



SIC ICWC Policy brief

№ 2, March 2023

International Practices of Irrigation Water Pricing

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- Currently, no unified methodology exists for irrigation water pricing. Current methods proceed from recovery of costs of irrigation water delivery by water users;
- The costs of irrigation water delivery are fully covered in the USA, France, Spain and Italy and partially covered in Japan, China, India, Pakistan, Kazakhstan, Kyrgyzstan, and Tajikistan;
- Volumetric or per area water charges are applied for irrigation water. Volumetric irrigation charges are used mainly in Australia, England, France, Israel, Jordan, Mexico, Morocco, Spain and the USA, while Bulgaria, India, Pakistan, Japan and other countries apply per area charges;
- In some countries (India, etc.), irrigation water pricing is based not only on the costs of water suppliers but also on gross earnings of water users (approximately 6-12%);
- Some countries (Italy, Spain, France, Portuguese and Uzbekistan) also charge water taxes along with irrigation delivery charges. However, many countries are refused from water taxes gradually and moving on full or partial cost recovery for water supply through fees. This is because water taxes are mostly considered as revenues of the state, not related to the costs of water suppliers. This neither encourages nor contributes to financial independence of water suppliers;
- Irrigation water prices virtually remain the same from year to year, especially in the USA and the European Union. Variations in prices are observed mainly in time of irrigation water shortage.

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Introduction

Irrigated agriculture in Uzbekistan is a key to ensuring national food security, providing jobs (especially in rural area) and attracting foreign currency. Under conditions of growing water scarcity, it is necessary to take extensive measures for water saving and improved water delivery.

One of such measures could be the adoption of water charges, i.e. full or partial recovery by water users of irrigation water delivery.

Currently, in Uzbekistan, the irrigation water delivery costs born by the Uzbek Ministry of Water Management related are covered through the water use tax [7].

From the position of the state, taxes solve only one issue –raising additional funds for state budget, since, according to Article 16 of the Tax Code of Uzbekistan, the tax is an obligatory non-refundable payment to the state budget of the Republic of Uzbekistan or to the state special-purpose fund (of the budget). Nevertheless, this type of tax is not directly related to standard and actual expenses of public water suppliers. From the tax payer's position, this is withdrawal of a part of his/her own earnings, and moreover this withdrawal is forced and non-equivalent [25]. This means that the same tax rate applies to all agricultural producers. However, in irrigated agriculture irrigation water consumption depends on a range of factors, such as soil composition and properties, profitability of crops related to quality and yield of soil. In such context, similar tax rates for all agricultural producers may lead to social and economic injustice.

Thus, the water tax does not reduce the load on direct state financing of the water sector in Uzbekistan, recover the operating costs of public water suppliers and contribute to their financial independence and, finally, lead to efficient water use. Moreover, it increases the tax burden on all agricultural producers.

Thus, new approaches and methods of irrigation water pricing are defined as one of the main areas in the "Concept of water sector development for 2020-2030" [5] and the draft Water Code of the Republic of Uzbekistan.

This policy brief provides an overview of irrigation water pricing in far-abroad countries and in Central Asia and offers recommendations for Uzbekistan. It should be taken into account that, irrigation services to end users are provided directly by water suppliers in some countries, while in others there could be intermediaries in the form of associations, agricultural cooperatives, unions, etc. In this policy brief we do not consider such intermediaries.

Irrigation Water Pricing Methods

As international practices show, currently, volumetric or per area water charges are applied for irrigation water.

Volumetric pricing method, where the fee for water delivery depends on the volume of water supplied, is used in Australia, England, France, Israel, Jordan, Mexico, Morocco, Spain and the USA [16]. This method is cost-effective as long as the marginal cost of water is maintained and the required volume and timing of water supply is reliably ensured. The method encourages efficient water use as water charges increase with greater use.

Area-based (per hectare) pricing method, where the rates for irrigation water delivery are determined per irrigated hectare depending on types of irrigation and crop, is applied in Bulgaria, India, Pakistan, and Japan. This method is believed to be more effective and simpler due to high costs of installation of water meters on the fields [20]. However, this method does not encourage better water use since it does not relate to the actual quantity of water delivered to irrigated area.

Irrigation water pricing in far-abroad countries

This section provides an overview of irrigation water pricing in the USA, France, Spain, Italy, Portuguese China, India and Pakistan (see the Table below).

In **the USA**, irrigation water pricing depends on geographic location, water sources, and institutional arrangements [26]. There are currently three federal rates in the USA: fixed contract rates, cost of service rates, and full-cost rates. Irrigation water pricing is based on operation and maintenance costs (O&M), capital costs, un-reimbursed O&M expenses and interest. Agricultural producers along the irrigation network receive water at a very low price from 0.005 to 0.010 US\$/m³, while the rest receive water from state water agencies at higher prices from 0.20 to 0.100 US\$/m³ [21].

In **France**, irrigation water pricing is determined on the basis of internal (investments in capital assets, O&M, other management costs) and external (pollution and water quality control, water planning) expenses. Water charges for irrigation service range from 0.23 to 1.50 €/m³ [15].

In **Spain**, irrigation water charges are determined based on full operating costs of irrigation district organizations and capital costs (called "derrama"). The average rate for irrigation water delivery is 0.07 €/m³.

In **Italy**, irrigation water charges are determined on the basis of fixed (capital costs, full-time costs, O&M) costs and variable (part-time labor, transportation and pumping) Costs. The average rate for irrigation water delivery is 0.05 €/m³ [14].

In **Greece**, irrigation water charges range from 0.054 to 0.645 €/m³ [15], while in Portugal the average rate is 0.03 €/m³ [14].

At the same time, some EU countries apply a water tax for agricultural producers. For example, the tax rates are 0.005 €/m³ in Spain, 0.002 €/m³ in Italy –, 0.007 €/m³ in France, and 0.003 €/m³ in Portugal. Water taxes were removed in Germany in 2011 and in the Netherlands in 2008. Denmark applies no water taxes at all [14].

In **China**¹, irrigation water charges are based on O&M costs (for most regions) and the full cost of water delivery (in some regions). Charges range from 0.993 to 1.008 CNY/m³ or 14.78 cent/m³ to 15.00 cent/m³ for surface water and from 2.343 to 2.358 CNY/m³ or 34.86 cent/m³ to 35.09 cent/m³ for groundwater [19].

In **India**, irrigation water charges comprise partly the irrigation water delivery costs. The rates vary greatly by states: less than 10 US\$/ha in many states [18], and depends on gross earnings (about 6-12%) of agricultural producers in some states.

In **Pakistan**, irrigation water charges are based on O&M costs. The average charge is about 0.33 US\$/ha [17] and the rate is based on either area or season. The main problem of this system is that it does not encourage better water use because it is not related to the actual volume of water supplied to irrigated area.

In far-abroad countries, especially in the USA and the European Union, irrigation water prices virtually remain the same from year to year. Variations in prices are observed mainly in time of irrigation water shortage, etc.

Irrigation water pricing in the Central Asian countries

In the Central Asian countries, agricultural producers engaged in irrigated agriculture are exempt from tax for the use of water, except for the Kyrgyz Republic² (the royalty rate is only 0.01 som/m³ [4] or 0.01 cent/m³ for freshwater) and the Republic of Uzbekistan³ (40 som/m³ [2] or 0.36 cent/m³). In all the countries

¹ The average annual exchange rate of the Chinese yuan to the U.S. dollar was 6.72 yuan in 2022. <https://www.poundsterlinglive.com/history/USD-CNY-2022>

except for Turkmenistan and Uzbekistan, part of the costs of water suppliers is covered through charges for irrigation water delivery (see the Table).

Water delivery charges in irrigated agriculture were first adopted in the **Republic of Kazakhstan**⁴ in 1992 [6]. Water prices are determined proceeding from planned water management costs of water suppliers and the volume of delivered water and the area of agricultural land, based on single- or double-rate tariffs and include VAT (12%).

Since August 1, 2021 to July 31, 2022, irrigation water charges for agricultural producers were 26.177 tenge/m³ or 5.68 cent/m³ for pumped irrigation and 0.703 tenge/m³ or 0.15 cents/m³ for gravity irrigation. This excludes VAT [12]. At the same time, the Republic has a mechanism for subsidizing the cost of irrigation water delivery [13].

In the **Kyrgyz Republic**, irrigation water charges were adopted in 1996 but became legally enshrined in 1999 [1]. The water charges are determined based on the planned costs of water suppliers and the volume of water supplied, with account of favorable natural and climatic conditions, as well as conditions of hard-to-reach and disadvantaged regions.

The current rates of irrigation water delivery by public water suppliers are as follows:

- for areas with favorable natural and climatic conditions: 1.0 tiyn/m³ or 0.01 cent/m³ in quarters I and IV -; 3.0 tiyn/m³ or 0.04 cents/m³ in quarters II and III;
- for areas with severe and adverse climatic conditions: 0.2 tiyn/m³ or 0.002 cent/m³ in quarters I and IV; 1.0 tiyn/m³ or 0.01 cent/m³ in quarters II and III [1].

In addition, preferential electricity tariffs are set for pumping – 0.03 som/kWh or 0.04 cent/kWh [11]. The tariff rates have remained unchanged since 1999, regardless of changes in consumer prices, national currency exchange rates and inflation indices.

² The average annual exchange rate of the Kyrgyz som to the U.S. dollar was 83.96 som in 2022. <http://www.finmarket.ru/currency/rates/?id=10124&pv=1#archive>

³ The average annual exchange rate of the Uzbek som to the U.S. dollar was 11,045.70 som in 2022. <http://www.finmarket.ru/currency/rates/?id=10133&pv=1#archive>

⁴ The average annual exchange rate of the Kazakh tenge to the U.S. dollar was 460.91 tenge in 2022. <http://www.finmarket.ru/currency/rates/?id=10123&pv=1#archive>

Table
Comparative analysis of water pricing methods and structure
and water rates in foreign countries

Country	Water pricing method	Structure	Average rate
USA	Full cost of irrigation water delivery by volume	<ul style="list-style-type: none"> • O&M costs • un-reimbursed O&M expenses • capital investment; • interests. 	0.005 to 0.010 US\$/m ³ 0.20 to 0.100 US\$/m ³
France	Full cost of irrigation water by volume	<p><i>Internal:</i></p> <ul style="list-style-type: none"> • investments in fixed assets; • O&M costs; • Other management cost. <p><i>External:</i></p> <ul style="list-style-type: none"> • pollution control; • water quality control; • water planning. 	0.23 to 1.50 €/m ³
Spain	Full cost of irrigation water delivery by volume	<ul style="list-style-type: none"> • full operating costs of irrigation district organization; • capital costs (called «derrama»). 	0.07 €/m ³
Italy	Full cost of irrigation water delivery by volume	<p><i>Fixed:</i></p> <ul style="list-style-type: none"> • capital costs; • full-time costs; • O&M costs. <p><i>Variable:</i></p> <ul style="list-style-type: none"> • labor costs for part-time work; • transportation; • water pumping. 	0,05 €/m ³
Greece	n/a	n/a	0,054 to 0,645 €/m ³
Portugal	n/a	n/a	0,03 €/m ³
Japan	Partial cost of irrigation water delivery by area	<ul style="list-style-type: none"> • partial capital costs; • O&M costs. 	246 US\$/ha
China	Partial and full cost of irrigation water delivery by volume	<ul style="list-style-type: none"> • O&M costs (most regions); • full cost of irrigation water delivery (some regions). 	14.78 to 15.00 cent/m ³ for surface water 34.86 to 35.09 cent/m ³ for groundwater

Country	Water pricing method	Structure	Average rate
India	Fixed fee for irrigation water delivery by area	<ul style="list-style-type: none"> partial cost of irrigation water delivery 	10 US\$/ha
Pakistan	Part of the costs of irrigation water delivery by area	<ul style="list-style-type: none"> O&M costs 	0,33 US\$/ha
Kazakhstan	Part of the costs of irrigation water delivery by volume	<ul style="list-style-type: none"> planned costs of water suppliers; VAT (12%). 	5.68 cent/m ³ for pumped irrigation 0.15 cent/m ³ for gravity flow irrigation
Kyrgyzstan	Part of the costs of irrigation water delivery by volume	<ul style="list-style-type: none"> planned costs of water suppliers. 	0.002 cent/m ³ to 0.04 cent/m ³
Tajikistan	Part of the costs of irrigation water delivery by volume	<i>Standard costs:</i> <ul style="list-style-type: none"> O&M; depreciation expenses; mandatory payments to the insurance fund; profit 	0,14 cent/m ³
Turkmenistan	n/a	n/a	n/a

Republic of Tajikistan⁵. In the Republic of Tajikistan, general water use, particularly agricultural irrigation, is free [24]. At the same time, charges for irrigation water delivery were adopted in 1996. The water charges are determined on the basis of total normative costs: for maintenance and repair of public irrigation, water-distribution and collector-drainage systems and associate structures; depreciation charges for full rehabilitation of capital assets value; mandatory payments; insurance fund in case of droughts and floods; profit sufficient to form funds for production expansion, scientific, technological and social development of the supplier [8].

During 2000-2022, irrigation water charges to the Agency for Land Reclamation and Irrigation increased from an average of 0.6 diram/m³ [23] or 0.05 cent/m³ to 1.5 diram/m³ [8] or 0.14 cent/m³, i.e. 2.5 times. At the same time, starting from October 1, 2022, electricity tariffs for tube water pumps and pumping stations of lift irrigation became 9.2 diram/kWh or 0.83 cent/kWh and from April to September 30 and 26.51 diram/kWh or 2.40 cent/kWh from October 1 to March 31, including 9.2 diram/kWh or 0.83 cent/kWh for vertical wells and pumping stations for land reclamation [9].

In **Turkmenistan**, water use is free, except for cases of special water use as required by law [3]. Water allocated for agricultural needs is provided free of charge within the planned quotas. However, a triple tariff rate is foreseen for exceeding the water quotas. The tariff rate is developed and set by “Turkmenobasuvhizmat” of the Ministry of Agriculture and Water Management of Turkmenistan⁶ [10]. Agricultural entities shall make payment for delivery of irrigation water as 3% of the cost of agricultural produce to the account of the Ministry of Agriculture and Water Management⁷ through peasant associations [22].

⁵ Average annual exchange rate of somoni to US dollar was 11.03 somoni in 2022.
<http://www.finmarket.ru/currency/rates/?id=10131&pv=1#archive>

^{6, 7} Currently, the State Committee for Water Management of Turkmenistan

Recommendations for water pricing in Uzbekistan

The following measures and mechanisms are recommended for water pricing in Uzbekistan, proceeding from international practices:

- gradually abolish or reduce to a symbolic level the tax for use of water as a natural resource by agricultural producers engaged in irrigated agriculture;
- move gradually from direct budget financing of full or partial cost recovery of water suppliers through adoption of irrigation water charges;
- develop a methodology for irrigation water pricing which is directly related to the financial systems of water suppliers, thereby increasing the material interest and responsibility of employees for irrigation water delivery;

- develop a subsidizing mechanism to partially cover the cost of delivery of irrigation water to users, depending on water use relative to crop irrigation norms;
- allow the private sector to provide outsourcing services for water accounting and reporting, irrigation water fee collection, etc., exempting them from VAT.

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