

of CWs for wastewater treatment in cold climate areas. The central issues focused are the long-term experiences of such wetlands, optimum design to improve purification efficiency, the intensity of the critical processes of organic matter mineralization and nutrient retention during winter, and constructed wetland use for multiple purposes.

Unlike in tropical climate, the constructed wetlands face two main difficulties in cold climates. First the lack of hydraulic continuity due to freezing temperature that changes the viscosity of the wastewater and, second the inadequate treatment purification processes due to absence of warmth. Nevertheless, the outcome of this book recommends that several effective measures be implemented to guarantee the functioning of purification processes in winter too.

In cold climates, the selection of constructed wetland type is of great importance. Experiences suggest that planted soil filters with not only vertical but horizontal flow also are the most suitable ones for cold regions, removing biochemical oxygen demand (BOD), suspended solids, faecal coliform bacteria and nitrate very effectively. Living reeds are important if only to provide litter on which aerobic biofilms grow. Phosphorus removal is proposed to be reliable only with specialized media in the bed, and ammonia removal requires specialized treatment. There is no strong evidence for reduced performance during cold weather and cold climate does not restrict the use of constructed wetlands for wastewater purification if proper design considerations are observed. Cold climates, however, require larger and deeper systems than those found in warm climates.

In cold regions, the treatment wetland must have a septic tank and an aerobic pre-treatment step of gravel-bed prior to reed-bed discharge and finally to an infiltration gravel bed. This design meets the secondary treatment standards for TSS, BOD and faecal coliform bacteria. The reduction in BOD loading possibly reduces clogging around the inlet of the constructed wetland. Nutrient removal has been somewhat poorer than expected. Horizontal flow systems are an appropriate technology for high-stability elimination of chemical oxygen demand (COD) and BOD but nutrient removal only amounts to average values of 30–50%. To achieve higher elimination rates, vertical flow systems have been developed. Chapter 6 suggests an

alternative to pre-treatment system which can be the multistage (hybrid) constructed wetland combining the well-aerated vertical flow beds (mineralization of organic matter, nitrification, phosphorus adsorption), horizontal flow beds (denitrification), and free-water surface beds (additional N removal, polishing). The crop of plants on the gravel-bed performs the potential role in enhancing the microbiological processes occurring in the gravel-bed and associated biofilms. An important role that they play, not related to the improvement of water quality, is in enhancing the aesthetics of systems by creating an environment attractive to birds, reptiles and amphibians, Chapter 5 reviews that additional species should be evaluated for use in cold climate wetland performance. Norwegian experience indicates that by simple design measures, such as increased depth of the system and adjustment of the water level, potential hydraulic problems during the winter can be avoided. For additional safety, straw can be used for insulation for a few years, until sufficient plant debris is produced by the system itself. Several light-weight aggregates (LWA) with high initial hydraulic conductivity and high rate of phosphorus adsorption seems to be the most effective filter media for constructed wetlands in cold climates (chapter 14). LWA are made from clay or shale by heating to temperatures above 1000°C and have been successfully applied in constructed subsurface flow wetlands in Norway. High hydraulic conductivity, combined with high phosphorus removal and good insulation properties, have characterized LWA. New results show that LWA exceeds sand systems for nitrogen removal.

The selected papers in the book were peer-reviewed. This valuable book, no doubt, will be immensely useful to researchers, planners, engineers and decision-makers in the fields of applied ecology, ecotechnology, wastewater treatment management, and environment impact assessment. The book represents a good contribution and deserves to be placed in libraries where this low-cost ecotechnology is at the door-step for take-off on a mass scale level.

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Four Decades of Marine Geosciences in India – A retrospect. Geological Survey of India, Special Publication No. 74, 2002. 325 pp. Price: Rs 575.

This special publication of the Geological Survey of India incorporates papers presented in a national seminar held at Mangalore, during 14–16 March 2001. The volume highlights the advancement of knowledge in the field of marine geosciences since Indian geoscientists started making forays into this domain. The present volume, as the title indicates is a retrospect measuring the efforts made to understand the geology of the sea floor especially the part adjacent to India's territorial boundaries. A long shoreline braces peninsula India, and the country has a long history of having maritime interest. Importance of marine geosciences lies not only in the exploitation of mineral resources present in the seabed; but the information on the seabed morphology is also considered vital from the point of view of the national security. This is true especially when we consider the territory represented by the chains of islands far from the mainland.

The volume includes fifty-one papers covering varied aspects of marine geology. Most of the contributions are from the Geological Survey of India, while a few are from other government organizations and university departments. Considering the fact that the efforts in the field of marine geosciences were initiated only four decades ago, it is invigorating to note the progress made in the field of marine geosciences in India mainly under the leadership of the Geological Survey of India.

The papers are grouped under eight heads. A shorter grouping avoiding the use of diverse criteria would have been more appropriate though this is not a very serious handicap. Thematically, the papers cover four important geological aspects, namely, seabed morphology, sedimentation and stratigraphy, palaeogeography and Quaternary processes and mineral resources. There are also a few papers dealing with the important aspect of coastal management.

Knowledge and understanding of the physiography of the seafloor falling within the 'Exclusive Economic Zone' (that extends up to 200 nautical miles from the territorial sea limit) is quite essential for proper exploitation of natural resources. If the inclusion of very few

papers under this category is any indication, it tells about the lack of significant efforts made so far in this direction.

Quite a number of papers deal with sediment characteristics in different morphological milieu, which reflects their variability in the proximal and distal parts of the shores and river mouths. Sea level changes and associated palaeoclimatic conditions during the late Quaternary is the theme of a large number of papers. The different authors of these papers have mastered evidences from stable isotope data, palaeontological studies, discovery of submerged archaeological sites, and also through the tracings of the palaeo-strand lines.

The mining of mineral resources present in the marine regime is still consid-

ered a virgin area in the field of exploitation of resources. This is aptly reflected in the papers included under this category. It appears that besides hydrocarbon deposits (about which there is hardly any paper!) the placer deposits of heavy minerals are the only deposits presently available for exploitation. There are a few papers highlighting application of geophysics in marine geology. One paper dealing with petrochemistry of the 'Central Carlsberg Ridge Basalt' deserves special mention. Readers would find this paper quite fascinating providing information on the youngest rocks forming over there. Only two papers are listed under the category of 'Coastal dynamics and management for development'.

Overall, this is a very important publication of the Geological Survey of India, and the credit for this should go to the editors of the volume. The quality of printing and binding of the hard bound volume are quite praiseworthy. The only disquieting part of the volume is the poor quality of illustrations (a common phenomenon with most of the government publications!). Also, the front cover could have been aesthetically more satisfying without so much writing on it!

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Errata

Isolation of a novel transcription factor from rice by differential display of mRNA

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Current Science, 2002, **83**, 1568–1573.

In this paper, we reported an isolation of a novel full length cDNA clone *RIG1A* using the partial cDNA *RIG1* derived from differential display. Here, we would like to clarify that *RIG1A* isolated from rice cDNA library was a false positive clone and its isolation was due to a cloning artifact. The original full-length *RIG1A* contained a full-length ORF encoding transcription factor-homologous protein, its 3'-UTR, a poly(A) tail, an artificially introduced adaptor-linker from the cDNA cloning system, a partial fragment of another rice cDNA, *RIG1B*, and a poly(A) stretch. Note that we have subsequently isolated a full-length cDNA, *RIG1B*, its 3'-UTR is fully homologous to *RIG1* (our unpublished data). The accession numbers for *RIG1*, *RIG1A* and *RIG1B* are AF503582, AF503585 and AF503583, respectively.

The errors are regretted.

— Authors

Quaternary alluvial stratigraphy and palaeoclimatic reconstruction at the Thar margin

M. Jain and S. K. Tandon

Current Science, 2003, **84**, 1048–1055.

On page 1053, second column, para 2, line 16–20: 'In the more calccrete-affected horizon of the same unit, there is a significant drop in the S/I ratio and an increase in the S/C supporting that an increase in the smectite content is due to alteration of ILLITE under alkaline conditions' should read as 'In the more calccrete-affected horizon of the same unit, there is an increase in the S/C ratio suggesting that the increase in the smectite content is due to alteration of CHLORITE under alkaline conditions'.

The error is regretted.

— Authors