GEOMORPHOLOGICAL STUDY OF ROCK BED AND GRAVEL BED CHANNEL: A CASE STUDY OF DHUL RIVER CHANNEL, MAHARASHTRA

ABSTRACT

Semi arid regions of upland Maharashtra are subject to wide fluctuations in water and sediment discharge. There appears a general predominance of coarse sediments in these rivers. Rivers in this region are found to respond fast to the changes in the hydraulic regime. (Rajguru et al 1993) There is a definite cut and fill sequence produced due to change in the river regime.

Number of studies have been made in last few decades on the various parameters of the river channel. Channel morphometry, role of vegetation in stream bank erosion, accretion in the channel as well as channel bars are also studied extensively.

The main aim of the present work is to study the geomorphological processes within rockbed and gravel bed channel of small streams.

Introductory chapter deals with the account of literature on the channel morphometry and channel morphology of rock bed and gravel bed streams. It also provides a description of fluvial systems in upland Maharashtra.

Chapter 2 provides a physical background of the study area and method of research work. The watershed of river Dhul is a substream of river Nira in Western Ghat section of Pune district in Maharashtra. River Dhul is a 5th order substream of river Nira with rock bed, gravel bed channel. Total length of the river is 15.7 km and basin covers an area of 99.1 km². It originates on the Raireshwar Plateau and meets river Nira at Sangvi near Bhor.

The study area is part of Deccan traps. The rivers having origin on upland of Western Ghat show similarity in their nature. For the study of morphogenesis in the Deccan Peninsular India the records are meager and to various degrees seemingly intractable. The Trappian landscape
essentially exhibits an erosional terrain over a relatively ancient and stable block. The rivers of upland originate in the elevated high rainfall zone of the Western Ghats (750-1400m ) ASL and flow through broad valleys towards the semi arid east.

The climate of the basin can be described as tropical type of climate. River basin is characterized by plentiful and monsoonal rainfall during the period of June to Sept.

Chapter 3 gives an account of drainage basin morphometry and includes quantitative study of the parameters pertaining to area, altitude, volume, profile of the land and drainage basin characteristics of the area. Linear, Areal and relief aspects are studied to understand the basin morphology.

Major land facets in the catchment are described in this chapter.

Chapter 4 describes the morphology of Dhul river channel. It includes channel geometry, hydraulic Geometry, channel bed topography and channel bed patterns. Salient features of Channel morphology in Maharashtra are described. The chapter also deals with morphology of gravel bed streams.

The channel features such as bars, potholes, waterfalls are also discussed.

Chapter 5 describes about the nature of channel bank deposits. The observations in the field suggest that most of the river channel is very stable and does not show any lateral migration. This is however not true for the channel in the upstream stretch. The river channel west of Titeghar bridge shows a distinct northward shift. There are no evidences of Paleo channels anywhere along the stream course.

The chapter deals with the properties of left and right deposits and the downstream variations.

Chapter 6 gives major findings and conclusions of the work.