

Task Order No. 813
Contract No. PCE-I-00-96-00002-00

**PROBLEMS OF RATIONAL WATER USE AND
METHODS OF THEIR SOLUTION IN
UZBEKISTAN**

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April 1999

Prepared for:
Central Asia Mission
U. S. Agency for International Development

Environmental Policy and Institutional Strengthening Indefinite Quantity Contract (EPIQ)
Partners: International Resources Group, Winrock International, and Harvard Institute for International
Development

Subcontractors: PADCO; Management Systems International; and Development Alternatives, Inc.

Collaborating Institutions: Center for Naval Analysis Corporation; Conservation International;
KBN Engineering and Applied Sciences, Inc.; Keller-Bliesner Engineering; Resource Management
International, Inc.;

Tellus Institute; Urban Institute; and World Resources Institute.

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Reforms In Agriculture

In agriculture, there are 1374 collective farms, 1 joint stock company, more than 20,000 independent farms, 526 private livestock farms and about 3 million individual plots. Social structure of agricultural production changed. The share of private sector is 98%. Agricultural sector produces a quarter of GDP. Water is still treated wastefully.

At the Session 10 of Oliy Majilis, which took place in the late December of 1997, the President said that it was necessary to open ways **to introduce market mechanisms in the management of water resources**. It is time to carry out eventual transfer to the charged water use. It is time to extend the introduction of water saving technologies. Under market conditions, after the legal basis has been prepared and institutional reforms have been effected, all the above measures can be carried out creating new structures such as WUAs.

WUA Activity At The Farm Level (World Experience)

Purpose of the Study

The purpose is to clarify under what conditions the use of WUA is the most efficient in managing irrigation. Prior approaches to the development of irrigation were focused on technological aspects of the system, on the structure of market and economy or on governmental institutions carrying out management of the system.

The examples of relatively successful irrigation systems (Malaysia and Morocco) show that considerable results can be achieved through the corresponding combination of technology, economic factors and competent institutions. However, their frequent failures and unsatisfactory performance indices caused by the failures showed that these factors are insufficient. It is essential to manage such structures in proper way; otherwise, they are not capable to provide irrigation services. Soon, these structures get out of order, because of the lack of required measures on operation and maintenance. In practice, state institutions cannot be omniscient and almighty, especially when they solve problems at the local level. In addition, private interests of officials often conflict with formal goals of management of irrigation.

This situation leads to **“rent seeking”**.

In 80-s a series of projects attempted to model the development of WUA, even **within the boundaries of irrigation systems managed by the state** (for example, Philippines, Pakistan and Sri Lanka). Successes resulted in the extension of policy of transferring management of irrigation systems from state institutions to local organizations. The creation of WUAs and their active participation in the management of irrigation using different methods facilitated the following:

- higher results;
- sustainability of irrigation systems;
- more efficient water delivery services;
- adjustment of designing and constructing irrigation projects to local needs and constraints;
- expansion of irrigated lands;
- higher yields;
- growth of farm incomes; and
- Reduction of financial burden for the state.

The majority of countries, which have state-managed irrigation system, expect that costs will be covered by farmers due to the introduction of **water pricing**.

In accordance with this policy, the costs associated with necessary water delivery services will be covered. These countries have legal basis to cover the costs. However, many regulations are poorly observed or not observed at all. However, farmers often contribute small shares into the total amount of costs of irrigation in the form of fees and their labor. Equity is achieved through the policy of **setting low prices on food**. The result of such approach is considerably **hidden charge for water**.

The lack of political will in developing countries, when water fees for farmers are introduced or increased, causes destructive chain reaction. Misallocation of earnings results in the insufficient funding for irrigation system.

In its turn, that causes low quality of operation and maintenance, unreliable irrigation, and unprofitable agriculture. This circle should be broken by allocation of big funds or by collection of more fees. These funds should be used to manage, operate and rehabilitate systems, which are in poor condition.

The opinion, that the state is the major central figure in the development and management of irrigation systems, was changed by the approach where local organizations of water users are provided with more serious role. **The major target of creating WUA** is to unite agricultural producers for joint operation and maintenance of irrigation network. WUA has all rights of a legal person. It is independent business entity based on principles of full financial independence. It is responsible for its activities and liabilities before governmental water organizations, founders and other institutions.

Primary Objectives of WUA:

- To improve annual regime of water use;
- To coordinate allocation of irrigation water and distribution of obligations associated with maintenance and repair of related irrigation infrastructure among farms.

Properly registered and legally established WUA can become a powerful weapon of farmers to represent their interests before local and national authorities regarding wide range of issues of water use and irrigation infrastructure.

Problems of Creating WUA:

- Participation and support of the state during the initial period of organizing and making of WUA;
- Development of insurance system to protect agricultural producers;
- Maintenance of principles of democratization and independence for WUA;
- Development of a program to train farmers and specialists for work under new market conditions;
- Improvement of methods of water pricing, both for water delivery service and for water as a natural resource.

Basic Functions of WUA:

- Cooperation with water management bodies and other partners while contracting;
- Organization of primary water accounting and control of water use of WUA members;
- Water diversion and water allocation in accordance with the provisions of water use license, authorized norms, plans, limits and water delivery contracts;
- Operation and maintenance of irrigation network and its special buildings and structures of farmers and other water users (members of WUA);

- Construction, repair, cleaning, technical reequipment and other measures to maintain and develop irrigation network, to improve the condition of irrigated, reclaimed and water lands.

Benefits of Creating WUA

WUAs positively affect the performance indices of irrigation systems in many countries and regions. Due to stronger incentives in allocating water resources, farmers can carry out this allocation with more flexibility and track actual water delivery. This results in higher indices of water delivery. If WUA is more interested in the system, technical maintenance and servicing of irrigation systems are improved.

The creation of WUA allows achieving the following results:

- High indices of irrigation water delivery due to the management of irrigation systems by farms;
- Improvement of maintenance and servicing irrigation systems;
- State support to operate and maintain irrigation and drainage canals within farms (especially in the first years of WUA);
- Possibility to extend irrigated areas;
- Growth of productivity and income.

Thus, while developing specific measures and legal of WUA, it is necessary **to enlist state support** on the following issues:

- Operation and maintenance of irrigation systems;
- Rehabilitation of irrigation systems based on long-term foreign investments (which should be paid back);
- Creation of normative and legal basis of WUA;
- Target lending and privileged taxation.

Where WUAs were properly managed, they became useful bases of coordinating other related types of activities of farmers. Characteristically, the decisions were made in respect to certain crops to use scarce water supply more efficiently, to distribute farm equipment, to help in harvesting and to obtain loans for agricultural needs. To manage irrigation systems effectively, two points should take into account: allocation of water for irrigation (i.e. establishment of water rights and delivery conditions) and water supply (physical allocation). Optimal use of irrigation system includes combination of efficient management of water flow supplied by the system as well as regular maintenance and repair of facilities and equipment, which provide for such flow. Evidence show that although WUAs increase operation efficiency of irrigation systems, they are not present everywhere. Sometimes they are not powerful enough to have considerable impact on the efficiency of operation. To understand factors, which affect the work of WUA, it is essential to pay attention to the internal structure and external factors.

Internal Structure of WUA

Establishment of WUA

Members of WUA

Due to the interest of water users in their own water resources, most often groups are **determined by the boundaries of irrigation systems.**

Size of WUA

There is no “**optimal size**” for WUA.

Federation

Structure

External Factors Affecting the Activity of WUA

The activity of WUA is affected by the following external factors:

- Water scarcity;
- Technology and infrastructure;
- Degree of market penetration;
- Local public organizations;
- System of encouraging and financial autonomy;
- Social and economic environment;
- Major implemented policy;
- Legal basis;
- Structure of organization and system of incentives;
- State and political powers regulating WUA.

Necessity to Interact at the Local Level

It is supposed that scale and technical complexity of irrigation systems require the efforts of government to manage them. Efficient work of market is achieved only in the cases, where everything is priced.

Technology and Infrastructure

To have advanced technology and infrastructure (transport and communications) is of importance for the organization. It creates the demand for specialized education, training and creation of services for related support.

Degree of Market Penetration

General commercialization of agricultural economy has contradictory impact on the development of WUAs. Interdependence through the mechanism of using water and land, public mobilization of water resources and efforts on operation and

maintenance of systems facilitate economic cooperation. Markets often are an alternative to collective actions. Due to market penetration, mutuality of farmers is decreased. In addition, the possibility of mutual accusations in case of negative behavior is decreased as well. Market penetration can increase economic return of irrigated agriculture and encouragement of farmers in respect to the issues of membership in WUA. For example, farmers in Western Madura (Indonesia) demonstrated big interest to WUA, where the markets of fruits and vegetables developed in surrounding towns. These fruits and vegetables were produced during the dry season. That facilitated the increase of returns from irrigation. WUAs are more successful there, where there are developed markets.

System of Encouraging Farmers

Farmers should clearly recognize that acceptance of responsibility for the management of assets brings certain benefits.

In order to achieve more active participation of farmers in the management of water use, it is necessary to carry out the following:

- Physical modernization of irrigation systems;
- Saving costs on unnecessary facilities;
- Efficient and reliable water delivery;
- Management of water consumption;
- Clearly defined ownership rights on water;
- Increased productivity and incomes of farms.

Financial Autonomy

Payment back of all subsidies associated with irrigation is not a necessary or sufficient condition to create better incentives for members of WUA.

Financial Viability of WUA

If fees paid by members of WUA to cover costs account for too big part of earnings from irrigation, WUAs are deemed to failure.

Legal Basis

Special necessary conditions:

1. WUA should be acknowledged as a representative organization of farmers, who irrigate their lands in cooperation with external agencies.
2. WUA should have the right to mobilize funds of its members.
3. WUA should be able to open and use bank accounts and obtain loans.
4. WUA should have the right to obtain loans as an organization.

Other conditions necessary for strengthening WUAs:

- Ownership rights on irrigation facilities and/or water rights;
- Control over management decisions;
- Rights for signing contracts with outside contractors for rehabilitation of irrigation systems;
- Rights for signing contracts between WUAs and state and other organizations;
- Flexibility.

Relations between WUAs and other Water Organizations

On the basin level, the state plays more important role. On the level of water systems, water users can make their own decisions. However, water organizations remain owners and responsible for O&M of water systems. Joint management will be carried out for water allocation.

Different Types of WUAs in Developing Countries

Examples

Application Of New Institutional Structures In Uzbekistan

The existing Services for Irrigation and Reclamation, as well as Cooperatives do not provide incentives for efficient water use. There is a need for establishing new institutional structures like WUAs.

At the initial stage, WUAs must be provided with support for strengthening of existing structures. Later, they must function independently without outside interference.

Organizational and technical duties must be distributed at the initial stage. **Organizational duties** are connected with administrative work. The most prominent people of the region must be elected for administrative work (from aksakals and chairmen of Agricultural Councils). Technical duties must be undertaken by hired specialists. As soon as irrigation systems become more complex, there will be hired personnel like accountants, auditors, lawyers, and [professional managers. Successful functioning of WUAs chiefly depends on qualification and training of personnel.

State Support

State support and legal framework are of great importance for long-term sustainable development of WUAs. The role of the state will change with time as WUAs take additional responsibilities. But state support must be carried out on the continuous basis.

Main functions of the state will include:

- Determination and adjustment of water rights;
- Regulation and control of external factors on water use process;
- Training of WUA personnel ;
- Assistance for developing, construction and funding of large water projects;
- Water resources conservation.

At the initial stage, WUAs will need a state support in the form of providing preferential loans and subsidies.

Justification of Water Charges in Irrigation Farming

Concept of Developing Water Charges in Uzbekistan

Water charges for water resources suggest licensing. Water service charges include services for water supply and water diversion from the water management network. Payments for the **quality of water** must take into account water quality of the water source.

WUA Budget As A Basis For Calculation Of Water Charges In Irrigated Farming

Budget costs must be covered by fees of water users when establishing charter funds for water service. It is especially problematic for irrigated lands with pumping equipment where high payments for power exist. The payments very often exceed total sum of fees that the WUA could normally collect from its members. Thus, it is necessary to develop various types of tariffs depending on water supply.

Practical Aspects Of Functioning Of WUAs And Calculation Of Marginal Difference For Choosing Agricultural Crops

Members of WUAs will improve the management of water resources. Introduction of water charges will permit to mobilize financial resources for funding water facilities. Improvements of water facilities due to technical measures will cause reduction of losses for discharges and infiltration. Though, these measures are very costly, future effects will cover many times the expenses of farmers.

Methods For Calculation Of Bigger Marginal Difference (Bmd) For Choosing Agricultural Crops

The members of WUAs have to know what other benefits they can have in future besides proper maintenance of water systems. Justification of these issues will provide sustainability of WUAs, as well as incentives for establishing the associations.

For covering WUA costs it is necessary that farmers make profit from their irrigated lands. Thus, in market condition, correct decision must be made regarding agricultural crops.

Conclusions

Irrigated farming plays a significant part in the economy of the state due to its importance for GDP. Considerable inflows of hard currency to the state budget depend on the export of cotton. Irrigated farming also provides high employment of the agricultural population. Increasing deficit of water resources due to state control over allocation, inefficient use of water resources, especially on the farm level, hamper the development of irrigated farming of the republic.

Deterioration of economic conditions of farms leads to reduction of engineering staff including irrigators of collective farms. Reduction of hydro technical engineers and increase of water users due to establishing of farms with different types of ownership leads to irrational use of water resources, uncontrolled discharges and losses.

The existing legal basis does not fully reflect new types of farming connected with private water users in Uzbekistan. For defining water allocation rights it is necessary to take into account historical traditions based on shariat and odat. For equaling the rights of farms and private water users, legal framework of the state must clearly define relations between farms and private water users taking into account specifics of farms. For improving water use on the farm level in the conditions of land reform and reorganization of farms, following measures must be undertaken:

- Introduction of new institutional structures for WUAs (self-financed organizations for water distribution and water management);
- Maintenance of water facilities for melioration;
- Investment of irrigation systems.

The existing interfarm irrigation systems have not been repaired for 5-7 years since the ownership rights were transferred. It resulted in big losses of water resources in the republic due to technical and organizational reasons. In this situation, a list of necessary measures and sources of funding must be clearly defined.

For efficient water policy in Uzbekistan in the conditions of market economy it is necessary to create appropriate economic environment, strengthen the property rights alongside with the right on manufactured goods and sale; right for free disposal of goods in accordance with market prices; development of market infrastructure and institutional reforms.

Introduction of WUAs will demand employment of specialists prominent among the local population and experienced in carrying out institutional reforms. WUAs are quite acceptable for conditions of Uzbekistan.

Legal framework for functioning of WUAs is of great importance for establishing relations with other organizations, opening of bank accounts, and conducting other types of activities. Clear-cut definition of ownership rights of

WUAs on water and irrigation infrastructure will be of great value for the process of transition of management rights and costs connected with it.

State support and legal framework are of great importance for long-term sustainable development of WUAs. The role of the state will change with time as WUAs take additional responsibilities. But state support must be on the continuous basis.

Calculation of water payments will be covered by the budget of WUA. These costs will be compensated from the fees of WUA members. Calculations show that benefits from establishing WUAs 1,5 -2 times exceed than benefits without WUAs.

Existing regulation of prices for basic crops and, as a consequence, low level of efficiency of agriculture, makes water payments impossible. Thus, introduction of WUAs and water payments demand fundamental changes in the policy of the country in market reforms.

Policy Recommendations

Following steps must be taken for improving the efficiency of water use in Uzbekistan: reform institutional framework of the water management system on the level of farms through establishing stable WUAs. For providing viability of WUAs in Uzbekistan it is necessary to:

- Create economic conditions for functioning of cost-effective agriculture; strengthen the property rights alongside with rights on manufactured goods and their use;
- Liberalize system of marketing and pricing of manufactured goods;
- Provide state support for WUAs during the first years in the form of preferential loans and tax privileges for WUAs members;
- Introduce fees for water use to decrease financial burden of the state and increase motivation of farmers in a more efficient water use (water tariffs must be based on WUAs budget);
- Develop legal basis for water use taking into account new forms of economy and new institutional forms of management of WUAs;
- Develop legal status of private water users and legal framework for rights on water.