

# Establishing tradable water rights: Case studies of two irrigation districts in South Africa

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## Abstract

The study revealed that a market for unused "outer land" water rights had emerged along the Lower Orange River. A discriminant analysis showed that water rights were transferred to farmers with the highest return per unit of water applied; producing table grapes; and with high-potential arable "outer land" without water rights. The institutional arrangements facilitating market development were well defined, reliable, enforceable water rights, that were transferable between irrigable properties; a large number of willing sellers, and an administrative function performed by the Department of Water Affairs and Forestry defining a transparent transfer process, supervising and recording transactions. A second study in the Nkwale Valley in Northern Kwa-Zulu-Natal found that no water market had emerged despite the scarcity of water in the area. While 41% of farmers wanted to purchase water rights, no willing sellers of water rights existed. Demand for institutional change to establish tradable water rights seems unlikely since crop profitability in this area is similar for potential buyers and non-buyers, whereas in the Lower Orange region buyers invariably produced highly profitable table grapes. Farmers generally use all their water rights in their farm operations, and may be unwilling to sell water rights for land they have developed as this involves sacrificing capital investment in this land. Farmers pay only for the portion of water they extract in terms of their water rights, but lose income from potential water rentals or sales to industry.

## Introduction

Water marketing has been advocated as one means of reallocating scarce water supplies in South Africa (Backeberg, 1997). Allocation of water through a market offers a number of potential advantages. Firstly, it promotes efficiency in allocation by placing water in the most highly valued uses in a flexible manner. Property rights to water empower water users as their consent is required for any reallocation of water and compensation is required for any transferred water. Decentralised information is brought to bear on water-management decisions by enabling individual users to apply first-hand knowledge in determining how much water to apply and which crops to produce. The market process establishes flexibility in response to changes in crop prices and water values as demand patterns and comparative advantage change and crop diversification proceeds. Within a water market, individual users are forced to consider the full opportunity cost of their water use, as well as some external costs related to their water use or transfer. Finally, a water market requires well-defined and enforceable water rights, providing for secure tenure of water and in turn stimulating investment in water-saving technology (Cummings and Nercissiantz, 1992; Howe et al., 1986; Anderson and Leal, 1989; Pingali and Rosegrant, 1995).

In a water economy, the institutional framework determines the feasibility of water-market transactions. Appropriate institutions reduce uncertainty by providing a structure to human relations in the exchange process, and affect economic performance through their impression on costs of exchange and production (North, 1990). The ability of a property institution to foster desired behaviour depends on how exclusively property rights are defined and how effectively it reduces transaction costs (Nieuwoudt, 1990). North (1994) states that deliberate institutional change towards transferable water rights will result from demand by individual users to alter the existing institutional framework. Hayami and

Ruttan (1985) contend that the new institution will be implemented if the resulting returns exceed the marginal cost of mobilising the resources needed to introduce the innovation. Implicit in this argument is that individuals are able to take collective action and that their lobby will succeed politically. Individuals do not always act in the interests of the group (Popkin, 1979: 252), therefore institutional change may not be forthcoming owing to problems of collective action or political resistance. This depends on the power balances among vested interest groups and their ability to act collectively to express their lobby (Olsen, 1971; Stiglitz, 1989). If individuals agree to institutional changes, and trade is voluntary, then the new institutional framework can be considered more efficient than the old. Since individuals are driven by self-interest, the institution that evolves as a result of change will allocate resources more efficiently (Buchanan, 1986).

The purpose of this research is to study demand-side responses to water allocation in two irrigation districts in South Africa, by investigating how water markets can lead to more efficient water allocation and use. In the first study area, the Lower Orange River, where water is a scarce resource and production is entirely dependent on irrigation water, one of the highest incidences of market trading of water rights in South Africa has occurred. In the second study area, the Nkwale Valley, water is similarly a scarce resource with production wholly dependent on irrigation, but no trading of water rights has occurred. This paper endeavours to highlight the benefits from, and institutional arrangements facilitating, market trading of water rights along the Lower Orange River, as well as the potential for, and institutional changes necessary, to facilitate the operation of a water market along the uMhlatuze River in the Nkwale Valley.

## Tradable water rights

### Requirements for a market in tradable water rights

An efficient water market requires:

- Well-defined rights that are completely specified in the unit of

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