

SECTION 1
INTRODUCTION TO THE PROJECT

By
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India is a vast country with a wide variety of climate and hydrological environments; snow clad mountains of the Himalayas in the north, a long coastline in the South, desert in the western part, alluvial plains to the north and hard rock regions to the south. The rainfall is seasonal in nature and most of it falls during the four monsoon months (July to October) with erratic patterns leading to floods as well as droughts in different parts of the country. To meet the increasing demands of the growing population, there has been considerable development of water resources in the country, since independence. During the last forty years, through irrigation, and also hydropower generation, the nation has marched forward towards self sufficiency in agriculture. The increasing rate of water resource development activity, and utilisation of water for various uses, including domestic and industrial purposes, has focused attention on environmental aspects and more particularly water quality. The catchments of rivers are no longer virgin; and the process of development and man's activities are continuously changing the hydrological regime of the river basins. The application of the science of hydrology is increasingly becoming necessary in all aspects and all stages of water resource development and management.

This need was well recognized by the Government of India and the National Institute of Hydrology. In 1978 an apex organization with headquarters at Roorkee, was established to undertake, aid, promote and coordinate systematic and scientific work in all aspects of hydrology. In the first phase of its establishment i.e. during 1979-84, the institute was provided UNDP assistance for equipment, experts and training besides Government of India, Grant in Aid.

For dealing with various hydrological problems in the constantly changing hydrological environment, traditional conceptual rainfall runoff models with lumped approaches are not suitable.

SHE (The European Hydrological System), developed jointly by the Danish Hydraulic Institute, Sogreah (France) and the Institute of Hydrology (UK) employs a physically based distributed modelling approach in order to provide realistic representation of the hydrological processes viz. interception, subsurface flows in the soil root, unsaturated, and saturated zones, overland and channel flows, snowmelt, evapotranspiration, etc., and their complex interaction in space and time. It involves subdivision of the catchment in square grids and models the entire land-based part of the hydrological cycle taking into consideration soil types and land use distribution. The model has the capability of predicting the effects of land use changes, runoff from ungauged watersheds and also for providing the hydrological basis for water quality and soil erosion modelling.

The present project ALA 86/19 Hydrological Computerised Modelling System (SHE) signed between the Government of India and the Commission of the European Communities (CEC) in June/July 1987, is funded by the CEC and involves transfer of technology in respect of the SHE modelling system, to the National Institute of Hydrology by the Danish Hydraulic Institute and its SHE partners for application to hydrological problems. Application of the SHE model to focus basins in India is a major component of the project. In view of the large scale water resources development activity in the Narmada basin and the availability of data, the following six subbasins of the Narmada have been selected as focus basins after discussion with M.P. Irrigation Department, to be used as typical cases for training of NIH staff in the use of the SHE model.

1. Kolar
2. Barna
3. Sher
4. Ganjal
5. Hiran
6. Narmada up to Manot

The climate, topography, vegetation, soil and rainfall in these subbasins have provided a good sample for application of the SHE model, from data collection and processing to simulation-validation and sensitivity studies. The objective of this workshop is to share the experience of the application of the SHE model with field engineers so that useful feedback is provided for further studies.