ANCIENT CHINESE IRRIGATION PROJECT MANAGEMENT AND ITS CONTEMPORARY ENLIGHTENMENT: A CASE STUDY OF CHATAN WEIR

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ABSTRACT

A lot of ancient irrigation projects have been executed in China for thousands of years and some of them still work today, playing a vital role in crop production. The evolution of the management of Chatan irrigation project is a representative case. The project is firstly transformed from family management into rural clan management, and then gradually changed from being constructed by the civilians alone to the civilians running the project under the government's supervision and to the officials and civilians jointly running the project. The running of Chatan irrigation project has at the same time completed the transformation from family business to a social public affair. During the process, the role that the government performs gradually evolves into one that makes decisions on the organization and management of the project as well as on the systems for organizing and managing. The government plays an increasingly important role in resolving the disputes over water using among the civilians as well as ensuring the sustainable operation of the project. The experience of management gained from Chatan irrigation project provides enlightenment about the management of irrigation projects at present times.

Keywords: management, Chatan weir, irrigation projects.

1. RESEARCH BACKGROUND

Most of the ancient irrigation projects in China were rationally designed with scientific input and some of them are functional even today. Besides the scientific and rational design, the management systems adopted at different times took care of equitable and timely distribution of irrigation water. The irrigation projects in ancient China were mostly constructed and run by the government and patriarchal clans, for the purpose of making an equitable division of water resources and of the authority and responsibility that each household claims. The government, because of the authority it exclusively assumes, has the final say in the maintenance and management of the projects as well as in the arrangement of labor, while the civil management group made up by the local squires safeguard the common interests enjoyed by the residents within the irrigation districts through participation in the formulating and enforcing of village regulations and agreements (Deng 2011). As a typical irrigation project set up by the patriarchal clan, Chatan irrigation project has been used for over one thousand years up to now. Covering the span of its history from the 9th century to the 20th century, this essay diachronically examines the organization and management of Chatan irrigation project, and brings to light the different ways of organizing and supervising the project in different periods, thus providing reference and guidance for the management of contemporary irrigation districts and for the protection of ancient irrigation projects.

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2. AN OVERVIEW OF CHATAN IRRIGATION PROJECT

Over the Niuhoujiang River, a tributary to the Ganjiang River in Taihe County, Jiangxi Province, there is a water conservancy project named Chatan weir set up more than a thousand years ago, which still nourishes tens of thousands of acres of land and people who live on it. As a county located in west central Jiangxi Province, at the center of the Jitai Basin, the average annual precipitation of Taihe reaches 1,434.2 millimeters. The soil is fertile, and the region has been a vital communications hub since ancient times.

In 930, Jinling investigating censor Zhou Ju, for the sake of fleeing from the social upheaval that erupted in the late Tang Dynasty, moved to Taihe with his family. Settling down in the village, Zhou Ju was always ready to experience and had an understanding of public feelings. He was fully aware that the local people suffered from droughts, which led to poor harvests. In 937, after carrying out on-the-spot surveys and thorough planning, Zhou Ju decided to set up a weir along Chatan Village in the upper reaches of the Niuhoujiang River, a large weir built from woodpiles and long bamboo stripes (Zhou, 1996). After the construction of the weir was finished, thirty-six ditches were dug, irrigating over 9,000 mu² of the farmland in Heshi Town and Luoxi Town. In all the subsequent dynasties, the weir underwent major repairs. The canal system and the irrigation district continued to develop. Yet the position of the weir and the main canal system did not change. The weir, being built in a position where the Niuhoujiang River, having run past the mountains, came to make a wide turn, naturally introduced the main stream into the ditch, which ensured the drainage water volume and meanwhile reduced the water pressure that the weir body withstood. In the beginning, the dam was made of wood. When it came to the Late Yuan dynast, it was renovated into a stone structure. Henceforth, the dam was renovated for several times. In 1983, the dam body was wrapped and strengthened by concrete and was used until today. Over the main ditch that was 3.5 kilometers’ away from the lower reaches of Chatan weir, Zhou Ju set up Diaoshi weir, an important flood control project in the irrigation district. During the flood season that lasts from spring to summer, Diaoshi weir may effectively discharge into the Niuhoujiang River the floodwater in the main ditch caused by Chatan weir, so as to keep the farmland in the lower reaches from being struck by floods.

Now the irrigation area of Chatan weir has been expanded to 50,000 mu. The construction of Chatan irrigation project has greatly improved the local ecological environment, promoted the land development and human reproduction within the irrigation district, and become the important foundation upon which the local society rests for development.

3. THE EVOLUTION OF MANAGEMENT DURING THE COURSE OF HISTORY

Since its establishment, Chatan irrigation project has lasted for more than a thousand years. It is documented that the management of Chatan weir differed in different historical periods. Previous to the Ming Dynasty the organization and management of Chatan weir went through a transformation process in two stages: The family management system under Zhou’s charge in the Song Dynasty and the rural clan management system jointly held by the five big families in the Yuan Dynasty. During the Ming Dynasty, in order to resolve the disputes over water resources, the government, patriarchal clans, squires and other forces got involved, thus continued and extended the rural clan management. After 1912, the local government tightened

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2 1 ha = 15 mu
its control over the water conservancy project and a new form of management appeared as the civilians and the government jointly ran the project.

3.1 The Family Management System

According to historical records, after setting up Chatan weir, Zhou Ju purchased Forest Hill and Bamboo Hill, and used the piles of wood, spring tea and bamboo stripes produced in the hills as the annual expenditure on renovations. The second son of Zhou Ju made additional purchases such as the farmland and fishponds, recruited the local tenants, and took the annual income paid by the tenants as the fees for renovations. The Zhou family established a comparatively mature system for management and maintenance, as family members conducted special management over the project and there were reliable expenditure sources (Sun, 2009). This type of management was continuously used until the Late Song Dynasty. During this time, the Zhou family seized sole ownership of the Chatan irrigation project. Other local forces and the government did not get involved. Yet in terms of water use, the Zhou family did not usurp any civilians' right to irrigation, which embodied the principle of “common benefit.” Based on this way of acting, the descendants of the Zhou family felt a sense of superiority and feelings of pride that urged them to consciously maintain the situation, thereby ensuring the Zhou family’s effective control over the Chatan irrigation project.

3.2 The Rural Clan Management System

In the late years of the Song Dynasty, because the members of the Zhou family responsible for the management over Chatan weir successively pursued the official career, the Zhou family’s management over Chatan weir as well as the property transformed from being direct to indirect, which laid the foundation for the participation of other clans in the management of Chatan weir. At the initial stage, the Zhou family still retained valid ownership of the property. However, as one dynasty was replaced with another and as the change of times, the Zhou family’s control over the property was gradually weakened. The Zhou family was losing their property. In 1341, to regain the occupied property, the Zhou family forged alliance with the other four big families and appealed to the local government. In this way, the Zhou family retook their possession of Chatan weir and formulated the “Five-Family Covenant” with the government’s support, which regulated that members of the five big families took turns to supervise Chatan weir, jointly responsible for the maintenance and management over Chatan weir.

The formulation of the “Five-Family Covenant” indicated a significant change in the management over Chatan irrigation project, which was transformed from single unitary family management into multi-clan joint management. The establishment of this type of management system established the position that the other four big families occupied in the management over Chatan weir, which exerted profound influences on the local social relations. In this system, the role that the government performed was only symbolic. The participation of the government was merely a formality. The five families strove to gain the official recognition for the ultimate purpose of acquiring the legitimate status as the supervisors of Chatan irrigation project as well as the owners of the property.

To a large degree, the fast development of the local clans within Chatan irrigation district should be attributed to the fact that Chatan irrigation project plays a vital role in promoting the local agricultural development. Because of this, contradictions and conflicts concerning Chatan irrigation project began to arise among the local clans. During the course of resolving the disputes, new types of management systems were
created, and various social forces achieved a fine balance that fostered further advancement of society.

3.3 Intervention from the Government and Squires during the Ming and Qing Dynasties

During the Ming and Qing Dynasties, with the further development of the village and reproduction of the clans, contradictions over irrigation resources became increasingly severe and conflicts continuously escalated. In order to resolve the disputes, the government, clans and the squires got involved, and a new system of local power was created. At the same time, changes took place in the way of organizing and managing Chatan irrigation project. In the early years of the Ming Dynasty, the government strengthened its direct management over the local public affairs, irrigation projects being included. The imperial commissioners were dispatched to supervise the renovation of Chatan weir (Liao, 2013). In the Mid-Ming Dynasty, due to the reform of the tax system, the government sank in increasingly dire financial strait and transferred various local public affairs to the local squires. As to the expenditure on renovation, after entering the Mid-Ming Dynasty, the government could not directly use taxes and corvée to renovate the water conservation establishment. The renovation expenditure on Chatan weir mainly came from the income from the weir property, the prorated water fees paid by the civilians within the irrigation district, and private donations from the squires. The maintenance and management over Chatan weir were changed back to the rural clan management system jointly manipulated by the five big families which formed since the Late Yuan Dynasty, while the government’s function was to further legitimize the five families’ authority. This type of management extended into the late years of the Qing Dynasty.

3.4 Community Management Formed in the Twentieth Century

When Chatan weir was renovated in 1938, a specialized committee responsible for the renovation of Chatan weir was established with the approval of the government. Committee members included, besides the five big families, other people that benefited from the project. To ensure the expenditure on renovation, the traditional way of collecting money was adopted, but not in the form of advocacy. Rather, it took the form of a government directive that required the direct beneficiaries to pay to the community organization. After the renovation was completed, to ensure the normal operation of the water conservancy establishment, the Taihe County government gave consideration to the proposal put forward by the local gentry and approved the formation of a non-profit organization, that is, the Chatan weir Management Committee, in a directive issued in 1939, which regulated the fundamental rules concerning the operation and management of the project. The committee consisted of eleven members elected by the beneficiaries (Taihe county annals. 1989 & 1826). A comparatively mature community management system took initial shape. The irrigation project has been smooth in operation up to the present, except that in 1952 and 1983 it was reinforced and anti-osmosis measure was implemented. It should be mentioned that the form of organizing and managing Chatan weir in this period brought about quite evident achievements.

4. CONCLUSION AND ENLIGHTENMENT

During a thousand years’ development, Chatan weir is transformed from family management into multi-clan management. In other words, it is a process during which family business evolves into a local public affair. The evolution reflects the law inherent in the society development and reveals the public nature of water conservancy projects.
The squires play a crucial role in organizing and managing as well as dealing with the disputes concerning Chatan weir, for they are representatives of local interests on the one hand, and on the other hand, subject to the government’s control. Since the Ming and Qing Dynasties, government power is concealed behind the squires’ management over Chatan weir. The civilians manage the project while enlisting help from the government.

Thus it can be seen, the interested parties enjoy autonomy over the project under the government’s guidance and supervision is probably a more effective management system.

5. REFERENCES

Sun, Jie, 2009, Modernization of management of traditional water conservancy project, Jiangxi Social Science, 12,115-118. Chinese