 耿橘,《常熟縣水利全書》,附錄上 10b.

⁹¹ The text does not specify who the magistrate was, but it most likely refers to Li Zai who was appointed as magistrate in 1602.

⁹² 《常熟縣水利全書》,附錄上 4a-6a. Whether his proposal was eventually put into practice is unclear, because extant texts, including Wuxi gazetteers, do not show that there was hydrological project in the seventeenth century until 1609. See 《吳中水利全書》,10:49b.

⁹³ It should be noted that, by this time, the famous Donglin leaders had been active in Wuxi for years. However, Wuxi magistrate did not mention any support from them.

because hydrological constructions were conducted to ensure the sources of clothes and food,” which “commonly concerned the wealthy, the poor, the commoners, and the gentry.” He hence recommended that the “compensation corvee” institution that had been used in other counties to define the gentry’s responsibility for hydrological projects also be established in Jiading.⁹⁴ Although, in the end, Han Jun could not change the situation in Jiading,⁹⁵ his criticisms of gentry’s exemption privileges were unequivocal. Moreover, when he characterized hydrological management as a shared responsibility, he adopted the principle of benefit to justify his stance.

To take up hydrological management as one of his major tasks, Changshu Magistrate Geng Ju synthesized a variety of up-to-date practices and views, including the principle of benefit, mobilization and collecting fees based on landownership, the technical-budgetary method, and revocation of gentry’s exemption privileges. He set an example for officials who planned on managing hydrological matters in local scale. Yet, this achievement was not done by himself alone. It was a result of his management in local elites’ support.⁹⁶

In petitioning for a dredging project of the Fushan Channel in 1605, on- and off-duty heads of community cited the precedents of dredging projects of the Baimao and Qipu Channels to argue that the Fushan was a major waterway in Chanshu. It was hence worth the state’s investments. In their view, the appropriate division of responsibility was to have the state shoulder fifty to sixty percent of the expenditures and to have several wealthy families in Changshu make up the rest. As for its tributaries, they admitted that they were people’s responsibility and people “who benefited should have been mobilized based on landownership.”⁹⁷ The latter part about tributaries was continuous with a convention that had been established in the sixteenth century. The former part about the Fushan Channel reflected a local attitude toward the construction of relatively large local waterways. In Lu Guangxun’s classification, the Fushan Channel was in the intermediate category, which was the people’s responsibility but which the state should financially help its dredging to some extent.⁹⁸ Therefore, in terms of the state’s financial role in this construction, the attitude of the on- and off-duty heads of community was thus in accordance with Lu’s classification. Geng did not see a problem in this respect of their

⁹⁴ 《吳中水利全書》，20:48b-49b. Hamashima, 《明代江南農村社会の研究》，337-346, and Kawakatsu, 《中国封建国家の支配構造》，461-491.

⁹⁵ 《常熟縣水利全書》，附錄上 10b.

⁹⁶ Hamashima and Kawakatsu had discussed Geng Ju’s work in length. See Hamashima, 《明代江南農村社会の研究》，425-435, and Kawakatsu, “明末揚子江デルタ地帯における水利慣行の変質,” 《史淵》 111 (1974): 65-112. See also 张芳, “耿橘和常熟县水利全书,” 《中国农史》 1985:3 (1985): 64-73.

⁹⁷ 《常熟縣水利全書》，附錄上 5b-6a and 7b.

⁹⁸ 《三吳水利圖考》，1:16b.

suggestion, and agreed to provide funding in a fifty-fifty manner.⁹⁹ To make up the half for which the county government was responsible, Geng did not mobilize all the available funds to meet the needs. He examined the accounting books of Changshu County and realized that there were overdue fees. He considered these overdue fees as a source that county government could legitimately claim. In the end, they constituted a quarter of the total. As such, the funds that came from existing county treasuries were only 595.88 taels.¹⁰⁰ It significantly cut government's expenditures, and, at the same time, had a local major waterway dredged.

With respect to the assignment of financial burdens solely to the wealthy families, however, Geng did not immediately accept the advice of the on- and off-duty heads of community. Instead, he carried out a series of negotiations to formulate a set of generally applicable regulations for his project. He ordered that heads of community in the Fushan area use Lu Guangxhu's technical-budgetary method to estimate the scale of the construction. The earth to be removed was 7448.5 fang in volume. Since one fang needed sixteen units of work, the volume equaled 119176 units of work.¹⁰¹ In the meantime, he discussed with them the possibility of having commoners shoulder the burdens as in the Jiading case. They refused. He then asked Suzhou prefectural hydrological official for assistance. He was instructed:

To dredge a waterway, [you] should not take into consideration the [following factors:] distance [between one's lands and] the waterway, the social status of landowners, the kind of forged landownership, and the size of landholding. You should just calculate all the lands in the same manner. You should apportion the work according to landownership.¹⁰²

The responses from heads of community and prefectural hydrological official not only blocked his way to make commoners take up all the burdens, but also showed him a direction to follow. He did not put his superior's instruction into practice by fiat. Rather, he consulted with three noted local families and obtained their positive reaction to the idea that gentry landowners also took part in hydrological management. Then, he sent a letter to local gentry landowners for their advice. In that letter, Geng told them that he had two options: to have commoners do the work like the Jiading case, and to ask gentry landowners to participate like the Taicang case. He expressed his preference for the Taicang case in two ways. He gave them a hint of the difficulty in the first option by showing them the responses of heads of community and the prefectural

⁹⁹ 《常熟縣水利全書》，附錄上 17a-b.

¹⁰⁰ 《常熟縣水利全書》，附錄上 17b-19a. Geng Ju used 848.8 taels to pay people before the overdue fees were completely collected.

¹⁰¹ 《常熟縣水利全書》，附錄上 17b. To be more exact about the application of this method, Geng reexamined whether one cubic zhang (one fang) of earth needed sixteen units of work to remove.

¹⁰² 《常熟縣水利全書》，附錄上 10b.

hydrological official. And, he made a comment on the prefectural hydrological official's instruction as "this was the best method and the thought behind it was fair and just." He further elaborated on his preference:

Gentry families have fairly large amount of lands. The benefits, damages, gains, and losses generated by dredging project are similarly shared by [the gentry] and commoners. This was why [dredging waterways] is not the same as other kinds of corvee. If the gentry enjoyed exemption privileges [in hydrological work], it will solely rely on commoners. Fewer people can be used, and work will hence be delayed. Common opinion will not be happy about it, and complaints will be boiling. I am afraid that it is not appropriate to rely on it [i.e. solely having commoners do the work].¹⁰³

Geng demonstrated a clear attitude toward the issue of the gentry's exemption privileges. His attitude could not be understood only in terms of administrative convenience. The ethical implication that underpinned the revocation of gentry's exemption privileges was the principle of benefit. Geng adopted the same reasoning behind Wu Yan's, Zhou Fengming's, Lin Yingxun's, and Wang Xijue's advice and practice.

In addition to ethical justification, Geng appealed to the gentry for their participation from practical perspective. He pointed to potential delay as the result of an insufficient number of workers. This warning certainly did not mean that Geng expected the gentry to be physically involved. It referred to their financial responsibility for hydrological management. According to Geng's report of the Fushan project, all the lands in the Fushan area were counted as the base to collect fees "without distinguishing which were owned by the gentry and which were owned by commoners." By this rule, landowners had to provide one worker for every forty mou of owned lands. The total number of workers was 4244. With this number and the estimated volume of earth to be removed (7,448.5), it could be inferred that every worker had to remove 1.755 fang of earth. Since every fang needed sixteen units of work, and every unit of work was paid 0.02 taels of silver, every worker would be paid 0.5616 taels, and the total expenditures were about 2,382.¹⁰⁴ This procedure kept the project financially under control. There was no concern with going beyond the budget, because the construction and funds had been both approximated in advance.

Geng's letter received an overwhelmingly positive reaction. The gentry confirmed that the principle of benefit could justify the revocation of their exemption privileges. For instance, Shen Yinke, who had retired as Guangxi Assistant Transmission Commissioner, responded,

¹⁰³ 《常熟縣水利全書》，附錄上 10b-11a.

¹⁰⁴ 《常熟縣水利全書》，附錄上 17b.

“Who would have different thought by distinguishing the gentry from commoners? Even if commoners were willing to follow the model of Jiading commoners, the gentry like us would do what Taicang gentry did.” Weng Xianxiang, then a supervising secretary, replied, “The gentry are leaders of students and commoners. If the gentry enjoyed the benefits but let commoners bear all corvee burdens, how could gentry feel comfortable? The view held by the Taicang [gentry] was just and fair. There should be no other thought.”¹⁰⁵ Qian Dai, who was in retirement, endorsed Geng’s idea by paraphrasing Geng’s afore quoted passage.¹⁰⁶ With their support, collecting fees based on landownership became a generally accepted measure in Changshu.¹⁰⁷

Besides the ethical reason, gentry landowners’ support of the principle of benefit had a practical reason. As shown in Geng’s letter, the gentry’s participation was decisive in determining whether a project would be launched. Qian Dai’s record of the dredging project done in Lin Yingxun’s tenure provided the clue to how they might have pondered the situation. He noted that the Sanzhang Channel greatly served his family’s interest. Since the late fifteenth century, the Qian family was able to talk officials in charge twice into a dredging project for the Sanzhang. The costs were covered by governmental funds—the first time, the money was from four prefectures, and the second time, it was from Suzhou Prefecture.¹⁰⁸ However, Geng’s tenure was in a period that no such funds could be expected from higher levels of governments. If these families refused to financially take part, hydrological projects would have to be suspended. For families who benefited from waterways like the Sanzhang Channel,¹⁰⁹ the suspension of dredging projects was contradictory to their interest. This concern must have been a crucial factor in their accepting the principle of benefit.

From administration standpoint, the principle of benefit helped subject all landowners to a single standard by which conflicts could be handled in a way that landowners agreed was fair. Geng recounted how he had persuaded landowners to maintain local waterways collaboratively. The case involved Gui Town and Xu Town. Gui Town was located in the Heng Channel area, and Xu Town was located in the Limu Channel area. There were two noted families—Gui and

¹⁰⁵ 《常熟縣水利全書》，附錄上 11a and 15a.

¹⁰⁶ 《常熟縣水利全書》，附錄上 12a. It should be noted that Qian’s support of Geng’s view had nothing to do with the Donglin scholars. Qian was Zhang Juzheng’s close assistant. See 王世貞，《嘉靖以來首輔傳》，8:16a-b. Yet, Gu Xiangcheng, who later became one of the Donglin leaders, had strongly despised Zhang in the 1570s. See 《東林列傳》，2:5a.

¹⁰⁷ This shared view eventually turned into two of Geng Ju’s rules that applied to other hydrological works. See 《常熟縣水利全書》，1:2b-3b.

¹⁰⁸ 《三吳水考》，16:43b-45a.

¹⁰⁹ It should be noted that there was not just the Qian family living in the Sanzhang area. As noted by another Changshu elite, Zhao Yongxian, there were at least “three to four noted families residing in” a broad area including the Sanzhang Channel and other waterways. See 趙用賢，《松石齋集》，27:37a.

Xu—in these two areas. Seventy percent of the Gui family's lands were located in the Heng Channel area, and seventy percent of the Gui family's lands were located in the Limu Channel area. Yet, thirty percent of Gui family's lands were in the Limu area, and thirty percent of Xu family's lands were in the Heng area. The problem was that dredging the Limu Channel was “three times as difficult as” dredging the Heng Channel. Before Geng was here, the two families could not reach an agreement on how to divide their duty. As Geng noted, the conflict had not been solved, because they conceived the result of the conflict as an indicator of the degree of their influence. Geng succeeded in convincing them that how much one contributed had nothing to do with one's influence, because, by the principle of benefit, one was responsible for as much as one benefited. Geng later concluded that this principle helped him handle problems without considering the fame of local families.¹¹⁰ It was an effective way to connect landowners to the localities from which they gained benefits, and, consequently, to ensure no hydrological matters were left unattended.

In Geng's administration, the principle of benefit was also used to determine the extent of the area from which people were mobilized. In doing so, it helped localize hydrological management. Geng explained his disagreement with the practice that determined one's responsibility by four degrees according to the distance between one's lands and the waterway to be dredged. He contended:

All paddy lands in Changshu cannot do without water. Differences only exist in the size of waterway, trunk or branch, and in the amount of water, large or small. Trunk waterways channel water from lake and river, but do branch waterways not channel water from trunk waterways? Paddy lands close to a trunk waterway benefit from it, but does paddy lands close to a branch waterway not benefit from a trunk waterway?¹¹¹

His point was to disregard the significance of distance in determining one's responsibility. His concern was that if the four-degree differentiation existed, there was no way to prevent dishonest clerks from manipulating the situation. He hence decided to develop a method based on the principle of benefit. When a waterway was to be dredged, he would examine the direction of its flow. The communities that benefited from its flow would be considered responsible for its dredging. Within all the concerned communities, people would be mobilized equally based on landownership.¹¹² The principle of benefit was integrated into Geng's localization of hydrological management with the community as its basic unit of mobilization. This measure

¹¹⁰ 《常熟縣水利全書》，附錄上 25a-b.

¹¹¹ 《常熟縣水利全書》，1:2b-3a.

¹¹² 《常熟縣水利全書》，1:3a.

was also reflected in Geng's policy that prohibited cross-community mobilization of people. One of his rules rejected the practice of "mobilizing people throughout the whole county" and "mobilizing wealthy families" on the ground that they were to drive people to work on distant and unrelated projects. Not only would the projects be ineffectively done, but also people would unnecessarily suffer.¹¹³ Qian Dai had brought this issue to Geng's attention in his reply to Geng's request for advice and support. On the one hand, Qian, like other gentry, agreed that the principle of benefit was a fair way to determine one's responsibility. On the other hand, he took the Sanzhang Channel as an example, and argued:

The Sanzhang Channel flow through eight communities: the sixth, seventh, eighth, ninth, eleventh, and upper, middle, and lower fourteenth communities. Dredging the Sanzhang should only involve the lands of these eight communities. Other communities have nothing to do with it.

Qian further pointed out that his lands were located in the Sangzhang area, in the ninth, sixth, seventh, eighth, and fourteenth communities. He expressed his willingness to be called upon for the dredging project of the Sanzhang Channel. However, he also emphasized that his lands located outside the Sanzhang area "had nothing to do with the Sanzhang," and thus should not be counted when the government apportioned responsibility.¹¹⁴ Geng took Qian's cue and turned it into one of his rules that strictly used the principle of benefit to dismiss the ideas of "mobilizing people across the county" and "mobilizing wealthy families to respond the most urgent tasks."¹¹⁵ This rule demonstrated that the principle of benefit had become a commonly accepted measure by which the government determined landowners' responsibility and landowners avoided excessive burdens.

In implementing his plan, Geng further developed a new method to define the relations between landowners and workers and to adjust state's role in hydrological management. He summarized this method in one rule: "landowners offer the payment, and tenants provide labor; for the poor landowners who farmed their own lands, the state offer the payment."¹¹⁶ This rule clarified that the source of labor was in tenants and in poor landowners. On the part of poor landowners, the reason to recruit them was simple. They did not have tenants so that they had to provide labor service themselves. On the part of wealthy landowners, which certainly included gentry landowners, they could just pay their tenants for their labor service in hydrological projects. This rule made sure that all workers to be paid. Furthermore, working in tandem with

¹¹³ 《常熟縣水利全書》，1:23a-b.

¹¹⁴ 《常熟縣水利全書》，附錄上 12b.

¹¹⁵ 《常熟縣水利全書》，1:24b-25a.

¹¹⁶ 《常熟縣水利全書》，1:18a.

the method of collecting fees based on landownership, this rule set Geng's administration apart from his predecessors in two respects. First, this rule applied to all kinds of hydrological works, including polder dikes and waterways, by the same measure.¹¹⁷ Before him, Li Chongsi in the early sixteenth century had touched upon the issue of payment in local minor projects, but he and his assistants did not regulate how the payment be made and what relationships between landowners and tenants should have been. In the late sixteenth century, Lin Yingxun did ensure that all workers be paid, but his compromise with "head-land system" made his adoption of the method of collecting fees based on landownership only partially. Geng erased the vagueness in Li's management and the compromise in Lin Yingxun's management. Second, the way in which this rule was put into practice gave the state a supervisory role. Geng's analysis of the current bad maintenance of polder dikes reached a conclusion similar to what Zhou Fengming had observed in the early sixteenth century. Geng pointed to several situations in which landowners and tenants were unwilling to invest in the maintenance of polder dikes. Like Zhou, Geng did not ascribe their unwillingness solely to their irresponsibility. Rather, he explained it in terms of a weak social mechanism.¹¹⁸ He thus saw the necessity of state's involvement as supervisor—it was what Zhou and other local elites had conceived as indispensable. To assume the role of supervisor, Geng specially invented a tally. Two pieces of information were filled in by a head of community on this tally: (1) the lengths of polder dikes and waterways for which a landowner was responsible, and (2) the payment that a landowner owed his tenant. One tally was issued to one tenant before a project started. After the work had been done, the tenant went to his landlord's place to get the payment, and then the tenant gave the tally to this landlord as receipt.¹¹⁹ With this tally, the state did not have to get involved in the process of collecting fees and distributing payments. This was a budgetary and administrative adjustment. The conventional way of raising funds prior to Geng included a period during which the collected fees were stored in governmental treasuries. This period lent officials opportunities to use the money for purposes unrelated to hydrological management. As a result, hydrological funds were always less than they should have been. Geng's tally ensured that what landowners paid could be exactly the same as what tenants received. There was no room for manipulation. Moreover, by confining transactions to occur only between landowners and tenants, it simplified and localized the procedure.

¹¹⁷ 《常熟縣水利全書》，1:18b.

¹¹⁸ 《常熟縣水利全書》，1:18a-b.

¹¹⁹ 《常熟縣水利全書》，1:19a.

Above all, the principle of benefit was generally adopted to redefine the roles of the state, the gentry, and commoners such that hydrological management could be conducted at local level without administrative coordination, mobilization of workers, and financial support on a regional scale.

Generalized Application of the Principle of Benefit in the Early Seventeenth Century

Geng Ju's success in Changshu soon became a model praised by his superiors. They instructed other county officials to model their hydrological management on Geng's administration.¹²⁰ Grand Coordinator Zhou Kongjiao took steps forward in his two orders of 1608. Both of them were informed by Geng's practices. In the "Prohibiting Dredging Contractors,"¹²¹ Zhou addressed a concern that emerged from the cross-community mobilization of people. The consequence of cross-community mobilization was that people of lowlands were recruited for projects in highlands, and people of highlands were conscripted for projects in lowlands. This mobilization pained the people, because they had to leave their homes and work faraway. To avoid the troubles, people would pay dredging contractors to work on their behalf. Clerks cooperated with contractors to make cross-community mobilization a routine such that clerks and contractors could take advantage of this situation for their private gain. This problem was actually rooted in a practice, "mobilizing people throughout the whole county," that Geng Ju had abolished. Zhou took Geng's cue and prescribed that the community had to be the basic unit of mobilization and cross-community mobilization would not be allowed.¹²² Zhou's other order was a set of rules regarding how hydrological management should have been done within the boundaries of a county.¹²³ All the crucial points of Geng Ju's administration were present in Zhou's rules. For instance, within each community,

The apportionment of responsibility is done based on landownership... without considering exemption privileges. Whether [a specific land can] access [the waterway in question] in terms of irrigation should not be taken into consideration... The reason that

¹²⁰ 《常熟縣水利全書》，1:25b-26b.

¹²¹ Morita has discussed this text by situating it in the context of the decline of the community and tithing system. See his, "明末における塘長制の変質" in his 《清代水利史研究》(東京: 亜紀書房, 1974), 452-3.. His explanation is correct to the extent that community and tithing system could not play its function in hydrological management in the seventeenth century. However, he did not explain how existing practice left room for manipulation and the relationship between Zhou's solution and Geng's administration, which was guided by the principle of benefit.

¹²² 《吳中水利全書》，16:92a-93a.

¹²³ This order was likely issued after the "Prohibiting Dredging Contractor," because it was included in the *Chongzhen Gazetteer of Songjiang Prefecture* after the "Prohibiting Dredging Contractor," which was dated in 1608. See 《吳中水利全書》，16:92a and 《崇禎松江府志》，17:36b and 38a. But, it must have been issued in 1608, because Zhou left in this year.

exemption privileges are not a factor is because dredging waterways is to get [one's lands] irrigated and keep [one's lands] from flood and drought. It is for the good of one's lands.

It is not the same as other kinds of corvee.

Zhou further localized hydrological management when he explained why whether a land could directly benefit from a waterway was not a factor in deciding one's responsibility. His reasoning was based on the idea that a community was the basic unit of mobilization. He prescribed that the people of a community would be divided into two groups. These two groups, in turn, would have been responsible for all the waterways that benefited this community.¹²⁴ By this method, each and every landowner would have proportionately contributed to and benefited from dredging works within a community.

As for the relationship between landowners and tenants, the government issued a tally to each worker, which showed how much a landowner should have paid, and how much work a tenant should have done:

The tally records how much a worker is responsible for, and how much a worker is to be paid... If the work was done by a landowner himself, he would be told the way in which responsibility is apportioned—that is, the volume [of earth to be removed] is assigned to him by the area [of his owned lands]. There is no payment involved. If the work was done by a tenant or by a hired worker, he would receive as much grain as noted on the tally... [The tally] would not give to the landowner until he had [paid the tenant] and put a note [of how much he had paid.] It is the receipt for future examination.¹²⁵

Zhou also reiterated Geng's and his policy that prohibited cross-community mobilization,¹²⁶ and adopted the technical-budgetary method with certain adjustments.¹²⁷ One year later, Huating Magistrate Nie Shaochang submitted to his superiors a set of rules that he was convinced would be effective for the moment and adoptable for the future. The rules were almost identical to Zhou Kongjiao's.¹²⁸ They certainly preserved what Geng Ju had done in Changshu in his tenure between 1604 and 1607.

The localized approach was not only accepted by bureaucrats, but also considered ideal by local elites. Wu Ercheng, Songjiang metropolitan graduate of 1604, wrote an essay on the maintenance of paddy fields, in which he analyzed the inappropriateness of cross-community mobilization. His solution was similar to Geng and Zhou. He also argued that, if every county

¹²⁴ 《崇禎松江府志》，17:40b-41a.

¹²⁵ 《崇禎松江府志》，17:43b-44a.

¹²⁶ 《崇禎松江府志》，17:38b.

¹²⁷ 《崇禎松江府志》，17:39b-40b.

¹²⁸ 《吳中水利全書》，16:93a-108b.

and village could have had paid attention to its own waterways and dikes, it would have achieved as much as what Master Yu had accomplished.¹²⁹ This emphasis on taking the community as the basic unit of mobilization was shared by Hou Zhenyang (Jiading metropolitan graduate of 1610), and Hou Tongzeng (Jiading metropolitan graduate of 1625)¹³⁰ As for the revocation of gentry's exemption privilege, Chen Renxi in the 1620s expressed his strong support when he criticized some landowners for their indifference to the maintenance of polder dikes.¹³¹ Xu Guangqi, a noted scholar with a wide variety of interests in practical matters, evidently endorsed Geng Ju's administration. He dedicated one chapter of his book to Geng by recording almost every rule set by Geng regarding techniques, mobilization, and funding.¹³² Zhang Cai, Taicang metropolitan graduate of 1628, also included Geng Ju's crucial methods in the *Chongzhen Gazetteer of Taicang Subprefecture* that he finished compiling in 1642.¹³³

The localized approach gained considerable currency in the last four decades of the Ming dynasty.¹³⁴ It made regular maintenance possible like Zhou Kongjiao's rules showed. However, it also put some restrictions on officials' policymaking and problem solving. The restrictions were most obvious when it came to some projects that potentially needed to involve more than one county. A magistrate could choose to find a way to conduct the project within his jurisdiction, or he could make a case for cross-county coordination. Either way, the principle of benefit was operative. For instance, although Geng Ju did not give up the idea of dredging the Baimao, he was aware that a request for labor and funding from other counties would likely be shrugged off. He hence planned to solely rely on Changshu people to dredge it.¹³⁵ There was another case in Geng's tenure. When Geng investigated one of the lowest areas in Changshu—the Renyang area including Communities Forty to Forty-five, he realized that the problem lay in the obstruction of the Qipu Channel in Taicang Subprefecture. The water flowed backward into this area when it

¹²⁹ 《吳中水利全書》，22:106a-107b and 109b.

¹³⁰ For Hou Zhenyang's essay, see 《光緒嘉定縣志》，7:7b. For Hou Tongzeng's essay, see 《吳中水利全書》，19:53b.

¹³¹ 《吳中水利全書》，22:107b-109a. Chen referred to gentry and non-gentry landowners when he voiced his opinion. The term he used was 官大戶業主.

¹³² 徐光啓，《農政全書》，15:1a-28a.

¹³³ 張采，《崇禎太倉州志》，7:26b-32a.

¹³⁴ It should be noted that it was not accepted without challenge. Actually, the revocation of gentry's exemption privileges was unstable. Zhang Cai's reserved comments on this issue indicated that how to deal with these privileges in hydrological management was still a challenge in the 1640s. See 張采，《崇禎太倉州志》，7:34a. Zhang Cai did not include Geng's rule that revoked gentry's exemption privileges. Yet, it did not mean he considered it was wrong. He had a long comment on Geng Ju's method, in which he was modest in voicing his criticism of landowners who insisted on their exemption privileges, but he was not soft on his position. Zhang was convinced that the gentry should have taken up more responsibilities because the more lands one owned, the more benefits one enjoyed.

¹³⁵ 瞿汝稷，《瞿岡卿集》，6:26b.

hit the obstruction. Geng did not appeal to his superiors for a dredging project to remove the obstruction in Taicang. Instead, he decided to build high dams around the Renyang area to prevent water from getting in.¹³⁶ From the perspective of ultimate solution, this was by no means the best course of action. However, it was an effective way to protect this area in terms of localized approach.

Another case illustrated a different way to apply the principle of benefit. It was the long-term dispute between Taicang Subprefecture and Jiading County over the division of responsibility for dredging projects of the Yantie Channel. From the geographical standpoint, this channel ran through both Taicang and Jiading. The first dispute took place in 1596. There were similar disputes in 1604, 1619, and 1640. The cause of these disputes was that Jiading County appealed to higher authorities for financial support from Taicang Subprefecture in order to have the Yantie dredged. Jiading County justified its request by arguing that:

The Yantie Channel run across [Taicang] Subprefecture and [Jiading] County. It is the main path for entrance and exit. It is also the life-line for irrigation. If this channel silts up, both subprefecture and county would suffer. If this channel is dredged unobstructed, both subprefecture and county would benefit.¹³⁷

However, Taicang Subprefecture countered Jiading County's argument by insisting that "the Yantie was the main transportation route in Jiading, but Taicang did not rely on it."¹³⁸ Without concrete reference to the benefits that Taicang could gain from the dredging project, Taicang people would refuse to participate in it. This dispute could not be solved at county level. It took a long bureaucratic process before a solution was worked out. In this process, the size of construction was estimated twice by the technical-budgetary method. The decisive point that the regional hydrological official made to solve the problem was a question for Taicang. In Jiading County's argument, the benefit that the Yantie generated for Taicang and Jiading were for transportation and irrigation. Yet, Taicang Subprefecture's counterargument stressed transportation, which Jiading enjoyed the most, and avoided mentioning irrigation. Regional hydrological official demanded that Taicang report whether the Yantie "could bring water to benefit its lands." He made it clear that, if it did, then Taicang had no reason to refuse to share responsibility.¹³⁹ This case clearly illustrated that the principle of benefit became a rule followed by officials and people to defend their own interests and to solve the disagreements in

¹³⁶ 《常熟縣水利全書》，6:2b-3a.

¹³⁷ 《萬曆嘉定縣志》，14:10a.

¹³⁸ 《崇禎太倉州志》，7:15a.

¹³⁹ 《崇禎太倉州志》，7:15b.

hydrological management. It was hence a principle that was generally stood by in policymaking and problem solving.

Conclusion

One of the core problems in hydrological management that was identified by officials and local elites was lack of efficient and consistent local mechanism that could maintain good hydrological condition. To solve the problem, local elites appealed to officials for more active involvement. They developed a diversity of arguments that not only turned local resources visible to officials, but also pointed to certain directions for them to utilize those resources. One of the main arguments that they provided was an ethical justification for mobilizing labor and collecting fees. It was the principle of benefit. By this principle, local elites attempted to stabilize sufficient labor supply and revenue for hydrological management without adding burden to the state. Over the course of one century and a half, officials experimented with strategies to incorporate this principle in their administration. At the local level, it gradually gained more currency. However, at the cross-prefectural and cross-county level, its application was limited by timing, budget, and administrative coordination such that the principle of “work for relief” continued to be an alternative to it. It was not until the late sixteenth century and the early seventeenth century, when the cross-prefectural and cross-county approach was abandoned, that the principle of benefit finally became a justification generally accepted not only for mobilizing labor and collecting fees, but also for settling disputes. It also served as a principle to engage gentry landowners by the same measure that applied to non-gentry landowners, especially when one’s responsibility was determined by landholding without exception. It linked one’s private interest and public good in terms of calculable responsibility.