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Financial mechanism for sustainable water management in irrigated agriculture of Uzbekistan

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Abstract

More than 80% of Uzbekistan's agriculture is irrigated and low water quality as well as insufficient water quantity is the main challenges for its development. Transition to a market economy requires reforms in agriculture and especially in water sector. The principal basis for transition to a market economy is introduction of paid water use.

The main source of funding for water management in Uzbekistan is the state budget. Allocations from state funds in recent years have grown substantially. Considerable part in the total amount of funding for operational needs accounts for electricity, the cost of which is growing much faster than the increase in appropriations in water sector in general.

Fundamental aspects of economic management system should be a mechanism for financing water management organizations, both at the expense of the state budget and at the expense of water users through setting water fees. Payment for water will be a major pre-requisite to save water resources.

In Uzbekistan transition to paid water use will allow the more economical use of water resources, and will help to resolve many political, social, economic and environmental problems. Moreover it will solve technical problems which will improve the soil conditions.

Keywords: Uzbekistan, agricultural sector, strategic crops, water management, water consumers association.

1 Introduction and Research Questions

The market reforms which are carried out as a whole in economy and particular in agriculture create necessary conditions for this purpose. At the same time its demand adequate transformations of water sector which to a certain extent act as the deterrent in its development. A principal basis for transition of water sector to market relations is transition to paid water use.

Creation of real conditions for establishment of market relations between agrarian sector and water management organizations is impossible without essential increasing of profitability of farms.

The main agricultural crops of Uzbekistan are cotton and wheat. In current conditions the conjuncture of the world prices for these crops is favorable enough. Perfection of the state order mechanism and purchasing prices will allow farms to realize a profit which will allow ordering economic relations between water and agricultural sectors.

The research hypothesis assumes that the state water management owing to chronic under financing of last years and an extensive way of the development with the big difficulties consults the problem on agriculture water delivery in present conditions. At the same time the agriculture not rationally uses this resource and water use efficiency remains quite low. Basic production of agriculture – cotton and wheat – beginning from growing stage create the additional product, allowing to form the taxes covering the State expenditure on water. Thus, cotton-growing as well as wheat-growing are subsidized branches at all, and quite self-sufficient and its contribution to republic economy is quite much. But if to continue process, having considered a processing cycle it is found out, that these crops occupy one of leading positions in economy and a social life of the country. From this means, that the state policy should be

directed on creation of the maximum conditions for effective functioning of branch that demands the solving of interfaced industries problems, in particular a water management.

The strategic course of Uzbekistan on transition to market relations of all economy puts a problem of acceleration of this process and in a water management and demands synchronization of reforms in branch with transformations to agrarian sector. It also will make a basis of the decision of the current problems.

2 Data and Methods

In the process of work depending on solved problems various methods has been used: the monographic, economic-mathematical, comparative, settlement-constructive, experimental analysis. In the substantial plan each of the presented methods, ways and receptions has been used at the decision of following problems:

- monographic - at research organizational, industrial and economic activities of managing subjects of water management and agriculture as well as the interfaced branches;
- the comparative analysis - by comparison received actual and prognostic results (under different scenarios of development), and comparison of general strategy efficiency of alternative directions for water management and agriculture organization's development;
- settlement-constructive - at a substantiation of expediency and efficiency of various directions of incomes and profitableness use of water management and agricultural organizations;
- experimental - at approbation of substantive provisions of the developed mechanisms and recommendations.

Data collection:

I. Primary data collection was conducted using the following questionnaires:

- Organizational and economic relations inside and between farms and WCAs.
- Crop budget for farms and dehkan farms with regard to crops produced on farm land, i.e. cotton, wheat, vegetables, fruits, etc.

II. Secondary data was collected from the different database of local and international organisations as UNDP, FAO, World Bank, ADB, SDC, MAWR, SIC ICWC, UzStat, etc, as well as from different literature and official web-sites.

3 Main results

3.1. Reforms in the Water sector of Uzbekistan

The important role of agriculture development belongs to water management due to the basic part of agricultural production of Uzbekistan depends on irrigation. The mid-annual requirement of republic for water makes 70-71 billion m³. According to the agreement between neighboring countries, Uzbekistan needs on the average 47-52 billion m³ of water in a year (in years abounding in water it can make up to 64 billion m³), from that Syr-Darya river - 41% (46.3 m³) and Amu Darya river - 59% (53.7m³)

Irrigated agriculture in defining degree depends on the transboundary rivers, the basic volumes of water of which are formed outside of Uzbekistan. For example:

- Syr-Darya river (arrives from Kyrgyzstan through Uzbekistan and Tajikistan, and even Kazakhstan);
- Amu Darya river (arrives from Tajikistan to Turkmenistan and to Uzbekistan).

The share of water resources formed directly on the territory of Uzbekistan represents by 6% on Amu Darya basin and by 16% on Syr-Darya basin, that as a whole Uzbekistan makes 10% from its total flow (MAWR 2009).

Irrigated agriculture in Uzbekistan has an historical roots, and enough strong material base has been created in formed times. Created irrigated agrolandscapes, provide certain employment of the population and play important economic and ecological role of dwelling of the basic part of the population (Cornish et al, 2004).

Water complex of Uzbekistan includes: water fund, regulation and territorial flow redistribution constructions, distributive network, reproduction of water resources, constructions of protection against harmful influence of waters, group of constructions for technological, biological and socially-hygienic water use, as well as the sanitation infrastructure. Functionally there are elements of water delivery, water consumption and water use.

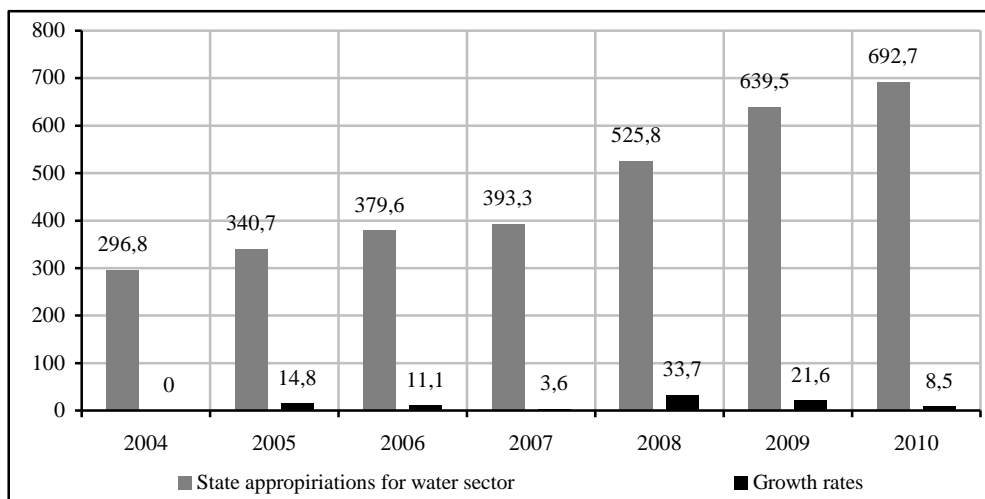
Taking into account the term of actual operation, considerable part of irrigation infrastructure requires serious reconstruction and updating. Especially it concerns pump stations constructed in 60-80 years of last century. Its working capacity is provided at the expense of frequent and expensive repair. The out-of-date equipment consumes the electric power on 5-25 % more than the modern one (Rudenko et al, 2009). The government of Uzbekistan in the last years undertakes efforts on its reconstruction and updating. These measures are carried out both at the expense of own sources of the government, and at the expense of foreign/donors' credits.

The basic source of financing for water sector in Uzbekistan is the state budget. The agriculture consumes water free of charge though the question of introduction of paid water use in the long term is discussed. At the same time there is a tax for using water resources which rates are sharply differentiated depending on the kind of branch. Hence, for industrial enterprises entering into a category of payers of this type of tax, the rate for 2010 is established by 29,8 Uzbek Soum (UZS)¹ for one cubic meter of water and for agricultural enterprises not captured by the single land tax the rate is 1,6 UZS for 1 m³.

The volume of finances allocated by state has essentially increases for last years, especially in 2008 - 2009 and its structure has changed and the figure 1 clear demonstrates it.

¹ 1 USD = 1 587,75 UZS according to www.oanda.com

Figure 1. Appropriations for water sector of Uzbekistan in 2004-2010 (million USD)



Source: synergy of MAWR data with own computation

Thus, in UZS equivalent these appropriations were increased by 3,6 times since 2004 to 2010, but in the same time in dollar equivalent - only by 2,3 times. More objective indicator characterizing this process is the ratio of finances allocated by the state budget to water sector to GDP of Uzbekistan. Thus, in 1995 this ratio made 2,9% and in 2010 was only 1,8%. The underfinancing problem characterized the 90ths continues to remain in nowadays.

In the same time there were some changes in structure of appropriations. Thus, expenses on operational needs in 2004 in total amount of allocated financing made 87,9%, by 2010 this indicator has made 73,6%. Mainly such decreasing was promoted by creation of special "Fund for reclamation improvement of irrigated lands" under the Ministry of Finance in 2007. The government program in which the complex of measures is provided and, including, increase in assignments at these purposes was accepted. In total amount of financing of operational needs the considerable part is necessary on the electric power payment which cost grows much higher rates, than growth of appropriations to water sector as a whole. If in the early nineties the electric power share in working costs made from a quarter to one third, now it reaches two third. The old equipment demands more and more financial and power resources and at the same time its return decreases. Unfortunately to refuse it without having replacement is impossible. As a result, the efficiency of branch strongly decreases.

The implementing of radical measures is required today. It is necessary to carry out consistently market transformations, to involve foreign investments more widely, along with essential increase of state financing, and escalating by higher rates of allocated finances for reclamation works and updating of fixed assets.

The carried out analysis testifies that producing and processing of cotton and wheat at the state level provides sufficient efficiency both in economic and in social aspects. Participation of the state in regulation of agriculture by creation of favorable conditions for its development and especially by financing of its components is an indispensable condition for successful development of all economy and human welfare. Listing some material aspects of the contribution of agrarian sphere in a social production, it is necessary to remember about not only economy branch, but also about the life style. According to PETRIKOV (2001) "The peasant not only produces a foodstuff, but also brings the contribution to culture, keeps historically mastered landscape for descendants, cares of ecological equilibrium. All it does not give in to a

monetary estimation in system of national accounts, but has a key value for national security of the country, completion of socio - demographic genofund, spiritual updating of the population“.

Economic achievements of Uzbekistan in last years and the contribution of agriculture to this process create real preconditions for the decision of many problems, both most this branch, and interfaced branches. It concerns as branches without which there can not be an agricultural production, namely a water management, and the industries which raw-material base on the agrarian sector. The set of large actions for improvement of these industries management, for increase in their contribution to economy in the conditions of independence of the country is carried out last years.

Together with the private phenomena, characteristic for this or that branch, take place both the general approaches and tendencies in the politician of the state for their development. Having representations about them it is easier to develop and approaches to reforming both the most agrarian sector, and the spheres providing conditions for its functioning. In this case the decision of problems of stable water delivery taking into account a developing situation. In a similar way it will be possible to provide realization of leadership principles of demand over the offer, i.e. branches consuming agrarian production should define its prospect, and adjacent economy sectors.

Process of transition to market relations and private property development has also predetermined the control system reforming at macro level. In the early nineties the system of some ministries has been liquidated. For maintenance of successful activity of joint-stock companies at the international level which have been formed in the result of privatization and before - the state property, republican associations and companies have been created. They have combined both the old and new enterprises. The foreign capital has also taken part in creation of some of them. As the initiator of these production associations creation the state has acted. This in turn creates favorable conditions for activity of directly local industrial structures on release of qualitative and competitive production (Dukhovny et al, 2011).

3.2. Financial bases reform of water management system

The main objective of conducted research was to develop the water management improving model based on conceptually new approach of organization of water use control system. This approach provides an intensive method of its functioning and connected with improvement of economic management method as the main component of a market mechanism, optimization on this basis of mutual relations between water management organization and agricultural producers taking into account ecologically pure and harmless development of irrigated agriculture. The main components of the model could be:

- Financial bases reform of water management system.
- Perfection of WCA activity
- Improvement of state order system and pricing for strategic crops

General development strategy of Uzbekistan includes modernization of the agricultural sector aiming to increase its water and agricultural productivities through improvements of agricultural water services without damaging the environment. More than 80% of agricultural lands in Uzbekistan are irrigated, and water deficiency, both in terms of quantity and quality, is one of the main factors limiting the optimal performance and sustainability of the agricultural sector. The main challenge is to mobilize the required resources for modernizing the

dilapidating water infrastructures and maintaining them on a sustained basis to ensure continued and quality agricultural water services in synergy with the environment.

However it is impossible to solve the given problems only by the maintenance of existing water management infrastructure in technically serviceable conditions. On the one hand the increasing population, developing urban infrastructure and the industry demand more and more water resources, with another hand – water sources are reduced. Ecological safety issues demand cardinal new approaches to water and land use and to solve these problems by old methods is impossible. For serious reforming of water management, new approaches are necessary.

The market reforms which are carried out as a whole in economy and particular in agriculture create necessary conditions for this purpose. At the same time its demand adequate transformations of water sector which to a certain extent act as the deterrent in its development. A principal basis for transition of water sector to market relations is transition to paid water use.

Creation of real conditions for establishment of market relations between agrarian sector and water management organizations is impossible without essential increasing of profitability of farms.

The main agricultural crops of Uzbekistan are cotton and wheat, which are also called “strategic crops”. In current conditions the conjuncture of the world prices for these crops is enough favorable. Perfection of the state order mechanism and purchasing prices will permit to receive a profit for farms. This in turn will allow ordering economic relations between water and agricultural sectors.

Other aspect of the present research is influencing of Uzbekistan agricultural specialization on the process industry development, economic and financial results of all cycle of production and processing of cotton and wheat at the level of enterprises and the state. The idea of research consists in influence analyzing of agricultural production on the interfaced branches and to conduct «chain analysis».

The full covering of necessary expenses for water management activities including managerial process, operation and maintenance and also development and reconstruction should become the basic part of integrated water resources management system. It includes the mechanism of water management organizations’ activity financing at all levels of water hierarchy, as for the account of the budget of various sources (state, regional, local, and for the account of water consumers and water users), and also direct incomes of water management organizations from their direct and indirect activity. Accurate planning must be economically and socially proved, expenses vis-a-vis definition of payment for water delivery services and for incomes from direct and interfaced activity, connected with water and water use, and also a share of budgetary appropriations, should be connected on the basis of means balance. Transition to this system will demand the certain period in which current organizing efforts of the state, a water management and water users, including farms both with other subjects of production and processing of agricultural production, should directed on universal introduction of means of water account without what it is impossible to pass to the effective financial mechanism of water use and water management.

Another component of this mechanism should become the system of stimulation of rational use, protection and restoration of water resources and objects, decrease in irrevocable water consumption, the prevention of water and soil pollution.

Introduction of various sources of water management organizations' maintenance and development should change basic approaches to the given process, having allocated resources saving as the basic direction.

Individual budget item should be provided on resource saving technologies financing at local level. These means must stand out in the form of the state credit, i.e. on a returnable basis and not exceed 50% of project cost. Other part should be covered by own means of beneficiaries and soft loans of banks. The state also has to create conditions for the banks stimulating them to allocation on favorable terms of these credits.

It is necessary to introduce the norm providing double benefit to the beneficiary from introduction of new technologies. The first benefit is well-known: "consume less – pay less". And the second benefit should consist that the state will give for it taxation concessionary terms (in this case rates of the single land tax) could be decreased. The system of preservation and increasing of soils fertility takes root since introducing modern technologies.

Definition of the optimum tariff for water delivery services is essentially important. Its size besides the primary goal decision should force the water consumer to economize the water. At the same time the payment for water delivery services should not be burdensome for water consumer.

At definition of tariffs it is necessary to be based on following positions (fig.2):

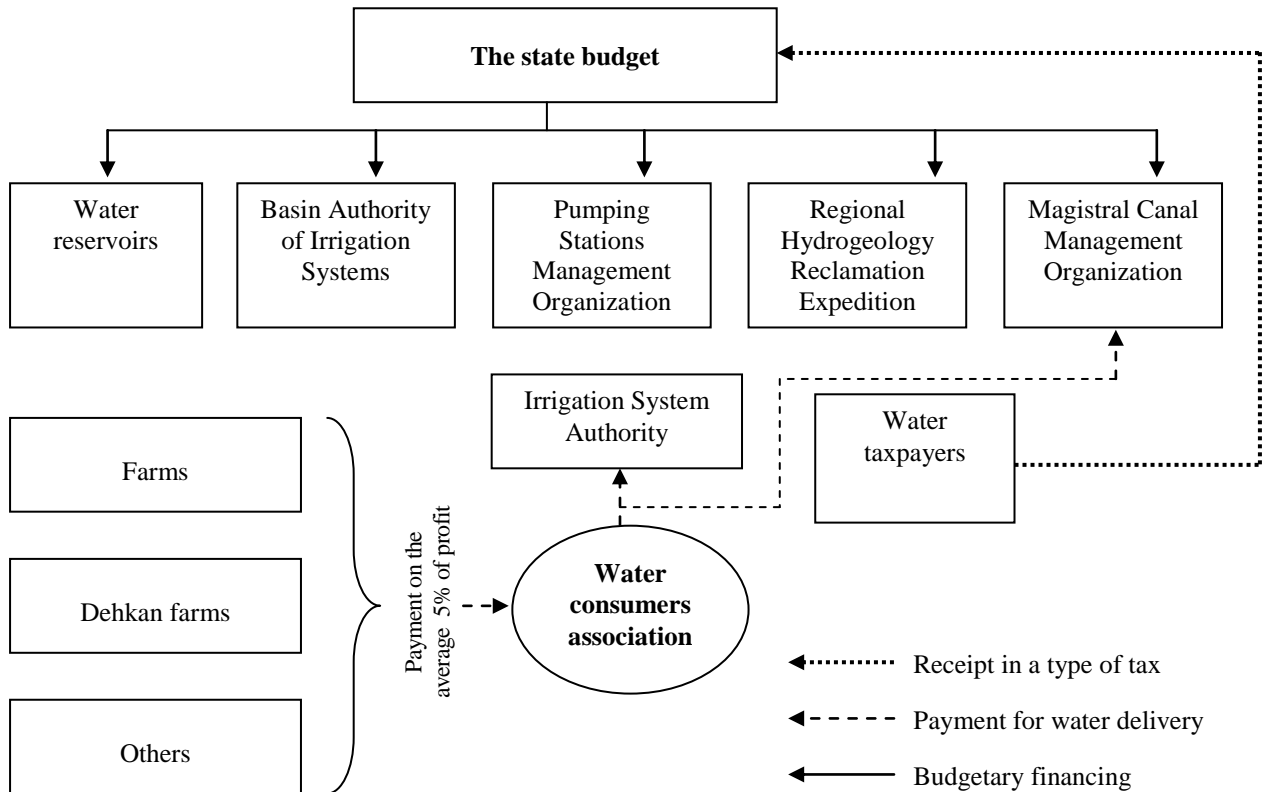
the collected volume of means must allow to contain the provided water objects in an appropriate technical condition and to cover up to the mark the salary of WCA staff, and at good work – bonus surcharges;

the size of tariff must be oriented on payment by consumers within an order of 5% from actual average profit of farm for last 2-3 years. The special place should be given tariffs for water delivery to small-scale (dehkan) farms. It must be not lower than tariff of services for water delivery on gardens as the actual size of income of these lands exceeds on the average income from gardens.

WCA contribution to the maintenance of canals should co-ordinate with performance of canal management organization duties on a guarantee of water delivery and increase in process of water users' incomes increasing in according to their payment for WCA services.

Tariff rates on water should be differentiated depending on the territory, producing crop, consider state policy priorities etc. Introduction of paid water use system becomes the new tool for the state on management of agriculture by economic (and not administrative) methods as a result of flexible tariff rate use on water consumption.

Figure 2. Model of water management financing improving



Source: Own developed model

Transition to paid water use and as its basic result the economical water resources use, besides set of political, social, economic and ecological problems, will solve also a technical problem i.e. will improve land reclamation. The state as the proprietor of water and land resources should provide safety together with their effective use. The solving of this problem through the given mechanism will be the most productive.

4 Conclusions

The new conceptual approach to the organization of a control system for water use should be based on intensive method of its functioning and is connected, first of all with perfection of an economic management method, as the main component of a market mechanism, optimization on this basis of mutual relations of water management organizations with agricultural producers with orientation to ecologically pure and harmless development of irrigated agriculture.

The mechanism of financing of water management organizations activity both for the budget account, and for the account of water consumers, having established a payment for water should become the basic part of an economic control system. Transition to this system will demand the certain period in which current organizing efforts of the state and farms should be directed on universal introduction of subjects of water account. Without that it is impossible to pass to effective paid water use.

The system of stimulation of rational use, protection and restoration of water resources and objects, decrease in irrevocable water consumption, the prevention of water and soils pollution should become a component of this mechanism.

Paid water use becomes the basic incentive motive for water and land saving. And a part of the public funds liberated as a result of water management organizations maintenance for the account of payment of water users, it will be expedient to direct on introduction of saving resources technologies. Realization of these projects should be based on state financing with attraction of means of beneficiaries.

Implementation of paid water use system becomes the new tool for the state on management of agriculture not by administrative, but by economic methods, as a result of use of the flexible tariff rate on water starting with crop's priority and state order presence.

Transition to paid water use and as its basic result economical use of water resources, besides set of political, socio economic and ecological problems, will solve also some technical problems—will improve a reclamation condition of lands. The state as the proprietor of water and land resources should provide safety both their effective use. And the decision of this problem through the given mechanism will be the most productive.

The process of pricing perfection is directly connected with process of state order for production, in particular regarding cotton production. As low level of profitability of cotton producing farms in present conditions, with introduction of paid water use considerably will decrease, that will make senseless from the economic point of view this production. To solve this problem, i.e. to provide not only indemnification of losses, but also to increase profitability, it is possible by perfection of the state order mechanism. Having carried out it, additional conditions for transfers both water sector and agriculture on market relations and their effective activity will be created. Having released from functions unusual for it the state will concentrate on efforts to decision of the important strategic problems of branch—on macro regulation questions.

The problem of rational water use is not only an agriculture problem. It is actual for all consumers. The industry of Uzbekistan has for today not a high indicator of water consumption, however in the long term it will grow. At the same time, participation of not agrarian spheres of economy in indemnification of expenses of the state on water delivery and in questions of its rational use through system of water taxes it is not effective enough. At present rates of the tax achievement of this problem is practically impossible, as it makes all an insignificant part in cost of production and its share is insignificant in total amount of tax assignment of enterprise. High cost of resource will induce the managing subject to its economy. And the approach from these positions should act as the dominating factor in taxation questions.

All these problems and ways of their solving should find reflexion in legislative and standard documents. In spite of the fact that in the current organic law, concerning this sphere—the “Water and water use Act” changes and additions have been brought in 2009, has ripened necessity for acceptance of new document—the “WCA Act”. The Water Code over which working out now there is begun work should become one of them. It should incorporate all experience which has been saved up in various areas of water use and water consumption last years, and also experience of the foreign countries which are carrying out successful water resources management, taking into account a role and their value for living standards of the population and the decision of country development (Yusupov et al, 2012).

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