



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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SHORT ABSTRACT

Alluvial channels with sinuosity follow an altered flow behavior, contradictory to straight flows. The usual sight of a river system consists of bends or loops along its course. Pervious channel boundary allows the transfer of water between the surface and sub-surface of a river system. Extensive use of groundwater causes depletion or lowering of the groundwater table. This has led the channel water to seep away and join the water table underneath, commonly known as downward seepage or suction. The association between surface water and groundwater is of great importance in the field of hydraulics and a large information can be gathered by analyzing the streamflow data. Seepage has its effects on both the flow parameters and the rate of sediment transport. To address the nature of turbulence and the morphology in sinuous channel with downward seepage an experimental framework was designed. The flow and the morphology studies were conducted in three different sinuous channels. A noticeable shift of the flow parameters near the channel bed were observed in the sinuous channel. Downward seepage promoted significant modifications along the channel bed. The flow alternations with seepage have led to enhanced sediment transport with active erosion at the outer bend and deposition at the inner bend. These results have highlighted the processes in a sinuous channel affected by downward seepage and provide interesting information of the natural alluvial channels, where groundwater table depletion is a significant concern.