

Increasing Irrigation Benefits by Irrigation Management Transfer

Wu Jingtang¹

ABSTRACT

THE BAYI IRRIGATION District was the location of a case study on the "Approaches to Irrigation Management Transfer (IMT) in Northern Part of China," undertaken jointly by the International Irrigation Management Institute (IIMI) and the Shijiazhuang Institute of Agricultural Modernization, the Academy of Sciences of China. In this paper, measures taken in the process of IMT, especially the approaches to and effects of joint management of irrigation systems by both professionals and farmers and the development of diverse sideline enterprises by the local irrigation management agency, are discussed in detail.

The paper also highlights the changes in the objective of irrigation management through IMT. Irrigation management, which was solely a provider of services will, in addition, be made profit-making. The experiences and results of IMT in the Bayi Irrigation District are invaluable because they will benefit many other irrigation districts in the northern part of China.

INTRODUCTION

Since 1985, a series of measures to reform its irrigation management system have been taken in the Bayi Irrigation District. The emphasis was on IMT. Generally speaking, more attention has been paid to formulating a rational system for levying water charges and the developing of diverse sideline enterprises. Up to now, a new framework of irrigation management, which involves the participation of both professionals and farmers, and which encourages competition and provides a proper set of incentives, has begun to take shape. Efforts have been made to accelerate the development of diverse sideline enterprises, so as to explore more sources of revenue, to strengthen the economic viability of irrigation districts and to consolidate the position of irrigation.

A BRIEF ACCOUNT OF THE BAYI IRRIGATION DISTRICT

The Bayi Irrigation District is located in the central hilly area of Yuanshi County, Hebei Province, North China. It is a medium-sized irrigation district. Construction of the project started in 1959. Its designed irrigation area is 5,330 hectares (ha). The actual irrigated area is 5,600 ha. Within the irrigation district, there is one main canal with a length of 5.4 kilometers (km) and two sub-main canals with a total length of 13.5 km. The numbers of primary canals and secondary canals are 16 and 89 and the corresponding lengths are 39.4 km and 104.4 km, respectively. Hydraulic structures total 1,423. The numbers of beneficial townships and villages are 8 and 45, respectively. The source of water for this district is the Bayi Reservoir. Before 1976, the yield of drainage in the locality had been very low. After 1976, with the accomplishment and opening to delivery of the "Yingang Canal," a transbasin conveyance project, water supply has been guaranteed, and irrigation management has also been improving. The amount of water diverted annually is about 20 million cubic meters (m³) on average. At present, there is a Management Division in charge of matters concerned with irrigation. The division has a staff of 66 of which 29 are responsible for water management and 37 are engaged in the development of diverse sideline enterprises. There are 5 offices under the Division, with responsibilities for project affairs, water management, finance, science and technology and administration. While there are 4 management institutes at the basic level, 9 sideline enterprises have also been set up. Since 1985, the revenue of the Division has been increasing year after year. It has basically been self-financed and is still striving for more rapid development.

ESTABLISHING A NEW REGIME OF IRRIGATION MANAGEMENT THAT INVOLVES FARMERS' PARTICIPATION

Being state-owned and constrained by the planned economy, the Bayi Irrigation District was fully managed by state authorities. Because of the serious squandering of land and water resources, the deterioration of irrigation projects and drawbacks in management, the irrigation projects were performing badly. For example, from 1976 to 1985, though the

¹Engineer and Deputy Chief, the Bureau of Water Conservancy in Yunshi County, Hubei Province. Former (1985-1990) Head of the Management Office of the Bayi Irrigation System.

government allocated substantial funds as subsidies for the construction and rehabilitation of irrigation projects, the Management Division was not able to support itself, although annual water supply was relatively sufficient.

After 1983, when the agricultural production responsibility system was introduced, the earlier practice where only cadres at township and village levels paid attention to water supply was discontinued. Instead, each household began to care for water supply. This resulted in some new problems. For example, in the irrigation season, there was illicit tapping of water and disputes over irrigation occurred more frequently. In such circumstances, staff members of the division realized that the old management system was no longer suitable for the new situation of agricultural production. Only by reforming irrigation management, and encouraging farmers to play an active role, can farmers' cooperation be assured. Furthermore, an integrated management of the irrigation district involving both professionals and farmers is vital to realize the full potential of water resources and irrigation development projects.

Reform in irrigation management was initiated in 1985. The emphasis was on setting up farmers' water management organizations—the Section of Water Conservancy—in each village. Rules and regulations for these sections and the work regulations for their staff members were formulated. Moreover, it was stipulated by the division that the establishment of the Section of Water Conservancy would be the precondition that a given area gets its water supply. This approach to reform made a sensation throughout the irrigation district.

The Section of Water Conservancy in each village comprised 2 to 9 members elected by villagers. The village head acted as its leader, and an irrigation management network consisting of 45 Sections of Water Conservancy and 184 farmers, took shape. At the same time, the Canal System Management Committee, a middle link in the management chain, was canceled.

Responsibilities for irrigation management were shared by the Irrigation Management Division and the Section of Water Conservancy of each village. With these reforms, the Division only retained the management of 3 main canals and 3 of the large primary canals (whose respective irrigation area is over 667 ha). The remaining 13 primary canals and all minor canals were fully managed by the Section of Water Conservancy. Within each Section of Water Conservancy, [the objective responsibility system] in relation to water management and project maintenance was introduced.

Water management was based on principles such as "water resources must be put under unified control; water amount must be allocated in light of irrigation area; water charges must be levied according to the amount of water applied; extra fees must be charged for extra-use of water, economized use of water will be rewarded and water is delivered after payment in advance," were adhered.

As for project management, the principle that "he who gets benefits must take the responsibility for management and must make investment," was satisfied.

Farmer participation in management brought about a new phase in irrigation development. First, farmers' awareness of water conservation was increased. The utilization of water in a planned, economized, scientific and civilized manner was promoted. Illicit tapping of water was eradicated. The orderly use of water enabled the saving of water.

Second, the adherence to the principle that "he who gets benefits must take responsibility for management and make investment" accelerated irrigation construction and improved irrigation management of each village. Since 1985, as much as 1,338,000 yuan² (US\$157,880) and labor inputs amounting to about 4,000,000 man-days have been contributed by farmers for the improvement of the operation and maintenance of their irrigation system. The irrigated area in the Bayi Irrigation District has increased from 3,600 ha to 5,567 ha. Grain yield has increased to 12,150 kg/ha from the 1985 figure of 7,500 kg/ha.

IMT has resulted in achieving a stable and higher level of agricultural productivity in the irrigation district. Moreover, IMT has also led to the restructuring and the perfecting of rules and regulations within the Irrigation Management District. For instance, 5 offices with responsibilities for project affairs, water management, finance, science and technology and administration, and 4 management institutes at the basic level have been set up. A monitoring system which involves 8 technical and economic indicators was established. A set of responsibility systems, including the objective responsibility system for Division Chief, the limited objective responsibility system for each of the offices and management institutes, and the post responsibility system for staff members have been introduced.

The experience of the past few years has proved that farmers' participation in irrigation management has resulted in the reduction in the wastage of water, prevention of the deterioration of the project and revitalizing of the irrigation district as a whole.

DEVELOPMENT OF DIVERSE SIDELINE ENTERPRISES

For many years, under the system of the planned economy, the Irrigation Management Division of the Bayi Irrigation District was considered as a unit of public welfare. Irrigation development was carried out by the government. The

²Yuan is the Chinese unit of currency; in 1994, 1 yuan = US\$0.118.

emphasis of management was service-oriented with realizing of social benefits. Economic interests of the division were neglected. Before 1985, there were times when the district could not support itself financially because it had not accumulated capital. Consequently, the regular operation and maintenance of local irrigation systems were adversely affected. Since 1985, greater attention has been given to the development of diverse sideline enterprises simultaneously with the efforts to improve irrigation management and reforming the levying system of water charges.

The development of diverse sideline enterprises in the Bayi Irrigation District dates back to 1981. At first, a small chicken farm was established as an experiment. Subsequently, tubers of elevated gastroliia were planted and the business of installing electric equipments was started.

Initially, leaders of the Division did not take these activities seriously due to the lack of experience and qualified personnel in business management. As a result, the enterprises coming under the Division incurred losses in 1981 and 1982, and realized only small profits in 1983 and 1984. In spite of these discouraging outcomes, staff members of the Division were not frustrated. In 1985, on the basis of past experiences, they developed the strategy of rigorously promoting the development of secondary and tertiary industries while improving irrigation management at the same time. From then on, through the arduous efforts made by all staff members of the Division, benefits from their sideline enterprises have increased significantly. As a result, the development of diverse sideline enterprises and irrigation management have been able to supplement each other effectively. To date, 37 people, constituting 56 percent of the staff of the Division, have been engaged in the running of its 9 sideline enterprises. The fixed assets of the Division have added up to 400,000 yuan (US\$47,200). Profits from its diverse sideline enterprises have been increasing year after year. Net profits from this source since 1985 have totaled 660,004 yuan (US\$77,880). For example, from 1985 to 1989, the accumulated surplus throughout the irrigation district was 392,000 yuan (US\$46,250) of which, 306,100 yuan (US\$361,198) comprised the income from diverse sideline enterprises, accounting for 78 percent of the total surplus. In one of the best profit-making enterprises, the profits were as much as 179,100 yuan (US\$21,120).

At present, enterprises of the Division deal with 9 kinds of businesses. These include the survey and design of irrigation projects, the installation of running water pipes and taps, the repair of irrigation and drainage equipment, and the boring of wells for the purpose of hydrological investigation and building construction. Besides, 5 products from the factories including cobblestone, lime cement tile, cement pipe and talcum powder are being produced on a mass scale.

It should be noted that in the development of diverse sideline enterprises in the Bayi Irrigation District, priority is given for the improvement of irrigation management. The achievements in this respect are also remarkable. For instance, the technique of determining hidden perils in dikes and dams developed by some staff members of the Division received the prize for advancing Scientific and Technological Progress by competent authorities at both prefecture and province levels. The inventors of this technique were invited by many other management agencies inside and outside the Hubei Province to pass on the relevant knowledge.

The technical services for the exploration for sources of water were welcomed by many villages, factories, mines and other enterprises, institutions and military units inside the Hebei Province. Building materials for irrigation projects manufactured in enterprises of the Division have been sold to Shijiazhuang, the capital of Hebei Province and many other cities and counties.

The skills of the team involved with well boring for hydrological investigation, rank first among dozens of teams of the same kind in the Yuanshi County; the team has been praised as "the team whose skill and quality of service can be trusted."

The development of diverse sideline enterprises in combination with the improvement of irrigation management has been successful in promoting the expansion of irrigated agriculture. For example, in 5 years' time, from 1985 to 1989, as many as 125 hydraulic structures built upon primary and secondary canals were completed and as long as 3,708 meters of open channels were lined with cement for seepage control. The magnitude of construction was 60,200 m³. Total investment on project construction amounted to 882,540 yuan (US\$104,140) of which, 472,520 yuan (US\$55,760) were raised by local farmers. Total irrigation area has now expanded to 5,600 ha from that of 3,600 ha in 1984. The Bayi Irrigation District, though accounting for only about 1/7 of the cultivated areas of the Yuanshi County, provides approximately 1/4 of the total grain output. It has turned out to be one of the most important production bases for grain and cotton in the county.

With the development of diverse sideline enterprises, more opportunities for employment have been provided. Specifically speaking, 37 persons from the Division and family members of the district staff have been given the chance to work in enterprises set up by the Division. The development of diverse sideline enterprises has also strengthened the economic viability of the Division itself. Consequently, educational levels and working and living conditions for district staff have been improved considerably. More attention and more money have been paid to technical training, so as to enhance the skill of its people. Since 1985, as many as 10 individuals from the Division have been sent either to a college or to a polytechnic for part-time or full-time education. These measures have not only stabilized the team of district staff but raised the level of management.

For its good performance, the Irrigation Management Division of the Bayi Irrigation District was chosen as an "Advanced Group" and as an "Advanced Unit for Developing Diverse Sideline Enterprises" in 5 successive years by competent authorities at both prefecture and province levels.

Evidence to date clearly indicates that by way of IMT, developing diverse sideline enterprises, while ensuring sound irrigation management can be very effective in raising both social benefits and economic benefits. Besides, IMT can be very helpful to the overcoming of difficulties existing in irrigation management, to the realization of self-finance by irrigation districts and to the operation and maintenance of irrigation systems [in a good circle].

CONCLUSION

Far-reaching measures have been taken in the Bayi Irrigation District in relation to IMT to establish a proper irrigation management system. The economic viability of the local management agency has been strengthened. However, it is at the initial stage of the reform in the irrigation district. With further reforms in the management system and further steps towards IMT, more attention should be given to the rehabilitation of the canal systems and to the improvement of field irrigation techniques. In addition, a concerted effort will be made to achieve the goal of "specialized administration, businesslike management, commercialized water supply and socialized service" for this irrigation district, so as to turn it into "a model irrigation district which has adopted IMT with northern Chinese flavor."