

## BOOK-REVIEW

### **GEOENVIRONMENT - AN INTRODUCTION, (1995)**

by U. Aswathanarayana. A.A. Balkema, Rotterdam, 270 pages.

The preface in the book succinctly puts forth the problem of geoenvironment thus: 'natural resources are available in the landscape, and this landscape is generally to be manipulated in order to get access to the resources and the environment side effects are unavoidable; to minimize them is part of the overall challenge' (p. xiv). As someone had put it long ago, the day man started first to till the soil, degeneration of land had been perhaps initiated!

During the last two decades, there have been many publications on Geoenvironment dealing either in great detail on certain specific aspects of it or covering the whole scenario, or exclusively dealing with case histories (as in the case of Proceedings of Seminars or Conferences). A vast majority of these pertain to problems in developed industrial countries. The book under review is a welcome departure in some respects.

The eleven chapters are aptly chosen starting with Introduction of the subject, successively followed by Dynamics of Geoenvironment, Environments of Soils, Water, Sediments, Air, Natural Radiation, Mining, Geotechnology and Health. The last Chapter deals with models proposed by World Bank on possible cost-effective methods to be adopted to minimize/eradicate the pollution problem. Almost every chapter commences with the nature of problem, the elements involved, their genesis, association, distribution, processes (where applicable), the methods of analysis and study, the permissible limits of the hazardous unit for survival, ending up with a few case histories. Numerous tables, charts and graphs provide substantial basic data. Such a treatment will be found to be most useful both for the novice as well as the professional.

Perusing the book, one would find data and statements quite revealing and not normally anticipated, indicating the complexities involved in the study of geoenvironment. For example, methyl mercury is more toxic than mercury itself; hexavalent chromium is more toxic than the trivalent form (p.31). It looks as though preparation of a geochemical atlas must be taken up by all countries as has been done by the Nordic countries in Europe (p.39), which would form a good data base. There are quite a few matrix diagrams evolved to identify the nature and magnitude of environment impacts and one of them is given here (p.43). That soil degradation is taking place at an alarming rate is known. It is estimated that every year 8 million hectares of good agricultural land is lost due to urbanisation (construction of habitations, industries, roads etc., p.61). One point emphasized here is that technical measures of soil conservation will succeed only when they go hand in hand with requisite socio-economic measures, particularly in developing countries in the south (p.66).

Man cannot control the hydrological cycle, but can make attempts to reduce unproductive evaporation and surface runoff and maximise the retention of precipitation as soil moisture. Whereas grandiose plans are usually formulated by the planners, taking the methodology adopted by the developed countries, to supply drinking water to the community, in the author's opinion, in third world countries, where feasible, it is best advised to obtain its supplies of drinking water from a number of hand operated tubewells, with sound well-head protection (p.82). It will be interesting to know that the farmers in the district of Devils Den found it more profitable to sell water to Santa Clarita, a suburb of Los Angeles (USA) and keep their land fallow, than undertake farming (indicating the increasing value of water to community)!

An example of how contribution from "source" countries to pollution has affected the Baltic Sea is given and these countries (Sweden, Denmark, Finland, erstwhile Soviet Union, Germany etc.) have now signed fresh agreements to manage together environmental problems (p.125). Since pollution in many cases transcends administrative and political boundaries, it is imperative that in future a group of nations have to come to such agreements in the larger interest of the people therein. This is particularly applicable in the case of air pollution. The effect of acid rain is treated in considerable detail (pp.135-145). It appears that an increase of CO<sub>2</sub> can also have some beneficial effects (p.146), even if surface temperature is increased by different degrees in different parts of the earth due to the greenhouse effect.

Finland has evolved a building code to minimize radon risk from its vast granitic basement (p.157). With Peninsular India having a large areal extent of igneous rocks, perhaps it is necessary to evolve a similar building code in our country as well. Mining of mainly iron ore and coal that has contributed to a large extent to the pollution in different parts of the world. Measures, however, are being undertaken even in India to reclaim and possibly bring about regeneration of biota in such areas. During the recent decades, governmental organisations world over have woken up to the problems posed by natural hazards. Some of these are monitored and warning given (floods, hurricane) and in some cases maps are prepared indicating hazard prone zones (earthquakes, landslides, floods etc.). Disposal of industrial waste into land or into the sea is a great hazard the governments are trying to combat this menace. These wastes are to be treated appropriately before they are dumped in (p.217), to minimize their harmful effects.

A subject often ignored is the interrelationship of endemicity of certain diseases with specific geographic locales due to more than permissible levels of certain elements in the natural environment (land, water or air). Iodine deficiency and fluoride disorders are among these and are described with examples (p.239). What deters more often a community or a government from undertaking remedial measures to minimize the ill effects of environmental pollution of whatever kind, is the cost involved. The last chapter deals with these aspects, in a brief manner, with the hope that appropriate technologies at minimal costs will be applied in developing countries to tackle this problem.

On the whole, this publication contains a wealth of basic information culled out from authoritative sources (listed at the end of each chapter) to help the students in developing countries to understand the problem and to initiate possible solutions. Example cited are mostly from developed countries and similar ones are wanting from the developing ones, it may perhaps be due to paucity of published data, or inaccessibility of the same to the author or the pollution level has not reached such alarming proportions in the Third World. We wish that the last to be the case!

This book deserves a place in Earth Science libraries, and as indicated modestly in the title - is a good introduction to the subject of Geoenvironment.

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