The Impact of Taxation on Efficiency of Water Usage: Evidence from Karakalpakstan Region, Uzbekistan

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Abstract

In this article, we tried briefly to look through the issue from the point of objective necessity and importance of the efficient use of water resources in these conditions. In fact, as it is obvious from the mentioned data and opinions above, while the global economic and financial crisis is threatening the world, inefficient use of all resources, including water resources, might have negative impact on the attempts to overcome this crisis. Uzbekistan suffers from the problem of shortage of water resources more than other countries of the Central Asia and successful solution of the problem of efficient use of water resources has a particular importance. In order to find the impact of taxation on the usage of water resources we have collected the data for descriptive analyses and conducted the unstructured interview in Karakalpakstan region, Uzbekistan.

Keywords: Taxation, water resources, Aral Sea, water shortage

I. Introduction

Institutional condition of successful realization of reforms carried out in the state, achievements and preservations of economic stability the steady condition of public finances and first of all growth of tax revenues in budgets of all levels is important. Formations of the tax income of the state in many respects are defined by quality of tax planning. In the conditions of permanent reforming of tax system and a tax policy of the Russian Federation tax planning also develops and improved.

On one side, tax planning serves as an object of scientific research, representing a relatively new direction for Russian finance science and on the other side it represents an area of practical activity. Tax planning can and should be considered both from the perspective of the state and local government bodies represented by their authorized agencies and from the perspective of a certain economic entity, i.e. on macro- and micro-levels. In spite of positive movements they pay inadequate attention to theoretical and methodological aspects of tax planning in Russia. Therefore, it will be logical to begin with a more precise definition of tax planning and the criteria of its classification.

Taking into consideration geographic and economic location of the Republic of Uzbekistan, water resources play a significant role in the welfare of the people providing the development of the economy. As historical sources prove, the water has been valued in the territory of the country as a source for vitality and has been considered as one of the factors of carrying out household and economic activities. Therefore, the water resources were used very carefully and always tried to be economized. Nowadays, it is impossible to

imagine development of the economy of the country, especially, agriculture sector without proper water supply. Therefore, an effective utilization of water resources, in the first place implies their targeted and economical use and this has become very important in conditions of the market economy. It is connected with the fact that growing cotton and grain, which are considered the main part of agriculture and other agricultural products are directly connected with water resources. Taking all mentioned above into consideration we propose the following research question:

1. What is the impact of taxation on effective usage of water resources?
2. What are the main problems in implementation of efficient taxation for the usage of water resources?

II. Literature Review

There are a lot of theoretical and empirical studies which review the impact of taxation on effective usage of natural resources, particularly water resources, in the case of various developing countries. Hoque and Wichelns (2013) describe the observed variation in water tariffs, with the goal of highlighting key features and the degree to which some tariff programs achieve local objectives. To this end, the domestic and non-domestic water and wastewater tariffs in 60 cities across 43 countries were examined. The non-weighted average of the per unit domestic water and wastewater bills in the cities considered was USD 2.10/m 3. The average per unit bills in Asia and Africa were generally lower than those in Western Europe, North America and Australia. On average, households spend about 1.5% of their monthly incomes on water and wastewater bills. In Asia and Africa, the average unit bills for the non-domestic sector were higher than those for the domestic sector, suggesting cross-subsidy. The study also analyzed the components of a metered tariff schedule with regard to the goals of cost recovery, demand management and affordability. The article also discusses the effectiveness of existing tariffs in addressing local challenges in the context of water pricing examples from Singapore, Los Angeles and Manila.

One of the influential studies on environmental taxation theory with special reference to developing countries and countries with economies in transition belongs to Bluffstone (2003). Central and Eastern Europe and the former Soviet Union and China have large-scale systems of pollution taxes and other countries are also experimenting with this type of instrument, particularly to reduce water pollution. Several countries have used taxes on environmentally harmful products, such as transport fuels, to raise revenues and reduce pollution. Challenges are associated with the use of environmental taxes in developing and transition countries, but the evidence suggests that despite shortcomings these instruments are making important contributions to environmental protection and economic efficiency.

Janmaat (2003) reviews salt and water transport external costs of irrigation are borne disproportionately by lower elevation farmers. The relationship between fields for an optimal Pigouvian tax plan varies considerably as the amount of available water changes, demonstrating that a simple rule cannot be relied upon. A numerical example demonstrates the optimal application pattern and Pigouvian tax plan in contrast to the sequential Nash equilibrium. Shadow values for water are used to argue that between distributaries, the second best optimum is unlikely to be equal allocation. Physical measures of soil state are also shown to be worse under the optimal plan, throwing doubt on their usefulness.

In the case of China, Shen and Wu studied water pricing reform in China after 1980, including framework, process, forces and considerations. China collects a water resources fee, a water supply tariff for hydraulic engineering, an urban water supply tariff, a wastewater collection and treatment tariff, and a pollutant discharge fee. The reform has been an exploration process. In theory, a comprehensive, systematic and advanced policy and framework have been developed. However, in practice, the reforms fluctuate among economic, social and environmental targets; do not comply with the reform objectives; and are heavily affected by external social and economic factors rather than by internal factors.

Coeck, S'jegers and Verbeke (1995) empirically investigated the water and solid water levies in Flandes. Their paper aims to determine the actual effect of environmental taxes on pollution levels. In particular, a case study of Flemish environmental taxes on water and solid waste pollution is reported. A quantitative model for testing the actual effectiveness of environmental taxes is developed, based on similar studies that analysed Dutch environmental policy. The conclusions of this analysis are extended with a qualitative analysis of information provided by in-depth interviews. Data-driven empirical research of the Flemish situation does not.

To the best of my knowledge, there is only one study which analysis the water usage issues in case of Uzbekistan. In his most recent study, Zinzani (2015) discusses the logic of IMT implementation and the establishment of Water Users' Associations (WUAs) in Uzbekistan, specifically in Samarkand province. These dynamics have been analysed over the last 10 years showing different trajectories within Uzbekistan. Data were collected through extensive fieldwork in three districts in Samarkand province. The evidence acquired shows that, on the one hand, WUAs were established to be a new structure for state control over water and agriculture, in conflict with IMT rationale, and, on the other, that WUAs were created in the province as a result of a local initiative promoted by the hydraulic bureaucracy and accepted by the national authorities due to influential power relations.

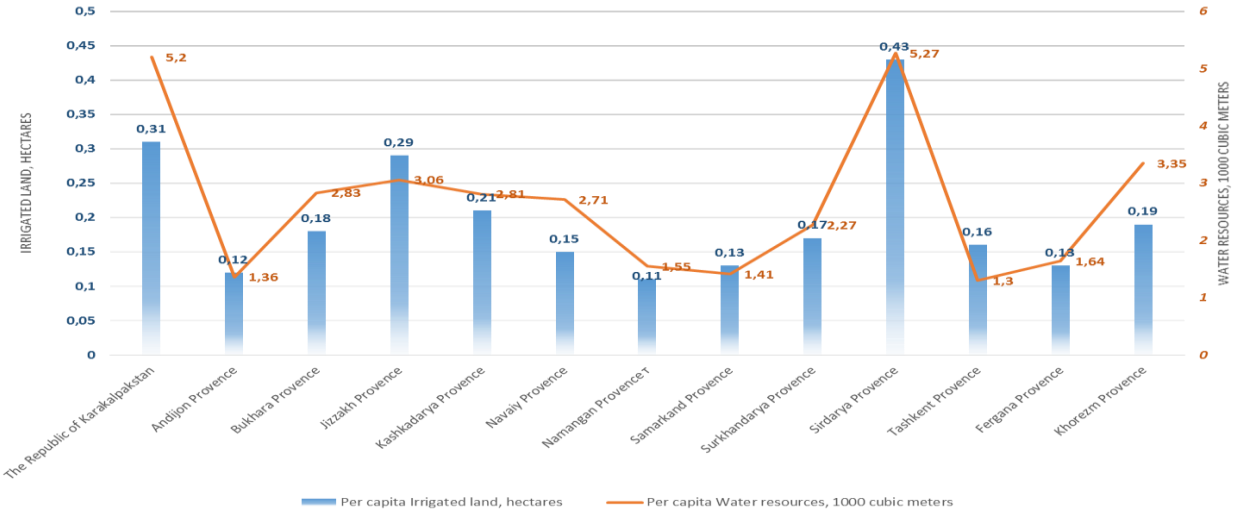
III. Methodology

We have collected data from the Tax Committee of the Republic of Uzbekistan and the Ministry of Agriculture and Water Resources to use it for the descriptive analyses. In order to have objective data from the field analyses and collect the primary data we have chosen Uzbekistan as a sample for our research, particularly we have targeted the data collection in Karakalpakstan region of Uzbekistan. Uzbekistan's agriculture has enough issues related to water shortage and there is a field for future researches. Beside of it, the economy of Uzbekistan is highly dependent on agriculture as the share of agriculture in GDP of the country is over 25 % for 2014, thus is this region is very suitable to use in our research.

We have used qualitative methods to analyse the research question. First, we have defined the biggest taxpayers in Uzbekistan and tried to define the share of tax amount related to the usage of water resources. We found that the amount of taxes paid by "big players" in agriculture industry is significantly low, which can cause the non-efficient usage of water resources and this assumption led us study closely the relationship between amount of taxes paid and the efficiency of the usage of water resources. In order to have accurate research and valuable results we decided not to use quantitative methods for our analyses, which recently became popular among researchers, but have focused on qualitative research methods.

Thus, we have conducted detailed unstructured interview among 21 respondents from Karakalpakstan region. This region is chosen because of high significance of related topic due to Aral Sea's continues problem on water shortage. Interview been conducted in face-to-face form, and control questions were allowed to use. None of interviews lasted more than 40 minutes. The shortest interview time was equal to 25 minutes. Questions were generated during the interview by the author based on the personal judgment and experience.

Figure 1: The degree of water availability of per capita irrigated land on administrative territories of the Republic of Uzbekistan [1]



IV. Main Results

On the basis of conducted research we have attained the following results and conclusions:

First, 70-80% of reserves of water resources of the states of the Central Asia are located in the mountain areas of Tajikistan, Kirgizstan and Kazakhstan. According to the calculations, only 8,0 million hectares of the area situated near the Aral sea has been irrigated recently. 126 billion cubic meters of water resources suitable for drinking and irrigation occur in this territory. If we can get about 25-30 hundredweights of harvest from 1 hectare so about 10 000 cubic meters of water resources will be needed for this purpose. These figures mean that agriculture and farming are done due to the big volumes of water resources spent. For example, in our country annually is used 60 billion cubic meters in average and among them about 50 billion cubic meters are used for irrigation. In average 11 – 12 thousand cubic meters are spent in each hectare of irrigated land.

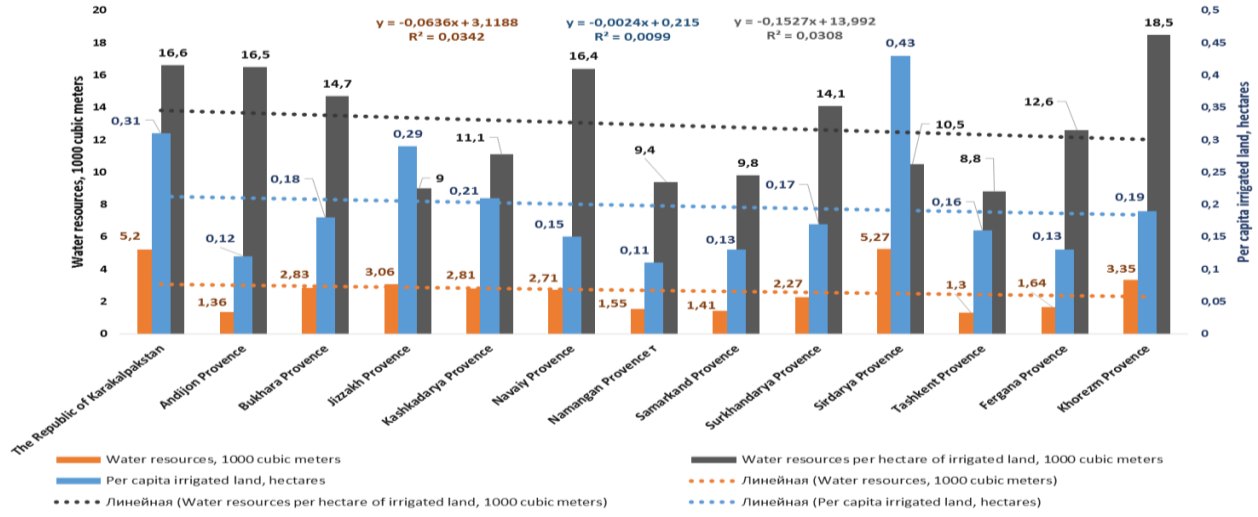
Second, our country utilizes almost the half of the resources used in the countries of the Central Asia. The most part of these resources comes from the territory of neighbor countries. 85% of water resources utilized in our country are used in our country. 98% of land allocated for farming and agriculture make irrigated land.

[1] Author's calculations based on information from the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan. www.agro.uz

Third, an overall volume of water resources in the territory of our country fin recent years does not exceed 8 – 10 billion cubic meters. It means that each hectare of irrigated land make approximately about 1000 cubic meters of water resources. If we take into consideration the fact that our republic is located in semi-prairie and prairie areas we can observe an obvious deficit of water resources in the territory of our republic**.**

Fourth, water resources existing in our country, are not equally distributed. The level of its distribution can be seen from the table 1 given in the next page. At the same time, unequal distribution of water resources by administrative areas of our country is more increased by its seasonal fluctuations. Therefore the balance of water resources and its seasonal distribution influence on the water supply of rivers.

Figure 2: The degree of water availability of irrigated land on administrative territories of the Republic of Uzbekistan



Unequal and unsuitable seasonal distribution of waters in rivers makes efficient use of water resources complicated and creates various problems in the agricultural balance.

Fifth, in order to reduce water scarcity and improve its security, despite the fact that, in our country within several years, several water reservoirs have been built (for example, Toktogul, Andijan, Charvak, Kayrakum, Chardarya, Nurek, Tuyamuyun, Talimardjan, etc.) and channels (“The "Big Fergana", "The Big Andijan", "The Big Namangan," "South Mirzachul", "Parkent", "Tashkent", "Karshik highway", "Amu-Bukhara", "Karakum "etc.) and as a result it has made a worthy contribution in the ordered and efficient use of existing water resources in agriculture, energy, industry and other sectors of the national economy, we cannot say that the problem of effective use of water resources has been fully resolved;

Sixth, industry development, the transition intensity of agriculture and population growth have led to increase of the degree of consumption of water resources.Basing on calculations, in 1950 the total water intake in the Republic of Uzbekistan was 40 cubic km, while in 1960 this figure was 50 cubic km, in 1970 - 55 cubic km, in 1980 – 57 cubic km, in 1985 - 60 cubic km, and in 2002 - 56 cubic km. It shows that the use of water resources over the past 50 years has increased by 1.5 times. According to experts, in the nearest future demand for water will grow further;

Seventh, the widespread construction of housing, creation of municipal and water-sports facilities in our country require a sharp increase in the capacity of water supply sources. Over recent years in our country more than 6% of all water resources have been consumed in the system of housing and communal services;
Eighth, in practice, water resources are mostly used in the industry. According to published data, to produce 1 ton of steel average of 350 cubic meters of water is consumed. In iron factories 800 cubic meters of water are used to produce 1 ton of product. The manufacture of 1 ton of silk requires 1,200 cubic meters and 1 ton of nylon fiber needs 2500 cubic meters of water resources. In general, almost ¼ of the acquired water resources are used in industry;
Ninth, water resources contain 90% of all plants and 75% of the weight of the animals. From 60 % up to 80% of the human body is water. If the human body loses 6% of water, the person loses consciousness, if the loss of water is more than 10% it leads to hallucinations; loss of 12% is fatal. If at the beginning of the twentieth century, the irrigated area was 40 million hectares, then in 1975 this number reached 135 million hectares, and in 2000, it went up to 420 million hectares. In our planet, there are more than 6.5 billion people. They should develop the industry and the processing of land. In agriculture and industry, the amount of water supply is not reducing, but it is increasing year by year. While in some European countries 150-160 liters of water is used per capita, 120-130 liters in Berlin, in other countries, including in our country, 500 liters of water are used every day. In Western countries, 1 cubic meter (1000 liters) of water costs 4.3 euros, in Russia 7-8 rubles, and in Uzbekistan, it is 140 soum[2] (UZS) 50 tiyin. Basing on current data, 1 euro is 2749 soum, 1 ruble is 41 soum[3], and it shows that in Europe the cost of one cubic meter of water is expensive more than 57-78 times, and in Russia it is 2-3 times more expensive than in our country. In addition, the cost of water delivery from one reservoir to another is very high. Therefore, it is not economically efficient to deliver water to "far" distances. Thus, the project "Swapping Siberian Rivers to Central Asia" in Soviet Union was not implemented formerly. If the project had been fulfilled, it would reach only 3 cubic meters of each 10 cubic meters of water would have been transferred to its destination, and the water would cost more expensive than oil.
Tenth, and finally, according to some objective (in particular, the reduction of the Aral Sea basin, the case of natural drought) and subjective (the actions of states located in the upper areas of the rivers in Central Asia, in particular Tajikistan, for the construction of artificial reservoirs and hydropower plants in the headwaters of the particular rivers) causes, an increase in the possibility of water scarcity, at the same time, determines the need for and the importance of their effective use.

V. Conclusion

In conclusion we can say that in this article we have tried briefly to look through the issue from the point of objective necessity and importance of the efficient use of water resources in these conditions. In fact, as it is obvious from the mentioned data and opinions above, while the global economic and financial crisis is threatening the world, inefficient use of all resources, including water resources, might have negative impact on the attempts to overcome this crisis. Uzbekistan suffers from the problem of shortage

[2] According to the Internet. Information for 2015. www.lex.uz/pages
[3] cbu.uz/eng/main

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