



A study on the characteristics of flow duration curve according to the operation of multi-purpose dams in Han-river basin

N. W. Kim , J. E. Lee, B. J. Lee

Korea Institute of Construction Technology (nwkim@kict.re.kr/FAX: +82-31-910-0251)

Many dams were constructed for the effective water resources management. Especially multi-purpose dams located in Han-river basin that provide capital region with valuable water source. The purpose of this study is to evaluate the changes of flow duration characteristics of the Paldang Dam basin due to operations of the Soyang and Chungju multipurpose dams. A semi-distributed watershed model, SWAT-K(Korea), was used in order to generate regulated and unregulated daily streamflows upstream of Paldang Dam. The reservoir operation module in SWAT-K was modified from original module in SWAT for modelling parallel multi-reservoir operations appropriately. Simulated flow regulated by the Soyang, Chungju, and Hwacheon dams was calibrated by comparison with the observed inflow data at Paldang reservoir. The flow pattern analyses by using this calibrated system show the entire effect of Soyang and Chungju multipurpose reservoirs is the storage capacity of 21.6 billion cubic meters/year for 54 days during flood season. For Soyang reservoir, the stored quantity is approximately 9.1 billion cubic meters/year which was stored for 64 days. For Chungju reservoir, the stored quantity is approximately 12.5 billion cubic meters/year which was stored for 28 days. This study is the first attempt to evaluate the flow pattern characteristics by using simulated flow according to dam operation. More accurate analysis is expected to reevaluate the operating status of multipurpose reservoirs in Korea.

keywords : SWAT-K, Long-term runoff, Dam operation, Flow duration curve, Storage capacity

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