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Hydrometeorology, environment and sustainable development of water resources in the Himalayan region

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Himalaya is one of the youngest and most sensitive and interactive atmosphere-snow-land-ocean mountain system of our Earth. The Himalayan Mountains harbors a network of catchments which feed all major rivers of the Indian subcontinent. There has been growing emphasis in the region about the importance of establishment of a good network of Hydrological and Meteorological Stations for the purpose of observing and measuring a large number of hydrometeorological parameters consecutively over a long period of time. Nearly 1, 20, 00000 million m^3 of water flowing down the Himalayan rivers annually. The average rainfall is 2400 mm yr^1 in the southern front, 1500 mm yr^1 in the populated Lesser Himalaya (1500 to 2500 m above msl), 2400 to 3500 mm yr^1 in the snow-capped Great Himalaya in the north. About 1, 46, 600 million m^3 of water from these rivers can be utilized for irrigation. The hydropower potential is about 78% of the total Indian hydropower resources. The Himalaya has varied climates and rainfall pattern. The rainfall decreases progressively from east to northwest-10000-12000 mm yr^1 near Cherrapunjee (Meghalaya), 3000 mm yr^1 at Darjiling (West Bengal), 1150 mm yr^1 at Almora (Uttarakhand, 500 mm yr^1 at Shimla (Himachal) to a mere 100 mm yr^1 at Leh in Ladakh. Himalayan glaciers have been found to be retreating rapidly. Increasing water consumption due to rapidly growing population is increasing pressure on the available water resources and this has had a serious impact on both the surface and underground hydrological regimes which have far reaching implications for the future of water resources and sustainable development of this region. Water harvesting, though is an old practice, is emerging as a new paradigm in water resources development and management. Water harvesting can no longer be labeled a technology of the past and fit only for the poor, and it is as relevant for urban areas as it is for rural areas. It is universal technology which is relevant to all situations with location – specific applications. The water resources generated locally provide benefits to the local community and minimize social conflicts. Rainwater harvesting systems are relatively more equitable and environmentally sound. The Himalaya today needs a people's movement to meet its water needs and to protect its water resources. The presentation will discuss the prospects of sustainable development of water resources in the Himalayan region.

Biography

M S Rawat is a physical geographer with specialization in environmental geomorphology/hydrology and has been working in the Himalaya for the last 30 years. After obtaining his Master's degree in Geography (1984) with Gold Medal, he obtained Doctoral degree (1990). He is presently working as Professor in the Department of Geography under School of Sciences at Nagaland (Central) University. He is the first among the few scientists who monitored the long-term hydrometeorological parameters in the Central Himalayan watersheds. His scientific achievements are in the field of Geomorphological and hydrological processes. He has implemented some R&D Projects sponsored by D S T, CSIR and G. B. Pant Institute of Himalayan Environment and Development, Govt. of India. He has contributed about 50 scientific research papers in various national and international research journals. In the year 2011 he has published a book on Environmental Geomorphology and Watershed Management. He has also presented his research results in different national (21) and international (17) seminar and conferences. He is recipient of many research awards from Government of India and Rashtriya Gaurav Award and Certificate of Excellence by the India International Friendship Society.

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