

Self-Financing Irrigation Districts Under the Hubei Water Resources Project

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BACKGROUND

In 1988, THE Water Resources Bureau (WRB) of the Hubei Province made extensive investigations into the institutions in the water resources sector. It was found that more than 95 percent of these institutions had deficits and that the irrigation facilities were old and seriously damaged. Because of this the provincial WRB started studying the possibility of transferring the management of irrigation and drainage projects, which was in accordance with the new World Bank policy on "Irrigation and Drainage Districts" (IDD). The Dongfeng Canal Irrigation District and the Zhanghe Main Canal No.3 Irrigation District were selected as pilot districts. Subsequently, with financial and technical assistance from the World Bank experiments were planned for implementing irrigation management transfer. The present state of the study is to identify in what ways the transfer can take place. A study group has been set up, basic data collected, ways of transfer studied, financial analysis carried out, an Interim Report made, and discussions made with experts from the World Bank and the FAO. National and international study tours are planned to collect related materials from other places. This should not only help us to determine how the experiments can be implemented but provide us with details on the way transfer can take place in China, especially in the Hubei Province.

The Zhanghe Main Canal No. 3 Irrigation District as mentioned earlier is one of the pilot districts. Water is diverted from the General Main Canal of the Zhanghe Reservoir and is used to irrigate 90,000 hectares (ha) of hilly area around the Jingmen City. The canals that run along the ridges of the hills are mainly used for irrigation. There are 8 medium reservoirs and 62 small reservoirs in the irrigation district. However, these reservoirs are not managed by the management unit of the Main Canal No. 3. Figures 1 and 2 show, respectively, the present institutional structure and flow chart of water charge collection of the Main Canal No.3. As the level of the water fee is low and mainly cut apart, the financial situation of the Management Unit of the Main Canal No.3 is poor. Moreover, there is little benefit from the diversified economy. For the year 1990, 1991 and 1992, the annual deference of income and expenditure was 433,000; 438,000 and - 1,262,000 thousand yuan RMB, respectively.²

The Dongfeng Canal Irrigation District is the second pilot irrigation district. Water is diverted from the Shangjiahe Reservoir, the third reservoir downstream of the Huangbohe River. The water is used to irrigate 73,000 ha of hilly and mountainous areas in the Yichang County, the Zhijiang County and the Dangyang City of Yichang. The diversion capacity of the main of the Dongfeng Canal is only 13.5 cubic meters per second. In order to meet the crop water requirements, water is diverted throughout the year to fill 12 medium reservoirs and 182 small reservoirs in the irrigation district. The irrigation system is a 'Long-Vane-with-Melons' system with high level of regulation. The area that is directly irrigated from the canal amounts to 1/6 of the total command area. The remaining part is indirectly irrigated by water from the smaller reservoirs: 39 percent from the Dongfeng Canal System, and 61 percent from the medium and small reservoirs. In accordance with the above infrastructure, the management has four levels (Figure 3): the Dongfeng Key Canal System, the medium reservoirs (which are managed by the counties), the small reservoirs (which are managed by the townships) and the mini reservoirs and farm canals (which are managed by the villages). Figure 4 shows the flow chart of water charge collection in the Dongfeng Area.

In addition to the facts that the portion of indirect irrigation is large and that the operation of the Long-Vane-with-Melons System is complicated, the management of the Dongfeng Canal is characterized by its dependency on authorities at different levels. From a financial point of view, the Dongfeng Canal Management Unit has favorable conditions to develop hydropower and domestic water systems. Except for overhaul and depreciation, water fees almost cover the daily operating expenses.

NECESSITY AND STRATEGY OF IRRIGATION MANAGEMENT TRANSFER

For four reasons it is necessary to carry out irrigation management transfer at the same time that the irrigation facilities are rehabilitated with a World Bank loan:

1. The facilities may deteriorate rapidly, which may induce new investment after a few years;

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²US\$1.00 = Yuan 5.7.

2. The financial burden will continue to be heavy;
3. It will not be possible to meet the farmers' demands, and hence their participation cannot be ensured; and
4. The management institutions and their personnel will continue to be poor.

The idea behind irrigation management transfer is to change the organizations that carry out plenary management of water resources works and key canals. Water Users' Associations (WUAs) have to become a self-financed economic cooperative that can carry out management of the lateral and smaller canals and that can participate in the management of the entire irrigation district. The problem of property rights has to be solved by the joint-stock system. The operating mechanism has to be changed and farmers' participation in policymaking and management be ensured. The water fee will be divided into two parts: one part is for the branch canals and the larger canals, while the other part is for the smaller canals. The latter part is the source of income of the WUAs. To supplement the lack of operating funds with the low water fee the amount of government subsidies have to be determined. The subsidy will be reduced with the development of the economy of the countryside and the increase in the level of the water fees. Ultimately, the management institutions have to become self-financing.

PLANS TO REORGANIZE WATER MANAGEMENT

Water Resources Bureaus are state-owned organizations that presently undergo a reform in the direction of state-owned and public-operated organizations with a stock system. Water Conservancy Bureaus are social public organizations that mainly serve farmers. Consequently, they do not make profits. That is why the reforms will be different from those in private enterprises. For instance, administrative interference has to be reduced and the nation's strength used to support the water conservancy management units. This is a problem that has to be studied. There is a difference between the two pilot regions in terms of their adjustment to the current situation and the level of understanding.

The First Plan of the Dongfeng Canal Irrigated Area

The first plan of decentralized management at four levels is as follows (Figure 5):

- Level 1: The Dongfeng Water Management Bureau is subordinated to the Yichang City Water Resources Bureau. Under it there are seven Water Management Departments (including Shangjiahe Reservoir) and corporations dealing with township water supply and water-power supply. The management of the headworks, trunk canals, main canals, two medium-sized reservoirs, as well as of the unified release of water is carried out in the irrigated area.
- Level 2: Under Yichang, Zhijiang and Dangyang Counties there are ten Water Management Departments managing their medium-sized reservoir and their main canals. The first and second levels deal with the adjustment of the accounting methods of measuring water costs of medium-sized reservoirs and distributing water fee in the promised proportion. Previously, measurement was done at the inlet of the reservoir so that all the reservoirs had to save water and could not use the full capacity. This is to prevent the water from being wasted.
- Level 3: The former twenty-two township Water Resources stations will remain. These stations generally have jurisdiction over the branch canals, lateral canals and the small reservoirs within the townships. These stations are responsible for maintenance, the distribution and use of water, collecting water fees and resolving conflicts among villages. These stations are managed by the counties' Water Resources Bureaus. Financially, they depend on discount water charges and other income sources.
- Level 4: Four hundred and sixty User's Associations will be established at the village level. The village committees are directly elected by the farmers, so that the associations represent the farmers' interests. The association generally assigns three persons to be charge of the canals, ponds and small reservoirs below the lateral canals. Water is distributed to groups as well as to households. The water fee is collected and handed over to the water resources stations.

The status quo of the property rights, financial relations and the participation of the farmers is basically maintained. The Yichang Municipal Water Resources Bureau owns the property right of the Dongfeng Canal. The counties' and cities' Water Resources Bureaus maintain the property right of the important medium-sized and small reservoirs and

the canal system. The Village User's Associations have the property rights of ponds and field channels. The farmers take part in the meetings held at different levels of the Water Management Bureau, departments, and stations. The flow of water charges between the Village Users' Association, Water Resources Stations, County Water Management Departments and the Dongfeng Management Bureau is the same as the present system. Water Resources Stations and Village Associations are dependent on the collection of water charges below the level of the branch canals.

From the evaluation of the first plan it is learnt that:

- a. It is possible to release water in a unified way after changing the way water in a medium-sized reservoir in the Dongfeng Canal is checked.
- b. The relationship between administrative subordination and the property right corresponds with the present situation; in practice, there will be little interference.
- c. There are many levels of management. Water resources stations are independent, but their management is limited and the representation of the user is poor.
- d. The associations are village-based. Therefore, their representation is strong, but their scale is too small and there is no independent and fixed organization. Therefore, it is hard to coordinate contradictory water uses. Farmers' participation in the management is limited.

The Second Plan: Management at Three Levels

The first and the second levels of the second plan are the same as those described in the first plan (Figure 5). At the third level, property rights and management of the canal, small reservoirs and ponds below the branch canal inlet belong to the Water Users' Associations (WUAs). The associations are formed out of one or several villages. This makes management easier. The association has a Board that is formed to lead and supervise the work carried out by the association. The village representatives form the main body. The Water Resources Stations, as well as district and farmers' representatives join the Board. The association has a manager with technicians, an accountant, a person in charge of water and workers working under him. Five to seven persons form the organizations' regular efficient body.

Property rights and financial matters are organized as follows. Property rights and financial relations at the first and second levels are the same as those in the first plan: no changes in the status quo. Property rights below the branch canal and the small reservoirs are with the WUAs. These rights are the farmers' reward for their labor contribution in the project. The WUAs collect water charges above and below the branch canal inlet and hand them over to the Dongfeng Irrigation District. The level of water charges below the branch canal inlet are decided separately and are used to cover the costs of operation and maintenance.

From the evaluation of this second plan it is learnt that it corresponds with the characteristic of the "Melons-on-Vine" Irrigation System, which maintains the management structure above the branch canals. The plan supports farmers' participation in management and it helps to reduce operation costs and to collect water charge. Still, it is rather difficult to deal with the relationship between Water Resources Stations and the Water User's Association. This plan may be seen as a transitional or temporary model of management.

The Third Plan: State Ownership and Private Management at Two Levels

The third plan comprises management at two levels (see Figure 5). At the first level, the owners include Yichang City, Yichang County, Zhijiang County and Dangyang City Water Resources Bureaus. The Deputies of these units are organized in a Board that manages the Dongfeng Irrigated District. They follow a system of joint responsibility for managing the canal system and reservoirs above the branch canal inlet in the Dongfeng Irrigated Area. The second level is the same as the third level of the second plan.

At present, property rights above the branch canal inlet remain unchanged, but accounting the capital and deciding the ownership of the property have become a joint responsibility, as in a stock company. Joint responsibilities include the provision of labor to create assets for existing as well as new and old projects. All the associations are also the shareholders and have the right to take part in the shareholders' meeting in policymaking and in management. Property rights below the branch canal, including small reservoirs are either transferred to the association or are commonly owned by the County Water Resource Bureaus and the WUAs. Water charges are divided into two levels: above and below the branch canal inlet and are collected by the associations. The owner's units of the corporation (Municipal and County WRBs) can keep some management cost in a certain proportion.

The third plan is beneficial to decentralized management. Since property rights are not transferred the plan embodies the principles of both state ownership and public management and the change of inner operation mechanism. Municipal and County Water Resources Bureaus are the main owners that control the Board and that have the right of policy decisionmaking and leadership. However, the Chief Manager is in charge of the daily operation. The plan reduces the number of administrative levels; it reduces the operation costs by recovering water charges. It stimulates self-support and bring about great changes in the administrative system. This is also the reason why it is difficult to put it into practice. People have no such habits or experiences and the interests in all aspects have to be adjusted. The user's associations are both shareholders and users and take part in policymaking and management. Responsibilities, rights and interests are all unified below the branch canal. The difficulty lies in the fact that there are no precedents but the problems of farmers' consciousness of participation and the status of water resources stations.

Below, the three alternative plans to change the management of the Dongfeng Canal Irrigated District are compared. The first plan, with four levels of management, is the most practicable one. The second plan supports users' participation and fits in with the status quo of the first and second level structure. The third plan, with only two levels of shared management is an ideal plan. The basic idea is all right, but there is no precedent for it in China and the plan needs to be further studied before it can be implemented.

The First Plan of the Zhanghe No. 3 Main Canal Irrigated Area

The first plan aims to maintain the management of the canals and medium reservoirs separately at two-levels. The management structure of the No. 3 Main Canal is basically the same as is shown in Figure 1. At the first level, the No. 3 Main Canal Water Management Department maintains its present jurisdiction, which goes down to the diversion points of the branch canals. At the second level, the distribution groups below the former management section are transferred down to the user's association. Generally, one branch canal forms one association, including one or several villages. There would be seventy five WUAs. The structure of the WUAs would be the same as the ones mentioned in the second and third plans of the Dongfeng Irrigation District.

Property rights above the branch canal belong to the Jingmen Municipal Water Resources Bureau, whereas those below the branch canal will be transferred to WUAs as assets in turn for their labor contribution. Water charges consist of two parts: one part is above the branch canal inlet and it is handed over to the Water Management Departments by the associations to pay for the operation costs, water source fee to the Zhanghe Reservoir as well as other costs; the other is below the branch canal inlet and is collected on the legal norm to be used to maintain engineering management and the expenditures of the associations. The association makes a contract with the Water Management Department and takes part in the meetings, management and policymaking activities.

This plan is not beneficial to unified release water in the No. 3 Main Canal and the reservoirs. The structure of the associations has a good foundation (because of earlier experiments) and [its goals] can be realized. Property rights are completely clear in this kind of two-level management. Water charge can be directly collected. And the plan is strong in economically managing operational costs.

The Second Plan: Management of Unified Canals and Reservoirs at Two Levels

At the first level the medium- sized reservoirs and the Dabiwan pumping station that are now under the municipal jurisdiction are put under the administration of the No. 3 Main Canal Irrigated District. The aim is to carry on unified release of water. Under the district there are twenty management sections (including four central sections, five medium-sized reservoirs and the Dabiwan Pumping Station) that manage the canals and reservoirs above the branch canal inlet. The second level is the same as described in the first plan.

Property rights, financial matters and farmers' conditions are the same as described in the first plan.

This plan is more beneficial to the unified dispatch of water resources than the first plan. It can ensure water supply and reduce the waste of water. It is beneficial in making full use of water and soil resources to develop diversified activities.

From comparing the two plans it is learnt that the second plan is better than the first one. Property rights of canals, reservoirs and stations belong to the Municipal Water Resources Bureau, so that it is not difficult to put the plan into practice. Besides, the water user's association of the No. 3 Main Canal has good foundations for putting the plan into practice (water supply, power generation, industry and trade).

SELF-SUPPORT AND SELF-FINANCING

The idea behind self-support is that three different maintenance grades (A,B, and C) are used and that water charges are collected to recover the expenses of the following facilities and services:

- A. The costs of the regular management, maintenance and annual repairs.
- B. Overhaul costs.
- C. Basic depreciation.

No matter what standards are used, the net income from each of the diversified water use sources (irrigation, industry and trade) can only be partly used to improve the financial situation and the welfare of the staff in the management units. Income and expenditures of water user's association depend on the collection of water charges.

The outline of the financial plan looks as follows:

1. The companies in the irrigated area collect water charge for agricultural irrigation according to the standard of Grade A. The norms and the way of counting and collecting the water fee [for] below the branch canal inlet are explicitly mentioned to [foresee] in the income for the water user's association.
2. The state will cover the cost of overhauls in the irrigated area in the annual investment in the capital construction of water conservancy or in other special funds in order to reach the level of Grade B.
3. The management units will not take care of the depreciation of fixed assets, while the state will be responsible for the renewal and reform costs of the irrigated district according to the plan so that self-support of the irrigated district may reach the level of Grade C.
4. The management reduces the number in administrative levels in order to increase the income by increasing the output and by making full use of water, soil and man power. If the above three conditions are satisfactory met, efforts will be made to surpass the level of Grade C (to make proper profit) of self-support.
5. The water user's association has its standing agency, fixed assets and water charges to ensure regular operation of the projects and reasonable distribution of water, so as to lessen the farmers' burden (to avoid the misappropriation by the townships, conflicts over water, extra expenses and so on).
6. The owner units: the Municipal and County Water Resources Bureaus have the advantage of making macroscopic control. Besides, they can draw the legal management fee and divide profits according to the rules and regulations.

IMPLEMENTATION DIFFICULTIES

It is difficult to formulate and subsequently implement a new financing policy under the present situation. Presently the government subsidizes the supply of water, and, consequently, the level of water charges are low. In the future, the fees will be determined by the actual cost of water. Local Departments of Finance and Water Resources Departments [of the governments] need to reform their investment policies.

One of the difficulties with establishing and managing self-financing irrigation districts is that the administrative system (in which only the administration at village level are administered by farmers themselves) is extended to branch and lateral canals which cut the irrigation system into different sectors. If the branch canals and smaller canals are to be run by WUAs, the position and functions of townships and the Water Resources stations of the townships will be the key problem.

The following difficulties of the collection and direct use of water fees remain:

1. At present, the Water Resources Bureaus at the various levels as well as the Water Resources stations of the townships use the basic water fee to fill the gap in the operation funds.
2. Water Resources stations of the townships, as well as Finance Departments and Agricultural Economy Stations, might object the reform because they do not receive anything of the collected water fees.
3. The existing Irrigation Management Units will worry about losing support from government departments to collect water fees [and to the living of staff and laborers].

Other difficult issues with the institutional reforms concern the reduction of staff and the transfer of expenses to be made. The current irrigation management institutions are financial burdens, and the institutional reforms mean that these burdens will be transferred. Furthermore, possibilities to make staff redundant and to 'socialize' relevant functions depend on the progress of the reform of the entire society.

The policy law and decree do not mention anything about the setting of water fees for canals below the branch canals. Therefore, it is necessary that the Central Committee, as well as the Water Resources Department and the Price Departments make investigations into this and come up with a policy.

Changing the management of water management bureaus, implementing joint-stock systems, establishing WUAs and getting their participation in the management are new things to cadres, management staff and farmers. A lot of work needs to be done. Property rights in the joint-stock system need to be determined. The stock distribution, the operating mechanism and the details of management regulations of irrigation districts should be studied carefully. Farmers need to be encouraged to take part in irrigation management. Propaganda to get support for the reforms from government cadres and irrigation staff need to be carried out.

TRANSFER POSSIBILITIES

The Central Committee's reform policy has created a good environment for irrigation management transfer. This policy includes programs like "setting up of modern enterprises," "transfer of government functions" and "deepening the reform of rural economies." Some of the 50 items concerned with the development of a socialist market economy support reforms that are similar to the transfer of irrigation management. This is clearly demonstrated by the present reforms taking place in many provinces and cities.

The "Water Law" and various decrees and policies provide a basic legal framework.

Studies show that farmers like to manage sub-canals and want to take part in the management of larger canals. The irrigation management institutions also want to improve their financial positions and maintain the canals properly with the direct cooperation of water users.

The pilot districts provide a good base for management experiments. Studies on reforming the Irrigation Districts have been carried out, and implementation of the World bank financed project will strengthen the material base.

AN IMPLEMENTATION PROPOSAL

Irrigation management transfer has to [be started within the five years of the is to be] started during the five-year period of the implementation of the project by using the World Bank loan and has to be continued for several years. This has to be a step by step procedure that requires careful planning. The proposed procedure is as follows :

1. Accomplishing the study on institutional reforms of the two pilot districts, with the technical and financial support from the WB.
2. Presenting the reform proposal to the provincial government and related prefectures and cities for support and approval when the appraisal by the World Bank is passed. Legal problems will be examined by relevant People's Congress.
3. Reform is to be started during the implementation period of the Project:
 - A. Training of staff of related water resources bureaus and management institutions, discussion on the selected proposal.
 - B. Selection and training of organizers of WUAs.
 - C. Checking of the assets of the management institutions; determination of property rights; developing detailed operating mechanisms, regulations and financial rules.
 - D. Transferring existing management units to new ones.
 - E. Training of farmer water users; organization of WUAs; transfer of property rights of small canals; entrusting WUAs with their own rights to collect water fees, expenses and management of irrigation works.

- F Transition to a state in which the new irrigation management units collect water fee directly from water users and use it for the operation and maintenance of the irrigation facilities.
 - G Reduction of social functions and staff in the new management units in order to reduce expenditures. This depends on the progress of the reform within the entire society.
4. Monitoring of the new operating mechanism, evaluation at proper time (by the World Bank and domestic-related departments), evaluating experiences, determination of ways for institutional reform, developing detailed implementation guidelines, and step by step carrying out of the implementation in other irrigation areas.

Figure 1. The present institutional structure of Zhanghe 3 Main Canal.

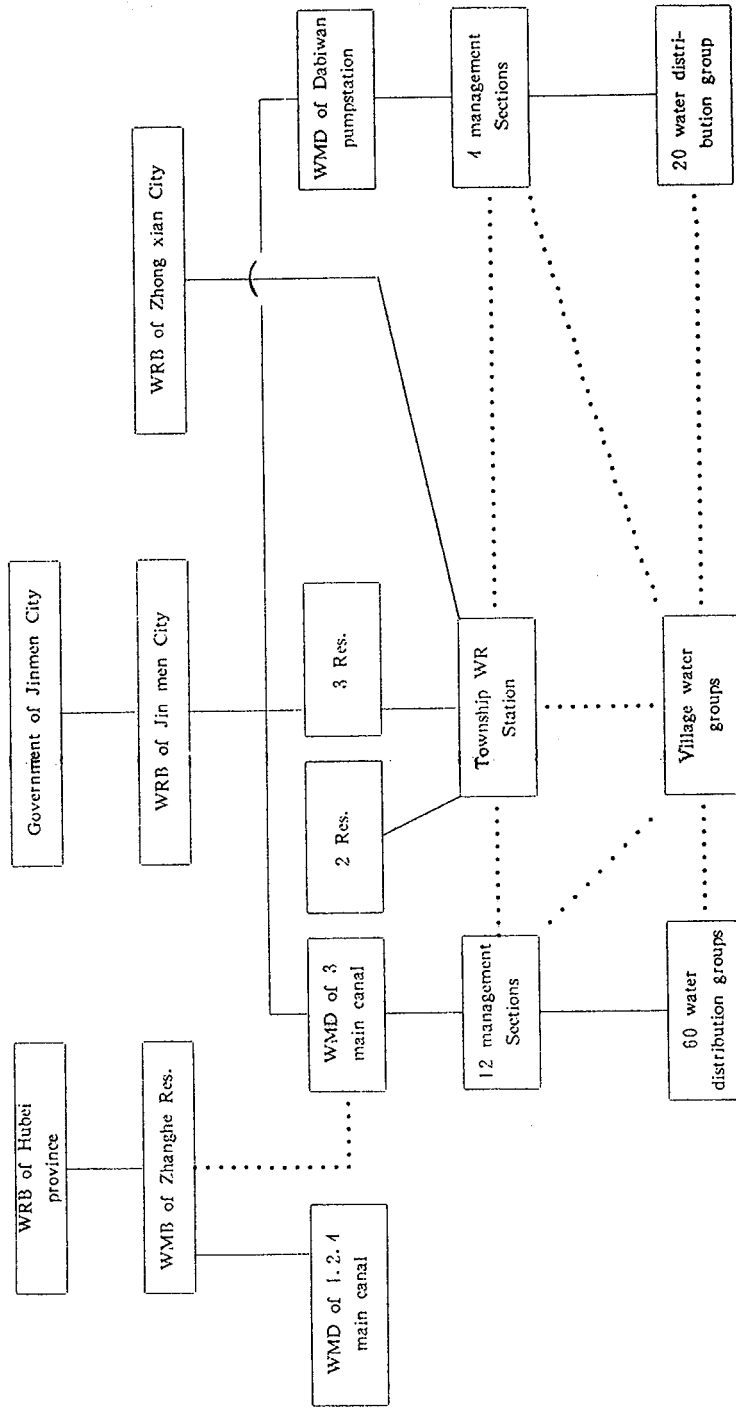


Figure 2. Flow chart of water charge collection in Zhanghe 3 Main Canal.

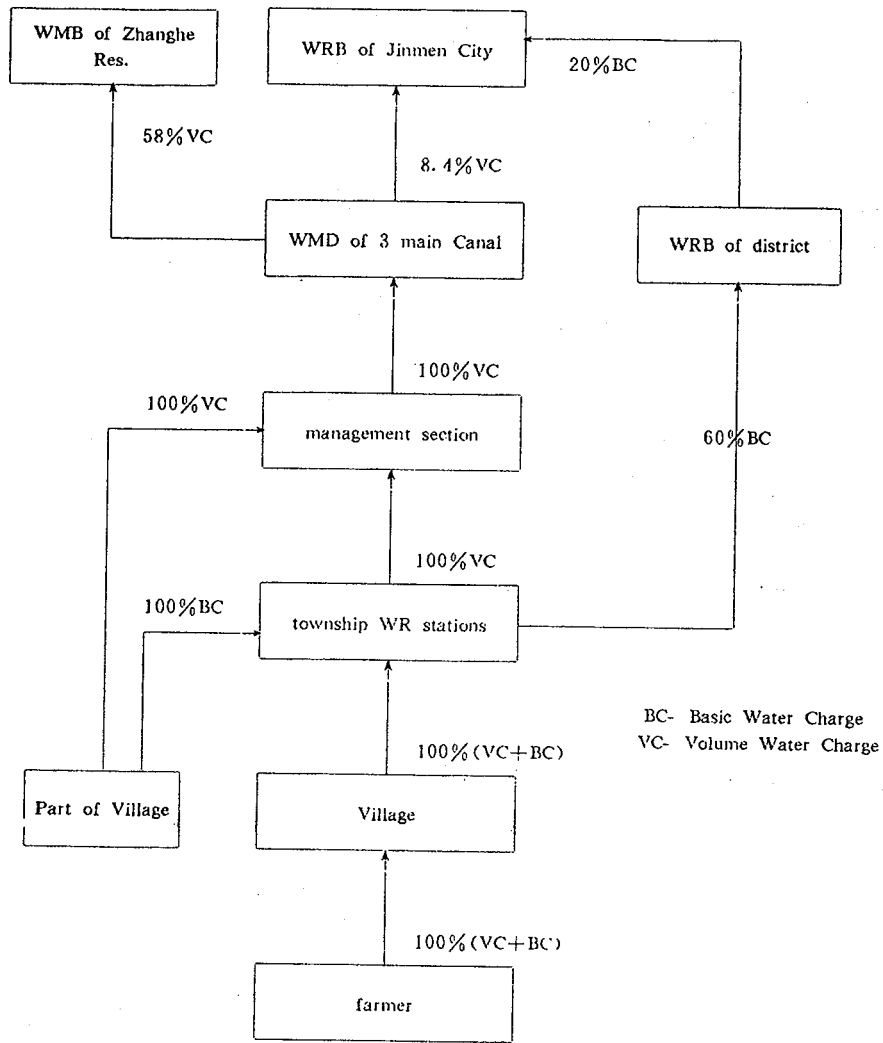


Figure 3. The present institutional structure of Dongfeng Area.

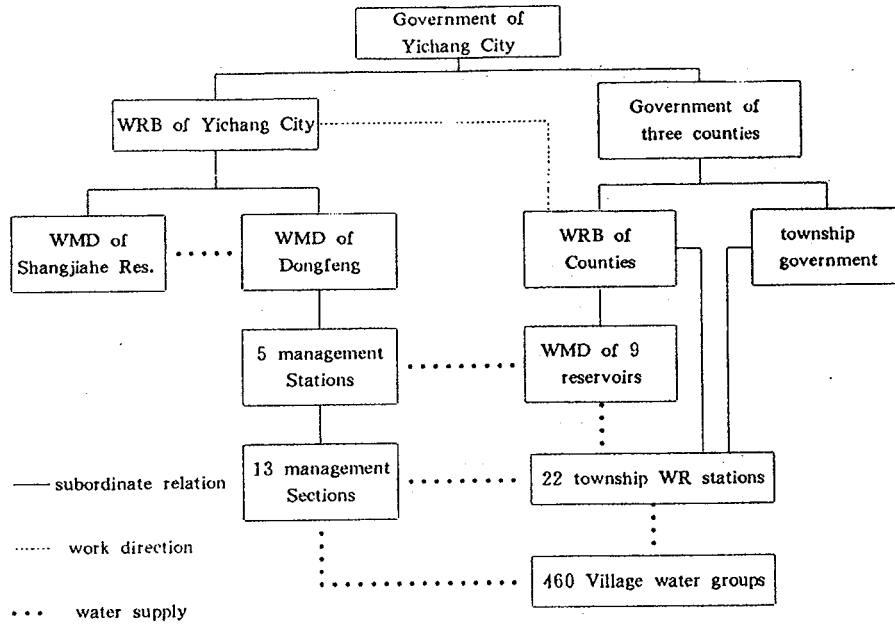
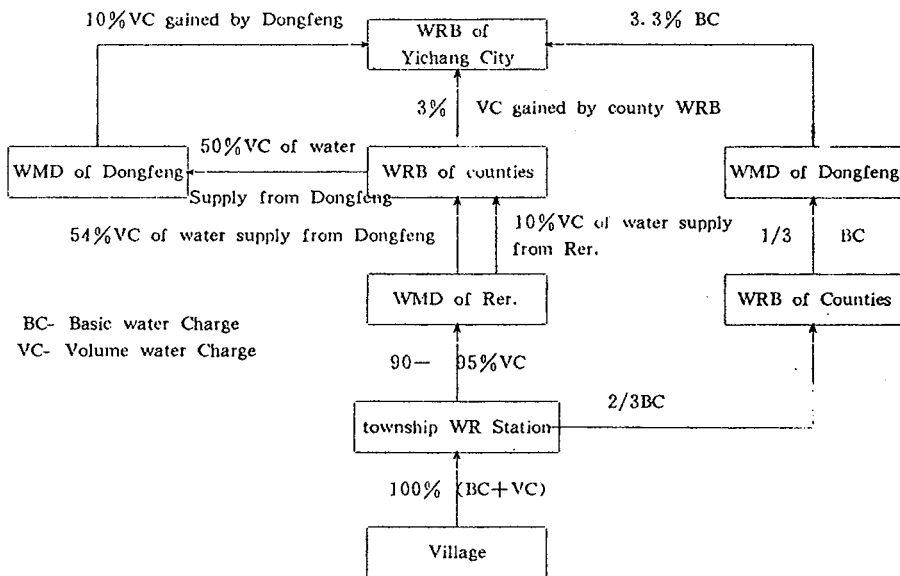


Figure 4. Flow chart of water charge collection in Dongfeng Area.



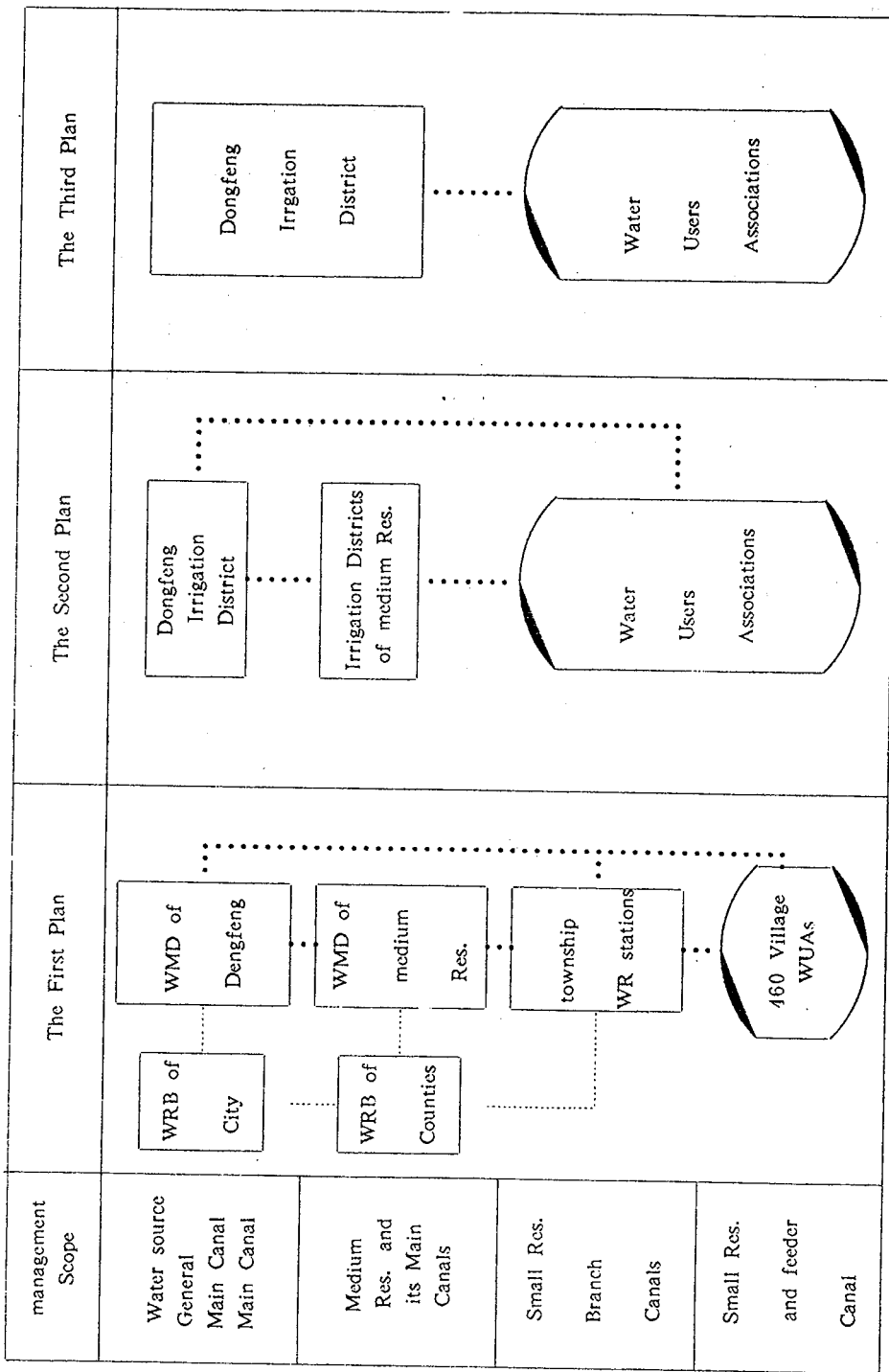


Figure 6. The proposal of institution for Zhanghe No. 3 Main Canal District.

