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Title: Impact of solid waste on soil and water quality in Himachal Pradesh, India and its scientific management: An environmental conservation perspective

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The focus of the study is to develop a systematic management strategy for the solid waste generated in the urban municipal areas of the state of Himachal Pradesh. The state of Himachal Pradesh consists of 12 districts covering 55,673 km2 geographical areas. It is situated in the abode of the Himalayas. Hence hold valuable ecological and economical resources such as water, land, air and forests. The conservation of these resources becomes beneficial as it fed all the low-lying population of the northern parts of India. The Himalayan ecosystems exhibit a great dynamism, and are recognized for its ecological and economic values manifested by ecosystem integrity, adaptability and ecosystem services. But, due to various anthropogenic activities namely, over exploitation, habitat degradation, deforestation, development of roads, different hydropower projects, industries, urbanization, mass tourism, solid waste generation, biomass burning, forest fire, etc., and changing environmental conditions particularly climate change, the important components of ecosystems are facing tremendous pressure and depleting fast. Among the anthropogenic activities, solid waste management has become one of the major problems across the globe. Increasing human population, rapid urbanization and unplanned disposal of solid waste has created a lot of problems across the globe, in India and in the Indian Himalayan region. The unplanned disposal of solid waste by the inhabitants has increased the air, water and soil pollution. The pollution in soil, air and food items have resulted the environmental degradation and deterioration of ecosystem health. On an average, waste generation in India is expected to increase at the rate of 1-1.33% annually, and by the end of 2047, India will be generating 260 tons of waste annually which is 5 times of current status requiring 1400 km2 of the land to dispose. Solid waste management in India is generally non-systematic.

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Public participation is must in managing household waste to reduce municipal solid waste in order to develop a proper solid waste management policy. In the state of Himachal Pradesh, the rise in urban population is due to migration from rural to semi-urban and urban settlements. This sudden increase has created a chaos in the solid waste management practices of local urban governing bodies. The unplanned disposal sites in the areas have drawn the focus as it is contaminating adjoining soil and water streams. The study for soil and water contamination due to solid waste was carried out at 7 sites (Manali, Kullu, Mandi, Bilaspur, Hamirpur, Kangra, Chamba) of the 6 districts (Kullu, Mandi, Bilaspur, Hamirpur, Kangra, Chamba) in the state of Himachal Pradesh. The soil and water samples were analyzed for the physical and chemical properties along with heavy metal analysis for the selected sites. Heavy metals were found below detectable limits or below the permissible limits prescribed by national standards in the samples but other chemical parameters indicated the contamination. Solid waste can be managed in a best way by way of people participation, capacity building and awareness programme, reclamation of dumping site by plantation of suitable planting species and solid waste demonstration models, etc. The findings and primary data of this study can be used as a baseline data for the future research and policy planning.

Keywords: Himalaya, Indian Himalayan region, Pollution, Community driven, Waste management, Solid waste, etc.

Biography

Rakesh Kumar Singh is presently working as Scientist-F & Head, G.B. Pant National Institute of Himalayan Environment, Himachal Regional Centre, Kullu–175126, Himachal Pradesh, India and has more than 18 years of R&D experience in various Government organizations on different capacities. He has executed 15 R&D projects on various environmental, socio-economic and other allied aspects. Presently, he is executing 06 R&D projects on various environmental and socio-economic issues of Himachal Pradesh, India. He has published more than 38 Research Papers in various peer-reviewed National and International journals; published 27 Popular Articles, 03 Edited Books, 07 Book Chapters, 08 Technical Manuals and 02 Monographs in various reputed publications; presented 10 papers in National/International Conferences.