

The challenges facing sustainable and adaptive groundwater management in South Africa

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Abstract

Long-term population growth and economic development are placing ever-increasing pressure on South Africa's freshwater supply. On the basis of the current climate change predictions, which often entail uncertain consequences for aquifer systems and the associated groundwater goods and services, it is expected that the stress on water will increase even further. Currently, South Africa's groundwater governance regime does not provide the capacity to assure effective and sustainable resource regulation and allocation. To date, the management of groundwater is hampered by a variety of uncertainties, such as global climate change and socio-economic growth, as well as ineffective governance structures affecting resource use, regulation, protection and the implementation of alternative strategies needed to achieve sustainable management. This paper presents the results of a qualitative assessment of interviews conducted with experts in South Africa. Four key challenges are identified to the development of adaptive and sustainable groundwater management and the successful implementation of current water legislation in South Africa. These are: the undervaluation of groundwater importance and significance; the need for expertise and information at all scales; the centralisation of power; and the disregard of ecosystems and the associated goods and services. As a means to tackle these challenges, it has been assumed that the concept of adaptive water management represents a suitable approach to governing groundwater resources, by taking into account complex system linkages between hydrogeological, political, socio-economic and environmental domains. Supporting principles, such as tools for cooperation, participation and information networks, have been developed to facilitate the implementation of adaptive water management approaches and hence to achieve institutional change in the political arena of groundwater management.

Keywords: groundwater, South Africa, ecosystem services, adaptive water management, qualitative assessment