EFFECTIVENESS OF WATER SAVING INTERVENTIONS UNDER A SHARED WATER SAVINGS CONTRACT

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ABSTRACT

Surface water comprises less than 0.01% of the total volume of water available in the water cycle; however, most of the world's population solely relies on surface water. Issues of rapid population growth, increased industrialisation, and climate change threaten the security of already limited surface water resources. South Africa is classified as semi-arid and a water scarce country, thus efficient management of water resources is of paramount importance. However, water mismanagement is occurring and it has been identified that the implementation of water saving interventions by end consumers, can reduce the impact of water mismanagement and water scarcity.

In view of the issues of water scarcity and water mismanagement in South Africa, a shared water savings contract (SWSC) was initiated to reduce water consumption at institutional facilities within three provinces. The service provider had the mandate of implementing various water saving interventions intended to maximise the water savings at 164 facilities. The facilities consisted of judicial buildings, military/naval bases, police stations and prisons. The study sought to assess the effectiveness of the water saving interventions implemented under the SWSC, focusing on; the significance of the water savings, how the combination of interventions affected the effectiveness of the water savings and the consistency of the water savings.

Prior to the implementation of interventions, a monthly baseline consumption was determined using the facility's historical water consumption. A total of eight water saving interventions could be implemented at a facility, based on the service provider's investigations, and these included leak fixing, pressure management, and awareness campaigns. Some facilities had only one intervention implemented, while others had a combination of interventions implemented. Once water saving interventions were implemented at a facility, water savings were determined by comparing the consumption on the facility's municipal water bill with the facility's monthly baseline consumption.

A data filtering process was undertaken and resulted in 131 facilities eligble for selection. By using a stratified statistical sampling method, 59 facilities were selected for analysis. Using data collected over 12 months in the 59 representative facilities, water saving interventions were found to yield a reduction of 60% in billed water consumption which is highly significant. The water savings were found to be independent of the magnitude of the pre-intervention consumptions of the facilities. It was also found that significant water savings could be achieved when different types of water saving interventions are implemented in isolation or in combination with other interventions. The effectiveness of water saving interventions was found to vary greatly across facilities and, the assessment of facility conditions would therefore be required to inform which interventions could maximise water savings. Leak fixing and retrofitting were popular interventions, although the savings achieved from the implementation of these interventions also varied substantially.