

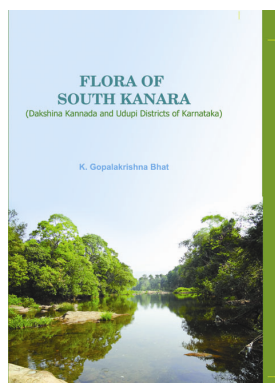
eye view of a remote sensing imagery. Being a teacher, I know the difficulty faced by some teachers when they need to impress on students how real-world features are represented in topographic maps and how they appear in imageries. This book would solve such teaching problems.

There are many academic institutions offering M Tech and M Sc courses in remote sensing and GIS or geoinformatics, for graduates of computer science, engineering and technology, with no background in earth sciences and remote sensing. They become experts in image processing on computers, but are clueless when questions regarding earth sciences arise. This book would be of great help to such students as well.

The size of the book, 40 × 27 cm, in hard cover is quite handy with good paper and print quality. It is worth having many copies of it for the purpose of teaching and training in institutes dealing with earth sciences in general and remote sensing and GIS in particular, because it presents excellent photographs of earth features of India, both from space as well on land. It could be an excellent coffee-table book in every home as well.

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**Flora of South Kanara: Dakshina Kannada and Udupi Districts of Karnataka.** K. Gopalakrishna Bhat. 'Madhuca', Srinivasa Nagara, Chitpady, Udupi 576 101, India. 2014. 928 pp. Price: Rs 2000.

Biodiversity is nature's fabric of life. The economic prosperity of any country

depends on this natural capital. Today we are in a global battle for conservation of this natural wealth. 'Being driven primarily by climate disruption, habitat changes and overexploitation, biodiversity loss is pushing earth towards the sixth mass extinction', says lead researcher Rodolfo Dirzo from Stanford University. 'Plants and animals are disappearing ten times faster than is widely believed in the scientific community', warns Stuart Pimm from Duke University. 'Nearly half of the world's biodiversity hotspots have less than ten per cent of primary vegetation left. Western Ghats currently is one of the few hotspots that have lost most vegetation since 2004', says William Laurance from James Cook University.

Further, ecologists are intensely studying the relationship between biodiversity and ecosystem function. The Millennium Ecosystem Assessment points to a clear role of biodiversity in the loss of ecosystem services. Natural forests of diverse native plant species function as watersheds, wildlife habitats and a source of livelihood for tribal farming and fishing communities, contributing to long-term human well-being in ways not captured by indices such as annual GDP growth.

Knowledge about species, documented from a given region, state or district, largely increases the efficiency and economic viability of conservation initiatives. Systematic documentation of identity, including description, ecology, status of conservation and such other basic information on plant species of a region, therefore, is fundamental for prioritizing areas for conservation and management action. Further, knowledge management mechanism and its implementation are essential for the developing countries, especially in today's competitive world of intellectual property rights.

Floras and similar botanical accounts of several regions are the most dependable source of authentic information about plants. Documentation of floral wealth of Karnataka and associated traditional knowledge has largely come from its district floras. Most of these works are at least three decades old. Also, some districts in the state do not have their plant wealth explored and the studies published so far. The composite 'South Kanara' (Dakshina Kannada and Udupi districts) is one among the under-explored areas and has not seen a com-

prehensive account of its vegetation published till now. This book, a fresh survey and assessment of plant wealth of the area by K. Gopalakrishna Bhat, therefore, is a welcome publication that fulfils a long-standing need.

Flora of South Kanara that lies along the Western Ghats manifests itself in thousands of species and several hundred genera of plants. The forests are reckoned for harbouring several endemic and rare plants. This zone of the southwestern peninsula, therefore, forms a place of exceptional botanical interest. In his brief introductory account, Bhat attributes this phenomenal range of diversity to the combined effects of South Kanara's physiographical disposition and topography, viz. coastline, hill ranges of the Western Ghats, and the vegetation being under the direct influence of elevation ranging from sea-level to almost 4500 ft.

The book under review truly is an outstanding effort that translates several decades of intensive field observations and laboratory studies of Bhat into taxonomic information of enormous value. Each one of the 1888 species of flowering plants belonging to 928 genera from 166 families has been described with utmost accuracy in crisp botanical terms. Species profiles are further spruced up with criteria of flowering and fruiting time, native range, endemism, conservation status and such ecological and information notes as 'very rare: collected only once' for *Hemisorghum venustum*; 'sometimes cultivated' for *Piper longum*; 'frequent along back waters and streams' for *Crinum viviparum*; 'common near the sea in sand' for *Drimia indica* and 'common on moist rocks' for *Cyanotis burmanniana*. Further, the English common name, the local Kannada and Tulu vernacular names recorded for most species help bring even non-botanists connected and engaged with plants and their



*Connarus wightii* Hook. f. [Connaraceae].



*Exacum tetragonum* Roxb. [Gentianaceae].

environment. The book is also sumptuously provided with colour photographs for several species.

The diagnostic descriptions and identification keys provided for the genera and species reflect Bhat's characteristic attention to detail. He has picked such features in each species that set it clearly apart from others by means of these keys. The systematic account of the volume, likewise, begins with diagnostic keys to families.

While arranging the genera and families in the book, Bhat follows 'The Linear Angiosperm Phylogeny Group (LAPG) III: a linear sequence of the families in APG III' by *Haston et al.* (*Bot. J. Linn. Soc.*, 2009, **161**, 128–131). This is good thinking because the present-day taxonomists are driven to embrace the concept that affinities among taxa are best based on molecular and phylogenetic considerations.

At a time when nature conservation seems to be a losing battle, the endemic species emerge as the worst casualties. It therefore becomes imperative to take stock of these species from time to time. The book has just done so by devoting an exclusive paragraph dealing with plants endemic to South Kanara.

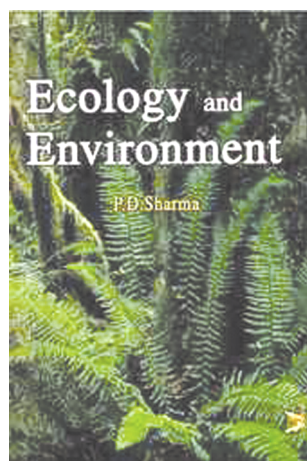
Thus this book is the outcome of a largest single person's collection of data and lifetime work of Bhat. It is truly an admirable scientific achievement that portrays the vast majority of flowering plants in Karnataka. It is a perfect and authentic presentation of the ground reality of the floristic diversity in 'South Kanara' that obviously serves as an immensely useful plant identification manual for botanists as well as many different groups of people interested in plants. The present resurgence of interest in conservation also adds to the need for a data book of information as this. The plant inventory apparently is so exhaustive and complete that we need never

again suffer the disappointment of locating a species unaccounted for in Udupi and Dakshina Kannada districts. Data pertaining to specimens examined at the various herbaria for comparison and validation of identification would be value addition to this work. I conclude with a suggestion that this information be circulated in hardcopy or its electronic version be made accessible on the website of Karnataka flora (<http://florakarnataka.ces.iisc.ernet.in>) by arrangement with Herbarium JCB.

The text is followed by literature consulted, indices of scientific and common names. The book comes in an elegant design and is also reasonably priced.

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**Ecology and Environment (12th Edition).** P. D. Sharma. Rastogi Publications, 'Gangotri' Shivaji Road, Meerut 250 002, India. 2009. 612 pp. Price: US\$ 50.

The word 'ecology' is derived from the Greek *oikos*, meaning 'house' or 'place to live'. Literally, ecology is the study of organisms 'at home'. Usually ecology is defined as 'a biological science which deals with complex interactions among organisms and between organisms and their environment'. We study ecology to learn how nature works. In ecology, 'niche' refers to the role an organism or species plays in its ecosystem. Ecology

may be studied with particular reference to animals or plants or microorganisms. Synecology is the study of communities, and autecology is the study of species. The term 'environment' etymologically means surroundings. Thus, the environment is a complex of many factors (light, temperature, soil, water, biota, etc.) which surround an organism. Any external force, substance or condition which surrounds and affects the life of an organism in any way becomes a factor of its environment. These have been called as environmental or ecological factors and may be living (biotic) as well as non-living (abiotic). The sum of all these living and non-living factors makes the environment of an organism. In order for organisms to exist, they must respond or adjust to the conditions of their environment. An organism is any form of life, with cell as its basic unit. A population is a group of interacting individuals of the same species living in a specific physical place, the habitat. A community consists of all the populations of different species of plants, animals and microorganisms living together in an area. An ecosystem is an integrated system of communities of different species, interacting with one another and their non-living environment in an orderly manner. All the ecosystems of the Earth together make up the giant ecosystem, the biosphere. All these aspects and hierarchical levels of ecology are covered extremely well in this book.

The book under review has 23 chapters. Chapter 1 gives the history and scope of ecology, while chapter 2 deals with the various environmental factors. Chapters 3 and 4 deal with the edaphic factors soil and water regimes respectively. Chapter 5 deals with different kinds of interactions between organisms, while chapters 6 and 7 cover autecology, and population structure and dynamics respectively. Chapter 8 provides information on community characteristics, chapter 9 on ecosystem structure, chapter 10 on habitat ecology and chapter 11 on environmental challenges and sustainable development. Chapters 12–14 discuss air, water and land pollution respectively. Chapter 15 is devoted to radiation and toxicology. Chapter 16 deals with bioremediation of polluted environments and chapter 17 with global warming and climate change. Chapter 18 helps a student to understand degradation of natural resources and their conservation. Chapter 19 deals with biodiversity and wildlife