International Journal of Ecology and Environmental Sciences 39 (4): 271-275, 2013
ISSN: 0377-015X (Print); 2320-5199 (Online)

BOOK REVIEWS

Rai, Raveendra K.; Upadhyay, Alka; Ojha, C.S.P. and Singh, Vijay P. 2012. The Yamuna River Basin: Water Resources and Environment. (Water Science and Technology Library Vol. 66). xxx+ 478 pages, 207 illus., 149 illus. in color Springer, Dordrecht. ISBN: 978-94-007-2000-8 (hardcover) € 129.95

A river basin covers the entire area drained by a river, including its tributaries and is synonymous with the term river catchment. River basins have for long been recognised as the basic units for the management of water resources (e.g., Newson 1992). In most parts of the world, as the demands for limited water resources grow and multiply, the rivers are seriously threatened. This has promoted in recent years the concept of integrated river basin management (IRBM) which seeks to coordinate conservation, management and development of water, land and related resources across sectors within a given river basin. The concept of IRBM is gradually gaining ground in India also as it is now planned to be implemented through an Act of the Central Government (*http://mowr.gov.in/writereaddata/Reports/Doabia-Committee-Report-2012.pdf*).

Among the rivers in India, River Ganga has a very special place not only because of its cultural and religious links but because its basin covers nearly 40% of the country's land area. The river only next to Ganga in importance is its largest tributary – the Yamuna which attracts global attention because India's capital (Delhi) and the city of famous Taj Mahal (Agra) lie on its banks. The basin of river Yamuna constitutes over 42% of the total Ganga river basin, and is mostly semi-arid. Having been interested in River Yamuna for decades, I welcomed the book, "The Yamuna River Basin" with great expectations. It was also interesting to see the statement of the authors of the book that the "book is designed to provide concepts, methodologies, and approaches for river basin studies with respect to water resources and environment". A case study of Yamuna river basin is surely suitable for providing a template for other river basin studies because the basin extends over a range of climatic and edaphic conditions from Himalayan glaciers to semi-arid parts of Rajasthan and the hill ranges in central India, and supports a large diversity of vegetation, fauna, agriculture and people.

The book begins with a detailed account of the river basins of India and the country's water resources before elaborating on the characteristic features of the Yamuna river basin. Separate chapters are devoted to climate and recent trends of climate change, geology and geomorphology, soils, landuse and agriculture, and the socio-economic status. Adequate data on all these features are a necessary requirement for planning the water resources management. With this background, the book moves on to a description of the river basin's water resources and a water budget but the next three chapters concentrate on water pollution, wastewater generation, wastewater treatment, and water quality indices. The next chapter on environmental flows springs a surprise because the authors neither describe the ecological state of the river Yamuna and its numerous tributaries (except water quality) nor provide any discussion of the impacts of flow related changes on the riverine ecosystem or the terrestrial components of the basin. The headwater areas of the River Yamuna where many dams are planned have not been described. The concept of environmental flows is very new to India and studies on environmental flow requirements are rare and preliminary. A methodology for environmental flows assessment that is appropriate for Indian conditions has not yet been developed. Unfortunately, the authors have missed an opportunity to provide some guidance into this important area of river basin management. The last chapter describes cropping plan for water resources management that does not bring out clarity on what needs to be done in a basin context. Each chapter lists the cited references at its end. Some data on dams, groundwater demands and rainfall pattern at a few sites are placed in the Appendices.

The book attempts to compile a lot of information that is scattered in numerous government reports, project reports and research publications but fails to analyse and synthesise it effectively. Many environmental aspects such as river ecology, biodiversity, river's ecosystem services have not been included except some cursory mention. Given the fact that hydrological data of the Ganga river basin (including Yamuna sub-basin) are classified, a comprehensive analysis and discussion of water resources could not be made. Most of the text is very sketchy and is marred by poor language. A couple of phrases from the Preface are enough to illustrate the quality of presentation and language: climate change has been come out as a major issue'; 'of which .. NCR-Delhi is one of them'; 'We are highly acknowledged to them' and 'geomorphological characteristics of the basin and their catchments'. It is surprising that the publisher also did not care to get the manuscript reviewed or language edited.

It may interest the readers that a Yamuna River Basin Commission Bill, 2013 has been presented to the Indian Parliament with the objective to "*promote and restore the health of the River Yamuna through a River Basin Management Plan*" (see List of Lok Sabha Business of 8 August 2013 at http://164.100.47.132/lob/15/XIV/RLOB8.8.2013.pdf). I wish the book could have served as a valuable input for the decision and policy makers and thereby the interest of the river. I doubt if the book meets its objective to be 'used as a reference for river basin studies'.

Newson, M.D. 1992. Land, Water and Development. River Basin Systems and their Sustainable Management. Routledge, London. xxxi + 351 pages.

BRIJ GOPAL
Centre for Inland Waters in South Asia
Jaipur 302017, India
Email: brij44@gmail.com

Bengtsson, Lars; Herschy, Reginald W. and Fairbridge, Rhodes W. (Editors). 2012. Encyclopedia of Lakes and Reservoirs. (Encyclopedia of Earth Sciences Series). xxx+ 954 pages. 475 illus., 251 illus. in color. € 399.00. Springer, Dordrecht. ISBN 978-1-4020-5616-1

Lakes are an important part of our environment because they hold about 90% of the Earth's total fresh water. There are millions of lakes of all kinds scattered over the Earth's surface (occupying less than 3% of the terrestrial surface area) - from the Arctic to Antarctic and from below the sea level to more than 5000 m altitude (near the Everest). However, vast majority of them lies in the higher latitudes of the northern hemisphere. They vary in their shape and size between extremes: whereas the 1600 m deep Lake Baikal (Russia) alone holds 20% of the world's total freshwater and the five Great Lakes of North America account for another 20%, numerous tiny lakes hold only a few thousand cubic meters of water for a part of the year. Humans have been fascinated by them for their beauty and the life in and around them. Thoreau (1854) wrote: "A lake is the landscape's most beautiful and expressive feature. It is earth's eye; looking into which the beholder measures the depth of his own nature." For thousands of years, lakes have served the humans by providing water for their domestic and agricultural use, and being at the center of many socio-cultural activities. In many places, human settlements started and expanded around the lakes. Over centuries, humans have also created numerous lakes, especially in drier climates. Increasingly larger and deeper lakes (better called as reservoirs) have been constructed in recent decades throughout the world.

Lakes are, however, more than storages of water. They harbour a significant proportion of Earth's biodiversity – ranging from microorganisms to mammals and large trees. Since Forbes (1887) described the lakes as a 'microcosm', numerous studies have been made in practically all parts of the world and on all kinds of lakes resulting in an enormous bulk of publications. Our understanding of lakes has changed and grown phenomenally with inputs from many disciplines such as geology, geography, climatology, hydrology, physics, chemistry, biology, ecology, engineering, and even sociology, economics and other social sciences. In fact an interdisciplinary science – limnology – was named for the study of lakes (extended to other inland waters) more than a century ago. It is wholly impossible to document and summarise the currently available knowledge on lakes and reservoirs of the world within one volume. Hence, the 'Encyclopedia of Lakes and Reservoirs' was received with surprise and great expectations as the editors attempt to showcase them within less than 1000 pages.

The editors note in their Preface to the volume that 'lakes are characterised from surface area, depth and their hydrological characteristics, water balance, thermal regime and river basin conditions, and hence, the volume follows a "rather physical and geographical approach". However, physical, chemical and biological processes are covered extensively. There are more than 180 alphabetically arranged entries. From a geographical viewpoint, each of the continents - North America, South America, Europe, Africa, Asia, Australia, and Antarctica - is covered by a review. There are regional reviews for Caribbean Central America, Arab region (which incidentally covers most of Northern Africa also), the Amazon basin, the Arctic region and the Antarctica (subglacial lakes, particularly Vostok and Ellsworth). Several countries receive special attention: these include United Kingdom, Sweden, Finland, Iceland, Austria, Bulgaria, Macedonia, Slovenia, Russia, China, Japan and India. Many larger and relatively more important lakes are described, usually in greater detail but sometimes focusing on a few aspects. They include Lake Baikal, Caspian Sea, Aral Sea, Lake Ladoga, Great Lakes of N. America, lake Memphre-magog (Canada/ USA), Lake Geneva, Dead Sea (Israel), Lakes Chad, Tanganyika, Victoria and Nasser in Africa, Lake Chilika (India), Lake Balaton (Hungary), Lough Neagh (N. Ireland), Lake Maracaibo (Venezuela), Lake Poopó (Bolivia), Lake Titicaca (Peru), Lake Peipsi and Võrtsjärv in Estonia, Lake Okeechobee and Great Salt Lake in USA and many others. A few lakes are covered twice or more in different entries. Interestingly, and surprisingly so, the review of Indian lakes spreads over more than 40 pages, covers some 40 lakes and occupies the greatest space in the volume (about 5%). This is besides separate entries for Lake Chilika, and the lakes in Udaipur and around Hyderabad. Among the reservoirs, only few are discussed specifically such as the Three Gorges and Xiaolangdi reservoirs in China, Katse Dam in Lesotho, Myponga Reservoir in South Australia, and those in Great Britain. Regional/continental reviews also include information on many reservoirs. Aquatic systems other than lakes and reservoirs are also described in several articles. Of particular interest are those on beaver dams and ponds, dew ponds, playas of Australia, fens of England, deltaic swamps of Egypt and some other wetlands, besides the Everglades. The list of aquatic systems receiving some attention in the volumes extends to rivers (riverine thermal bar), estuaries (hydrology), coastal lagoon, canals, glaciers, fjords, and Baltic and Bengal sea basins.

The physical, chemical and ecological characteristics of lakes are discussed in detail, often under several entries. Besides introducing methods of lake surveys, different types of lakes, their origin and physical characteristics as well as nomenclature for lake shores under separate headings, their classification is presented on the basis of origin, hydrology and trophic status. An account of the bathymetric studies of Scottish lochs represents morphological aspects.

Hydrological and hydrodynamic aspects are discussed under the topics such as sources of freshwater, volume of water in lakes and reservoirs, water balance of lakes and its determination, hydrodynamics of shallow lakes, and exchange of water between open areas and the littoral zone. Thermal characteristics of the lakes are discussed under four headings: thermal regime, stratification, mixing and circulation processes, with further articles elaborating upon thermal bars, thermobaric stratification of very deep lakes, stratification in tropical African akes, and meromictic lakes, besides surface and internal seiches and wind waves. Great Lakes receive special attention for their thermal structure and circulation.

Topics related to sediments include sedimentation in lakes, trap efficiency and capacity of reservoirs as well as flushing from the reservoirs, estimation of suspended sediments by acoustic methods, and sedimentation in Australia under extreme conditions. Descriptions of carbon cycle in lakes, dissolved oxygen in ice-covered lakes, phosphorus exchange at the sediment-water interface, organic carbon in relation to water quality and nutrient balance are major

topics related to chemical aspects. Readers are also introduced to brownification - a process of dissolved organic matter enrichment occurring in northern temperate lakes in recent years. Biological aspects are poorly covered by the volume. They include only primary production, aquatic plants, submerged vegetation in shallow lakes and microorganisms. Various contributors have included information on different faunal groups (zooplankton, benthic macroinvertebrates, fish, birds, etc.) in the accounts of different lakes but the fauna do not have any specific entry in the volume.

Discussions on water quality in lakes and reservoirs consider issues such as drinking water standards, acidification, eutrophication and cyanobacterial blooms.

Paleolimnology is represented by accounts of paleolakes (and especially those of Australia), lakes as archives of earth's history, and determination of age of lake sediments.

Dams and reservoirs are covered from various angles. The wide range of topics includes their design and construction in historical perspective, distribution, importance and relationships with environment and health, and dam safety and failures. One of the world's oldest dams – the Marib dam (Yemen) and its irrigation system are also described.

A few articles devoted to wetlands provide a brief introduction, an overview of classification, distribution and function, and some details of the wetlands in Bulgaria and the Canadian Arctic. Floodplain wetlands form the subject of a separate entry but it focuses upon only Kaziranga National Park in Brahmaputra basin (NE India) and includes several factually incorrect statements.

Among other topics included in the volume, a few deserve special mention. An article refers to pollution, silting and pathogens, besides droughts and floods as hazards though another article describe the lake outbursts. At least two articles are concerned with hydropower and the Kingairloch Hydroelectric Scheme which is kn own for its high efficiency. The causes and effects of climate change, use of satellite data, transboundary issues, and restoration of lakes are also concered, albeit briefly. An fairly detailed account of lake monsters around the world and especially in Loch Ness (along with its history) is of great interest.

World Lake Database and the World Lake Vision developed by the International Lake Environment Committee Foundation (ILEC) and the European Union's Water Framework Directive are important international efforts towards conservation of lakes that receive attention in the volume.

The editors recognised three categories of the topics and placed definitions, concepts and phenomena requiring short explanations into category C, and 'terms that are typically textbook subheads' into category B. However, several topics of considerable interest are described quite briefly. For example, topics such as lake types, lakes as archives of earth's history, mixing of pollutants, acidification, wetlands and artificial wetlands certainly deserved more space just a page each in the volume. The diversity of styles of presentation as well as the depth and coverage of thee topic by various contributors matches the large diversity of topics themselves.

I could go through carefully only a few articles of direct interest to me and the topics which I understand well. I found several problems with the text. The article on Indian lakes compiles a wide variety of information on about 40 lakes but fails to bring out the characteristic features which may distinguish them from those elsewhere. In most cases the information is out-of-date. The location of Pangong Tso (misspelt as Pangon) is incorrectly mentioned to be in Sikkim (and yet in Ladakh). The article on the effect of tsunami on a coastal lake - Kokilamedu lakes near Madras Atomic Power station in Kalapakkam, is entirely in the style of a research paper which seems to have e*scaped the editors' attention. Encyclopedia like this one are not a place suitable for research papers. The article on Udaipur lakes has little to add to what is already covered in the larger article. The contribution on Chilika lakes is fairly comprehensive but duplicates the information in the larger Indian review. Incorrect or inappropriate statements are not uncommon but one deserves to be noted here from page 174: "A surface bloom of cyanobacteria may persist if there is a shortage of carbon. Without carbon photosynthesis cannot occur".

The editors have succeeded in bringing together more than 160 scientists from some 30 countries to summarise information on several hundred lakes and reservoirs as well as some wetlands. The volume will prove to be an useful source of information to a researchers from many disciplines such as geography, geology, hydrology, engineering, limnology, water resources management, and environmental science. Whereas individuals will not be able to afford a personal copy, the volume will make a welcome addition to the libraries of all institutions where water is the focus of interest.

Thoreau, H.D. 1854. Walden; or, Life in the Woods. Ticknor and Fields, Boston, USA.

Forbes, S.A. 1887. The lake as a microcosm. Bulletin of the Scientific Association (Peoria, IL) 1887: 77-87.

BRIJ GOPAL
Centre for Inland Waters in South Asia
Jaipur 302017, India
Email: brij44@gmail.com

Middleton, Beth A. (Editor) 2012. Global Change and the Function and Distribution of Wetlands. (Global Change Ecology and Wetlands, Vol. 1). v + 151 pages. Hardcover, € 139.95. Springer, Dordrecht. ISBN 978-94-007-4493-6

Climate change is now real and happening. There is growing evidence that it is caused by anthropogenic activities which result in increased concentration of green house gases in the atmosphere. The latest report of the IPCC confirms the major consequences being rise in the Earth's atmospheric temperature, increased variability of precipitation (hence greater frequency of extreme events) and sea level rise. It is however well known that the climate has been changing in the past as well though for different reasons. Wetlands are the greatest repositories of evidences of past climates – and biota. Wetlands are a major focus of climate change research because they may act as sinks as well as a source of GHGs and thereby regulate climate change. They are also affected directly by the climate change through alterations in hydrological regimes and extreme events (floods and

droughts). The Society of Wetland Scientists has developed a section for Global Change Ecology which organises sessions at annual meeting to discuss latest current research on wetlands in relation to global change. The contributions to these special sessions are planned to be published in a series of books for wider dissemination.

The first volume in the series covers a fairly wide spectrum of studies on *Function and Distribution of Wetlands* in relation to global climate change. This book includes only four articles placed in four sections concerning aspects of paleoecology, sea level rise, atmospheric emissions and drought. In an exhaustive review of paleohistory of wetlands, LePage et al. discuss how the studies on micro- and macro-fossils (pollen and wood, for example) and sediment deposits from the past help reconstruct the wetland communities and their environment millions of years ago, and can provide insights into the future of wetlands under scenarios of climate change. They present a case study from Axel Heiberg Island, Nunavut (Canada) from which they report the existence of highly productive, redwood-dominated forested wetlands with an ice-free warm climate in the Arctic region during the late Paleocene to middle Eocene. They further review studies on pollen and spores in sediment cores from the Rift Valley lakes in Africa to evaluate climate-induced changes in tropical wetlands during the Pleistocene to Holocene period (2.588 Ma BP). They show that even subtle changes in energy reaching the earth had significant influence on global hydrology. They show that during the past wetlands expanded and declined under changing climates, and suggest that global warming in future may cause even the return of past wetland types to the Arctic region. We can certainly learn from the paleohistory of wetlands about the future.

In the second contribution, McKee et al. review the studies on the responses of mangroves and coastal marshes to the main components of climate change, i.e., an increase in temperature and CO_2 concentration, changes in rainfall and the sea level rise. They summarise the effects of CO_2 and temperature on physiology, growth, distribution and diversity of various plants occurring in salt marshes (e.g., *Spartina*) and mangroves (e.g. *Rhizophora*). The responses to water level changes in terms of photosynthesis and water use efficiency are discussed among other variable. Impacts of sea level rise are discussed in relation to hydrological, geomorphic and biological processes. It is pointed out that the impacts are related to elevational changes along the coast that are governed by several factors including deposition and erosion, compaction, root growth, etc. Further, the review brings out the paucity of, and hence an urgent need for, studies on faunal components and the functions and ecosystem processes of these coastal systems.

The next contribution, by Kang et al., presents a rather brief overview of the mechanism of methane emission from wetlands and the variable controlling it. These role of water level (depth), Carbon supply, vegetation type and productivity, and temperature are discussed. Water and temperature affect plant growth, decomposition, availability of dissolved organic C and the activity of both the methanogens and methanotrophs. The role of wetland plants as conduits for methane transport, and their growth relations with temperature and CO_2 are also discussed.

The final contribution to the book by the editor discusses in considerable details the effects of drought, which is expected to occur more frequently with the climate change, on freshwater wetlands. Drought is generally defined by the occurrence of greatly lower precipitation (usually rain) than expected from a long-term mean for a region over a year (mostly during the rainy season) or several years in succession. In monsoonal climates, droughts are quite common as the monsoons are influenced by a large number of interacting factors, some in distant areas (such the El Nino effect on Asian monsoon). Drought is a relative term and does not refer to any specific amount of precipitation. A general consequence of drought is a drop in water level for a long period. The change in the water depth, duration, timing, and amplitude of change have direct consequences for a wide range of biological processes – growth, production, decomposition, reproduction (flowering, seed germination, viability) etc. and further for distribution and migration. Species that are tolerant or resistant to drought often take advantage of the situation and even replace others. These and other related aspects with implications for management of wetlands and their biodiversity are discussed with several examples from different countries. Although the human activities and land use changes are also considered, the human management of water resources in the event of drought is of critical importance to the future of wetlands.

The book makes an important contribution to the understanding of wetlands vis-a-vis climate change by reviewing current knowledge of a wide range of issues. The excellent beginning promises the series to be very fruitful and valuable addition to the wetland literature.

BRIJ GOPAL
Centre for Inland Waters in South Asia
Jaipur 302017, India
Email: brij44@gmail.com

Mukherjee, Sacchidananda and Chakraborty. Debashis (Editors) 2012. Environmental Scenario in India: Successes and Predicaments. xxiii+290 pages. Hardcover. Routledge, Abingdon, Oxon, UK: (Imprint of Taylor & Francis Group). ISBN: 978–0-415-66655-8

In the editors' own words, the basic objective of this book is "to capture the impacts of various sectoral activities on the environment by using simple methodology within the discipline of environmental economics through empirical/primary survey-based case studies". The book presents 13 case studies, which examine the environmental costs of various economic activities, and are placed in four sections dealing with four sectors: agriculture, manufacturing and power, service and trade. Whereas most of the studies relate to entire India, the state of Tamil Nadu is the focus of several of them.

Agriculture forms the backbone of Indian economy and the vast majority of human population in the country depends upon agriculture for its livelihoods. It is natural that the first section begins with the environmental impacts of agriculture. The phenomenal increase in agricultural production in India has relied heavily upon intensification with the use of fertilizers, pesticides and irrigation besides the development of high yielding varieties. The agriculture has become a major and significant non-point source of pollution of surface and

ground water. Whereas practically all attention has been concentrated on point source pollution from industries and domestic sources, the nonpoint sources continue to be ignored. In rural areas, groundwater pollution is increasing with growing use of N fertilizers as well as due to human wastes and open storage of livestock wastes. The case study included in the book examined the increased nitrate concentration in groundwater in many villages in the lower Bhavani river basin (Tamil Nadu). A survey of the village community showed that the willingness of farmers to protect groundwater is influenced by their perception of impacts of agricultural practices on groundwater quality.

Fisheries constitute a major component of India's food security. Aquaculture has steadily grown so much that India is now the world's second largest producers of shrimps. A case study examines the problem of water pollution caused by inland shrimp aquaculture which is a major economic activity in coastal Andhra Pradesh. The study reveals that the lack of integration of shrimp farming with other livelihoods and resources of coastal areas is a major contributor to the problem. The study focuses on institutional problems and suggests optimum land allocation for shrimp farming. Marine fisheries are next in importance. However, mechanised trawler fishing is highly destructive of the natural stocks. The case study of trawler fishing in Tamil Nadu examines the effects of monsoon trawling and trawl net mesh size on the fish catch. It evaluates the effect of 45 day ban on fish landing and its composition but no significant increase in fish catch was observed. The study observes that either the 45-day period is insufficient or the regulation of mesh size is not effectively implemented. However, the study points out to many other factor affecting fisheries and recommends detailed studies on ban periods and breeding patterns of fishes.

The industrial sector is represented by a case study of damage caused to agriculure by industrial pollution in the Noyyal river basin. It shows that the economic value of agricultural damage exceeds the economic cost of pollution control. The study analyses economic reasons for not controlling pollution in the past and discusses the policy failure. Another case study, based on surveys in two districts of Tamil Nadu, deals with the economic aspects of brick making by removing top soil and its impact on agriculture. The study takes into account only the organic matter and nutrients in the top soil in its economic analysis and shows that the farmers find it useful to get money for various needs by selling off the top soil as the cost of replacing the nutrients, leveling of land and applying tank silt is only 3.3% of the revenue earned from sale of soil. However there are other unaccounted serious environmental consequences which have not been investigated. Use of topsoil for brick making is widespread throughout India and a thorough analysis of the cost of restoration of soil as an ecosystem in itself is required.

Two case studies in power sector examine the environmental impacts of coal-based thermal power generation and hydropower. The first study analyses the energy generation efficiency, environmental damage caused by fly ash, CO_2 and other greenhouse gases (GHG), global impacts of GHGs and the current emissions in India, and then offers a few policy prescriptions. The other contribution on hydropower describes the procedural layout of an environmental impact assessment using Rapid Impact Assessment Matrix (RIAM) software for hydropower projects considering all components during construction and operation. Employing 11 levels of impact classes, the study shows that these projects are only economically positive but otherwise have large negative impacts on physical/chemical, biological/ ecological and social/cultural components. It is noteworthy that such a comprehensive EIA is never done in any hydropower project in India.

The section on service sector looks at urban water supplies and waste management. The study on urban water supplies points out the multiple problems related to collection, transport, treatment and disposal of wastewater and also of storm water management. It calls for integrated urban water management that requires scientific, technical and human resource inputs, institutional capability and finances. It also emphasises the need for coordination between various concerned departments and agencies. The study on municipal solid wastes (MSW) management focuses on the problems of implementation of MSW Management and Handling Rules (2000) and discusses the issues of policy for institutional reforms and for minimising the costs of compliance. A case study from a private hospital in Chennai examines the issues of biomedical wastes – their segregation into infectious and non-infectious wastes, their collection, transport and disposal costs, and the problem caused by outsourcing to cut costs. The Biomedical Waste Management Rules of 1998 are also discussed. The next contribution in this section considers the problems of electical and electronic wastes (e-wastes) and their recycling involving collection, segregation, and dismantling of non-hazardous portions. The relationships between the informal and formal sectors involved in the process are discussed.

The fourth section on trade includes two studies. The first, analyses the pattern of agricultural production, nutrient use and environmental impacts. It points out that Indian cereal production along with the use of agrochemicals, is far lower than in European Union countries. However, examining the environmental impacts, the study calls for an enhanced access to water and a shift in cropping pattern using crops which are more efficient in their use of water and nutrients. The final contribution to the book examines the Pollution Haven Hypothesis (PHH) with an analysis of relations between trade, foreign investment (FDI) and environmental degradation. It analyses environmental governance in India and the linkages between FDI and pollution in the context of environmental regulations. The example of ship breaking industry that results in serious environmental hazards and health problems is also included.

The editors themselves provide an introduction to the book highlighting the issues covered by each of the 13 contributions, and then, a concluding chapter where they discuss past policies, the lessons learned and offer suggestions for the future. The editors highlight the role of National Environment Protection Act, the National Green Tribunal and the civil society, the importance of standard setting and the EIA in policy making.

The book covers a large array of environmental issues, the economic aspects of environmental degradation, and the matters of policy, law, governance and institutions as well as the community. The book would be of interest to researchers, planners, policy makers, managers and all those interested in our environment.

BRIJ GOPAL
Centre for Inland Waters in South Asia
Jaipur 302017, India
Email: brij44@gmail.com