GREEN economy

Uruguay

Sustainable Water Pricing Reforms

BACKGROUND

The proportion of the world's population using improved drinking water sources increased to more than 90%, with improved sanitation up to almost 70%, by 2015. This means, however, that several hundred million people still use unimproved drinking sources and more than two billion lack improved sanitation. The main challenge facing countries of Latin America and the Caribbean to achieve the Sustainable Development Goals (SDGs), including SDG 6 on ensuring "availability and sustainable management of water and sanitation for all", is the need to use water in an efficient and sustainable manner. Further, the region is characterized by fiscal constraint, which limits potential budgetary allocations to the water sector, hence other self-financing options for environmental management need to be explored.

There is a need in the region, and in Uruguay, to ensure that water resources are used efficiently, as an unclear allocation of exploitation rights and poorly designed regulations can lead to waste and mismanagement. While Uruguay leads the region in access rates to sanitary water, challenges remain in service expansion and inclusion of the rural population. The country also has a worrying trend in terms of deterioration of water quality. With an economy highly linked to its natural resource base, the 2014 UN Environment Green Economy Assessment in Uruguay recommended the use of fiscal incentives to encourage more efficient water use and increase productivity in the agriculture and livestock sectors.

A recent constitutional reform in Uruguay acknowledges water as a fundamental right and a new institutional set-up on water issues has been established. In July 2016 a participatory process of drafting the National Water Plan was launched. One of the main proposed actions in the plan is the introduction of agricultural usage charges and contamination fees to raise revenues, increase water-use efficiency, and improve water quality. Such reforms can also improve social equity, especially if the revenues raised are redirected to achieve other environmental, social, or development objectives, thus supporting delivery of multiple SDGs in Uruguay, including SDG 6 on ensuring "availability and sustainable management of water and sanitation for all."

FISCAL POLICIES RELATED TO AGRICULTURAL USES OF WATER RESOURCES

- The predominant use of surface water is agricultural irrigation, with rice consuming as much as 80% of the resource. The proposed agricultural charges have two key objectives: 1) to promote efficient use of water, and 2) to improve environmental sustainability.
- While agricultural usage charges are mentioned in previous water-related codes and policies, they never became regulations. To that end, analytical work could inform possible fee levels and their impacts on farmers' profits, expected public revenue, and other economic indicators, also taking into consideration that water for agriculture competes with hydroelectric demand in some basins, and therefore its abstraction is limited by regulations.
- The main instruments used for water management in the region include various tariffs and charges. Turning to environmental quality, the primary instruments are regulations designed to address problems of pollutant runoff.
- While all public interventions seek to change the behaviour of consumer and producers, usually there is no single solution or a single fiscal instrument that achieves the desired goal. Often it is the combination of instruments providing incentives, sanctions, and information necessary to improve environmental quality.
- These instruments will be all the more important in an environment of increasing demand for water resources coupled with more pronounced inter-annual rainfall variation.

This summary is based on the UNEP working paper (2018) 'Achieving Sustainable Development Goals on Socially Inclusive and Sustainable Water through Fiscal and Pricing Reforms in Uruguay', prepared by Miguel Carriquiry, Matías Piaggio, Felipe Bertamini, Gabriela Pérez Quesada, and Guillermo Sena.

UN environment

ESTABLISHING A BASELINE FOR AND MODELLING THE IMPACTS OF AGRICULTURAL WATER CHARGES

- Introducing an agricultural water fee would impact the costs to producers, which can have implications both on the amount of water per hectare produced as well as on the acreage irrigated. The introduction of the fee will also increase the state's revenue collection, though this may have unintended consequences (potential spill-over effects can include reduced employment at the farms, different transportation needs, etc.).
- While economic theory allows policymakers to predict the behavioural changes in the use of water and land, the intensity of these changes can only be determined empirically. Two mathematical models were constructed to measure such a response, the first analysing the response in terms of substitution of land use against different fee levels, and the second adding restrictions on the availability of water for agricultural irrigation (on account of competitive uses in the river basin).
- The expectation drawn from the theoretical and empirical literature is that the introduction of the fee should yield a reallocation in land use and a reduction of water-intensive uses in agriculture. Activities using irrigation water will be curtailed, with less water-intensive activities to be promoted. Further, areas with water-intensive activities (i.e. for rice or other irrigated crops) will suffer major changes in land use depending on the fee usage levels implemented, as profits are reduced and costs rise.
- The results drawn from the modelling exercise confirm these expectations. The primary activity where reductions of water use are observed both in absolute and relative terms is rice cultivation. In areas where rice cultivation decreased, production was mainly transferred to livestock, while in areas of other irrigated crops, transfers went to rain-fed farming and dairy activities.
- Introducing the fee caused agricultural producers to suffer economic losses at a slightly decreasing rate as three fee levels were assessed (USDc 0.45, USDc 0.90, and USDc 1.80/m^3 corresponding to increases of 25%, 50%, and 100% of the average costs paid by rice producers for irrigation water respectively). The losses were highly geographically concentrated around rice producing regions.
- On the public revenue side, areas with heavier irrigation activities saw the greatest increases. However, as above, revenues increase at a decreasing rate against proposed fee increases, as the revenue elasticities change. For example, at USDc 0.45/m^3, a 1% increase in the fee yields a 0.74% increase in revenues, which decreases to 0.59% when the fee doubles to USDc 0.90/m^3.
- Turning to reductions in the amount of water available for agricultural activities, on account of competitive uses in the basin, such as hydroelectricity, the farmers' potential profits decrease fairly dramatically. Decreases of 10%, 20%, and 30% in water availability of the Gabriel Terra basin in Northeast Uruguay yield to decreases of 12%, 27%, and 45% in profit respectively.
- Crucially, such decreases in profitability need to be carefully weighed not only against increases in government revenue, but also against the benefits of increased hydroelectric production as well as ecosystem services resulting from lower levels of cultivation.

WAY FORWARD

The analysis of the proposed agricultural water charge in Uruguay could be improved in several ways, which would provide policymakers with a better basis to apply the charges and set the levels. First, additional data could help in improving the simulation models. On account of data limitations, it is quite difficult to develop a counterfactual scenario when building the baseline. This could be addressed through developing partnerships with statistical institutes in neighbouring countries as well as collecting data on rice cultivation before and after the implementation of the charge. Also important would be to use proceeds collected from the charge to finance projects that have a clear monitoring and evaluation protocol, thereby returning valuable data for improving the functioning of the system.

Further investigations could also explore costs and benefits that have not been incorporated into the analysis. For example, costs due to changes in agricultural activities, such as the need to rebuild and repopulate fences when moving livestock farming activities, or the costs incurred by having to repurpose infrastructure or store idle machinery, have not been included. Finally research could be expanded to include analysis of additional effects and interactions in other business sectors.

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