

# The changing role of groundwater in regional economic development

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In Australia, groundwater makes up about 17% of available water resources, and in some regions accounts for 30% of consumption. In fact, in many regional areas it is the only source of water. However (and perhaps because it is important mainly to regional and rural communities), groundwater remains a poorly understood resource. Yet, as climate changes and water becomes scarce, it is anticipated that groundwater use will increase. This study looks specifically at a groundwater-dependant region of southwest Victoria, and the possibility of expanding agricultural production (both of existing commodities and new commodities) to meet the food demands off a growing population. The work was initiated on the request of local government and water authorities. We developed expert-system models to quantify the potential impact of climate change on the yield of eight agricultural commodities. The results indicate that some rain-fed crops will require more water to maintain current production levels, while the geographic extent of others could be substantially increased (for example, to double production volume) if access to water is possible. However, the complexity of the water situation was not well reflected in the models – specifically the likely competition between different groundwater end-users as the region embarks on one development path over another. As such, new models are being developed to address the impacts of alternative agricultural development pathways on the groundwater resource, and how supply-demand changes relative to competition between agricultural and domestic users. This paper therefore outlines how groundwater considerations can be integrated into regional crop-climate models and how the results can be used to inform strategic planning to take advantage of economic development opportunities. We also investigate the implications for agricultural development under a changing climate where water supplies from more traditional sources are under increasing stress.

