

# Irrigation Management Transfer in Yanguan Town of Zhejiang Province in China

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## ABSTRACT

YANGUAN TOWN, UNDER the jurisdiction of Haining City of the Zhejiang Province, has a total cultivated area of about 1,000 hectares (ha). Irrigation and drainage are conducted fully by pumping stations. In this paper, the problems facing irrigation at this town and the methods and effects of irrigation management transfer are introduced. The tasks of irrigation management transfer in future are also put forward.

## GENERAL FEATURES OF THE IRRIGATION AND DRAINAGE SYSTEMS IN YANGUAN TOWN

Yanguan Town is under the jurisdiction of Haining City, the Zhejiang Province. It is situated in the southern fringe of the Hangjiahu Plain, standing by the famous Qiantang River of China. Its terrain slopes gently, being high in the south and low in the north, and is featured by a crisscross network of rivers. With a subtropical climate, the four seasons vary distinctly. Although annual precipitation averages 1,300 millimeters (mm), droughts still occur frequently in autumn and winter because of the uneven distribution of rainfall. This town includes 12 villages and has a population of 22,200. The total cultivated land is 943.5 ha of which, 712.3 ha are planted with rice. The annual output of rice averages 12.9 tons per hectare (t/ha). The annual output value of cash crops is as high as 16,500 yuan/ha (US\$1,950/ha). In recent years, township enterprises have seen a rapid development. The gross output value of industry and agriculture of this town amounted to 250 million yuan (US\$29.5 million) in 1992 of which, 225 million yuan (US\$26.55 million) was from agriculture. The per capita income of farmers is 1,447 yuan/year (US\$171/year). At Yanguan Town, irrigation is conducted mainly by lifting water from the Grand Canal and its tributaries. In this town, there are 28 pumping stations installed with 32 pumps, with their delivered horse-power totaling 423.5 kilowatts (Kw). The length of power transmission lines with a voltage of 10 kilovolts (kv) is 42 kilometers (km). The number of transformers with an electric power of 1,216 kilovoltampere (kva) is 27. The fixed assets of pumping stations in all are valued at 1.762 million yuan (US\$208,000). The length of irrigation canals is 85 km, and that of drainage canals 16.2 km. Hydraulic structures to complete canal systems add up to 346 km. Their static head, averaging 3 meters (m), is suitable for both irrigation and drainage. Therefore, stable yields can be ensured in all of the cultivated lands despite drought or excessive rain. The assets in the form of irrigation projects are put under the collective ownership of the town level and village level. Within the town area, the irrigation management staff members number 76. Among them, 4 are specialized managers from the Irrigation and Drainage Management Station of Yanguan Town, a basically self-supporting institution which receives only a few subsidies from the government. The rest are village heads, who are assigned personal responsibilities for irrigation and drainage (normally there is one village head of this kind in each village), leaders and operators of pumping stations and weathermen. These people are generally under the dual leadership of the Irrigation and Drainage Management Station and the Villagers' Management Committee.

## PROBLEMS OF IRRIGATION MANAGEMENT

In the past, a production team was taken as a business accounting unit in agriculture. Irrigation management followed the road of collectivization. Water charges were paid for by collectives. Management staff got their income the same way as other members of a production team did, i.e., making money by accumulating workpoints (a unit indicating the quantity and quality of labor performed, and the amount of payment earned, in rural people's communes). These practices were, by and large, appropriate at that time. However, with the introduction of the output-related system of contracted responsibilities and with the readjustment of cropping patterns, irrigation management has been facing the following problems:

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<sup>3</sup>Yuan is the Chinese unit of currency; in 1994, 1 yuan = US\$0.118.

## **Irrigation Regimes Do Not Match the New Farming System**

In the past, irrigation was carried out on large blocks of farmland owned by production teams. Nowadays, it is done on small strips of farmland allocated to farmers. The area of these strips ranges from 0.1 ha to 0.2 ha. The busy season in farming is shortened. For instance, the time taken for sowing and harvesting wheat was 15 to 20 days in former years. However, it is now shortened to 5 to 7 days. Consequently, the irrigation period is also shortened, leading to a concentrated demand for water and irrigation disputes.

## **The Policy of Water Charges and Ways to Pay Irrigation Managers Are in Contradiction with the Output-Related System of Contracted Responsibilities**

Strictly speaking, water charges are still paid for by villages as a collective. Irrigation managers are paid for through fixed salaries. Under this situation, some problems, like water charges were the same regardless of water consumption, and the salaries of irrigation managers were the same regardless of their conduct at work. The fact that farmers only use water but do not undertake relevant responsibilities has led to the squandering of water and has dampened the enthusiasm of irrigation managers.

## **The Significant Increase in Farmers' Income Has Contrasted Sharply with the Low Income of Irrigation Managers**

The fixed annual income of irrigation managers was lower than 1/3 of that of the farmers. As a result, irrigation managers were in low spirits. Many of them who were both young and competent gave up their posts to make a fresh start in township enterprises. Hence, the team of irrigation management has been unstable due to lack of successors.

## **METHODS OF IRRIGATION MANAGEMENT TRANSFER**

For the purpose of adapting to the reform in the system of rural economy and to the development of an agriculture with high production, good quality and high benefit, a reform in the framework of irrigation management, or the adoption of irrigation management transfer, becomes a necessity. Otherwise, the sustainable development of irrigation cannot be ensured. The measures of reform taken by the Irrigation and Drainage Management Station in the past few years are as summarized below:

### **Carryout Technical Innovation by way of Rehabilitating Pumping Stations and Canal Systems**

From 1987 to 1992, a total sum of money as much as 1.346 million yuan (US\$158.8 thousand) was invested for technical innovation of which, 311,200 yuan (US\$36.72 thousand) was paid for through government subsidies; 120,000 yuan (US\$14.16 thousand) through depreciation funds; 342,000 yuan (US\$40.4 thousand) through profits turned over by enterprises subordinate to the Irrigation and Drainage Management Station and 573,800 yuan (US\$67.7 thousand) through funds raised by villagers. As many as 32 low-lift pumps, newly developed by relevant agencies of the province, were installed to replace all of the low-efficiency ones. Irrigation canals, as long as 65 km, were all lined with concrete. As a result, the average overall efficiency of pumping stations throughout the town was raised from 0.5 to 0.85. Both water and power consumption were reduced by a big margin.

### **Adopting Irrigation Management Transfer**

The economic benefit-related system of contracted responsibilities, in which the authority over management is separated from the title, was put into effect as follows:

#### ***Formulating a Joint Pledge of Irrigation Water Use***

In this pledge, responsibilities, authority and interests of farmers and managers of pumping stations are stipulated clearly. It guarantees the day-to-day operation of irrigation systems.

#### ***Implementing the Economic Benefit-Related System of Contracted Responsibilities***

The Irrigation and Drainage Management Station of Yuanguan Town and each of the Villagers' Management Committees, that have the title to irrigation projects, put forward a base price (on the basis of accounting various costs,

such as the prime cost of electricity, cost of upkeep, cost of project and mechanical maintenance, management expenses and salaries of staff members) and contracted the system. The contractors took over the entire irrigation system and exercised their authority over management in light of contracted specifications. Moreover, the contractors kept separate accounts and assumed the sole responsibility for its profits and losses.

### **Implementing a System for Monitoring the Post-Responsibilities of Contractors**

The central point is that each individual was assigned specific tasks and the income was determined on merit. The aim was to overcome the so-called "equalitarianism," that each individual gets the same pay as others irrespective of his or her performance.

### **Formulating Strict Rules for Irrigation Water Management, Project Management, Mechanical Management and Financial Management**

There were guidelines for irrigation management in the locality.

### **Developing a Diversified Economy**

In 1984, the Irrigation and Drainage Management Station began to develop a diversified economy by making full use of its technical superiority and financial resources accumulated in many years. By the year 1992, the assets of enterprises which had been set up by the station were valued at 10.14 million yuan (US\$1.197 million). The gross output value and the sum of profit tax for this year amounted to 21.05 million yuan (US\$2.48 million) and 1.15 million yuan (US\$136 thousand), respectively.

## **EFFECTS OF IRRIGATION MANAGEMENT TRANSFER**

### **Reliability of Irrigation System Has Been Raised while the Cost of Irrigation Has Been Reduced**

Irrigation management has been improved so that water demand from farmers can be satisfied promptly. At the same time, escalation of the prime cost of water and power has been restrained. Annual power consumption for irrigating one hectare of irrigated land has been reduced. For instance, power consumption in irrigation which was 316.2 kwh/ha in 1984 dropped to 181.65 kwh/ha in 1991 (Power consumption in irrigation for the past 10 years is as shown in Table 1). The collection of water charges has averaged 100 percent.

*Table 1. Power consumption per unit area in irrigation from 1984 to 1993.*

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Power consumption (kwh/ha)	316.2	273	336	240.75	274.5	251.7	319.2	268	271.4	181.65

### **Staff Members of the Irrigation and Drainage Management Station and Village Cadres Are Able to Pay More Attentions to Irrigation Development**

In the past, staff members of the station and village cadres were kept busy with sundry duties of irrigation districts. For example, they were preoccupied with administrative duties and resolving many irrigation disputes. After the adoption of irrigation management transfer, they were only responsible for the coordination and supervision of irrigation management, checking at the end of the year whether the signed contracts have been honored or not and superintending the signature of new contracts for the next year. As a result, they can spare more time and energy to concentrate on project management, water resources management and the development of a diversified economy.

### **The Economic Performance of Irrigation Management Agencies Has Been Improved and the Team of Irrigation Management Stabilized**

Because of irrigation management transfer and the development of a diversified economy, the family members of irrigation managers could be provided with opportunities for employment by enterprises set up by the Irrigation and

Drainage Management Station. As a result, the family financial situation of irrigation managers has been improving. Besides, a welfare fund for retirement has been established, so that irrigation managers can enjoy an endowment insurance. Furthermore, some 60 of the irrigation managers have been given the chance to participate in various training classes. These measures have not only stabilized the team involved with irrigation management, but also raised the level of competence of irrigation managers.

To sum up, it has been proved in practice that the adoption of irrigation management transfer has achieved very positive results.

### **TASKS OF IRRIGATION MANAGEMENT TRANSFER IN FUTURE**

With the establishment of the socialist market economy, irrigation management will be further improved in 3 aspects:

1. The title will be further separated from the authority over management. More specifically, pumping stations will be managed by lease or contracted out to individuals.
2. The system of water markets will be introduced. On the basis of unified water pricing, volumetric water rate will be charged, treating water as a commodity. In the meantime, the water-saving irrigation technique for rice will be popularized so as to promote farmers in the use of water more efficiently.
3. Apart from running its own enterprises, the Irrigation and Drainage Management Station of Yanguan Town will support pumping stations of each village to develop a diversified economy in accordance with local conditions. Thereby, the income of irrigation managers will continue to improve, the economic viability of pumping station will be further strengthened and irrigation management as a whole will be directed to the road of self-development.