

# Should commercial forestry in South Africa pay for water? Valuing water and its contribution to the industry

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## Abstract

Water is a limiting input/factor in the production of timber in the commercial forestry industry of South Africa. Being a water-stressed country, South Africa has opted for demand management strategies which suggest pricing of water as a commodity. Since commercial forestry is one of the big users of the country's water resources, it is time to decide whether the industry should now pay for water or not. The questions that need to be answered are:

- If yes, how much should the industry pay?
- Is the current proposed charge for water a fair representation of the value of water in timber production?

The value of water used by the commercial forestry is essential information and is very much needed for making water-demand management decisions. The results of the study indicate that water values are much higher than the water management charge levied on the commercial forestry, confirming large subsidies being transferred to the industry. This ushers in a debate on whether South Africa should have more commercial forests or significantly convert them to grasslands.

**Keywords:** water value, residual value, marginal value, subsidy, commercial forestry, South Africa

## Background and objectives

Commercial forestry is an economic force in the South African economy. It has a capital base of R30 bn. (US\$ 5 bn. @ R6 = 1 US\$) and an annual turnover of R12 bn. (US\$ 2 bn.). It meets 95% of the country's needs in wood-based products and has a positive trade balance of R2 bn./a (US\$ 333m./a). The industry employs some 75 000 people directly, 500 000 people indirectly in the related industry, and some 2.1 m. people are dependent on commercial forestry for their survival (Forest Owners' Association, 2000). For every one direct job created in the commercial forestry sector, six jobs are created indirectly through the multiplier effect. Each job generated (directly and indirectly) supports roughly four dependents. (Based on data from Forest Owners' Association (2000)).

Commercial forestry is also one of the major users of scarce water resources. Hydrological research during the past six decades in South Africa indicates that water is the most important limiting input in the growth of alien trees such as eucalyptus, pine, and wattle. These trees use a lot of water through evapotranspiration (ET). This leads to a reduction in the runoff or streamflow from the afforested site (known as streamflow reduction or SFR). The ET use consists of transpiration by vegetation and evaporation from soil, lakes, and water intercepted by canopy surfaces; it is also known as green water. The streamflow reduction or SFR use refers to the runoff reductions due to afforestation; this is known as blue water (Jewitt, 2002). The SFR use in the commercial forestry industry is estimated to be in the order of 1.4 bn-m<sup>3</sup>/a from an area of 1.44 m-ha of plantation (equivalent to 972.2 m<sup>3</sup>/ha-a or 100 l/m<sup>2</sup>). This accounts for about 8% of the total utilisable water (Anonymous, 1998).

The SFR is thus a major concern in South Africa, as it reduces water availability to downstream users. The ET use is roughly 10 times that of the SFR use (Tewari, 2003).

South Africa being a water-stressed country has opted for a new approach in water demand management in early 1990s. The approach aims at meeting water demand by making its use more efficient and put water to more productive uses (Gleick, 2000). As a result, South Africa has developed a National Water Resource Strategy (NWRS) which entails using water judiciously and pricing water for all possible uses is its major objective (Department of Water Affairs and Forestry, 2004). Following these developments, valuation of water in commercial forestry is essential information required for water pricing policy. The major objective of this study is to put value on water use (ET and SFR) in commercial forestry using non-market valuation techniques. And, based on these estimates, decide on the extent to which the industry is being subsidised.

The material of this study is organised under various sections: first, the conceptual model used for valuing water uses in the commercial forestry is described; secondly, a description of selected species and experimental sites is given; this is followed by the method of estimation and data and the results are discussed next. Water subsidy and policy implications are explored in the semi-final section followed by conclusions.

## Measuring the value of water: The conceptual model

The value of any commodity can be defined in terms of use and its exchange value. No doubt water is an essential element for human survival and its utility in that sense is non-priceable. However, economists in general refer to the exchange value - a value that is determined by the interaction of demand-and-supply forces. The value of water can be estimated like the value of any economic good. The value of an economic good can be approximated by a measure of the user's willingness-to-pay

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