BOOK REVIEWS


The technology related to remote sensing has improved many-folds since the time when the first edition of this book was published in 1986. It has also become affordable and hence more accessible to students, researchers, and practitioners. There has been a significant improvement in the supply of satellite and aircraft remote-sensing data in digital form, gathered by various sources. Another important aspect is the availability of powerful computing platform and software that is required for analysing and manipulating such data. As far as image interpretation is concerned, techniques and methodologies available in digital image processing will be of immense use even in the presence of sophisticated user interface. Though the present day practitioner now does not require a very high level of understanding in the computing mechanism itself, it has become more important to have an in-depth appraisal of the algorithms as this will enable him to make best possible use of the available technology.

The book has been organized into a set of thirteen chapters covering various aspects of remote sensing starting with an extremely useful Chapter 1 regarding sources of remote sensing data. An interesting feature of this chapter is that even when newer data gathering technology details have been incorporated the others considered obsolete have not been excluded from archival importance viewpoint. The chapter provides sufficient introductory material, which will enhance the scope of understanding in the subsequent chapters. For example, sufficient details are given about weather satellite sensors, earth resource satellite sensors in the visible and infrared region the SPOT HRV, HRVIR, HRG, and vegetation instruments, ADEOS, Sea WiFS, MOS, IRS and Russian RESURS-01. Characteristics such as spectral bands, swath, IFOV or effective pixel size and dynamic range for the “range and the number of discrete brightness values” for these are tabulated. Some details of aircraft scanners in the visible and the infrared region, image data in microwave region (SLAR, SAR), etc., are also incorporated by the author. Besides a comprehensive list of references the author also provides a few important web sites of responsible agencies for further information.

The second chapter deals with various sources of radiometric distortion or errors in the measured brightness value of the pixels and geometric distortion along with correction mechanism of each of these in some details. It also contains details on registration of images to maps and images to images. Extraction of information from digital image data by means of quantitative analysis and photointerpretation are covered in the third chapter.

Radiometric enhancement of image is the subject matter of Chapter 4, where techniques such as histogram equalisation, histogram matching, density slicing are covered in the context of scalar images and also to scalar components of vector imagery. On the contrary, multispectral data can be mathematically appraised by constructing a vector space with as many dimensions as there are spectral components in each pixel. Principal components transformation and image arithmetic form the subject of Chapter 6. Image domain techniques for geometric enhancement of image data is the subject matter of Chapter 5. On the other hand, frequency domain techniques, using discrete Fourier transformation for image data enhancement and the fast Fourier transform algorithm are discussed in chapter seven.

Chapters 8, 9, and 10 cover various methods of image classification. Supervised methods such as Maximum Likelihood, Minimum Distance, Parallelepiped, Mahalanobis, and Table Look-Up
classification are covered in sufficient detail in Chapter 8. This chapter also covers context classification and classification techniques based on neural networks. The subject matter of the remaining two chapters are clustering algorithms for unsupervised classification and reduction of insignificantly contributing features towards discrimination of spectral classes. Chapter 11 critically discusses both supervised and unsupervised classification methodologies from an operational viewpoint along with a set of case studies.

The data, e.g. found in GIS, contains a mixed spatial database whose interpretation forms the subject matter of the chapter on data fusion in Chapter 12. Hyperspectral data analysis and reduction technique form the subject matter of chapter thirteen.

The book contains an exhaustive list of references, many appendices to supplement the main text and numerous illustrations with real-life data at appropriate places. All this makes the book highly lucid and appropriate text for an introductory level course.


Tropics of the world is a cradle of vegetation and a veritable storehouse of economic plants from which mankind has been drawing liberally for use in daily life. Out of about an estimated 16,000 flowering plants, about 7000 are reported to be economically important including medicinal plants in India. It is reported that 3000 species of plants have been tried under cultivation for food in various parts of the world. However, only 200 of them have become more or less domesticated for use as staple food. About 15 of these are of major importance. In the modern world, search is on among the vegetable resources, discovery and identification of novel chemicals and collection of genetic information, chiefly from tropical species for possible application in genetic engineering of crops under the bioprospecting activity.

In the field of medicine, plant-based drugs are more in vogue now than ever before. In order to meet the increasing demand, attempts are being made to cultivate them. For cultivation, a knowledge about the wild source, cultural practices, evolving elite varieties and utilization, would help in their domestication.

The book on **Economic Botany in the Tropics** by Prof. S L Kocchar has given an insight into origin of cultivated crops, methods of cultivation, improved agrotechniques, advances in biotechnology in agriculture and utilization of economic and medicinal plants, spread over 21 chapters.

The book describes, in detail, plant fibres, cereal crops, sugar, starch and cellulose products, pulses, vegetable oils and fats, fruits and nuts, vegetables, spices, condiments and other flavourings, fumitory and masticatory materials, beverages, wood and its products, vegetable tannins and dye stuff, rubber, medicinal plants, herbicides and insecticides, and essential oil yielding plants.

Each chapter deals with detailed information on origin, history, significance of plants used and general utilization and provides statistics on area of cultivation, production, yield both in the world and in India. Some major species under each category are described, in detail, including their morphology and systematics in each chapter.

The text is interspersed with interesting historical anecdotes on the species described, such as in the case of potato. It is said that in the time of Louis XVI, potato being a newly found highly valued crop, its fields were provided with military guard; that the flowers of potato plant were made into bouquet and that Queen Marie Antoinette even wore potato blossoms on her hair! All these show the diligence and hardwork of the author in going deep into all the aspects of economic plants.

The information on the origin and significance of antibiotics, year of discovery, source of the drug and the table listing plant insecticides, toxic plants and toxic constituents are of academic value.

In the chapter on essential oil, its characters, function, methods of extraction and utilization have been described. It also gives an interesting account of how different types of perfumes were adorned by regality in different countries. The author has also provided lists of important aromatic and essential oil yielding plants used in natural flavours and fragrance and perfumery along with their constituents and
ingredients. This will be of interest to the industries employing them.

Having described, in detail, on multifaceted aspects of major economic plants, Prof. Kocchar goes on to describe how self-sufficiency in cereal crops, especially in rice and wheat, was achieved in India through green revolution and has highlighted the major contributions in this field by Dr N E Borlaug and Dr M S Swaminathan with the latter himself contributing a write up to this chapter on the origin and genesis of green revolution.

The book also contains contributed chapters on the Rice Varietal Improvement Programme at the International Rice Research Institute by Prof. G S Khush; on transgenic plants co-authored by Prof. A Grover and Prof. S C Maheshwari in which different methods of raising transgenic plants by agrobacterium, electroporation, liposome mediated uptake and microparticle bombardment methods, and on the role of biotechnology for an economically rewarding and environmentally sustainable agriculture, by Prof. J Schell.

While dealing with green revolution, transgenic plants, bio-technology in agriculture, etc., the author has also discussed merits and demerits and socio-economic impact of these advanced agricultural techniques.

The pioneering work done by Dr N I Vavilov in tracing the centres of origin of cultivated crops and its role on crop evolution has been described at length in the chapter co-authored by Ms Monica Manchanda and Prof. H Y Mohan Ram. The appendices I to IX carry information of academic value useful to the students such as on radio-carbon dating to assess age of trees and wood; glossary of medical terms; names of some national and international Agricultural Research Centres and Institutes; old and new names of countries; old and new names of certain plant families; list of promising high-yielding varieties of major crops of India; a table of common trees of economic value other than those mentioned in the text; and the methodology to detect the presence of plant metabolites employing simple microchemical tests.

The text matter is well supported by illustrations, photographs, histograms, tables, etc., that add further values to the book.

The book contains information on all aspects of economic plants and crops in just 604 pages and renders a valuable source of reference to students of Botany and Agriculture. Information on yield, marketing, and trade would be interesting to cultivators, progressive farmers, and plant-based industries.

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