

## ‘Geomorphology and Environmental Sustainability’

Kalwar, S. C. Sharma, M. L., Gurjar, R. D., Khandelwal, M. K. and Wadhwan. S. K.

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Geomorphology and Environmental Sustainability: Festschrift to honour Professor H. S. Sharma one of the well known Geomorphologists in India, is a collection of 29 papers, organised in five main themes. It deals with contemporary research trends in applied geomorphology and environmental sustainability.

The first section with seven papers is devoted to geomorphological processes. The first paper by Amal Kar gives a detailed account of erosional processes and morphology of sand dunes in the Thar desert, highlighting the spatial forms of aeoline activity and sand stabilization initiatives undertaken in the area. The other two articles focus on fluvial processes. By computing the sinuosity index, Basu and others look at fluvial processes related to meandering and cut-offs, of the Bhagirathi River. While Kalwar and others study the problem of floods and water logging in the Ghaggar River, in Hanumangarh district of Rajasthan. They suggest raising the water table and building embankments to channelize the course of the river as remedial measure to cope with natural disasters. The other three articles identify problems arising from desertification and land degradation. Dhinwa and others analyse the problems of desertification in the cold desert regions of northern Ladakh,

while Patra and Thakur look at land degradation processes in the highlands of northern Orissa. The authors, by calculating the amount of degraded land, have determined the spatial pattern of distribution, highlighting the causes and the inter-linkages underlying the degradation processes. Doi in his study uses LISS III data to classify the non-arable land in the sub-watershed of Morel River in Rajasthan. The same data is also used to identify and interpret ravine lands in the area. The lone article by Sharma and Sharma in this section is related to neo-tectonic activity and seismicity in and around the Sambhar Lake area of Rajasthan. Sharma’s study provides useful introduction to the geomorphology and geology of this region.

Section two has six articles, all related to applied geomorphology. The paper by Surendra Singh demonstrates the application of geomorphic concepts in appraisal and integration of natural resources for sustainable landuse planning in an arid region. Besides highlighting the salient morphological, biophysical and morphohydrological character of natural resources, he concludes with a discussion on the degradation of natural resources in terms of the problems related to wind and water erosion and deposition, floods, industrial effluents and water logging. He emphasises the significance of major land

resource units for integrated assessment and management of natural resources. The article by Mukhopadhyaya looks at land use shifts and attendant ecological problems in the Sundarbans. Singh, in another study of land use and land cover in Jhunjhunu district of Rajasthan proposes a scheme for a thematic integration of landforms and groundwater prospects to optimise the present land use practices. The paper by Padmaja and Somiah is an attempt to evaluate landforms for recreation, using quantitative qualitative parameters, giving due weightage to consumer perception of scenic quality. Agarwal in another study, looks at the distribution of settlements and morphometric attributes in the Parbati Basin in southeast Rajasthan. In the same view Sharma too looks at the relationship between land resource and cropping activity in the central Indian states of Madhya Pradesh and Chattisgarh.

The third section has four essays related to climate change and its impact on the environment. Wadhwan and Singhvi's study provides an insight into environmental changes in the dry lands of India- looking at the phases of quaternary changes in western India, the authors are of the opinion that the timings of major millennium scale of dryland environmental changes was not synchronous from place to place. Savindra Singh, using a number of indicators - biological, geological, cryogenic, tectonic along with some historical records of climate, puts into perspective the role of geomorphological indicators of climate change. His essay presented in a reader friendly format will motivate and stimulate those interested in looking at issues arising out of climate change in the Indian context. In the same section, Khan elaborates on

greenhouse effect, global warming and climate change, drawing attention to the likely impact of such changes, particularly acid rain, may bring in forests, crops and other natural vegetation. Akhtar and Hironi in a similar study also issue a warning of the serious consequences of acid rain on vegetation and plants.

In the fourth section most of the authors are concerned with the issues of sustainability and their impact on the environment. There are two essays which deal with the general theme of environmental impact assessment (EIA), natural resource management and sustainable development. Shukla's is an excellent account which helps to acquaint the reader with the aims, scope and procedural framework of the EIA, including its status and institutional set up in developing countries. Padmaja and Ramchandran discuss the issues of natural resource management and comment on the type of sustainable programmes that need to be undertaken in India. The other three papers focus on problems related to anthropogenic impact on the environment. Attention is focused here on a variety of issues like the impact of urbanisation on the environs of Ajmer city, or Rai's study of the environmental aspects of mining in Meghalaya and the EIA for the Kota thermal power station in Rajasthan. Bhakar's study is an attempt to reevaluate the sustainability of irrigated agriculture in arid zones, while Hironi assesses the impact of the largest fertilizer plant in the neighbouring villages. His findings point to pollution of groundwater in the area. Ozha and Golani, looking at groundwater management in depleted areas are of the opinion that integrated approach seems to be a viable

option for bringing about sustainable development.

The fifth and last section has two papers on biodiversity, the one by Meena discusses how a desert national park can be a significant input for conservation and development in India. Bakres article, the last in the volume, draws the readers attention with its eye-catching title. He talks about the phenomenon of 'Vanishing birds' in the Indian skies and attributes their absence to the increased use of pesticides by Indian farmers.

Geomorphology and environmental sustainability is a well edited collection of papers which reflects a broad spectrum of contemporary concerns related to the theme of sustainability. Such a wide coverage of topics is bound to interest geographers and students of geomorphology to undertake serious research on a number of questions raised in the discussion which need to be resolved.

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