

The Use of Water Resources Yield Model at Kleinfontein Dam

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Abstract : Water resources development and management are regarded as crucial for poverty reduction in many developing countries and sustainable economic growth such as South Africa. The contribution of large hydraulic infrastructure and management of it, particularly reservoirs, to development remains controversial. This controversy stems from the fact that from a historical point of view construction of reservoirs has brought fewer benefits than envisaged and has resulted in significant environmental and social costs. A further complexity in reservoir management is the variety of stakeholders involved, all with different objectives, including domestic and industrial water use, flood control, irrigation and hydropower generation. The objective was to evaluate technical adaptation options for kleinfontein Dam's current operating rule curves. To achieve this objective, the current operating rules curves being used in the sub-basin were analysed. An objective methodology was implemented in order to get the operating rules with regards to the target storage curves. These were derived using the Water Resources Yield/Planning Model (WRY/PM), with the aim of maximising of releases to demand zones. The result showed that the system is over allocated and in addition the demands exceed the long-term yield that is available for the system. It was concluded that the current operating rules in the system do not produce the optimum operation such as target storage curves to avoid supply failures in the system.

Keywords : infrastructure, Kleinfontein dam, operating rule curve, water resources yield and planning model

Conference Title : ICEHEH 2022 : International Conference on Environmental Hydraulics and Engineering Hydrology

Conference Location : New York, United States

Conference Dates : January 28-29, 2022