

# Historical Changes and Optimization Measures of Rural Water Conservancy Projects in the Context of Rural Revitalization

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**Abstract:** *New China's water conservancy construction has its own development process, stages and characteristics, and the dynamics of development are related to the national policies and institutional arrangements of the time. The most effective manifestation of the "collectivization" of "people", in other words, "organization", in the first 30 years was the construction of farmland water conservancy. After the rural reform and before the tax reform, the construction of farmland water conservancy became a "peasant burden". In China at the time, there was no real reform, and it was difficult to have peasant-organized water conservancy without the ties of power and grassroots social management, so it was extremely important to have a holistic national top-level design and focus.*

**Keywords:** *farmland water conservancy, farmers' burden, coordination mechanism, post-management, rural revitalization*

## 1. The background of the era of the new Chinese rural water conservancy project construction

At the beginning of the founding of the People's Republic of China, the biggest problem facing agriculture was the ravages of rivers and floods. Thousands of rivers, large and small, flood every year. River banks were broken, fertile fields were washed away, village houses collapsed, people were displaced, and even families are broken. Floods have become the biggest scourge of the masses, and rural people were struggling with death. Water is the lifeblood of agriculture. In the view of the first generation of China's leadership, agriculture is the foundation of the country, and if it is not done well, it will shake the foundation of the country. Comrade Mao Zedong recognized the importance of water conservancy construction in early days of the founding of the country. The first is to combat drought, the second is to prevent flooding and drainage, the third is to improve the low-lying flood-prone saline land, and he put forward the famous saying that "water is the lifeblood of agriculture". From the 1950s to the 1970s, there was a large and medium-sized water conservancy construction boom. Therefore, the first 30 years of large-scale water conservancy construction (not only farmland water conservancy, but also the Three Gorges Project and the South-North Water Transfer Project were started during this period), is one of the best manifestations of the superiority of socialism. "Focus on doing great things". For rural areas located in the middle reaches of the Yangtze River in the flood storage area, the rainfall is large and concentrated in summer, and water logging is prone to occur. Therefore, the main functions of farmland water conservancy projects in these areas are the flood control, irrigation of farmland, and water supplying for the residents' daily life.

In 1952, China's first large-scale electric irrigation project, Irling Irrigation District, was officially started. Since then, the expansion of Dujiangyan, the renewal of the Hetao Irrigation District, the construction of the People's Victory Canal and the Luxuriant Irrigation District, the main canal of the Inner Mongolia Yellow Irrigation District, the Red Flag Canal, the first phase of the Gansu Jingtai River Electricity Irrigation Project, the Ningxia Guhai Water Raising Project, and the Salt Ring Ding Yellow Raising Project have been started one after another, providing a strong guarantee for China's grain production. In the 1950s and 1970s, under the call of the Party and the government, almost all rural young adults began to engage in farmland water conservancy construction in full swing. During agricultural leisure time, most rural laborers were mobilized to build ditches, ponds and weirs. It is worth mentioning that during that period the rural areas were in the production team mode of the people's commune, and villagers worked according to a collective organization. On this basis, each group or settlement would excavate a large pond (usually only three or four acres of land area, and larger ones would have more than ten acres), and then ditches are excavated to connect each pond and farmland with

ditches. A small pumping station is set up in some of the patches of paddy fields as a power equipment for the water supply to the paddy fields. The ditches are also divided into small and large ditches. Small ditches are constructed and managed by the village. The water supply and drainage mainly come from natural ponds and weirs in the village. While large ditches are connected to reservoirs, lakes, and large and medium-sized irrigation facilities, and their management authority lies in the county-level. Water Resources Bureau, generally to ensure water for farmland in major grain, cotton and oil production areas. However, the organization of peasants to build water conservancy is not the same as the people's commune, but is based on the central government and the government's focus on agriculture as the top priority for the country's stability.

Since the land was divided into households in the 1980s, the construction of rural water conservancy has been increasingly neglected, and the maintenance of ditches, ponds and weirs has been left unattended. The state has invested in the management of large rivers, but has not built the most important ditches, ponds and weirs for farmers.. In addition, contractors of water conservancy facilities are seriously engaged in short-term profit-seeking activities after the market-oriented reform, and most of them use water conservancy facilities for other purposes to seek profits, which has created a huge conflict with agricultural water use. The water conservancy sector has been heavily capitalized, and the limited water conservancy funds have been invested in industry, with very little investment goes to grassroots farmland water conservancy facilities. The appeal issue has resulted in a decrease in effective irrigated area, an increase in disaster rates, and a decline in drought and flood resistance since the 1990s. Over time, many rural water storage facilities have been razed to the ground by silt, making it difficult to play the role of water storage. Due to the disease, many rural areas are flooded in the summer rainy season and drought in the spring and summer dry season.

## **2. Contemporary causes of the dilemma of China's rural water conservancy project construction**

In the late 1980s, there was an obvious slide in water conservancy construction. The idea that water conservancy investment was wasteful, inefficiency had a very large market, and even affected the decision-making level at that time. For this reason, during the national economic adjustment in the 1980s, water funding was greatly reduced. The public welfare of rural water conservancy is weakened, and market-oriented reform are dominant.. At that time, the reform of rural water conservancy construction model mainly included two aspects. On one hand, the water conservancy project unit carried out enterprise restructuring; on the other hand, the management of agricultural water conservancy projects was transformed into the production of farmers and the original public welfare of agricultural irrigation has changed. It has become an agricultural service operated by water conservancy engineering units, and agricultural irrigation water fees have become part of farmers' production costs.

In 1988, the State Council forwarded to the Ministry of Water Resources a document entitled "Notice on Relying on Mass Cooperation for the Construction of Rural Water Conservancy", which suggested that the future construction of water conservancy should continue to be based on the principle of self-reliance, supplemented by state support, and the accumulation of labor in a multi-level and multi-channel manner. "In the 1990s, the State Council promulgated the "two workers" policy, which allowed the government and grass-root organizations to build large-scale farmland water conservancy construction, temporarily concealing the seriousness of the problem. In 2002, the State Council abolished the "two workers" system, which had a serious impact on the construction of farmland water conservancy facilities at the grassroots level that used to relying on the "two workers" for maintenance. With the full restoration of the traditional small farm economy, the uncertainty of individual farmers' expectations of their own income in relation to the maintenance of farmland water conservancy infrastructure has increased. There was a tendency for farmers to seek "free-ride" and opportunism. The apparent lack of maintenance investment reduces the sustainability of the water infrastructure and low irrigation efficiency. The abolition of the "two worker" system has eliminated the possibility of large-scale direct use of labor in rural water conservancy construction, leaving rural infrastructure, especially small-scale infrastructure that is closely related to farmers' production and livelihoods, largely without its primary input channel.

Faced with the actual work of farmland water conservancy project that the government is responsible for, the low efficiency and other "last mile" problem. It is recommended to introduce social capital and market players, so that farmland water conservancy work from the government "solo" to the government, social capital, and the masses "ensemble". The cause of a dilemma is often multi-faceted. Before the reform and opening up, the main body of farmland water conservancy infrastructure was the collective (production team, production brigade, people's commune), with clear responsibilities. After the implementation of the joint production contract system, the collective economy in most areas

withdrew and disintegrated, the main body of agricultural water conservancy infrastructure is absent and disappeared. Mainly reflected in: unclear rights, assets and other issues, that is, social benefits over economic benefits, construction over management. Industry to eat "pot rice", the community to drink "pot of water"; water conservancy input channel is single, the scale of investment is small; the project is aging and dilapidated, and the benefits declines. The most intuitive manifestation of the "pot of water" is to water the land without spending money. Today's people may not understand, but as long as you understand the people's commune system, you will understand -the land is collective, the production tools such as cattles are collective, the irrigation ditches are built together, and even the people are also collective that how much food they eat are not up to them directly. Not only that, but even how many work points the peasants earn, in fact, can not be completely determined by themselves. The so-called "more work, more pay", means that no means of production can not be disposed of at will, production decisions can not be decided independently, the labor force can not choose to work independently and even can not move freely, the work does not contribute to the situation has become common. On the other hand, water conservancy facilities are built by the peasants themselves, and the water resources are "ownerless". Unless the state levies a tax on water resources, but to whom will the money go? Thus, although a relatively complete farm irrigation system had been developed before the rural reform, the efficiency of water use has been relatively low. For a water-scarce agricultural country, the application of water-saving projects and water-saving cultivation technology is relatively lagging behind, and it is not uncommon to see extensive use of water for irrigation.

### **3. The history of China's rural water conservancy project construction and its specific impact**

Since the mid-1990s, a large number of farmers have gone out to work, making it difficult to organize the "two workers". The grass-roots government and village organizations changed the mandatory "two workers" from collecting labor forces in the past to collecting money from farmers, but most farmers have very little cash income. This increased the burden on farmers and became a major source of conflict in the rural areas at that time. At that time, the water conservancy project unit has become an autonomous market entity, and the grassroots government lacks the organizational capacity to mobilize farmers to carry out regular farmland water conservancy construction. During this period, water conservancy facilities such as the canals and culverts were not maintained in a timely and effectively manner, and the original farmland water conservancy system tends to decline. It should be said that it is the most shrinking period of water conservancy construction since the founding of New China.

First, the villagers' drinking water goes through the tap water pipe. This directly caused the villagers to basically stop going to the ponds and weirs to collect water, and even began to dump garbage into the weirs, discarding sick and dead pigs. After the 2000s, ditches, ponds and weirs were basically forgotten; but during this period, due to the excessive reduction of state input, more through the "two workers" (labor accumulation and compulsory labor) form, the construction of farmland water conservancy as part of the burden of farmers by the local government organizations. This became one of the reasons for the increasing burden on the peasants.

Second, there was a serious loss of land and population. The background of this phenomenon is the outward employment of rural labor. In the 1980s and 1990s, the wave of migrant workers from the south also swept through the countryside. A large number of young and strong laborers went out to work, leaving their parents to plant the responsible fields, or abandoning them if they were too old to plant. The main reason is the high agricultural tax and the county and township retention in the 1990s, coupled with the low price of agricultural products, which led to a loss of money in farming, and the wages of migrant workers were much higher than those of farming. The fields are irrelevant, who care about farmland water conservancy facilities?

Third, the disorganization of the rural collectives. After the advancement of market economy, it was difficult for rural organizations to manage villagers. In the era of purely planned economic system, villagers went out to do business and work outside the province, which directly resulted in no attention for the village collective rural water conservancy project. For example, every winter in the collective era, the production brigade would organize a labor force from each family to dredge the weirs and ponds to ensure that the water flowed normally and the weirs were clear in the coming year. Later, after the 1990s, the village could no longer be organized, because there was no one to do this for the public welfare, even if it was an apportioned task, people were unwilling to do this even if they are paid. As a result, ponds and irrigation systems that were once clear and well-maintained became disorganized, incapable of maintenance by single-family farmers, so they fell into disrepair and accumulated silt until they were abandoned.

The main reason is not the change in the rural management system, but a reflection of China's over-reliance on market-oriented means to solve various conflicts in the process of exploring the market economy, which is the orientation of many reform initiatives at the time. For example, the reform of the science and technology system and the reform of the education system, to a certain extent, over-relied on market forces, and the state was absent from the public interest. In rural areas, the "seven stations and eight institutions" formed during the planned economy, such as agricultural machinery stations, agricultural technology stations, seed stations, animal husbandry and veterinary stations, etc., have joined the flood of marketization in this period of reform. And seed sellers, animal vaccine sellers, fertilizer and pesticide sellers occurs instead. These social organizations, which should mainly undertake agricultural public welfare services, became a "double interest group" in the market-oriented reform, which is also considered a "dual system" in certain industry sectors during a specific period.

#### **4. China's transformation and renewal of the current status of rural water conservancy construction**

Since 2005, counties, towns and rural areas have all faced with the loosening and disintegration of grassroots power and management systems. China's rural water organizations and management have traditionally been closely linked to grassroots social management and grassroots power. If the grassroots regime, from the grassroots social organizations to talk about the reform of the water conservancy system, it has become a rootless purely technical problem. In 2011, the country released the Central Document No. 1 "decision on Accelerating the Reform and Development of Water Conservancy" to fully deploy water conservancy work. The document clearly put forward that the construction of farmland water conservancy should be greatly promoted, and strive to fundamentally reverse the situation of obvious lag in farmland water conservancy construction within 5 to 10 years, and basically complete the task of renewal of large irrigation areas, key medium-sized irrigation areas supporting and water-saving transformation. In 2018, the Ministry of Water Resources issued a notice on printing and distributing the "Guidance on Deepening the Reform of Farmland Water Conservancy", requiring increased efforts to improve rural rivers and ponds. In response to the deterioration of the water environment of rural rivers, ponds and ditches, we will carry out the construction of rural livable water environment and rural river cleaning actions, with the goal of "smooth drainage, mutual assistance of water sources, protection of irrigation, and clear water and green shores, As the goal, through centralized renovation of small rivers, small ditches, small ponds, small lakes, dredging, shore improvement and other concentrated improvement, construction of ecological rivers and ponds. In order to improve the agricultural irrigation and drainage system, improve the ability to allocate water, disaster prevention and mitigation, river and lake protection, and effectively improve the rural living environment and river ecology. The Ministry of Water Resources issued the "Main Points of Water Resources Rural Revitalization Work" in 2022, and the "14th Five-Year Plan" of the Ministry of Water Resources to consolidate and expand the achievements of poverty alleviation, ensure the effective combination of water resources for rural revitalization in 2022, and further Suggestions on strengthening the management and protection of rural water conservancy projects are put forward..

(1) In order to completely solve the vicious situation of "drought when there is little rain and flooding when there is much rain", it is suggested that the state should allocate special funds to build small farm water conservancy projects, so that farmers in those villages can build ditches, ponds and weirs for water storage during their agricultural leisure time. For example, a village with a population of 100 was given 20,000 yuan for reconstruction funds, part-time jobs in exchange for food, and allowed them to build water storage facilities in their own villages. These capital inputs can use a lot of labor because it is for the farmers themselves, and it is estimated that the farmers will be happy to use a small amount of money with more manpower. For example, each farmer is paid 500 yuan a month, 6000 yuan a year, and 60 billion repair funds a year can provide 10 million jobs. Not only farmers can engage in food production in the agricultural leisure time without going out to work, but also increase their income. Issues such as drinking water and drought are guaranteed.

(2) To alleviate the widespread disasters, the national treasury must substantially increase the investment in water conservancy facilities and rural irrigation systems, and strengthen government supervision and implementation to gradually repair and maintain the abandoned reservoirs and irrigation facilities and restore their functions of water storage in summer (flood) season and water supply in winter (drought) season. Clearly farmers, farmers' cooperative organizations and village collective organizations are the main bodies of construction and management of small farmland water conservancy projects. Change the traditional management model of "collective ownership, collective income, and collective funding", according to the scale of farmland water conservancy facilities, sources of investment, the

status and efficiency, based on a good asset assessment, in accordance with the principles of openness, fairness and equity, according to the beneficiaries and scope, the financial investment in the formation of assets into collective equity. Or quantified as the share of beneficiary farmers. According to the principle of "who benefits, who is responsible", the responsibility for management and care will be decomposed and implemented to the villagers, farmers' professional cooperative organizations or contracted management units through apportionment, convention or auction, etc.

(3)With the reform of the management system of contracting small farmland water conservancy facilities as the core, the small farmland water conservancy facilities are contracted to farmers; the villagers "self-selected, self-built, self-managed, self-use" model, the village collectively applies for farmland water conservancy projects and the elects the project construction council, which is responsible for organizing construction, material procurement, equipment leasing and water use association models, the establishment of farmers water association, through the collection of water fees, the organization will take care of farmland water conservancy facilities; professional management team model, water pipe units to implement the separation of management and maintenance, the formation of professional maintenance team; entrusted enterprise management mode, agricultural enterprises signed a small farmland water project trust agreement within the scope of the transfer of land, on the basis of property rights to the collective care of farmland water conservancy facilities within the scope of the transfer of land. Cooperative model, the establishment of professional water conservancy cooperatives to serve the construction and management of farmland water conservancy.

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