

A STUDY ON THE HYDROLOGICAL FEASIBILITY OF DIVERSION OF THE WEST FLOWING AGHANASHINI

A DISSERTATION

Submitted in Partial fulfilment of requirements for the award of degree of
Bachelor of Engineering in Civil Engineering to
The National Institute of Engineering, Mysore (An Autonomous College)
by

VISHWANATHA BHAT	4NI10CV061
YOGESH	4NI10CV062
SHASHANKA MOHAN V.	4NI10CV052
SUSHMA R.	4NI11CV411

under the guidance of
Dr. R. Yadupathi Putty

A Project Sponsored by
Karnataka State Council for Science and Technology, Bengaluru
Under Student Project Programme – 37th Series



Dept. of Civil Engineering,
The National Institute of Engineering, Mysore – 570008
May, 2014

ABSTRACT

The aim of the present work is to study the feasibility of diversion of west flowing Aghanashini, proposed by Dr. Madhu Seethappa, a stake holder from Kolar. The proposal intends to interlink the basins of Aghanashini and Sharavathi and to feed the drought prone areas of Kolar, Chikkaballapur and Bengaluru Rural districts through pipe or open channel flow. From the past studies, it is evident that almost all river diversion projects are over ambitious and involve erroneous estimates of yield, obtained from models not applicable in the region. The present work adopts locally developed models to estimate runoff, in order to estimate the yield available for diversion. The reliability of estimation of runoff yield from ungauged catchments is always governed by reliable rainfall data and locally suitable methods for estimation. Hence, reliable data, tested for consistency of records, are used and the yield estimation is carried out for 80% dependable rainfall, obtained by probability analysis. Monsoon runoff volumes are obtained by deducting catchment losses, estimated to be equal to 1000 mm in the Western Ghats regions, by earlier workers. The 10-daily yields are estimated using rainfall – runoff relationships developed for a gauged catchment in the vicinity.

Based on a detailed study of the volume of yield available during the various 10-daily periods, the minimum environmental flow is considered as that equal to the virgin flow during the middle September. The surplus yield is determined by deducting the minimum environmental flows from runoff. It is found that during an 80% dependable year, surplus flows will be available only during the months of July and August. A part of this surplus yield is considered as the divertible yield. A 70% value sums up to about 19 TMC of divertible flow for the monsoon months. Distribution of peak surplus yield by considering runoff values of similar gauged catchment shows that 1.5 TMC may have to be diverted on certain days. This requires lifting 650 m³/s (more than 20,000 cusecs) of water considering 18 hours pumping per day. Lifting of this huge amount by 77 m, over 18 km length is found to be impractical. In this background, the proposal to divert Aghanashini flow to the intended extent is considered not feasible. Since this project does not seem to see the light of the day, it is suggested that alternatives are thought of for making up the shortages in the South Karnataka regions. A few alternatives are also suggested in the concluding part of this study.