

UDK: 338.23

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## **IRRIGATION WATER USE PAYMENTS AND POLICIES IN DEVELOPING COUNTRIES**

Nowadays, water tariffs in economic developing countries are considered one of the important factors and it is not a secret that one of the reasons for the water crisis in Central Asian Countries is the growing demand for water resources. The resource is becoming scarce like in other continent of earth. It is measured as the most important natural resource and abundant liquid on earth. In this study irrigation water charging case of Uzbekistan and foreign practices, model of tariffs for water services and pricing elements have been analyzed. Irrigation water charging methods in different countries are used in different ways.

**Keywords:** Water charges; irrigation water; pricing, tariffs; taxes and payments

### **1. INTRODUCTION**

“Water is an important natural resource and essential for life on earth. Consistent efforts are being made to develop and manage precious water resources. The growing demand for water is expected to surpass supply, if not managed properly. Due to spatial and temporal variation of water resources availability, integrated efforts in each field of water such as development distribution, consumption, and management are required. In recent times, there has been increasing interest in employing a water pricing system as a tool for managing the demand of water. The financing of irrigation projects was initiated and provisioned during the British era in India. Gradually, the financial aspect of the irrigation project deviated from its initial aim after World War II. For developing nations, proposing a new irrigation infrastructure plan and construction of dams and reservoirs became important investment options, especially in newly independent states” [1].

The article analyses water use practices in developing countries including Uzbekistan. The World Bank experts' analysis show that by 2050 year the water resources in the Syrdarya basin expected to decrease to 5% and in the Amudarya basin to 15%, the shortage of fresh water in Central Asia countries may lead to 11% decrease in Gross Domestic Product.

Confronting the impending water crisis occupies one of the central places in any country's development management system. In the context of continuing water resources issues, new approaches to water use are needed in the context of transition to sustainable development of "Green Economy". One of the reasons for the water crisis in Central Asia is the continually growing demand for water resources, and that naturally if this demand were reduced it would be easier to solve these water problems. Demand is managed through institutional measures that include systems of incentives, rules and organizations.

After gaining independence Central Asian countries have been attempting to reform their economies, including water and agriculture. Irrigated agriculture is key to ensuring food security, providing jobs (especially in rural areas) and attracting foreign investment. In the condition of increasing water scarcity, it is necessary to introduce comprehensive measures to save irrigation

water and improve the water delivery system. Example, one of the measures could be the introduction of a system of paid water use, i.e. full or partial payment by water users of the costs of irrigation water delivery in the form of payment for such services.

## 2. DISCUSSION

“Major features of the large scale irrigation policy” [2].

In order to promote the rational use of its water resources and to overcome the constraints related to the situation of its peasants, Morocco has adopted an "interventionist" type of irrigation policy for Large Scale (LSI) irrigation systems development.

The basic philosophy of this policy is that "to attain the desired objectives, it is not sufficient as it has been done in the past - to construct irrigation infrastructure as rapidly as possible, the State must also create the conditions enabling development to take place". "A comprehensive framework for this policy is defined by a variety of laws grouped in the "Code of Agricultural Investment" of 1969" [1]. This Code is regarded as a contract between the State and the farmers to build the national economy through irrigation development:

- “The State pays for the dams, the irrigation network and necessary on-farm development. It provides credit, selected seeds, fertilizer, farm equipment etc. Finally, it guarantees the prices of certain crops (mainly sugar beet and sugar cane) through contracts”.

- “In turn the farmer is obligated to farm his irrigated land in the national interest, to follow the norms imposed for his hydraulic sector, and to repay the State 40 % of the investment costs and 100 % of O&M costs through a land improvement tax and volumetric water charges”.

It is important to note that this concentrated comprehensive development effort in LSI perimeters is mainly dictated by the efficient and productive use of scarce water resources for the benefit of the country as a whole. It is to be achieved;

(i) technically through: (1) defining cropping patterns that optimize the use of the available water resources taking into consideration local conditions and national planning goals of food security; and (2) designing a model for land consolidation and the irrigation system layout known as the "Rationale Layout" which is unique and incorporates three important complementary features: (a) equitable and efficient water distribution by using state-of-the-art irrigation technologies and designing irrigation systems to supply crop allocations rather than farmers; (b) annual and seasonal crop diversity according to the mandatory cropping pattern; (c) accommodation of wide variations in individual land ownership patterns in such a way that limitations in the size of individual land holdings are not obstacles to the adoption of modern technologies both for irrigation and farming practices.

(ii) institutionally through: (1) providing a comprehensive framework for conclusion of crop contracts and for price supports and subsidies and encouraging cooperative arrangements to stimulate agricultural productivity; (2) providing a legal framework for significant cost recovery of both investments and O&M costs;

(3) integrating under one management structure all the activities related to design, construction operation and maintenance of irrigation networks as well as all the agricultural support services required by farmers.

“It appears therefore that the irrigation policy in LSI development has been designed as a «coherent whole». Its merit lies in the holistic approach adopted. But this comprehensiveness is also a source for its weakness as if one component of the chain is missing « the whole » may lose its merit” [1].

Irrigation water pricing. The Agricultural Investment Code provides a legal and institutional framework for significant recovery of both investment and operating costs in irrigation. It calls for full recovery of O&M costs and up to 40 % of initial investment costs. Three types of charges are established. Thus, farmers are expected to pay:

1. A Land Betterment Levy. A fixed betterment levy which covers 30 % of the original investment cost. The first five hectares of holdings of less than 20 hectares are exempt from this charge. Land betterment levy may be paid in 17 years at an annuity rate of 4%;

2. A Volumetric charge is intended to cover 100 percent of O&M costs, 10 percent of

original investment cost and 40 per cent of replacement cost.

3. A Pumping Charge. A supplementary charge adds to the above charge to cover the energy cost for pumping wherever applicable. Initially, the Code specifies that this charge is applicable if water is lifted from an irrigation main canal to supply a public water distribution system and/or if water is put under pressure for a sprinkler irrigation system.

Some policy issues [2]

“Since the inception of the LSI policy, the principle of recovery of full recurrent costs of irrigation has been adopted. It was partly implemented for the reasons discussed above. Now, the new restructuring of the irrigation water tariff to better reflect the trend to water scarcity in Morocco and the growing economic competition from other sectors and to cover the entire estimated O&M costs has raised some issues related to macroeconomic policies with regard mainly to agricultural commodity prices and energy prices”.

Model of tariffs for water services:

There are 3 types of tariffs for water services: a cubic meter tariff (per cubic meter of water); a hectare tariff (per hectare of irrigated land); and a mixed two-part tariff (per hectare of irrigated land). Mixed two-rate tariff (per cubic meter of water and per hectare of irrigated land) [3].

Pricing elements:

“The water pricing system consists of many components. Based on the natural and economic conditions of the command area of any irrigation project, several methods have been developed for irrigation water pricing. These methods are broadly grouped into four categories: water market, quotas, non-volumetric pricing, and volumetric pricing”<sup>4</sup>[4].

In general, there are no big differences in pricing factors however some aspects need to be kept in mind:

- accounting for fluctuations in the water availability of the year which predetermines the creation of an insurance fund;

- accounting of water as a resource is obligatory if the water charging mechanism is aimed at ensuring water resource reproduction or when assessing new investments;

Nowadays water charges in Uzbekistan, Tajikistan and Kyrgyzstan has different sources. The main source of water sector financing in the Republic of Uzbekistan is by government budget. An additional source of financing funds is received by water management organizations from providing services to water users, or other customers for repair of irrigation and land reclamation network or works related to operation of water management facilities. In Tajikistan and Kyrgyzstan, payment for water supply services for agricultural water users is currently a significant additional source of financing the water sector.

The existing system of water sector financing in Uzbekistan does not allow:

- create a mechanism of economic relations between water management organizations and water users, stimulate economic expenditure of both financial and water resources;

- attract water users` funds for financing water management measures and increase mutual responsibility on the material basis of water supplying and water consuming partners under fulfillment of their obligations;

- create a national water market as the main lever for redistributing water resources from low-efficiency water users to high- efficiency ones and create a mechanism of common and personal interest in water savings among water users and water sector employees;

- create economic levers to improve the environmental situation under resource use. The shortcomings of the existing financing system can be issue for an effective incentive mechanism for efficient use of resources. Many facilities require their reconstruction, which is a very capital-intensive activity and, consequently considerable funds are needed to implement these measures. All these issues should be solved not only with the introduction of paid water use, but also under certain state support in the form of direct participation in financing the water sector establishment of favorable crediting and taxation conditions for this sector of economy.

In the world practice, there are no unified approaches in establishing water use charges for different categories of water users. Practically everywhere, paid water use is implemented as a

compensation of costs related to water formation, transportation and distribution among water users as well as a factor contributing to the improvement of water resources management and their rational use in the interests of the whole society. Water sector payment costs are realized in different forms:

- payment for quantity of consumed water;
- payment for water use unit (person, user, irrigated hectare, etc.);
- payment for exceeding the water limit;
- payment for water pollution;
- sale of water right (license fee);
- enterprise tax that includes a water fee;

Practically everywhere the highest payment for water is for industrial and municipal water supply, which fully covers the share of water sector costs for their service. Irrigation water users are in privileged position due to the state subsidies to cover the costs of the water sector. In developing countries, where the introduction of paid water use is at initial stage, incentive measures for irrigation water users are applied in the form of:

- liberalization of the agricultural products market;
- preferential lending to farmers;
- preferential taxation;
- labor of water users maintenance of water management facilities.

Water sector development, large-scale water management construction and land reclamation are carried out under full financing of the government, sometimes with support of funds from local budgets and land users. The following principal general provisions can be noted:

most countries set the price of water for industry and municipal consumption taking into account self-sufficiency of the systems and a certain share of profit;

most countries have introduced a block- increasing system of prices, under which payment within the limits of the required hard norm is made at the minimum price. State participation in water charges mainly depends on the income level of the population and institutional type of organizations that supply water and operate irrigation systems. On average the price for supplying 1m<sup>3</sup> of water in water supply systems in developed countries varies from \$2 to \$13.

The situation in Central Asian countries for the agricultural sector of the economy is as following, there are two methods of payments established in the Republic of Kazakhstan. Part of irrigation water delivery cost is by volume. Fee structure is planned cost of water management organizations and value added tax is 12%. Average level of payment for pump irrigation is 5.68 cents/m<sup>3</sup> and gravity irrigation is 0.15 cents/m<sup>3</sup>. In the Republic of Kyrgyzstan payment methods is as following, part of irrigation water delivery cost is by volume. Fee structure is based on planned costs of water management organizations. Average payment level is from 0.002 cents/m<sup>3</sup> to 0.04 cents/m<sup>3</sup>. In the Republic of Tajikistan payment<sup>5</sup> methods also the same, part of irrigation water delivery cost is by volume. Fee structure is as following: based on regulatory costs; E&M costs; amortization charges and compulsory payments to the insurance fund.

The case of People's Republic of China is typical. Methods of payment partial and full cost of irrigation water delivery by water volume. Fee structure is accordingly to costs of operation and maintenance (most regions) and full cost of irrigation water delivery (several regions). Average level of fees is for surface water from

14.78 to 15.00 cents/m<sup>3</sup> and for groundwater

34.86 to 35.09 cents/m<sup>3</sup>. Chinese economists

believe that water charges should not exceed 2- 4% of gross income.

In Turkmenistan, water use is free of charge, except for cases of paid special water use provided for by the legislation. Water allocated for the needs of agricultural production is supplied free of charge within the limit established by the plan, but for exceeding the water volume established by the plan a tripartite tariff rate is provided. The tariff rate is developed and set by "Turkmenobasuvkhyzmat" of the Ministry of Agriculture and Water Resources of Turkmenistan. It is established that entities producing agricultural products will transfer payment

for irrigation water delivery in the amount of 3% of the cost of agricultural products to the account of the Ministry of Agriculture and Water Resources<sup>6</sup>[6].

### **3. CONCLUSIONS AND RECOMMENDATIONS**

- reducing the tax for the use of water resources as a natural resource for agricultural producers engaged in irrigated farming;
- to implement paid water use in Uzbekistan it is necessary to create conditions under which agricultural water users could pay for water services;
- gradually shifting from direct budget financing to covering full or part of costs of water management organizations through the introduction of payment for irrigation water delivery;
- to develop a subsidy mechanism to cover part of the payment for irrigation water delivery to water users in accordance with the level of actual water use relative to irrigation norms of crops.

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