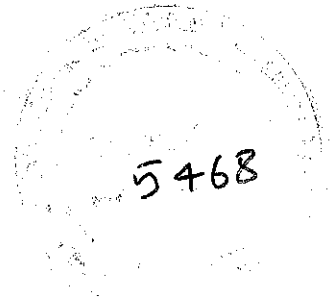


THESIS

PERFORMANCE OF NUMERICAL MODELS FOR SEDIMENT ROUTING  
IN ALLUVIAL CHANNELS



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## ABSTRACT

### PERFORMANCE OF NUMERICAL MODELS FOR SEDIMENT ROUTING IN ALLUVIAL CHANNELS

Unsteady flow in rivers involves flow of sediment and sediment laden water, which is described by three governing equations (i.e. Saint venant equations and sediment continuity equation). The formulation of the governing equations can take different courses, similarly the solution of the resulting algebraic equations may be worked out in numerous ways. The outcome of this is then many models each using different numerical formulation and/or solution approach.

These models can generically be classified as coupled and uncoupled models and/or linear and nonlinear models. The uncoupled models neglect the coupling of water and sediment phases. Models which account for rate of deposition and erosion are called coupled models. Linear models, neglect the non-linearity of sedimentation phenomena by linearizing non-linear terms in the difference equations.

The different classes of unsteady flow models were studied thoroughly by analyzing them theoretically and by comparing results of four representative models. The

effects of some parameters used in the models were also studied. The relative performance of the models were compared with respect to each other. From the comparison non linear coupled model (NCM) was selected as best among the given models in terms of overall performance. The selected model (NCM) was further verified using data from main river (Indus River) and was found to describe the sedimentation phenomena adequately.

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