



The United Republic of Tanzania
Ministry of Water



POLICY BRIEF

Valuing water's contribution to the economy

Assessing the economic contribution of water in Tanzania

The SDG 6 IWRM Support Programme, in partnership with the Ministry of Water of Tanzania, conducted a study to assess the hidden value of water in three of the most important sectors of the Tanzanian economy: agriculture, manufacturing and mining. This brief outlines the key findings and policy implications, offering perspectives on evaluating the economic significance of water and using shadow pricing techniques towards building an investment rationale for enhancing water governance.

2024





Key messages



1
Production function approach



2
Replacement or damage cost avoidance



3
Contingent valuation



4
Hedonic pricing



5
Travel cost method



6
Next best alternative method

Water plays a crucial role in our economies, yet we often fail to properly assess its value and contributions to the national economy. Valuation methods and shadow pricing techniques can help reveal the economic value added that water resources bring to economic sectors. Each valuation method has its strengths and limitations, and the choice of method depends on the context, data availability and the objectives of the valuation exercise.

Anticipated return on bean irrigation investment

\$1 USD = 11.47 kg output rise

Our quantitative analysis shows that for every 1 USD allocated to bean irrigation during the short rainy season, an estimated output rise of 11.47 kg is projected. Considering the 2020 price of beans at 0.83 USD per kilogram, the anticipated return ratio for bean irrigation stands at approximately 955%. Using productive function as a valuation tool can help reveal where and when the business case for investing in irrigation is the greatest.

0.05%
of total production costs are for water supply and treatment

Water-related expenditures represent a negligible proportion of total production costs in the manufacturing sector in Tanzania. Both supply and water treatment costs account for an average of 0.05% of total production costs in the manufacturing sector. Even in the most water-intensive manufacturing processes, water costs remain proportionally low; for instance, water costs for manufacturing food and beverages represent only 0.104% and 0.914% of their total production costs, respectively.

Contribution of water to agriculture, mining and manufacturing in Tanzania

\$2,100 million USD = 3.31% of Tanzania's GDP

The results of this study reveal that a conservative estimate of the contribution of water to agriculture, mining and manufacturing in Tanzania is 4,816,560 million TZS (2,100 million USD), which is the equivalent of 3.31% of Tanzania's Gross Domestic Product (GDP) in 2020. Out of the three sectors considered, the added value of water was found to be highest in the agricultural sector with an estimated 4,614,037 million TZS (2,012 million USD), representing 95% of the total estimated value of water in the three sectors.

Volumetric value of water used



Cattle

\$2.34 USD/m³



Goats

\$0.95 USD/m³



Sheep

\$0.49 USD/m³

The volumetric value of water used for different livestock was estimated at 5,356 TZS/m³ (2.34 USD/m³) for cattle, 2,169 TZS/m³ (0.95 USD/m³) for goats, and 1,114 TZS/m³ (0.49 USD/m³) for sheep. Such volumetric water pricing findings can help inform water allocation decisions, especially in times of water scarcity and drought where water demand restrictions between and within sectors may be needed.



manufacturing

99.7%
of water-related costs are from water treatment



mining

Water treatment costs dominate water-related expenditures in the manufacturing and mining sectors in Tanzania. The analysis of total water-related costs in these two sectors indicates that 99.7% of these costs are attributed to water treatment. This suggests that water supply services, abstraction fees and licensing fees are relatively minimal, particularly when compared to other production costs.

Assessing the overall contribution of water to society should incorporate the economic and non-economic values. As such, the total value of water identified in this study is likely to be a lower limit, as it does not incorporate broader non-economic value to Tanzanian society. Integrating multiple shadow pricing methods and sectoral perspectives can provide a more comprehensive understanding of the true value of water. The [Valuing Water Principles](#) and approach are powerful tools to understand and embrace the non-economic value of water.

The need for valuing water

From helping us grow our food, to supporting the transport of goods and services and giving us electricity to power our industries and manufactures, the economic role of water is undoubtedly of vital importance. Many economic activities would not be possible without water, yet water is often under-valued and under-priced. Water-intensive sectors such as agriculture, manufacturing, and mining typically overlook economic externalities and end up paying directly only a fraction of the total costs of water. The economic impacts of systematically underinvesting in water and mismanaging water-related challenges is however becoming increasingly visible. As evidenced through the [Global Commission on the Economics of Water](#), there is now a growing momentum towards revaluing water and rethinking its position within our economic systems, at all levels.

In Tanzania the economic role and contribution of water has also been traditionally underestimated. Based on figures from the *National Economic Survey (NES)*, the Ministry of Finance evaluated the economic value of the water sector in Tanzania at 635,959 million TZS in 2020 (277.29 million USD), accounting for about 0.44% of the national GDP¹. The *National Economic Survey* evaluated the water sector value based on the direct revenues and investments made in water supply, sewage and wastewater treatment. This water sector figure did not consider, however, the added value that is derived from the use of water in other economic sectors, meaning that its full economic value was not captured by such estimates. By focusing on the (often overlooked) added value that water brings to other key economic sectors, this study breaks away from assessing the economic contribution of water through the limited lens of “water sector investments”.

Methodological considerations for assessing the economic contribution of water in Tanzania

The objective of this study was to shed light on the unaccounted contribution of water to the Tanzanian national economy, by:

1. Evaluating the economic contribution of water, providing a low-bound economic valuation of the value of water in the agricultural, manufacturing and mining sectors in Tanzania,
2. Offering a methodological reflection on the process and challenges of evaluating the economic contribution of water at the national level, and
3. Suggesting entry points to spark multi-stakeholder discussion and engagement processes towards revaluing water in Tanzania.

While the true economic value of water is not commonly assessed, methodologies exist which facilitate this understanding, even in areas where high quality data are not abundant, such as in Tanzania. After studying these methodologies, our methodological framework followed an iterative process, commencing with the identification of a preliminary set of shadow pricing methodologies suitable for implementation. Subsequently, we delineated the requisite information for each potential shadow pricing technique and proceeded to an extensive data collection phase spanning six months. Based on the data made available, we concluded that “revealed preference” approaches were the most appropriate methodological choice for this study. Leveraging primarily the data from the *National Agricultural Census Survey 2019-2020 (NBS, 2020)* and the *Annual Survey of Industrial Production 2016 (NBS, 2018)*, our calculations were derived employing scale-down methodologies based on production functions and market price valuations. Where nation-wide statistics weren’t available, estimations were extrapolated from figures based on the Wami-Ruvu Basin.

1 MoF. (2023). [The United Republic of Tanzania: The Economic Survey 2022](#). Note: the MoF estimates the value of the water sector to 746,403 million TZS in 2021 and to 893,174 million TZS in 2022.





Key results and implications

The analysis reveals that the contribution of water to Tanzania's economy, using estimates limited to the agricultural, manufacturing and mining sectors, is 4,816,960 million TZS (2,100 million USD), which is equivalent to 3.31% of Tanzania's GDP (based on 2020 current prices). Out of the three sectors, the value of water for agriculture had the highest economic contribution. It must be noted that these sectoral valuation estimates are based on production functions that derive the value added based on the proportion that water-related costs represent in terms of total production costs. Since we worked on a proportional costs basis, and that we know that some of those water costs may be affected by market price distortions, we conclude that this figure thus represents the lower bound economic contribution of water in these three sectors.

This analysis has shown that water brings many tangible (and yet often underrepresented) contributions to the national economy in Tanzania. Applying production functions and market-based approaches as well as other shadow pricing methods could be used to raise awareness on the hidden value that water brings to other important sectors such as tourism, construction and the service industry, as well as the economic value of domestic water supply and sanitation (WASH). The more sectors for which such economic valuation exercises are conducted, the closer we would get to estimating the total value of water in the country.

Yet, such valuation exercises should aim to go beyond monetary terms and consider non-economic values of water, such as spiritual, cultural, health, or environmental benefits (VWI, 2020). Since water knows no sectoral or political boundaries, a final implication of this study is, therefore, that reassessing water in Tanzania needs to be guided by a multi-stakeholder engagement process. We hope that this study contributes to sparking renewed cross sectoral engagements and societal dialogues for a greater valuing of water in Tanzania and other countries.

Consolidated results of water valuation for mainland Tanzania (Current 2020 prices).

Sector	Value Added Proportion Derived from Water	National Value of water (Millions TZS/year)	National Value of water (Millions USD/year)	% of GDP
Crops	17.66%	3,871,103	1,687.9	2.66%
Livestock	6.99%	742,934	323.9	0.51%
Subtotal Agriculture	-	4,614,037	2,011.8	3.17%
Manufacturing	0.24%	27,173	11.8	0.02%
Mining and Quarrying	1.78%	175,749	76.6	0.12%
Total Value of Water	-	4,816,960	2,100	3.31%
Tanzania's GDP (2020)	-	145,429,645,000,000	63,409,757,618	-

Note: GDP figures obtained from MoF (2023). Source: Elaborated by authors.

Photos: Canva photo bank



Are you interested in understanding how valuation methods work and can be applied to assess the economic contribution of water in your country? The [SDG 6 IWRM Support Programme](#) is available to provide technical assistance. Contact us on sdg6iwrmsp@gwp.org.

