

## REVIEWS & NOTICES

**The State of India's Environment 1982—A Citizen's Report.** Centre for Science and Environment, 807 Vishal Bhavan, 95 Nehru Place, New Delhi 110 019, India: [iii] + 190 pp., illustr., 28.5 × 21 × 1.5 cm, Rs 125, 1982.

Towards the end of the first world war it used to be said that the situation in Berlin was serious but not hopeless, whereas in Vienna it was hopeless but not serious. I have often lightly used the Vienna situation as an analogy when discussing India with those who 'know' it only from the press and television, and so can have no appreciation of the capacity of India and its people to survive. In fact, of course, Berlin is really the correct analogy, for India's environmental situation is serious, very serious; but it is not hopeless.

The gravity of the deterioration of land, water, forests, and air, and of the quality of life of a high proportion of Indians, has now been neatly documented by a dedicated group of non-official men and women, who have ransacked official and non-official reports and added personal observations of experts. Their achievement is part of the reason why the situation is not hopeless.

*The State of India's Environment [1982]*—A Citizen's Report, has been produced by the Centre for Science and Environment, a recently-established private organization which operates an information service on science, technology, and development, and whose address is given in the heading to this review. The book is well summed up by the Editors themselves, as 'a dramatic picture in which the misery of the human condition in our country is mirrored by the sweeping degradation of its environment.'

Each of the 11 chapters, dealing with various aspects of the environment, is preceded by half-a-dozen highlights calculated to chill the blood of anyone who cares about the future of India and its people. Here are some examples:

**Land**—From a quarter to a half of the lands brought under irrigation could go out of cultivation permanently because of soil salinity and waterlogging.

**Water**—Seventy per cent of all the available water in India is polluted. About 73 million man-workdays a year are lost owing to water-related diseases. In a 158-km stretch of the Hoogly, the average annual yield of fish in the unpolluted zones was 719.25 tonnes as opposed to only 124.94 tonnes in the polluted zones.

**Forests**—Although the forest department controls 23% of India's total area, only about 10–12% of the country has adequate tree-cover.

**Dams**—Siltation rates in the reservoirs behind major dams are from three to four times as high as the projected rates. The lifetime of the Tehri Dam may be just 30 to 40 years instead of the proposed 100 years.

**Atmosphere**—India's premier pollution research institute claims that 60% of Calcutta's residents suffer from respiratory diseases because of air pollution.

**'Habitat'**—India's urban population has doubled in the last 20 years. In the 30 years from 1951 to 1981, Calcutta and Hyderabad have doubled their populations, Greater Bombay, Madras, and Ahmedabad, have tripled, while Delhi and Bangalore have quadrupled.

**People**—The rapid conversion of pasture lands into farms has robbed pastoral nomads, who comprise almost 6%

of the country's population, of their resource-base, greatly impoverishing them in the process. Many millions have already become landless labourers.

**Health**—Every third person who dies in India is a child below the age of five—a victim of a vicious combination of poverty, malnutrition, insanitary environment, and unclean drinking-water.

**Energy**—Firewood scarcity in rural and urban areas is increasing dramatically. In mountainous Garhwal, women walk at least seven hours, three out of every four days, to bring back 25 kg of wood each time. In many cities firewood prices have nearly doubled in the last six years.

**Wildlife**—A little over 10% of India's flora faces extinction; many species may be lost even before their possible value is known to society. Wildlife is threatened by a flourishing illegal trade in wildlife products.

**Government**—In the last few years a number of environmental institutions have been established but the Government has yet to develop an explicit national policy on the environment.

That is the bad news. But the last of the above items indicates that consciousness of the problem of environmental conservation is growing in India, and there is now a Department of the Environment under the direct charge of the Prime Minister, Mrs Indira Gandhi. This adds greatly to the strength of a movement which began ten years ago with the establishment of the National Committee on Environmental Planning. The latter has sponsored projects on a whole range of subjects, including investigation of the long-term environmental impact of the Idukki Dam in Kerala and the impact of the link between the Beas and Sutlej Rivers. Guidelines have been prepared for mining activities, and another group is undertaking research on the environmental problems of the metallurgical industry.

Of special interest are the efforts which are being made to involve the universities in studies of environmental problems,\* which could help to create awareness among young people. Moreover, environmental impact assessments are now frequently required, although there is the problem of lack of expertise to carry them out. One such effort was successful in dissuading the Tamilnadu Government from building a hydroelectric project in the middle of a wildlife sanctuary!

Environmental conservation, which is a directive principle of the Indian constitution, is now the subject of increasing legislation. However, implementation is handicapped because the importance of the subject has yet to penetrate deeply into Government and administration, where many officials continue to neglect environmental factors.

Past failures are officially recognized in the Draft Sixth Five-Year Plan. This gives hope that those charged with the care of India's environment will take up the challenge

\* Here we recall the relatively new Indian Journal *Environmental Awareness*, edited by our Advisory Editor Dr G. M. Oza and published by the Indian Society of Naturalists (INSONA), but should comment that, after the United States, we still get sent probably more papers and shorts from India than from any other country. Unfortunately, rather few of them are prepared in the style of our Journal.—Ed.

to see that their message penetrates all governmental and developmental activities, and activates the people themselves. Unless that happens, the future for India's people could be dismal.

This 'Citizen's Report' will itself help to raise public consciousness and, one hopes, act as a spur for Government. It will arm the press with good documentation. Probably no other country has produced a report to match this one, which is soundly based and has an excellent annotated list of sources for each chapter; it is also well illustrated with charts, diagrams, and photographs. There may be some weaknesses in the Report, but it provides a sound base on which to build successive editions.

PETER F. R. JACKSON  
*Haut Verger, 1171 Bougy-Villars, Switzerland.*

**Saltmarsh Ecology**, by STEVEN P. LONG & CHRISTOPHER F. MASON. Blackie, Glasgow & London, UK: 160 pp., figs & tables, 20 × 14.6 × 1 cm, paperback [no price indicated], 1983.

This little book is a good, brief summary or 'state-of-the-art' treatment of the distribution, ecology, dynamics, and importance, of salt marshes—ostensibly of the world, but primarily of England. The writing is uninspired, but reasonably clear—except for, in some chapters, an undue dependence on mathematics and pseudo-mathematics. The book is amply illustrated with diagrams, tables, maps, drawings, and photographs, though many of those last are badly reproduced.

This is neither an elementary nor a popular book, but will be useful for advanced students and professional ecologists. Others may find it dull or hard reading. The subject is broadly covered, though some topics are only briefly treated. The last chapter is on the conservation of salt marshes, covering the subject but showing only matter-of-fact interest on the part of the Authors. It does, however, bring out the distressing fact that these valuable wetlands are seriously threatened practically everywhere—even where they are legally or officially protected.

F. RAYMOND FOSBERG  
*National Museum of Natural History  
Smithsonian Institution  
Washington, DC 20560, USA.*

**Long-distance Water Transfer**, Edited by ASIT K. BISWAS, ZUO DAKANG, JAMES E. NICKUM & LIU CHANGMING. Tycooly International, Dublin, Ireland: xv + 417 pp., 71 figs, 24.5 × 17 × 2 cm, stiff paper cover, £17.75, 1983.

Water is an essential component for human survival which, seen as an environmentally 'clean' and renewable resource, has been intensively exploited during the past two decades. Severe droughts in many regions of the world, the increasing costs of thermal power, and accelerated industrialization within developing countries, provided the impetus for water developments. Food and energy self-sufficiency are perhaps the most important objectives for any nation, not least the countries of the Third World; yet increasing water pollution imposes growing management problems. A fundamental impediment for many countries has been the inequitable spatial distribution of water supplies, such that economic developments have been restricted because of limited

local resources. One potential solution to this problem is the transfer of water over long distances from water-surplus areas to water-deficient ones; other possibilities include weather modification, desalination, iceberg-towing, and recycling. But these latter means, at least at the present time, can only be used as possible local solutions, and are unsuited for extensive agricultural development.

*Long-distance Water Transfer* focuses upon the economic and environmental issues associated with large-scale artificial mass-transfers of water from a water-surplus to a water-deficient region in order to further the economic development of the latter, mainly through agricultural and industrial development. Such transfers are achieved by diverting the course of a river, or by constructing a large canal or pipeline which could carry a significant portion of the available water. This book is a direct result of discussions on China's water-transfer plan between an international team of experts, Academia Sinica, and appropriate Chinese water management agencies. It seeks to present generalized conclusions from case-studies which could be used as broad guidelines for other developments.

The first five chapters outline the general considerations for long-distance water-transfer projects and the experiences gained from such projects in some different parts of the world. These are followed by twenty-four chapters dealing with the present plans for long-distance water-transfer in China which, when carried out, will certainly be one of the largest water projects ever undertaken in the history of Mankind.

Unlike the north-to-south transfers of North America and the Soviet Union, where both the exporting and importing regions are sparsely populated and have only limited industrial or agricultural development, the Chinese proposals will affect densely-populated industrial and agricultural centres. Nevertheless, it is perhaps surprising that important water-transfer schemes such as the California aquaduct, USA, and the planned 2,500-km-long Ob-Amu-Darya transfer in the Soviet Union, are not examined in detail. Instead, we have rather brief discussions of past, present, and planned, water-transfer projects in Egypt, India, Japan, and Texas, USA.

Despite the lack of detailed evaluations, the first part of the book emphasizes the need for the balanced planning of any proposed transfer schemes. China's proposals involve the south-to-north transfer of water from the Chang Jiang to the Huang-Huai-Hai Plain, but the extensive discussion presented by the forty-five contributors lacks adequate editorial control: basic descriptive information is duplicated, much of the discussion is repeated, and the individual papers do not appear to be organized in any meaningful way. Nevertheless, the 'Chinese Experience' contains a large amount of valuable hydrological and ecological data, and raises many questions pertaining to the assessment of economic and environmental values. It is recognized that the project will have a tremendous impact upon the natural and social environments, and on the productive activities of society.

The diversion of water will alter the riverine, floodplain, delta, estuarine, and even near-shore, habitats not only within the yielding drainage basin but also within the receiving basin. In the Huang-Huai-Hai Plain, one special concern is for the salinization of soils, and salt-water intrusion in the Chang Jiang estuary has already affected industrial and agricultural production in Shanghai. For nearly five-thousand years, dams have been constructed

