

Quaternary Deltas of India. R. Vaidyanadhan, ed Geological Society of India, Bangalore, Memoir 22, 1991. 291 pp.

Deltaic areas are significant because of their importance in agriculture, settlement sites, navigation, and hydrocarbon exploration. The delta regions are the most dynamic coastal domain where quick, significant changes in the form of land loss and land gain take place. There are continuous changes in the landform due to abandonment and development of river channels. In India, a number of deltas are developed on the East Coast which vary in the role of tidal and wave energy, and sediment and water discharge. In contrast, the major rivers of west coast make prominent estuaries. In the last few decades, deltaic regions have gained significance as they are the sites of major hydrocarbon discoveries world-over. In India too, several East Coast deltas have attracted hydrocarbon exploration.

Keeping significance of studies of deltas in mind, a seminar was organized by R. Vaidyanadhan at Andhra University, and the book under review contains papers presented at that seminar.

In India, study of deltas has been essentially carried out by geographers, emphasizing mainly the various landforms of the subaerial part. There is very little information on the subaqueous part and on the nature of deltaic deposits. Vaidyanadhan brings out significant points on the status of study of deltas in India in the opening chapter of the book.

Study of a delta requires good documentation of subaerial and subaqueous geomorphic features, characteristics of various depositional environments and nature of their deposit, physical, chemical and biological characters of the sediments. It is also important to document vegetation and animal life of the delta region. Detailed oceanographic and hydrological information on the active river mouth is essential in understanding the deltaic processes.

The East Coast of India shows the development of a number of deltas of various dimensions, forming in a wide range of conditions with varying role of tide, wave and river processes. It offers a unique opportunity to study the variability in deltaic deposits with changing physical parameters. It is also important to understand the role of monsoon climate, extreme fluctuations in discharge, and effects of cyclone on delta-building.

The book under review contains articles on deltas of the major rivers of East Coast, namely Ganges, Subarnrekha, Mahanadi, Godavari, Krishna, Pennar, Cauvery, and small rivers of Tamil Nadu. There is also an article on the Narmada and Tapti estuaries of West Coast, to provide a contrast to East Coast deltas.

The Godavari-Krishna delta is discussed in several articles dealing with morphological changes, sediment characteristics, shallow seismic structure of shelf, and land use patterns.

There is a review article on hydrogeology of important delta regions of India discussing groundwater problem of delta zone. There are also review articles on soils and floral characteristics of delta regions. There is an

interesting paper documenting short-term changes in the coastal zone of Bengal and Orissa. One paper gives comparison of Niger and Godavari delta from the point of view of hydrocarbon potential. At the end, there is a useful selected bibliography on deltas. The quality of data and emphasis of various deltas is highly variable.

Going through the volume it becomes evident that the study of deltas in India is in a very preliminary state. Essentially, the geomorphic features of subaerial parts are described, without any description of subaqueous parts. There is no attempt to develop time-relationship amongst various geomorphic features. There is no attempt to develop evolutionary models for various deltas during Quaternary, giving vertical and lateral sequences. Studies on dynamics of river mouth processes and their relationship to oceanographic-meteorological parameters are missing. It would be very important to understand the effect of monsoon and cyclone on delta-building. It is hoped that future studies would emphasize these aspects.

Nevertheless, R. Vaidyanadhan and the Geological Society of India must be congratulated for bringing out this useful volume, giving clearly the state of research on deltas in India. The book is useful to geographers and geologists interested in the deltaic studies and East Coast deltas of India.

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