PREFACE

Since time immemorial, people have depended on mighty rivers for their livelihood. However, these same rivers have been migrating, and thus, sweeping and ultimately removing agricultural land and cities in their path. The manner in which rivers change the form and pattern of their channels has been a recurring theme in river studies for many years. Planform analysis helps us to understand the changes in channel pattern in both time and space. The Ganga river is one of the most important rivers in the Indian subcontinent. It has numerous large and small tributaries, of which the important ones are the Yamuna, the Gandak, the Kosi and the Mahananda. The total length of the river Ganga is 2,506 km and its catchment area is about 10,73,070 km^2. The middle Ganga basin in Bihar is especially prone to river migration. In this stretch, the river course changes considerably in magnitude as well as direction. In the absence of any industrial developments in the nearby area and it being one of the densely populated regions of the country, the pressure on land for sustaining life is very high. The conventional approach to collect information regarding the shifting characteristics of the rivers is not only uneconomical but time consuming as well. Remote sensing data obtained through satellites may be effectively used to evaluate the shifting characteristics of rivers in a quick and cost effective manner. In this context, a one day seminar on the topic "**Shifting Characteristics of Rivers Using Remote Sensing**" is being organized by Centre for Flood Management Studies, National Institute of Hydrology, Patna.

During this seminar, a theme paper entitled "**Evaluation of Shifting Characteristics of River Ganga between Ara and Patna Using Remote Sensing Data (IRS –1C LISS –III and PAN Data)**" will be presented and this volume is a compilation of this theme paper. The study has been carried out by Dr. Chandranath Chatterjee, Shri Pankaj Mani, Shri Rakesh Kumar and Dr. Sanjay Kumar, Scientists, Centre for Flood Management Studies (CFMS), National Institute of Hydrology, Patna. In this study, the shifting course of river Ganga between Ara to Patna has been studied using IRS-1A LISS-II data for the year 1989, IRS-1C LISS-III data for the years 1996, 1998 and 2000 as well as Survey of India toposheets for the period 1974-76. Based on the study, the critical locations along the Ganga river course from Ara to Patna where shifting has occurred were identified. For the identified critical locations, detailed study was carried out using IRS-1C PAN data for the years 1996 and 2000 in order to determine the extent of erosion and the population affected. The study not only evaluates the shifting characteristics of the river Ganga between Ara and Patna but also demonstrates application of satellite remote sensing data in river migration investigations. The seminar is intended to disseminate the findings of the aforesaid study including deliberating on the methodology adopted for the study and come out with recommendations for applications and further studies. It is expected that the water resources planners and flood protection agencies both at the State and Central levels, will be benefited by the deliberations and discussions during this session and useful recommendations will be drawn up and feasible action plan will be evolved for taking up future flood management studies for Indian rivers.

Patna
May 02, 2003

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