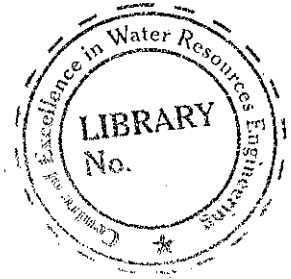
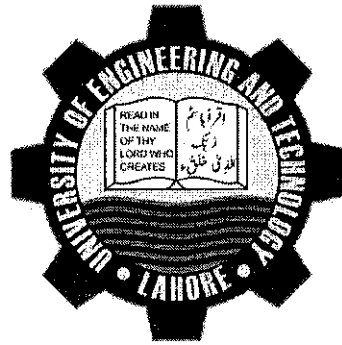


ASSESSMENT OF HYDROLOGICAL DROUGHT IN ANTHROPOCENE: A CASE STUDY OF RESERVOIR EFFECT IN ARID REGION



By

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(2016-MS-WRE-10)

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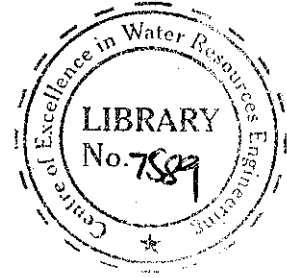
Centre of Excellence in Water Resources Engineering

University of Engineering and Technology, Lahore

**ASSESSMENT OF HYDROLOGICAL DROUGHT IN
ANTHROPOCENE: A CASE STUDY OF RESERVOIR EFFECT
IN ARID REGION**

Submitted By

KHALIL AHMAD
(2016-MS-WRE-10)



A THESIS

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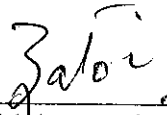
in partial fulfillment of the requirements for the degree of

Master of Science

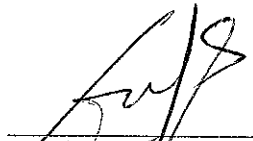
in

WATER RESOURCES ENGINEERING

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ABSTRACT

Drought is an important natural hazard that can cause severe environmental and socio-economic impact in different region of the world especially arid regions. Drought is regarded as a deficit in available water compared to the normal condition and climate variability is considered the only drives of the drought. On the other hand, pressure on water resources in arid regions has led to increase the management practices e.g., construction of dams, however the impacts of these anthropogenic activities on hydrological drought have yet to be incorporated and assessed. Moreover quantification of the human influence will improve our understanding and builds fundamental knowledge for water resource management. Hence, in current study, the impact of Simly dam on hydrological drought characteristic at downstream has been analyzed. Two drought analysis methods i.e. (a) threshold level method using 50th and 80th percentiles (TL-50 and TL-80) and (b) standardized index approach were used for hydrological drought calculation and upstream-downstream approach was used for assessment of impact of Simly dam. For upstream-downstream approach the entire data period was divided into two sub periods i.e. pre dam (1970-1982) and post dam (1983-2012). Based on the analysis, it was concluded that during post-dam period there was a decrease in total drought duration by 1.88%, frequency by 15.24% and maximum severity by 69.5% at downstream as compared to upstream. The Simly dam reservoir might have mitigated the short term drought at downstream, however, unable to reduce the impact of long-term drought. Moreover, in presence of dam a delay in drought occurrence were observed at downstream. Conclusively, this study showed an applicable way forward with quantifying the human influence on hydrologic drought, and this method can be applied elsewhere and on other human activities.