

Quantifying Total Water Productivity for Multiple-Use Small Reservoirs in Mzingwane Catchment, Zimbabwe

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The Government of Zimbabwe embarked on construction of small, medium and large multiple-use dams as a strategy to increase the level of water security in the country. Over 10,000 dams have been constructed in communal and large-scale-commercial farming areas. So far, the socio-economic contributions made by medium-to-large scale dams have been fairly documented. However, contributions made by small reservoirs are hardly appreciated and are scantily documented. A study was conducted to find out how a measured total water productivity can be used to value and allocate scarce water resources for the attainment of maximum societal benefit. Water productivity gives the value of a product that can be obtained from using a unit amount of water on alternative functions such as domestic use, livestock watering, crop production, fishery, brick making and related uses so that the resources can be wisely allocated to more productive sectors. The current study, carried out on eight small reservoirs surrounding Avoca Business Centre in Mzingwane Catchment, attempted to assess total water productivity of multiple-use small reservoirs. Questionnaires were administered to respondents and physical measurements carried out on crop yields, livestock, grass harvests, bricks, fishery and flows. The study recognised scarcity of water resources in terms of dry season yield, water productivity of individual uses and societal values. Two paths for increasing productivity per unit of utilizable water resources were considered; depleting developed primary water supply for beneficial purposes by increasing water savings and producing more output per unit of depleted water by increasing unit water productivity. On water productivity, donkeys had the highest monetary water productivity, in US\$/m³ terms, of 145.27 followed by bricks (31.67), cattle (31.52), tomatoes (24.14), sheep (11.0), goats (10.93), small vegetables (8.0), green maize (2.25), dry beans (0.93), fish (0.65), wheat (0.17), domestic water (0.03) and grass (0.02). By increasing water allocation only to selected high water productivity products, income levels were increased by 104% from current uses. Significant improvements in livelihood and poverty reduction among rural communities can be achieved through careful selection of water allocative strategies. Formulation of the water productivity strategy, however, should be complemented by wide stakeholder consultations to derive maximum societal benefits.

Key words: Integrated water resources management; Livelihood; multiple-use; small reservoirs; water productivity

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