

## Review "Remote Sensing of Northwest Himalayan Ecosystems"

Navalgund, R.R., Kumar, A.Senthil & Nandy, Subrata (Ed.s): Remote Sensing of Northwest Himalayan Ecosystems. 564 pp. Springer. 1st edition 2019 (already published November 2018). ISBN-10: 9811321272. ISBN-13: 978-9811321276. Price: eBook \$169.00 / EUR 153.99, Hardcover \$219.99 / EUR 160.57.

It may be considered a hopeless undertaking to prepare an objective review of a multidisciplinary book of LII (= 52) plus 564 pages about *Remote Sensing of Northwest Himalayan Ecosystems*, written by 65 authors. And in fact, the present evaluation cannot be meant to be a comprehensive overall appraisal, but it rather wants to point out few debatable points and most of all the clearly existing strengths and highlights of this voluminous book. Mentioning the amplitude, the issue comes up whether it is really necessary to spend exactly 30 pages with rather detailed scientific CVs for the introduction of all the authors and the three editors? Nobody would have questioned their qualification, anyway.

First of all it might have been reasonable - in particular for the non-Indian readers with less geographic knowledge – to outline the borders of the *Northwest Himalaya*, one of the global biodiversity hotspots. The editors should have made clear in Chapter 1 *Northwest Himalayan Ecosystems: Issues, Challenges and the Role of Geospatial Techniques*, possibly with a map, what they consider the *Northwest Himalaya*. From the text, and in particular from Part 1.3 *Indian Research Initiatives ...*, it can be concluded that – last not least due to the fact that all authors are Indians – the book almost exclusively only treats the *Indian Himalaya*. In some chapters, however, it goes significantly beyond the borders (e.g. depicting Kanpur and Kolkata) of what in science is normally considered *Northwest Himalaya*, i.e. the region geographically defined by “classic” researchers like Algernon Durrand, Aurel Stein, Sven Hedin, Albert Heim and Augusto Gansser. Above all, it would have been correct to entitle the volume *Remote Sensing of Indian Northwest Himalayan Ecosystems*.

Recognizing the importance of the Himalaya, a *National Mission for Sustaining the Himalayan Ecosystem* of the Government of India to conserve biodiversity, forest cover and ecological values in the Himalayan region has been taken up by the Indian Institute of Remote Sensing (IIRS) of the Indian Space Research Organisation (ISRO). The overwhelming majority of the authors is affiliated to this centre of excellence. In the above context the present volume may be considered a research exhibition of its scientists.

The book is logically subdivided into 6 parts, i.e. Part I *Ecosystems of the Northwest Himalaya – An Overview* (one article), Part II *Geology and Geodynamics* (three articles), Part III *Water Resources* (four articles), Part IV *Forest Resources and Biodiversity* (eight articles), Part V *Agriculture* (two articles), Part VI *Urban Environment* (three articles), and Part VII *Geospatial Data, Web Services and Analysis Tools* (four articles), thus resulting in a total of 25 highly interesting contributions. This brief overview already indicates that the present book puts emphases on what here is called *Forest Resources and Biodiversity*. An ecologist may be surprised that only one of the eight papers included in this section deals with wildlife habitats, two, however, with carbon monitoring and mountain fires and the rest with vegetation. Also, a separate part describing the basic actual facts of the changing climatic conditions, in particular the currently altering interplay of Westerlies and Monsoon in the whole region and its concrete impacts onto the Northwest Himalayan ecosystems within the last

decades might have been worthwhile to be included. Anyway, sufficient studies, also from the Indian side, have been published within the past years.

It takes wonder that – apart from geology and in particular tectonics - the tremendous body of *international* research put into the remote sensing of the (Indian) Himalayan glaciers has not been given adequate room, particularly in the article *Cryosphere Studies in the Northwest Himalaya* (39 pages). The recent findings by non-Indian scientists about glacial impact onto mountain ecosystems, and beyond should have been reflected in a greater measure in this volume.

Part VII *Geospatial Data, Web Services and Analysis Tools* offers in two of its four papers valuable information about remote sensing- and geodata of the treated region and their characteristics. In particular, the open online data repositories are of inestimable value.

Several of the articles [in fact] reflect the educational background and research experience of the author(s), in particular once the approach to the treated topic and, interestingly enough, the selection of referenced – and even more so, not referenced - literature is analysed. In this sense it is a pity that for some articles papers of international importance which one would have expected have not been considered and, hence, referenced. This is also reflected in the fact that some contributions like the one about earthquake-precursor detection are at the global frontier of research, whereas others do not represent the current international state of science.

A small linguistic note about a book dealing with technologies applied to natural sciences: The readers of Springer should have found a consistent way of writing between *Himalayas* and *Himalaya* (the latter one being the older but more correct geographic spelling). Further, the book would have gained utility value if a detailed glossary would have been included at the end.

All in all a *very valuable* book which does not only contain many facts about recent remote sensing- and GIS-based ecological research by Indian researchers in the Indian north-western part of the mightiest mountain range on Earth, but also quite some leading-edge methodological articles. As pointed out in the foreword, this may serve both as useful reference material for future work and a sound basis for development planners in this region. Beyond that, also in a global context the present volume is one of the books which should not be absent in any pertinent library.

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