

BOOK REVIEWS

with the rivers Harahvaiti and Harayu of the west Afghanistan, and all the necessary consequences of that fact are sought to be rigorously worked out in all its detailed ramifications. Just as it would be necessary to study the seven rivers of Pakistan for studying the *later Rigveda*, similarly, it would be essential to study the lands and rivers of Afghanistan itself for tracing the geography and history of the *early Rigveda*.

It is therefore apparent that the work of Kochhar at the best qualifies only to be referred as an extension of the earlier works. Unfortunately Kochhar has not made a sufficient expression of his indebtedness to authors like Roy. Roy's work is undoubtedly a forerunner research in the same field of the history and geography of Vedic people. In fact we can find the seeds of almost all the arguments of Kochhar in the different works of Roy. Central Asian origin, ancient cultures on the banks of Afghan rivers like swat, different Sarasvatis of the early and later *Rigveda*, collation of the puranic/genealogical, astronomical, archaeological, PGW/NBPW, and linguistic evidences, etc., all can be found in the monographs of Roy. Kochhar's work is apparently an update with a far more sophisticated get up and attire designed to impart the impression of an independent work.

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Water in Kumaon: Ecology, Value and Rights. Gopal K. Kakodi, K.S.R. Murthy and Kireet Kumar (eds). G.B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora 263 643. 2000. 256 pages. Price not mentioned.

This is a very useful book produced by the collaboration among the Institute

of Economic Growth, New Delhi, the Centre for Multi-Disciplinary Development Research, Dharwad and the G.B. Pant Institute of Himalayan Environment and Development, Almora; a wide umbrella of respectable research institutions. It contains data regarding the central Himalayan water problems, which may be useful for students and for development planners in the new state of Uttaranchal, with perhaps some relevance for the neighbouring state of Himachal Pradesh and also for ICIMOD, Nepal. It may also be useful to NGOs in the region. The maps could have been as clear as the charts and tables. They are too faint.

Before an extensive analysis of the water problems, the first two chapters are of a general nature, dealing with methodology, objectives and the development profile of Kumaon. In these, two major fallacies compel attention. They are figures of forest cover and population densities. Plainsmen have been using the wrong yardsticks to calculate population densities the world over, namely density in total land area. As a result, they come to the wrong conclusion that the hills are less densely populated than the plains. In the context of the fact that in the old state of Uttar Pradesh (before its division), over 60% of the land area was cultivated in the plains and less than 15% in the hills, this common measure is fallacious. People cannot live on vast areas of ice, snow, glaciers and deserts. A truer comparative measure is population per square unit of cultivated land and forests, as forests are 'support' systems for rural communities. When will scientific researchers adopt this more realistic measure, which the reviewer has been pointing out for 20 years? Demographic data should be realistic for development and land use purposes. More so, as the authors of Chapter 2 invite 'major land use and population management policy interventions'.

The second unrealistic fallacy is the long mistaken confusion between forest lands (as per Forest Department sources from 33 to 53%) and actual forest cover, which is far less after 100 years of deforestation. Based on satellite imagery, a study done by Kumaon University in the early 80s showed that good forest cover (i.e. over 60% canopy) in

Nainital district was only about 5% (J. S. Singh), against the 'total forest cover' of 52% for the district in 1995. Even 'dense forest' in the table amounts to 43%!

Such figures need careful satellite imagery confirmation, or else all conclusions and plans may be fallacious.

In Chapter 3, the tables of rainfall data are shockingly discontinuous in this scientific age. In nine locations of table 3.2, only one is complete from 1970 to 1992, and one till 1983; the rest terminate between 1973 and 1982. Similar discontinuities are seen in tables 3.3 and 3.4. In table 3.3, data for 6 out of 7 stations cease after 1983. Researchers must ensure continuity and accuracy of rainfall data, if they are to be of scientific use. This leads to doubts regarding the accuracy of river water discharge figures also. Are Indian researchers working with unreliable data, without serious questioning and rectifying them if headed, especially when they are served by inefficient, unreliable, unchecked, low-level data collection agencies of governments?

Perhaps, the most useful chapter on which to base future policies and plans is on a dynamic model for the Gaula Catchment. The detailed study of one catchment highlights the major single threat to the water resources of the hills – more than 50% drying up of hill springs – a medium-term ecological disaster threatening the next generation. More so, if rainfall is diminishing simultaneously, it beckons a major water crisis.

In Chapter 6 on socio-economic profiles and water management, what one seriously misses is an analytical study of investments made by Jal Nigam and Jal Sanstha, and its results; except for a passing mention of government taps without water! The majority of villagers were prepared to pay for reliable water supply. The authors rightly point to Article 243b of the Constitution – ignored and dormant – about the rights of the people to basic resources, including water, ignored primarily by government agencies themselves. This and the next chapter on water rights could be useful for future local water management plans, jointly between government and local bodies, especially

village panchayats; an area calling for radical decentralization reform, as in the case of forests, with local people's management responsibility for local resources of water and forests.

This interesting study fails to see major future political conflicts for water between urban and rural areas, and

between the people of the hills and plains; more so after the formation of Uttaranchal. We have been cautioned about the water wars of the future.

Science in isolation is a waste of public money. Scientists need to collaborate in public policy, as they too are citizens. They also need to learn traditional

science and technology from the people, especially in water management.

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Indian Academy of Sciences elects new Fellows – 2000

S. K. Acharya, Department of Gastroenterology, All India Institute of Medical Sciences, New Delhi
Area: Gastroenterology and liver diseases.

Anil Kumar, Physical Chemistry Division, National Chemical Laboratory, Pune
Area: Physical organic chemistry.

Sudha Bhattacharya, School of Environmental Sciences, Jawaharlal Nehru University, New Delhi
Area: Molecular parasitology and genomics.

P. K. Chattaraj, Department of Chemistry, Indian Institute of Technology, Kharagpur
Area: Density functional theory and quantum chaos.

B. C. Das, Division of Molecular Oncology, Institute of Cytology and Preventive Oncology, Maulana Azad Medical College Campus, New Delhi
Area: Molecular biology of cancer, virology and human genetics.

A. Jayakrishnan, Polymer Chemistry Division, Biomedical Technology Wing, Sree Chitra Tirunal Institute for Medical Sciences & Technology, Thiruvananthapuram
Area: Polymer chemistry and biomaterials.

Amitabh Joshi, Evolutionary and Organismal Biology Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore
Area: Population and evolutionary genetics.

Shyam Lal, Planetary Atmospheric Sciences Laboratory, Physical Research Laboratory, Ahmedabad
Area: Atmospheric science.

Bhaskar G. Maiya, School of Chemistry, University of Hyderabad, Hyderabad
Area: Bio-inorganic chemistry and photochemistry.

G. Marimuthu, Department of Animal Behaviour and Physiology, School of Biological Sciences, Madurai Kamaraj University, Madurai
Area: Animal behaviour and chronobiology.

Rahul Mukerjee, Indian Institute of Management, Kolkata
Area: Asymptotic theory and survey sampling.

R. Nagarajan, Department of Condensed Matter Physics and Materials Science, Tata Institute of Fundamental Research, Mumbai
Area: Cryogenics and superconductivity.

Nitin Nitsure, School of Mathematics, Tata Institute of Fundamental Research, Mumbai
Area: Algebraic geometry.

R. Ramesh, Physical Research Laboratory, Ahmedabad
Area: Climatology.

Ram Sagar, UP State Observatory, Nainital
Area: Astrophysics, astronomy and high energy physics.

R. Raghavendra Rao, National Botanical Research Institute, Lucknow
Area: Plant taxonomy and ethnobotany.

Vijayalakshmi Ravindranath, National Brain Research Centre, New Delhi
Area: Neurobiology, neurotoxicology and pharmacology.

Girish Sahni, Institute of Microbial Technology, Chandigarh
Area: Protein engineering and biotechnology.

Dinakar M. Salunke, National Institute of Immunology, New Delhi
Area: Structural biology and molecular biophysics.

M. K. Sanyal, Surface Physics Division, Saha Institute of Nuclear Physics, Kolkata
Area: Condensed matter physics.

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Raghavan Varadarajan, Molecular Biophysics Unit, Indian Institute of Science, Bangalore
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