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ENVIRONMENTAL STUDIES IN INDIAN GEOGRAPHY: EMERGING TRENDS AND FUTURISTIC APPROACH

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Introduction

Environmental studies are at the forefront for a number of reasons. The most obvious is the very visible and apparent human impact and the consequences being faced. Climate change, global warming, rising temperatures, cloudbursts and flash floods, are all much talked about. By virtue of its nature and strong tradition of man-land relationships, all investigations related to the environment fall within the purview of geography.

Geography studies the earth as the home of humankind – its habitat and environment, in a spatial perspective. Simmons (1978) believes that geography can be considered as a study of 'holistic system of man-environment relations in which, from time to time and place to place, one or the other component of the system is dominant'. The spatial aspects of interactions between humans and the natural world form the core of environmental geography.

The environmentalist definition of geography considers it as the study of man-environment relationships. The emphasis has shifted from environmental control to human domination and to environmental implications at different points in time. Needless to say, the shift in emphasis occurred in response to the perceived nature of man-land relationships at varying points in time.

Perspectives on Man-Land Relationships

The man-land relationship has passed through several phases. At the beginning of the

20th century, the physical environment was considered to be the major controlling factor. It controlled all nature of human activities ranging from distribution to social character. This philosophy was called determinism or environmentalism.

The fundamental argument of the environmental determinists was that aspects of physical geography particularly those of climate, influenced the psychological mind-set of individuals, which in turn defined the behavior and culture of the society that those individuals formed (Crawford, 1863; Lewthwaite, 1966; Livingstone, 1992). Allegations of racism made the determinists relinquish influence in favor of the possibilists.

The pendulum then swung to the other extreme with the emphasis moving to humankind with environment playing a secondary role. This marked the period of unabated technological and industrial development. Geographic research responded with half baked attempts at locational model building and theorization.

As human relationships with the environment changed as a result of the increasing technological prowess environmental problems came to the fore. A new approach was needed to understand the changing and dynamic relationship. The ecosystem approach rose in conjunction with the General Systems Theory. The adoption of this concept has given a new orientation to the study of man-environment relations in

geography. In particular, it established a balance between the previous two contrasting approaches of determinism and possibilism. The first had over-emphasized the role of physical forces and the latter of human capabilities in any analysis of this kind. The ecological approach placed a due and differing emphasis on the two in varying regional contexts.

Geographers are increasingly reverting to the view that nature still plays a significant role in human affairs despite technological advancements. This has caused a resurgence of ecological studies in geography and they now form one of the major thrusts in the subject. Earlier the man-land paradigm was selective in highlighting the role of either nature or man. The ecosystem approach imparts a balance by way of emphasizing mutuality of relations between the two. At present there is a tilt in favor of studies focusing on the impact of man on nature, with a concern for the latter. This is not surprising under the emerging scenario of a variety of environmental problems.

The ecological perspective in geography has a long history. It can definitely be traced to the works of Marsh (1864). His was essentially an ecosystem view of man's unity with his environment. He, of course, did not coin the term.

The concept of geography as human ecology can be traced to Ratzel who, taking his cue from the biological use of the term ecology, once suggested that anthropogeography is, in effect, human ecology. He stated that human ecology is the study of interaction between man and environment; it is that aspect of animal ecology, which is particularly concerned with human species (House, 1936).

Likewise, Barrows (1923) highlighted the significance of human ecology in geography. Similar sentiment was later expressed by Chorley (1973), Johnston (1981)

and Morrill (1985). Stoddart (1965) points out that a great contribution of the ecological concept was by way of providing a research methodology in geography.

Simmons (1980) describes agriculture in ecological terms. His viewpoint has the advantage of linking both physical and social systems and also of allowing agriculture to be viewed as a set of ecosystems. He suggests that modern ecological models which emphasize energy flow and nutrient cycling can be used as viewpoints from which to analyze agricultural systems.

With man's growing concern for matters relating to conservation, pollution and quality of life, the application of the ecological model has become even more relevant. The earth has to be seen as essentially an ecosystem. Any thing happening in one part of the world has to impact elsewhere. Hence, a global view is imperative in understanding and solving our problems relating to ecology.

Environmental Studies and Indian Geography

Under the spell of a universal concern for the environment, Indian geographers have exhibited an interest in such studies. Their efforts can be classified as follows:

I. Impact of human activities on environment: forests, grazing lands, mining, water (rivers, lakes, lagoons, wetlands, groundwater), soils, coastal environments

Dash (2005); Saha, K. et. al. (2005); Saha, K. (2005); Singh and Sarkar (2005); Ghosh and Khan (2004); Hussain and Surrong (2004); Nayak, (2004); Rai, (2004); Sarkar and Singh (2004); Sarma (2004); Singh and Shah (2004); Thakur and Sachar (2004); Asgher (2003); Babu and Pitchaiah (2003); Baksi (2003); Chauhan, (2003); Das et. al. (2003); Nadaf (2003); Srivastava (2003); Datta (2002); Mitra

(2002); Singh, RB (2002a); Thangamani and Rao (2002); Bhandari (2001); Chakraborty (2001); Dasgupta and Chattopadhyay (2001); Gangadri and Rao (2001); Mukhopadhyay (2001); Rahman (2001); Sharma, VN (2001); Bhutia (2000); Ansari (1998); Jamwal (1998); Inderjeet (1997); Singh, O. et. al. (1997); Brar (1996); Manoj (1996); Nagabhushanam, et. al. (1996); Saxena (1996); Nigar Anjum (1995); Sharma, Puran Chandra (1995); Husain (1994); Shafi (1994); Singh, O. et al (1993); Singh, R.P.B. (1993); Brar (1992); Shafi and Raza (1992); Singh, P. (1992); Sivagnanam and Kumaraswamy (1983); Basu and Santra (1988); Chakrabarti (1988); Shashikala (1988); Tewari, (1970); Bhardwaj (1960).

II. Manifestation of degraded environments: pollution, desertification, climate change

Das, N. (2005); Ghaffar (2005); Narasimha Rao, (2005); Nianthi, (2005); Ahmed and Das (2004); Singh, R.Y. (2004); Geist (2003); Mandal and Mandal (2003); Raju, et. al. (2002); Rao and Devi (2002); Ikeya (2002); Basu (2001); Mazumdar and Mazumdar (2001); Nandeshwar et. al. (2001); Brar (2000); Singh and Rahman (1997); Chitralkha and Vidya (1997); Nigar (1997); Vats (1997); Moses et. al. (1996); Ramaniam et. al. (1996); Siddiqui (1996); Singh, V.K. (1996); Yadav et. al. (1996); Pandey (1995); Sen and Kar (1995); Singh, R.B. (1995); Miyazaki and Tsunekawa (1994); Gupta (1991); Sinha (1990); Bagla and Agarwal (1989); Sahu (1989); Patil and Gadgil (1988); Bano (1984); Murty, et. al. (1984).

III. Human response to environmental degradation: conservation, environmental impact assessment, legislation, management, planning, monitoring, environmental regeneration

Singh and Minhas (2005); Chauhan and

Sharma (2004); Meena (2004); Nandy (2004); Roy (2004); Troumbis (2004); Dasgupta (2003); Nag (2003); Singh and Sarfaraz (2003); Zodage (2003); Ibrahim (2002); Kumar and Mishra (2002); Reddy and Rao (2002); Roy et. al. (2002); Sarfaraz (2002); Shashikala (2002); Bhakat (2001); Subrata (2001); Upreti (2001); Singh, S. (1999); Ansari (1997); Kumar (1997); Mandal (1997); Mukherjee (1997); Singh and Chauhan (1997); Bahuguna (1996); Misra (1996); Krishan and Singh (1993); Singh, R.B.(1992a); Mathur and Yadav (1988); Vohra (1988); Misra and Misra (1986); Mithal et. al. (1984); Yadav (1984); Kayastha (1970); Kayastha (1965); Puri (1956).

IV. Sustainability issues/biodiversity

Banerjee (2004); Das (2004); Gurjar (2004); Hassan and Atkins et. al. (2004); Sharma (2004); Diwan (2003); Mitra (2003); Roy et. al. (2003); Kundu et. al. (2002-2003); Lahiri and Lahiri (2002); Singh, R.B.(2002); Bhagabati (2001); Khan and Singh (2001); Siddiqui, S. (1998); Bhattacharya (1997); Obi Reddy (1996); Gupta and Gurjar (1993).

V. Development and environment

Jinnah (2001); Siddiqui, M.A. (1998); Rathore (1996); Singh, R.B. (1996); Kant (1995); Singh, Y. (1994); Agnihotri and Mukherjee (1993); Raza (1992); Bhattacharya (1991); Verma and Singh (1991); Meher-Homji (1983); Kayastha (1982); Narain (1980); Mahadev and Thangamani (1979).

VI. Disaster/ hazard studies

Das, C.S. (2005); Joshi (2005); Pande (2005); Parida (2005); Chakraborty (2004); Singh, R. (2002); Mahanta and Bora (2001-2002); Gardner and Singh (2001); Singh, R.P. (2001); Basu et. al. (1997); Pande and Jalal (1997); Pirazizy (1992a); Chander (1990).

VII. Agriculture-ecology interface; rural ecology

Agrawal (2004-2005); Khan (2004); Singh and Sarfaraz (2004); Mansoor Ali (2002); Singh, R.S. et. al. (2002); Brar (1999); Singh, H. (1992a); Kumar (1991); Misra (1988); Purohit (1988); Singh, R.L. (1986).

VIII. Urban environments

Banerjee (2005); Singh and Singh (2004); Sharma (2002-2003); Brar (2002); Drujiven (2002); Sethy et. al. (2002); Chaudhary (2001); Mushir (1999); Barai and Naseeba (1997).

IX. Enquiries into mountain environments, especially the Himalayas

Khan (2002); Shahnawaz (2001); Pirazizy (1992b); Singh and Haigh (1995); Lama (1994); Singh, V. (1993); Raina (1992); Singh, H. (1992b); Singh, R.B. (1992b); Desai (1986); Gopalakrishnan (1986); Singh, A.K. (1986).

X. Landuse/landcover change/planning

Singh, T. (2002); Pawar (2001); Bhudevi (1998); Kapur (1989); Das (1973).

XI. Women and environment

Mandal (2005).

XII. Environment and health

Mathapati (2002).

XIII. Geomorphology and land use; Environmental geomorphology

Lepcha (2004); Yadav and Singh (2002-2003); Gangola (1994); Kumar (1987).

A careful perusal of these studies reveals the following:

- Environmental studies made a beginning in 1956 and 1960 when only one study for each year can be traced.
- Environmental problems became evident

from the late 1960s which was acknowledged at the United Nations Conference on the Human Environment, Stockholm in 1972. Despite this Indian geographers have been slow at picking up this area of study. Of the total of 214 studies done close to half (105) were done post the year 2000.

- For a period during mid-1980s to mid-1990s a lot of work was done in the environment development mode. It appeared that even though the reasons for environmental degradation were very apparent, Indian geographers were not willing to let go of their fixation with regional planning and development. They continued to study the environment from the 'natural resource use' perspective. Environment was seen as something that could be managed through planning.
- A majority of the studies address the impact of human activities on the environment followed by the manifestation of the degradation.
- The approach of most studies is in the vein of problem presentation.
- Several important themes such as agriculture-environment interface, women-environment interface, health and environment are often neglected by the geographers.

Neglect of Environmental Studies / Perspective / Approach

The neglect of environmental studies in Indian geography needs to be seen from two viewpoints. The first relates to the total number of studies done in this field in comparison with other branches of the subject. An examination of the Fourth Survey of Research in Geography (Gosal, 1999) covering the period 1976-82 reveals some statistics that endorse this stand. The number of studies covered under the

subject of environment during the period was 120; this is in contrast with 658 covered under 'urban geography'; 344 covered under 'economic geography'; 265 covered under 'geography and planning' and 237 covered under 'social geography'.

The second relates to the failure of Indian geographers to develop an 'environmental' perspective from which these studies should be done. Many geographers continue to harbor ideas of possibilism. They are shy of environmentalism. This may be attributed to the fact that the ushering in of the planning era in India in the 1950s made control of the environment seemingly possible. The emergence of regional planning exercises such as the Damodar Valley Corporation (DVC), served to underline this misplaced feeling along with providing geographers with a feeling of relevance in policy making and implementation. It is not surprising to note that the initial work on environment was carried out in the spirit of 'optimum resource utilization' and 'environmental planning'. This stance may be termed as viewing environment from the perspective of development. An examination of the literature reviewed in this study only serves to substantiate this and it underlines two points: firstly that the viewpoint developed earlier has not been shed by most geographers and their work is still being done in the same vein. Secondly, some geographers who have tried to break the mould find themselves in the familiar arena of environmental degradation.

The neglect of environmental studies in Indian geography is attributable to several reasons. The first which may be cited is that the base of physical geography in India is weak. One reason for this is that in post-Independence period, the development of geography took place in a manner which had a bias in favor of human geography. The economic and social fields seem to have pushed physical geography

to relative insignificance and the ratio of publications is roughly about eighty to twenty (Thakur, 1994).

This neglect of physical geography is reflected in environmental research in geography. Most of the ongoing discourses on environment appear to have bypassed the geographical academy (Ahmad, 1996). This is happening despite the growing magnitude of environmental degradation which is very evident and despite the raging debate on various related issues.

Data availability emerges as a severe constraint. It is difficult to adhere to a strict geographical approach as data are not available for all micro units of a region. Physical phenomena require generation of data through experimentation and practically no effort is made by geographers in this direction. This may be explained by lack of funds or expertise or both. There is a necessity for conducting fieldwork in environmental studies and the base of fieldwork is weak in geography. Instead of making an effort at generating data, geographers take the easy way out and pick a field, like population geography or agricultural geography, where data are easily available to conduct research. Therefore there is a stress on those aspects/specializations which do not require fieldwork and where studies can be conducted with secondary data. In environmental studies, there is a need for geographers to base their observations on rigorous analysis of data rather than on popular impressions.

The understanding of physical phenomena requires specialized knowledge and the sciences, being more specialized, are more advanced than geography in such an understanding. Most geographers are trained as social scientists and find it difficult to compete with the physical sciences. This has kept the geographers away from such studies and other

scientists have taken a lead in the study of the environment.

The above observations raise a pertinent question: What should be the approach to correct such a situation?

Agenda for Future Research

Indian geographers need to take cognizance of the changes taking place in viewing environment and nature interface; this should not be difficult because the changes taking place in the perceptions of the western world are essentially rooted in traditional Indian view of the environment. There is a need to emphasize the unity of human beings with nature and the character of the studies must reflect this.

Several themes that are relevant but have not found representation in the studied literature must be delved into. Issues of sustainability need to be understood with greater depth and vision. The weaving together of traditional Indian knowledge with the prevalent understanding of the term 'sustainable' would yield valuable results. Having done so, the research into disasters and hazards, environmental management, human-environment interactions and even climate change would become more rooted in reality.

Such studies may be conducted in the regional spirit. Identifying the varying nature of environmental problems in different parts of the country, demarcating environmentally susceptible zones and specific nature of susceptibility could be a fruitful exercise. Studies dealing with changes in landuse and landcover could form an important adjunct to such studies. The issue of extension of non-agricultural activities onto prime agricultural land should be especially useful and relevant for a country like India. Ascertaining the reasons for and the likely fallouts of the changing landuse and landcover in different

parts of the country would form significant inputs for policy making.

The expanding urban environment requires special attention. Besides examining the entire spectrum of urban environmental issues, perspectives need to change with regard to many aspects. There is a need to dispel popular impressions with regard to urban environmental problems. Slums are a case in point. These need to be viewed as an integral component of the urban environment rather than as an eyesore. The urban fringe is a case ripe for environmental planning and management. Planning for the traffic problems of most urban areas is essential.

There is a lot of focus on problems that have a sudden onset and intense though short term impact like flash floods, earthquakes and cloud bursts. Very little work has been done on events with a slow onset like desertification. India, and Punjab in particular, are prone to this and it should form an important aspect of the research orientation.

The interface between agriculture and environment with special reference to changes taking place in agriculture practices is a relevant area of research along with examining the issue of sustainability of the current agricultural practices; investigating the pressure on land resource base in terms of demands from agriculture, urban areas, infrastructural facilities (such as roads) is another theme that deserves attention; the environmental basis of emerging social and economic issues and ills could form the focus of other studies.

It is evident that Indian geographers are trying to get into research in the field of environmental studies. Research in this field needs to be rooted in the traditional Indian view of 'human-environment unity'. This would yield a conceptual framework peppered with the environmentalist tradition. Areas that need

special attention in the Indian context must form the crux of environmental geography in India. The judicious use of methodologies like GIS and Remote Sensing could provide geographers with the 'cutting edge' that they so desperately seek. The above agenda may work to some extent to sharpen the focus on environmental studies in Indian geography in the spirit that it deserves.

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References

- Agnihotri, V.K. and Mukherjee, A. (1993): *Environment and Development: Views from the East and West*, Proceedings of Indo-British Geography Seminar, Concept Publishers, New Delhi.
- Agrawal, L.C. (2004-2005): 'Slope Suitability and Agriculture (a case study of Gangapur tahsil in Sawai Madhopur district, Rajasthan)', *Annals of the Rajasthan Geographical Association*, Vol. 21-22, pp. 54-61.
- Ahmad, A. (1996): *Progress in Indian Geography, 1992-96*, INSA, New Delhi.
- Ahmed, M. and Das, N.K. (2004): 'Impact of Deforestation on Pattern of Rainfall and Number of Rainy Days of Goalpara district, Assam, India', *Transactions, Institute of Indian Geographers*, Vol. 26, No.1, pp. 39-46.
- Ansari, A. H. (1997): 'Tree Plantation Program in Indira Gandhi Canal Project Command Area of Western Rajasthan, India', *National Geographer*, Vol. XXXII, No. 1, pp. 83-90.
- Ansari, A. H. (1998): *Socio-economic and Ecological Impact of Indira Gandhi Canal in Western Rajasthan*, Unpublished Ph.D. thesis, Aligarh Muslim University, Aligarh.
- Asgher, M.S. (2003): *Impact of Brick Kilns on Land and Environment in and around Aligarh City*, Unpublished Ph.D. thesis, Aligarh Muslim University, Aligarh.
- Babu, M.N. and Sankara, P.P. (2003): 'Mine Water Quality from Brahmanapalle-Vemula Area, Cuddapah District, Andhra Pradesh', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 26, No. 2, pp. 64-70.
- Bagla, S and Agarwal, R. (1989): 'Pesticide Residues in Ganga waters at Kanpur and its Management', *The Brahmavart Geographical Journal of India*, Vol. 1, pp. 67-74.
- Bahuguna, A. S. (1996): *Environmental Study of Lower Ramganga Basin with Special Reference to Wasteland Management*, Unpublished Ph.D. thesis, Hemwati Nandan Bahuguna Garhwal University, Srinagar.
- Baksi, K. (2003): 'Trends of Ecological Changes in the Chilika Lagoon', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 26, No. 2, pp. 144-147.
- Banerjee, A. (2005): 'Population Growth, Urban Environment and Sustainability Issues: A Case Study of Delhi, India', *Indian Journal of Landscape and Ecological Studies*, Vol. XXVIII, No. 2, pp. 77-93.
- Banerjee, B. (2004): 'Sustainable Management of Water Resources', *Transactions, Institute of Indian Geographers*, Vol. 26, No. 1, pp. 5-11.

- Bano, H. (1984): 'A Note on the Problems of Pollution in Dal Lake', *The National Geographical Journal of India*, Vol. 30, pp. 255-258.
- Barai, D.C. and Umme, N. (1997): 'An Integrated Solid Waste Management: A Case Study of Bangalore', *The Geographer*, Vol. XLIV, pp. 8-19.
- Barrows, H.H. (1923): 'Geography as Human Ecology', *Annals of the Association of American Geographers*, Vol.13, pp. 1-13.
- Basu, S. and Santra, S. (1988): 'Flood Problems of Howrah District', *Geographical Review of India*, Vol. L, No. 4, pp. 69-74.
- Basu, S.; Lama, S. and Sarkar, S. (1997): 'Causes and Consequences of Landslides in Darjiling Town', *Indian Journal of Geography and Environment*, Vol. 2, pp. 20-35.
- Basu, S. (2001): 'Problem of Arsenic Contamination in Drinking Water of the Deltaic Plain of West Bengal', *The Geographer*, Vol. 48, No. 2, pp.32-41.
- Bhagabati, A.K. (2001): 'Biodiversity and Associated Problems in the Islands of the Brahmaputra, Assam', *Geographical Review of India*, Vol. 63, No.4, pp. 330-343.
- Bhakat, R.K. (2001): 'Coastal Dunes of Digha India: A Plea for Continued Protection', *Indian Journal of Geography and Environment*, Vol. 6, pp. 54-60.
- Bhandari, G. (2001): 'Coastal Defence Strategy and its Impact on Coastal Environment', *Indian Journal of Geography and Environment*, Vol. 6, pp. 38-53.
- Bhardwaj, O.P. (1960): 'Problems of Soil-Erosion in Bist-Jalandhar Doab', *The National Geographical Journal of India*, Vol. 6, pp. 159-175.
- Bhattacharya, G. (1997): 'Impact of Environmental Problems on Regional Sustainability: A Case Study of the Bhal Region of Gulf of Khambhat, Gujarat', *The Geographer*, Vol. XLIV, No. 1, pp. 49-62.
- Bhattacharya, R.N. (1991): 'Development and Environment: A Perspective for Hill Regions', *Indian Journal of Regional Science*, Vol. XXIII, No. 1, pp. 11-16.
- Bhudevi, A. (1998): *Urban Growth Trend and Land Use/Land Cover Study of Visakhapatnam Development Area Using Remote Sensing and GIS Techniques*, Unpublished Ph.D. thesis, Osmania University, Hyderabad.
- Bhutia, P.T. (2000): *Environmental Degradation, Problems and Prospects: A Study in Kurseong Sub-Division of Darjeeling Himalaya*, Unpublished Ph.D. thesis, University of North Bengal, Darjeeling.
- Brar, K.K. (1992): 'The Ecological Costs of the Green Revolution in Punjab' in *Sachitra Ayurved (Special issue on Environment)*, Vol. 44, pp. 221-224.
- Brar, K.K. (1996): 'Economic, Social and Political Aspects of the Ecological Implications of Green Revolution', in *Sustainable Development: Ecological and Sociological Dimensions*, K. Gopal Iyer (ed.), Vikas Publishing House Pvt. Ltd, New Delhi, pp. 157-166.
- Brar, K.K. (1999): *Green Revolution: Ecological Implications*, Dominant Publishers & Distributors, Delhi.
- Brar, K.K. (2000): 'Impact of the Green Revolution on the Rainfall Regime of Punjab', *Transactions of the Institute of Indian Geographers*, Vol. 22, pp. 63-74.
- Brar, K.K. (2002): 'Chandigarh: Temperature, Planning and Lifestyles', *Urban India*, Vol. 22, No. 2, pp. 103-121.
- Chakrabarti, S. (1988): 'Problems of the Upper

- Dwarakeshwar River Basin', *Geographical Review of India*, Vol. L, No. 4, pp. 75-80.
- Chakraborty, S. (2001): 'Deforestation, Related Environmental Problems and Remedial Measures- Sanjal Basin, Singhbhum (East and West), Jharkhand', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 24, No. 2, pp. 38-46.
- Chakraborty, S.C. (2004): 'The Tsunami of 26 December 2004', *Geographical Review of India*, Vol. 66, No. 4, pp. 311-320.
- Chander, A. (1990): *Landslide: An Expression of Man-Nature Interaction in the Western Himalayas*, Unpublished Ph.D. thesis, Panjab University, Chandigarh.
- Chaudhary, P. (2001): 'The Calcutta Canals', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 24, No. 2, pp. 66-68.
- Chauhan, S.S. and Sharma, H.S. (2004): 'Strategies for Desertification Control, Management of Land Degradation and Enhancement of Productivity in the Thar Desert of India', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 27, No. 2, pp. 154-164.
- Chauhan T.S. (2003): 'Land Degradation in Shekhawati Region, Rajasthan, India', *The Indian Geographical Journal*, Vol. 78, No. 1, pp. 37-42.
- Chitralkha, R. and Vidya, R. (1997): 'Ambient Air Quality in Chennai', *Indian Geographical Journal*, Vol. 72, No. 2, pp. 150-153.
- Chorley, R.J. (1973): 'Geography as Human Ecology', in Richard J. Chorley (ed.), *Directions in Geography*, Methuen, London, pp.155-169.
- Crawford, J. (1863): 'On the Connection between Ethnology and Physical Geography', *Transactions of the Ethnological Society of London*, N.S. 2, pp. 4-23.
- Das, C.S. (2005): 'Tiger Straying Hazards in Sundarban, West Bengal', *Geographical Review of India*, Vol. 67, No. 1, pp. 80-87.
- Das, N. (2004): 'Interlinking of Rivers and a Concept of Sustainable Development', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 27, No. 2, pp. 165-169.
- Das, N. (2005): 'Water Development Program-Opening of a New Horizon in Drought-Prone Watershed Areas of Puruliya District', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 28, No. 2, pp. 194-200.
- Das, P.L. (1973): 'Changes in Landuse Pattern of Dehra Dun', *Geographical Review of India*, Vol. 35, pp. 52-60.
- Das, S.; Bandopadhyay, M.K. and Das, T.H. (2003): 'Pedo-Ecological Environment of Yaksam Area of West Sikkim in Eastern Himalaya', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 26, No. 1, pp. 27-33.
- Dasgupta, A. (2003): 'Water Resource Planning-Changing Perspective of the Upper Ravi Basin', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 26, No. 1, pp. 78-82.
- Dasgupta, T. and Chattopadhyay, R. N. (2001): 'Man-Forest Relationship: A Study in Geo-Historic Retrospective of India', *Indian Journal of Geography and Environment*, Vol.6, pp. 61-76
- Dash, N.R. (2005): 'Impact of Deforestation on Tribal Economy: A Case Study of Selected Tribal Villages of Gujarat', *Hill Geographer*, Vol. XXI, Nos. 1 & 2, pp. 24-38.
- Datta, K. L. (2002): 'When the Mines Come: Some Observations', *Transactions*,

- Institute of Indian Geographers*, Vol. 24, Nos. 1&2, pp. 89-92.
- Desai, M. (1986): 'Environmental Problem of Sikkim Himalaya', *Geographical Review of India*, Vol. 48, pp. 45-50.
- Diwan, G.R. (2003): 'Sustainable Development in Hill Areas- Protection of Environment through Effective Citizen's Participation: The Case Study of Pune', *Indian Journal of Regional Science*, Vol. XXXV, No. 2, pp. 23-26.
- Drujiven, P.C.J. (2002): 'Environmental Aspects in the Urban Fringe: A Kaleidoscopic View', *Geographical Review of India*, Vol. 64, No. 3, pp. 233-242.
- Gangadri and Rao, S.M. (2001): 'Water Balance, Climatic Classification and Water Resource Development of Chittoor District, Andhra Pradesh, India', *The Geographer*, Vol. 48, No. 2, pp. 78-88.
- Gangola, P. (1994): *Environmental Geomorphology of Gagan Basin, Central Himalaya*, Unpublished Ph.D. thesis, Kumaun University, Nainital.
- Gardner, J.S. and Singh, R.B. (2001): 'Management of Water-Related Disasters in the Context of the Himalayan region', *Annals of the National Association of Geographers, India*, Vol. 21, No. 2, pp. 41-46.
- Geist, H. (2003): 'The Role of Population as an Underlying Force of Deforestation and Desertification (Insight from Two Meta-Analytical Studies)', *Population Geography*, Vol. 25, Nos. 1 & 2, pp. 29-40.
- Ghaffar, A. (2005): 'Spatial Pattern of the Pollution in Lahore', *Punjab Geographer*, Vol. 1, pp. 18-27.
- Ghosh, A.K. and Khan, D.K. (2004): 'Freshwater Wetland and Loss in Nadia district, West Bengal', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 27, No. 2, pp. 170-180.
- Gopalakrishnan, R. (1986): 'Himalayan Geoecology', *Geographical Review of India*, Vol. 48, pp. 87-88.
- Gosal, G.S. (1999): *Fourth Survey of Research in Geography*, Manak Publications, New Delhi.
- Gupta, J.P. (1991): 'Pollution of Drinking Water and its Impact on Rural Public Health: A Case Study of Banda District, UP', *The Brahmavart Geographical Journal of India*, Vol. III, pp. 25-35.
- Gupta, N.L. and Gurjar, R.K. (1993): *Sustainable Development*, (eds.) Rawat Publications, Jaipur.
- Gurjar, R.D. (2004): 'Concern for Biodiversity with Reference to Rio and India', *Transactions, Institute of Indian Geographers*, Vol. 26, No. 1, pp. 71-76.
- Hassan, M. and Atkins, P. et al. (2004): 'Sustainable Arsenic Mitigation Options in Bangladesh: Voices of Local People', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 27, No. 2, pp. 1-7.
- House, F. N. (1936): *The Development of Sociology*, McGraw-Hill, New York.
- Husain, M. (ed.) (1994): *Ecology and Environment*, Anmol Publishers, New Delhi.
- Hussain, Z. and Surrong, P. (2004): 'Type and Extent of Land Degradation in the Upper Mynrut River Basin of Meghalaya', *Hill Geographer*, Vol. XX, Nos. 1 & 2, pp. 33-45.
- Ibrahim, R. (2002): 'Environmental Impact of Quarrying Activities of Stone Crushers- A Case Study of Mewat Region in Haryana', *The Deccan Geographer*, Vol. 40, No. 2, pp. 55-62.
- Ikeya, K. (2002): 'Political Ecology of Land

- Degradation in the Kalahari Desert: Relationship between Desertification and Regional Society', *The Indian Geographical Journal*, Vol. 77, No. 2, pp. 89-98.
- Inderjeet (1997): 'Spatio-Temporal Analysis of Groundwater Balance in Eastern Haryana', *Transactions of the Institute of Indian Geographers*, Vol. 19, No. 1, pp. 7-16.
- Jamwal, A. (1998): *Regional Patterns of Flood Caused Degradation and its Socio Economic Impact in parts of North Western Himalaya from 1950 to 1992: A Geomorphological Study*, Unpublished Ph.D. thesis, University of Jammu, Jammu.
- Jinnah, S. (2001): *Environmental Problems and Development of District Udham Singh Nagar: A Geographical Study*, Unpublished Ph.D. thesis, Kumaun University, Nainital.
- Johnston, R.J. (1981): *The Dictionary of Human Geography*, (ed.), Blackwell, Oxford.
- Joshi, V.U. (2005): 'Tsunami: the Killer Wave that Struck the Asian Coasts on 26th December, 2004', *Transactions*, Vol. 27, No. 1, pp. 1-18.
- Kant, S. (1995): 'Development and the Environment in an Indian Mountainous State', *Geographical Review of India*, Vol. LVII, No. 2, pp. 97-111.
- Kapur, A. (1989): *Ecological Implications of Changing Land Use Pattern in the Kashmir Valley*, Unpublished Ph.D. thesis, University of Delhi, New Delhi.
- Kayastha, S.L. (1965): 'Some Aspects of Soil Erosion and Conservation in India', *National Geographical Journal of India*, Vol. 11, pp. 22-29.
- Kayastha, S.L. (1970): 'Conservation of Natural Resources in Himalaya—A Vital Need', *National Geographical Journal of India*, Vol. 16, pp. 208-220.
- Kayastha, S.L. (1982): 'Perspectives on Environment and Development', *National Geographical Journal of India*, Vol. 28, pp. 37-43.
- Khan, M. (2004): *Environmental Impact on Changing Cropping Pattern in Etah District*, Unpublished Ph.D. thesis, Aligarh Muslim University, Aligarh.
- Khan, M.A. and Singh, S. (2001): 'Water Harvesting and Sustainable Development in an Arid Environment', *The Geographer*, Vol. 48, No. 2, pp. 28-37.
- Khan, T.A. (2002): *Environmental Deterioration in Kashmir Valley with Special Reference to Lidder Valley*, Unpublished Ph.D. thesis, Jamia Millia Islamia, New Delhi.
- Krishan, Gopal and Singh, Mehar (1993): *The State and the Ecology Management through the People: Some Lessons from the Sukhomajri Experience*', in Amitava Mukherjee and V.K. Agnihotri (eds.), *Environment and Development*, Concept Publishing Company, New Delhi, pp. 197-205.
- Kumar, A. (1997): *Spatial Patterns, Process and Environmental Impact of Industrialization in the Upper Ganga-Yamuna Doab*, Unpublished Ph.D. thesis, Himachal Pradesh University, Shimla.
- Kumar, P. (1987): *Geomorphological Evaluation of Environmental Degradation and Management in Dhauliganga Basin, Central Himalayas*, Unpublished Ph.D. thesis, Jawaharlal Nehru University, New Delhi.
- Kumar, R. (1991): *Land Use of Kashmir Valley: Agro-Ecological Analysis*, Unpublished

- Ph.D. thesis, Jawaharlal Nehru University, New Delhi.
- Kumar, S.N. and Mishra, J.N. (2002): 'On-Farm Water Management- A Vital Key to Water Conservation and Utilization', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 25, No. 1, pp. 97-104.
- Kundu, B.S. et. al. (2002-2003): 'Sustainable Development through Remote Sensing Techniques', *Annals of the Rajasthan Geographical Association*, Vol. 19-20, pp. 8-15.
- Lahiri, T.B. and Lahiri, K. (2002): 'Sundarban: Environmental Diversity, Opportunities and Challenge', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 25, No. 1, pp. 20-23.
- Lama, M.P. (1994): *Sikkim – Society, Polity, Economy and Environment*, Indus Publishers, New Delhi.
- Lepcha, I. (2004): *Study of the Environmental Geomorphology in the Balason Basin Darjeeling*, Unpublished Ph.D. thesis, University of North Bengal, Darjeeling.
- Lewthwaite, G.R. (1966): 'Environmentalism and Determinism: A Search for Clarification', *Annals of the Association of American Geographers*, Vol. 56, No. 1, pp. 1-23.
- Livingstone, D.N. (1992): *The Geographical Tradition*, Blackwell, Oxford.
- Mahadev, P.D. and Thangamani, K. (1979): 'Environmental Dimensions of Regional Development: A Theoretical Approach', *Transactions of the Institute of Indian Geographers*, Vol. 1, pp. 33-38.
- Mahanta, P. and Bora, A.K. (2001-2002): 'Flood and Erosion Hazards in the Kaziranga National Park of Assam', *North Eastern Geographer*, Vol. 32, Nos. 1&2, pp. 50-57.
- Mandal, M. (2005): *Impact of Rural Environmental Degradation on Women in Selected Localities of Medinipur, Bankura, Birbhum and Purulia of West Bengal*, Unpublished Ph.D. thesis, University of Burdwan, Burdwan.
- Mandal, R.B. (1997): 'Management of Wetlands in North Bihar', *Annals of the National Association of Geographers, India*, Vol. XVII, No. 1, pp. 123-129.
- Mandal, S.K. and Mandal, S. (2003): 'Survey of Weed Flora of the Lower Ganga Plain Region in West Bengal', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 26, No.2, pp. 18-21.
- Manoj (1996): *Impact of Industrialization on Environment: A Study of Jamshedpur and its Environs*, Unpublished Ph.D. thesis, Banaras Hindu University, Varanasi.
- Mansoor Ali (2002): *Dynamics of Agriculture Agro-Ecosystem in Jharkhand State (A Case Study of Garra River Catchment)*, Unpublished Ph.D. thesis, Aligarh Muslim University, Aligarh.
- Marsh, G.P. (1864): *Man and Nature or Physical Geography as Modified by Human Action*, University Press, Harvard, (reprinted in 1965).
- Mathapati, S.S. (2002): *Environment and Health in Belgaum Division of Karnataka State: A Spatial Analysis*, Unpublished Ph.D. thesis, Karnatak University, Dharwad.
- Mathur, H.S. and Yadav, S.D. (1988): 'Environmental Impact Assessment of the Mahi-Bajaj Sagar Project', *Indian National Geographer*, Vol. III, Nos. 1 & 2, pp. 37-44.
- Mazumdar, K. and Mazumdar, B.C. (2001): 'Bacterial Contamination of Tank Water in the Eastern Fringe of Kolkata City', *Indian Journal of Landscape Systems*

- and Ecological Studies*, Vol. 24, No. 1, p. 103.
- Meena, V.P. (2004): 'Desert National Park: A Unique Biosphere Reserve for Conservation and Development of Biodiversity', *Annals of the National Association of Geographers, India*, Vol. XXXIV, No. 1, pp. 66-80.
- Meher-Homji, V.M. (1983): 'The Development-Vegetation-Environment Link', *Geographical Review of India*, Vol. 45, pp. 66-73.
- Misra, K.K. (1988): 'Rural Ecology: The Crucial Issues (Notes and Comments)', *The Deccan Geographer*, Vol. XXVI, Nos. 2 & 3, pp. 429-434.
- Misra, R.P. and Misra, H.N. (1986): 'Human Survival and Development', *Annals of the National Association of Geographers, India*, Vol. 4, pp. 21-38.
- Misra, R.P. (1996): *Environmental Ethics: A Dialogue for Cultures*, (ed.) Concept Publishers, New Delhi.
- Mithal, R.S.; Joshi, B.C. and Gohain, K. (1984): 'Environmental Impact of the Ramganga Dam Project', *The National Geographical Journal of India*, Vol. 30, pp. 81-91.
- Mitra, B. (2002): 'Expediency of Surrogate Data in Accounting Hydrological Balance of Small River Basins: A Case Study of the Kunur Basin', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 25, No. 1, pp. 38-48.
- Mitra, S. (2003): 'How Sustainable is Sustainable Development', *Indian Journal of Regional Science*, Vol. XXXV, No. 1, pp. 53-56.
- Miyazaki, T. and Tsunekawa, A. (1994): 'Towards solving the Global Desertification Problem – Research on the Evaluation of Interaction between Desertification and Human Activities, (Papers on Indian Desert Region), Tsukuba: National Institute of Environmental Studies.
- Morrill, R.L. (1985): 'Some Important Geographic Questions', *The Professional Geographer*, Vol. 37, pp. 263-270.
- Moses, E.J.; Sankaragururaman D.; Rajendran, S. and Jaganathan (1996): 'Intensity of Groundwater Pollution in Ariyalur-Udayarpalayam Region of South India', *The Indian Geographical Journal*, Vol. 71, No. 2, pp. 133-136.
- Mukherjee, R.B. (1997): 'Evolution of Forest Acts and Forest Policies in India', *Geographical Review of India*, Vol. 59, No. 1, pp. 25-33.
- Mukhopadhyay, S.C. (2001): 'Problems of Water Availability in India', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 24, No. 2, pp. 95-113.
- Murty, K.P.R., et. al. (1984): 'Air Pollution Climatology as a Means of Pollution Management and Abatement Planning of India', *The National Geographical Journal of India*, Vol. 30, pp. 236-244.
- Mushir, S. (1999): *Quality of Urban Environment: A Case Study of Saharanpur City*, Unpublished Ph.D. thesis, Jamia Millia Islamia, New Delhi
- Nadaf, F.M. (2003): *Environmental Degradation along the Coastal Belt of Goa: A Spatial Analysis*, Unpublished Ph.D. thesis, Karnatak University, Dharwad
- Nag, P. (2003): 'Can we Monitor the Environment?', *Transactions, Institute of Indian Geographers*, Vol. 25, Nos. 1 & 2, pp. 1-8.
- Nagabhushanam, N, et. al. (1996): 'Quality Assessment of Groundwater in Erapedu

- Mandal, Chittoor District, Andhra Pradesh', *The Indian Geographical Journal*, Vol. 71, No. 2, pp. 121-126.
- Nandeshwar, et. al. (2001): 'Environmental Degradation and its Impact on Hydrologic Processes in Attappadi Valley', *The Deccan Geographer*, Vol. 39, No. 2, pp. 60-76.
- Nandy, D.R. (2004): 'Need for Management and Conservation of Water Resources', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 27, No. 2, pp. 19-24.
- Narain, H. (1980): 'Resources, Environment and Economic Development', *The National Geographical of India*, Vol. 26, pp. 17-18.
- Narasimha Rao, G.V. (2005): *Urbanization and Industrialization: Implication to Urban Climates and Human Health in Visakhapatnam City, India*, Unpublished Ph.D. thesis, Andhra University, Waltair.
- Nayak, R.D. (2004): 'A Drainage Profile of the Gumti River: Tripura', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 27, No. 2, pp. 53-57.
- Nianthi, K.W.G. (2005): *Climate Change and its Potential Influence on Agricultural Economy of Sri Lanka*, Unpublished Ph.D. thesis, North-Eastern Hill University, Shillong.
- Nigar, A. (1995): *Environmental Consequences of Industrial Development - A Case Study of Meerut and Ghaziabad Districts*, Unpublished Ph.D. thesis, Aligarh Muslim University, Aligarh.
- Nigar, A. (1997): 'Habitat, Environmental Degradation and Quality of Life in Modi Nagar, Ghaziabad District, Uttar Pradesh', *Geographical Review of India*, Vol. 59, pp. 159-163.
- Obi Reddy, G.P. (1996): *Applied Geo-Ecological Study of Land and Water Resources for Sustainable Land Use Development of Ananthapur District, Andhra Pradesh, India Using Remote Sensing Techniques*, Unpublished Ph.D. thesis, Sri Krishnadevaraya University, Ananthapur.
- Pande, A. and Jalal, D.S. (1997): 'Saran Flash Flood: A Geomorphological Appraisal- A Case Study in Upper Sarayu Basin, Kumaon Himalaya', *National Geographical Journal of India*, Vol. 43, No. 2, pp. 122-129.
- Pande, N. (2005): 'Relationship between Configuration of Terrain and some Hazards Related to Natural Calamities as well as Manmade Hazards', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 28, No. 2, pp. 120-124.
- Pandey, B.W. (1995): 'Environmental Degradation and Vanishing Livelihood Security in Western Himalaya, Himachal Pradesh', *The Deccan Geographer*, Vol. XXXIII, No. 2, pp. 107-119.
- Parida, P.K. (2005): 'Understanding Natural Disasters in India: Causes, Effects and Solutions', *Man and Development*, Vol. XXVII, No. 1, pp. 63-80.
- Patil, P.N. and Gadgil, A. (1988): 'Environmental Lead Distribution in Relation to Road Dust Samples in around Pune', *Transactions of the Institute of Indian Geographers*, Vol. X, No. 2, pp. 65-67.
- Pawar, D. (2001): *Land Use Planning in the Greater Nainital Lake Region*, Unpublished Ph.D. thesis, Kumaun University, Nainital.
- Pirazizy, A.A. (1992a): *Environmental Geography and Natural Hazards*,

- Concept Publishers, New Delhi.
- Pirazizy, A.A. (1992b): *Anthropogenic Impact on Environmental Changes in Temperate Zone of the Himachal Pradesh Himalayas*, Unpublished Ph.D. thesis, University of Delhi, New Delhi.
- Puri, G.S. (1956): 'Soil and Water Conservation Problems in Bashahr Himalayas' *The National Geographical Journal of India*, Vol. 2, pp. 7-13.
- Purohit, K.C. (1988): 'Ecological Control on the Rural Settlements in Garhwal district', *The Deccan Geographer*, Vol. XXVI, No. 1, pp. 318-327.
- Rahman, A. (2001): 'Assessing Groundwater Quality (Hand Pump Water) in the Shallow Aquifers of Aligarh City', *The Geographer*, Vol. 48, No. 2, pp. 13-21.
- Rai, R.K. (2004): 'Deforestation and its Impact on Environment with Special Reference to Assam', *Hill Geographer*, Vol. XX, Nos. 1&2, pp. 8-13.
- Raina, J.L. (1992): *Himalayan Environment, Man and the Economic Activities*, Pointer Publishers, New Delhi.
- Raju, S.T. et. al. (2002): 'Deforestation and Rainfall Characteristics in Chittoor district in Andhra Pradesh', *The Deccan Geographer*, Vol. 40, No.2, pp. 63-70.
- Ramania, M.S. et. al. (1996): 'Traffic Noise Pollution in the City of Visakhapatnam', *The Indian Geographical Journal*, Vol. 71, No. 1, pp. 72-75.
- Rao, S.N. and Devi, S.S. (2002): 'Nitrate Occurrence and its Behavior in the Groundwater of Godavari Delta, India', *The Indian Geographical Journal*, Vol. 77, No. 1, pp. 31-38.
- Rathore, M.S. (1996): *Environment and Development*, Rawat Publications, Jaipur.
- Raza, M. (1992): *Development and Ecology: Essays in Honour of Professor Mohammad Shafi*, Rawat Publications, Jaipur.
- Reddy, G.P.O. and Rao, S.M. (2002): 'Landscape Ecological Planning and Management of Anantpur District, Andhra Pradesh', *Annals of the National Association of Geographers, India*, Vol. XXII, No. 2, pp. 63-73.
- Roy, S.B. (2004): 'Systematic Approach to Sustainable Joint Forest Management', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 27, No. 2, pp. 181-185.
- Roy, S.B. et. al. (2003): 'Conceptual Framework for Criteria and Indicator for Assessment of Sustainable Development: An Illustration on Joint Forest Management', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 26, No. 2, pp. 9-17.
- Roy, S.B. et. al. (2002): 'Micro Water Management- The Concepts, Methods of Intervention and Experience at NBTDP', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 25, No. 1, pp. 8-19.
- Saha, K. (2005): *Mine Fire Problem: A Study of Environmental Impacts of Mining in the Raniganj Coal Belt, West Bengal*, Unpublished Ph.D. thesis, University of Burdwan, Burdwan.
- Saha, K. et. al. (2005): 'Impact of Coal Mining Activities on Environment: A Case Study of Raniganj Coal Belt, West Bengal', *Indian Journal of Regional Science*, Vol. 37, No. 2, pp. 85-95.
- Sahu, D. (1989): *Environmental Pollution and its Implications in Sagar District*, Unpublished Ph.D. thesis, Dr Harisingh Gour Vishwavidyalaya, Sagar.
- Sarfraz, A. (2002): *Impact of Brick Kilns on Land and Environment in and around*

- Aligarh City*, Unpublished Ph.D. thesis, Aligarh Muslim University, Aligarh.
- Sarkar, S. and Singh, G. (2004): 'Spatial-Temporal Variation in the Consumption of Fuel Wood in the Western Himalayas: A Micro Level Case Study', *Regional Symbiosis*, Vol. 12, pp. 117-123.
- Sarma, K. (2004): *Coal Mining and its Impact on Environment of Bokrek Biosphere Reserve, Meghalaya*, Unpublished Ph.D. thesis, North-Eastern Hill University, Shillong.
- Saxena, H.M. (1996): *Environmental Geography*, Rawat Publications, Jaipur.
- Sen, A.K. and Kar, A. (1995): *Land Degradation, Desertification in Asia and the Pacific Region*, Scientific Publications, Jodhpur.
- Sethy, K.M. et. al. (2002): 'An Environmental Study of Solid Waste Management in Bhubaneswar City', *The Deccan Geographer*, Vol. 40, No. 2, pp. 71-84.
- Shafi, M. (1994): *Geography of Environment*, Rawat Publications, Jaipur.
- Shafi, M. and Raza, M. (1992): *Forest Ecosystem of the World*, Rawat Publications, Jaipur.
- Shahnawaz (2001): *Environment Development Interface in Mountain Ecosystem: A Case Study of Pangi Valley in the Western Himalayas*, Unpublished Ph.D. thesis, Jawaharlal Nehru University, New Delhi.
- Sharma, A. (2004): 'Floods: A Threat to Sustainable Development', *Indian Journal of Regional Science*, Vol. XXXVI, No. 1, pp. 48-52.
- Sharma, P.C. (1995): *Environmental Degradation and Management in Ramganga Water Shed*, Unpublished Ph.D. thesis, Rohilkhand University, Bareilly.
- Sharma, R. (2002-2003): 'Geo-Environmental Problems of an Industrial City: A Case Study of Bhilwara', *Annals of the Rajasthan Geographical Association*, Vol. 19-20, pp. 87-98.
- Sharma, V.N. (2001): 'The State of Ramgarh Lake, Gorakhpur', *Geographical Review of India*, Vol. 63, No. 1, pp. 68-76.
- Shashikala, A.V. (1988): 'Evaluation of Forest Resources in Rayalseema', *The Deccan Geographer*, Vol. XXVI, No. 1, pp. 345-354.
- Shashikala, A.V. (2002): 'Augmentation of Groundwater through Biotic Treatment in Shankara Samudram Reservoir, Andhra Pradesh', *Hill Geographer*, Vol. XVIII, Nos. 1&2, pp. 56-67.
- Siddiqui, M.A. (1998): *Impact of Development on the Environment in the Fringe Areas of Aligarh City*, Unpublished Ph.D. thesis, Aligarh Muslim University, Aligarh.
- Siddiqui, M.F. (1996): *Nature of Pollution and Environmental Degradation in Aligarh District*, Unpublished Ph.D. thesis, Aligarh Muslim University, Aligarh.
- Siddiqui, S. (1998): *Sustainable Development of Tourism in Uttar Pradesh Himalayas*, Unpublished Ph.D. thesis, Aligarh Muslim University, Aligarh.
- Simmons, I.G. (1978): 'Physical Geography in Environmental Science', *Geography*, Vol. 63, pp. 314-323.
- Simmons, I.G. (1980): 'Ecological-Functional Approaches to Agriculture in Geographical Contexts', *Geography*, Vol. 65, pp. 305-316.
- Singh, A.L. and Rahman, A. (1997): 'Indoor Air Quality and Respiratory Diseases in Aligarh City', *The Geographer*, Vol. XLIV, No. 1, pp. 20-32.
- Singh, A.L. and Sarfaraz, M.A. (2003): 'Environmental Impacts of Brick Kilns

- in the Fringe Areas of North Indian Cities- A Case Study', *The Deccan Geographer*, Vol. 41, No. 1, pp. 1-14.
- Singh, A.L. and Sarfaraz, M.A. (2004): 'Impact of Brick Making on Soil Fertility and Agricultural Productivity: A Case Study of Aligarh', *Geographical Review of India*, Vol. 66, No. 4, pp. 331-340.
- Singh, A.L. and Shah, M.B. (2004): 'Loss of Forest Cover and Land Degradation in Jhum in India's North-East: A Case Study', *Annals of the National Association of Geographers, India*, Vol. XXXIV, No. 1, pp. 19-31.
- Singh, A.K. (1986): 'The Changing Environment in the Nilgiri Hills', *Geographical Review of India*, Vol. 48, pp. 28-35.
- Singh, D.N. and Singh, J. (2004): 'Studies on Solid Waste Disposal and Management: A Review', *Annals of the National Association of Geographers, India*, Vol. XXIV, No. 2, pp. 74-90.
- Singh, G. and Sarkar, S. (2005): 'Consumption of Biomass while Grazing in Western Himalayas', *Punjab Geographer*, Vol. 1, pp. 70-77.
- Singh, H. (1992a): 'Ecological Setup and Agrarian Structure of High Altitude Villages of Ladakh', in R.B. Singh, Dynamics of Mountain Geosystems, Ashish Publishers, New Delhi, pp.193-208.
- Singh, H. (1992b): 'Environmental Constraints on Agriculture in a Cold Desert', in Noor Mohammad, (ed.) *New Dimensions in Agricultural Geography: The Ecology of Agricultural System* (Vol. 2), Concept Publishing House, New Delhi, pp. 79-91.
- Singh, O. et. al. (1993): *Frontiers in Environmental Geography*, Concept Publishers, New Delhi.
- Singh, O. et. al. (1997): 'Impact of Mining Activities on Surface Water Quality: A Case Study', *National Geographical Journal of India*, Vol. 143, No. 4, pp. 354-360.
- Singh, P. (1992): *Indian Environment*, Ashish Publishers, New Delhi.
- Singh, R. (2002): 'The Flood Disaster and Mitigation Project in the Lower Gandak Basin', *Hill Geographer*, Vol. XVIII, Nos. 1&2, pp. 9-19.
- Singh, R.B. (1992a): *Environmental Monitoring: Application of Remote Sensing and GIS*, Geocarto Int. Centre, Hong Kong.
- Singh, R.B. (1992b): *Dynamics of Mountain Geosystems*, Ashish Publishers, New Delhi.
- Singh, R.B. (1995): *Global Environmental Change*, Oxford and IBH Publishers, New Delhi.
- Singh, R.B. (1996): *Disasters, Environment and Development*, Oxford and IBH Publishing, New Delhi.
- Singh, R.B. (2002a): 'Prediction in Ungauged Basins (PUB): Hydrological Challenges for India', *Annals of the National Association of Geographers, India*, Vol. XXII, No. 1, pp. 89-98.
- Singh, R.B. (2002b): *Human Dimensions of Sustainable Development*, Rawat, New Delhi.
- Singh, R.B. and Haigh, M.J. (1995): *Sustainable Reconstruction of Highland and Headwater Regions*, Oxford and IBH Publishers, New Delhi.
- Singh, R.B. and Chauhan, G.S. (1997): 'Environmental Regeneration of Wastelands through Agroforestry in Rajasthan', *The Geographer*, Vol. XLIV, No. 1, pp. 33-48.
- Singh, R.L. (1986): 'Ecological Processes of Rural Habitat Transformation in India',

- Geographical Review of India*, Vol. 48, pp.1-11.
- Singh, R.P. (2001): 'Environmental Degradation Causing Ecological and Chemical Disasters', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 24, No. 2, pp. 80-86.
- Singh, R.P.B. (1993): *Environmental Ethics, Discourses and Cultural Traditions*, Nat. Geog. Society of India, Varanasi.
- Singh, R.S. et. al. (2002): 'Agro-Ecological Evaluation of Bhilwara District for Crop Suitability', *Geographical Review of India*, Vol. 64, No. 2, pp. 165-173.
- Singh, R. Y. (2004): 'Land Degradation/Desertification as an Environment Dilemma and its Rebuttal', *Annals of the National Association of Geographers, India*, Vol. XXIV, No. 2, pp. 1-12.
- Singh, S. (1999): *Minerals, Mining and Environmental Impacts in Himachal Pradesh*, Unpublished Ph.D. thesis, Himachal Pradesh University, Shimla.
- Singh, S. and Minhas, A.S. (2005): 'Status of Environment Legislation in India', *Punjab Geographer*, Vol. 1, pp. 40-47.
- Singh, T. (2002): 'Landuse and Landcover Change in Global Context', *The Deccan Geographer*, Vol. 40, No. 2, pp. 27-44.
- Singh, V. (1993): *Eco Crisis in the Himalaya: Causes, Consequences and Way Out*, Int. Book Distributor, Dehradun.
- Singh, V.K. (1996): *Environmental Pollution and its Effects on Human Health: A Geographical Study of Agra City*, Unpublished Ph.D. thesis, Banaras Hindu University, Varanasi.
- Singh, Y. (1994): *Impact and Implications of Development on Ecosystems: A Case Study of Inter-State Chandigarh region*, Unpublished Ph.D. thesis, Panjab University, Chandigarh.
- Sinha, B.N. (1990): *Ecosystem Degradation in India*, Ashish Publishing House, New Delhi.
- Sivagnanam, N. and Kumaraswamy, K. (1983): 'Groundwater Quality in the Vaippar Basin, South India', *The Indian Geographical Journal*, Vol. 58, pp. 127-142.
- Srivastava, S. (2003): 'Forests and their Spatial Relations- A Case Study of Raigad District, Maharashtra', *The Deccan Geographer*, Vol. 41, No. 2, pp. 29-39.
- Stoddart, D.R. (1965): 'Geography and the Ecological Approach', *Geography*, Vol. 50, pp. 242-251.
- Subrata, P. (2001): 'Kumardhubi Mining Area- A Study in Environmental Impact Assessment', *Indian Journal of Landscape Systems and Ecological Studies*, Vol. 24, No. 2, pp. 71-79.
- Tewari, A.K. (1970): 'Rough Pastures and Pastoral Activities of Jaisalmer', *Indian Geographical Journal*, Vol. 45, pp. 46-51.
- Thakur, B. (1994): 'Indian Geography: Development, Trends and Prospects', *Transactions of the Institute of Indian Geographers*, Vol. 16, pp. 67-85.
- Thakur, B. and Sachar, P. (2004): 'Spatio-Temporal Study of Water Balance in the Hindon Basin: 1980-92', *Regional Symbiosis*, Vol. 12, pp. 49-69.
- Thangamani, U. and Rao, M.S. (2002): 'Water balance of the Palar Basin, India', *The Indian Geographical Journal*, Vol. 77, No. 1, pp. 60-65.
- Troumbis, A.Y. (2004): 'Environmental Management, Theoretical Inputs of Ecology', *Regional Symbiosis*, Vol. 12, pp. 70-96.
- Upreti, M. (2001): *Resource Analysis and Environmental Management for Sustainable Development: A Study of*

- Dabka Watershed, Kumaun Himalaya*, Unpublished Ph.D. thesis, Kumaun University, Nainital.
- Vats, P.C. (1997): 'Ecosystems and their Degradation in an Arid Environment', *The Deccan Geographer*, Vol. 35, No. 2, pp. 121-126.
- Verma, B.L. and Singh, C. (1991): 'The Natural Resources and Economic Development of Sikkim', *The Brahmavart Geographical Journal of India*, Vol. III, pp. 37-44.
- Vohra, B.B. (1988): 'Managing the Environment', *Management in Government*, Vol. XX, No.1, pp. 17-28.
- Yadav, B.K. et. al. (1996): 'Ghaziabad City: Noise Pollution and its Effect on Human Health', *National Geographical Journal of India*, Vol. 42, Nos. 3&4, pp. 216-222.
- Yadav, H. and Singh, R. (2002-2003): 'Geomorphology and Landuse Planning of Ajmer District', *Annals of the Rajasthan Geographical Association*, Vol. 19-20, pp. 1-7.
- Yadav, R.S. (1984): 'Environmental Problems and Eco-Development Strategy in South Mirzapur', *National Geographical Journal of India*, Vol. 30, pp. 259-268.
- Zodage, S.B. (2003): *Impact of Urban Growth on Environment: A Case Study of Kolhapur*; Unpublished Ph.D. thesis, Shivaji University, Kolhapur.

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