Short communication

Watercharging methods in developing countries

Abstract

Nowadays, watertariffs 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. Theresource is becoming scarce like in other continent of earth. It is measured as the most important natural resource andabundant liquid on earth. In this study, irrigation water charges and cases in case of developing countries`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.

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.

Discussion

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).

[1]Fakeha Parween, Pratibha Kumari, Ajai Singh. Irrigation water pricing policies and water resources management.Official journal of the World Water Council.Volume 23 Issue 1,February 1,2021y.130–141p.

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[2].

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;

Nowadayswater charges in Uzbekistan, Tajikistan and Kyrgyzstan has different sources. Themain source of water sector financing in the Republic of Uzbekistan is by government budget. Anadditional source of financing funds is received by water management organizations from providing services to water users, or other customers for repairof 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.

Theexisting system of water sector financing in Uzbekistan does not allow:

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

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

[2]Fakeha Parween, Pratibha Kumari, Ajai Singh. Irrigation water pricing policies and water resources management.Official journal of the World Water Council.Volume 23 Issue 1, February 1, 2021y.130–141p.

-create a national water market as the main lever for redistributing water resourcesfrom 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. Theshortcomings 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, consequentlyconsiderable 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. Watersector 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 averagethe price for supplying $1m^3$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 twomethods of payments established inthe Republic of **Kazakhstan**.Partof 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 paymentfor pump irrigation is 5.68 cents/$m^3$and gravity irrigation is 0.15 cents/m^3.Inthe Republic of **Kyrgyzstan**payment methods is as following**,** part of irrigation water delivery cost is by volume. Fee structure is based on plannedcosts of water management organizations.Average payment level is from 0.002 cents/$m^3$to 0.04 cents/m^3.In the Republic of **Tajikistan**payment[3] methodsalso the same,part of irrigation water delivery cost is by volume. Fee

[3]Average annual exchange rate of the above mentioned Central Asian countries to the US dollar for 2022y. Calculations by author based on data of National banks.

structure is as following: basedon regulatory costs; E&M costs;amortization charges and compulsory payments to the insurance fund.

The case ofPeople`s Republic of**China** is typical.Methods of payment partial and full cost of irrigation water delivery by water volume. Feestructure isaccordingly to costs of operation and maintenance (most regions) and full cost of irrigation water delivery (several regions).Average level of fees is for surface waterfrom 14.78 to 15.00 cents/m^3 and for groundwater34.86 to 35.09 cents/m^3. Chinese economists believe that water charges should not exceed 2-4% of gross income. Republic of **India,**payment method is based on fixed payment for irrigation water delivery by area. Fee structure is part of irrigation by water delivery.Average level of payment is 10 US$/hectare.

Conclusions and recommendation

-it is necessary to develop a methodology for calculating payment for irrigation water delivery, which is not directly related to the financial systems of water management organizations thereby increasing the material interest and responsibility of irrigation water delivery workers;

-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 Uzbekistanit 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.

References

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