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Water Infrastructure: Groundwater in the Basin:

Potential Impacts of Climate Change

Climate Change and Groundwater

Climate change is expected to affect all of natural resources to some degree, groundwater included. Not only will changes in climate affect the amount of water falling as precipitation and the amount of evapotranspiration, ultimately affecting the amount of groundwater recharge; but, it will also affect the degree to which populations rely on groundwater. A summary of possible impacts is provided in the box below.

Climate change may be responsible for increased frequency and intensity of drought in the region.
Source:©iStockphoto/Marchetti 2007
(click to enlarge)

Box: How Does Climate Change Affect Groundwater Resources?

Past observations and future projections of the global climate indicate that precipitation patterns are changing. Rainfall is a key factor in groundwater recharge and changes in the amount, frequency, duration and intensity of rainfall events will thus have a significant impact on groundwater resources.

The following may result as a consequence of Climate Change:

- Decrease in water quality due to salt water intrusion
- Increase in runoff due to elevated water table
- Increase in the occurrence of international water conflicts
- Decrease in water quality due to nutrients/contaminants being more concentrated
- Decrease in water quantity and quality due to runoff and erosion
- Decrease in agricultural development and profits due to drought

The changes that are being observed in precipitation and other factors that impact water balance suggest that a dynamic framework is necessary to conceptualise and investigate the projected changes in groundwater. Hydrological models are valuable tools for confirming past phenomena through the use of historical data while enabling projections from suggested scenarios.

Southern Africa is classified as a developing region, so issues surrounding poverty alleviation and economic development are still in the forefront of the public policy agenda. The integrated approach to determining the future impact of climate, societal values and economy on groundwater resources should assist policy makers in their efforts to balance the demands of protecting the environment without stifling the economic growth necessary to transition from a developing nation into a first-world country.

Source: Maserumule *et al.*, 2008

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