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INDIAN GEOGRAPHY : DEVELOPMENT, TRENDS AND PROSPECTS

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In the post-independence period, geography has emerged as a strong academic discipline in India and has made rapid strides in colleges and universities. It has made impressive progress in substance and form, albeit less perceptibly in applied fields. However, the practitioners are engulfed by doubt about the possible and desirable directions they would like to choose in the decades ahead. It is, therefore, necessary to look back over the past forty years to take stock of our achievements so that the existing forty years to take stock of our achievements so that the existing gaps can be identified and main areas of future reesearch be channelized to keep up with the societal needs. A number of reviews are available on the status of geography in India. Among these are a highly perceptive and critical assessment of some major works of the 1960s and early 1970s by Sopher (1973). A brief review of the twentieth century research on the geography of South India has been made by Murton (1975). A resume of the progress of Indian geography under the formative, informative, conformative and reformative stages was made by L.R. Singh (1980) in his Presidential Address to the Indian Council of Geographers. Schwartzberg (1983) has outlined the current state of human geographic art in South Asia and has regarded geography as a low-status discipline. Mukerji (1990) has diagnosed the ailments Indian geography is suffering from and having identified the causes, suggested the potential methods for tackling them. The present paper attempts to offer a few suggestions on shaping the future of geography in India. The purpose is fourfold : (a) to trace the history of geography as an academic discipline, (b) to describe briefly the direction in which geography as a field of research has developed, (c) to present a short, critical appraisal of the trends in its development, and (d) to indicate some research dimensions and frontiers which will have relevance to contemporary Indian society.

GEOGRAPHY AS A UNIVERSITY DISCIPLINE

The recent history of geography in India may be divided into three periods : Pre - 1950, 1951-1970 and post-1970. This division is based on major phases in the development of geography as an academic discipline. The year 1950 can be broadly taken as divide between a highly rudimentary and descriptive subject matter and an expanding, more organised, research - oriented disciplien in the subsequent phase. The last phase began at the end of the sixties and derived its strength and substance from the International Geographical Congress organised in India in 1968.

During the first phase the main emphasis was on teaching and as such progress in geographical research was meagre and was overtly disheartening. Geography was taught in high schools in different states in the beginning of the twentieth century. To cater to the teaching

needs, teacher training courses were started for school teachers at Aligarh in 1931 under the direction of I. R. Khan, at Madras in 1932 under N. Subrahamaniam, and at Calcutta in 1937 under S.P. Chatterjee. Undergraduate classes were first opened in colleges afiliated to the Universities of Punjab (1920) and Patna (1927), and the Department of Geography at the Aligarh Muslim University became the first university department to offer undergraduate courses in 1928. These were followed by St. John's College Agra (1935), Allahabad (1937), Calcutta (1939), Mysore (1942), Osmania (1942), Banaras (1946), Ranchi (1946), Udaipur (1947), Jodhpur (1948), and Gauhati (1949) (Chatterjee, 1968, 7). In general, the 1930s and 1940s witnessed rapid development of undergraduate courses in universities and colleges. However, there was a gap of between two to twenty-two years before these undergraduate departments begin to offer graduate courses at the university level (Chatterjee 1968, 7). Teaching of geography at the postgraduate level began at seven centres, namely, Aligarh (1931), Calcutta (1941), Varanasi (1946), Allahabad (1946), Madras (1948), Panjab (1948), and Patna (1949). Notable geographers of this period were Kazi S. Ahmad (Aligarh), S. P. Chatterjee* (Calcutta), H. L. Chibber (Varanasi), R. N. Dube** (Allahabad), I. R. Khan (Aligarh), Sohan Lal (Lahore), Tahir Rizvi*** (Aligarh), and N. Subrahmaniam (Madras). Initially, departments providing post-graduate teaching were established at the initiative of persons who themselves had specialised in fields other than geography. For example, the PG departments at the universities of Calcutta, Varanasi and Patna were established respectively by S. P. Chatterjee, H. L. Chibber and S. C. Chatterjee, the first had a M.Sc. in Geology and a Ph.D. in Geography from the University of London; the latter two had their doctorates in Geology. Chibber's Geology of Burma has the same status as Wadia's 'Geology of India'. The University of Calcutta, under the leadership of S. P. Chatterjee, became the pioneer in geomorphology in India. In this period, under the leadership of the above-mentioned stalwarts,the emphasis was mainly on the study of the physical landscape, evolution of landscape through time, relationship between man and environment, economic activities of man and the uniqueness of phenomena leading to spatial differentiation in the mode of Herbertsonian regional geography. It was really a period of gazetteer geography which was an extension of the geography as taught and learnt in the U.K.

The most outstanding feature in the history of Indian geography during this period was the formation of geographical societies and the publication of journals to promote research and teaching. The Aligarh Muslim University Geographical Society, initially known as the Curzon Geographical Society, was founded in 1925 and its professional journal. The Geographer, started in 1926. The Indian Geographical Society - earlier known as the Madras Geographical Association - was founded in Madras in 1926. The Journal of the Madras Geographical Association launched in 1926, was renamed the Indian Geographical Journal in 1940. The Geographical Society of India was established in Calcutta in 1933 under the name of Calcutta Geographical Society. Initially, its journal was started in 1936 as the Calcutta Geographical Review, which was renamed the Geographical Review of India in 1951. The National Geographical Society of India was founded at Varanasi in 1946 and publication of the National Geographical Journal of India commenced in 1955. The Indian

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Council of Geographers was established at the Delhi session of the Indian Science Congress in 1947 to co-ordinate the work of different geographical societies. However, this purpose could nto be met due to the annual change in its headquarters.

The second period (1951 - 1970) is characterised by a shift in focus to one which is formative in growth and analytical in approach. After 1950 the development of undergraduate departments in the universities appeared to have slowed down because of greater emphasis on postgraduate teaching (Chatterjee, 1968, 7). the number of postgraduate teaching centrs in universities increased from seven in 1950 to about thirty in 1970 due to the demand for teachers in colleges and the introduction of geography as a compulsory subject in high schools. Many geographers with B.A. and M.A. degree became teachers. Teaching therefore had priority over research. Some of the important postgraduate centres were Poona (1954), Ranchi (1954), Osmania (1955), Baroda (1956), Sagar (1956), Gauhati (1958), Gorakhpur (1959), Mysore (1959), Delhi (1959), Karnataka (1961), North Bengal (1962), Magadh (1962), Jodhpur (1963), Udaipur (1964), Ravi Shankar (1965), Shivaji (1966), Rajasthan (1968), Kurukshetra (1968), Jawaharlal Nehru (1969), Bombay (1969-70), Utkal (1970), Bhagalpur (1970), Burdwan (1970), and Madurai Kamraj (1970). The spatial distribution of these centres indicates a concentration in northern India with only a few centres in the south. The well-known leaders of geography in this period were E. Ahmad (Ranchi), S. M. Alam (Osmania), S. Mazaffar Ali (Aligarh and Sagar), K. Bagchi (Calcutta), A. N. Bhattacharya (Udaipur), H. P. Das (Gauhati), P. Dayal (Patna), C. D. Deshpande (Bombay), V. S. Gananathan (Poona), G. S. Gosal (Panjab), V. A. Janaki (Baroda), G. Kuriyan (Madras), V. L. S. Prakasa Rao (Delhi), M. Shafi (Aligarh), R. L. Singh (Banaras), and R. P. Singh (Body Gaya). They, including many others, received their doctorate degrees from European Universities[1] and many of them were appointed to Chairs of Geography in Indian universities during the 1950s and 1960s. Therefore, the research priorities in Britain got major attention in India too. Agricultural land use planning and urban geography were priority concerns of Indian geographers until the sixties. It was this period when we began to receive the concepts, themes, philosophy and methods from U. K. Thus, this was the period of emergence of western-trained Indian geographers at the helm of geographic education and research (Ramchandran, 1985, 18). However, geographers like V.L.S. Prakasa Rao did not receive their professional degrees from abroad and their efforts bore an indigenous stamp on the growth of post-Independence geography. Credit must be given to S. P. Chatterjee, R. L. Singh and M. Shafi for their valuable contribution to the development of geography by promoting research, developing infrastructure for the advancement of teaching and research, and organising summer and autumn schools, and national and international conferences. The 21st International Geographical Congress held in New Delhi in 1968 under the Presidentship of S. P. Chatterjee afforded a valuable opportunity to Indian geographers to get acquainted with the philosophical and methodological developments in geography. Another notable achievement was the establishment of National Atlas and Thematic Mapping Organisation by the Government of India in 1956 in Calcutta with S. P. Chatterjee as its Director. Professor Chatterjee rendered a signal service to Indian geography by starting this organisation. Its main purpose was to prepare an inventory of physical, economic and cultural resources of the country. This organisation produced many thematic maps of high value.

The Association of Indian Geographers was founded in New Delhi in 1955 and the Indian Geographer was launched in the following year. However, its publication was discontinued in 1975. In 1962, the Deccan Geographical Society, the second in South India, was founded in Hyderabad and the Deccan Geographer was published in collaboration with the Department of Geography at Osmania University. This period also witnessed the launching of several publications, viz., Geographical Outlook (Ranchi University, 1956), The National Geographer (University of Allahabad, 1956), Bombay Geographical Magazine (University of Bombay, 1964), Uttar Bharat Bhoogol Patrika (Association of North Indian Geographers, Gorakhpur, 1964). The Geographical Observer (Meerut College Geographical Society, 1965), The North-East Geographer (The North East Geographical Society, Gauhati University, 1966), Bhoodarshan (Bhoodarshan Parishad, Udaipur, 1967), Indian Journal of Regional Science (Regional Science Association, IIT, Kharagpur, 1968), Ajmer Geographer (Geographical Society, Dayanand College, Ajmer, 1968), The Geographical Knowledge (Society for Geographical Studies, Kanpur, 1968), The Geographical Viewpoint (Agra Geographical Society, Agra, 1969), and the Indian Geographical Thought (Gorakhpur, 1965), Journal of Geography (Jodhpur, 1970). During the sixties, a few more journals emerged but in due course either they died or could not maintain the standards. This trend of establishing societies and publishing annual and bi-annual periodicals testifies both to a growing consciousness at regional level and also the lack of a national level association.

The third period (1971-93) is distinguished as an expansionary, more diversified and scientific one. Many existing departments expanded due to increase in grants from government and several new ones were opened. There was tremendous expansion of teaching and research centres and the number increased from thirty in 1970 to about sixty-five till 1993. Some of the important new centres were Bihar (1971), Andhra (1972), Sri Venkateshwar (1972), Panjabi (1974), Bangalore (1974), North Eastern Hill (1976), Garhwal (1977), Gujarat (1977), Mithila (1978), Vishwa Bharati (1978), Kashmir (1979), Maharshi Dayananad (1983), Jamia Millia Islamia (1983), Manipur (1984), Sri Krishnadevraya (1984), Jammu (1988) and Himachal Pradesh (1989). In this period, the discipline has developed under the dynamic leadership of many third generation leaders. They are A. Ahmad (J.N.U.), B. Arunachalam (Bombay), B. Banerjee (Calcutta), L. S. Bhat (Indian Statistical Institute), S. Chakroverty (Burdwan and Calcutta), S. P. Das Gupta (NATMO), K. R. Dikshit (Poona), R. D. Dikshit (Panjabi and Maharshi Dayanand), S. L. Kayastha (B.H.U.), Gopal Krishan (Panjab), P. D. Mahadev (Mysore),

1. E. Ahmad (London), S.M. Alam (Edinburgh), O.P. Charadwaj (London), S.C. Chakravorty (London), A. B. Chatterjee (London), S. P. Chatterjee (London), H.P.Das (London), P. Dayal (London), K.R.Dikshit (Paris), Maya Dutt (London), Meera Guha (London), A.R. Irawathy (London), A.S. Jauhari (London), N. r. Kar (Gottingen), K.R.Khatu (Warshaw), George Kuriyan (London), S.D. Misra (London), P. Pandey (London), S.K.Saha (Wales), P. Sengupta (London), M. Shafi (London), A. Sharan (London), R.c. Sharma (Edinburgh), C.P. Singh (London), G. B. Singh (Edinburgh), Jasbir Singh (Edinburght), R.L. Singh (London), R.P. Singh (London), U. Singh (London), K. S. Sivasamy (Moscow), M.P. Thakore (London), A.R. Tiwari (London) and R. C. Tiwari (Reading).

R. P. Misra (Mysore), A. B. Mukerji (Panjab), Indra Pal (Rajasthan), C. R. Pathak (Indian Institute of Technology, Kharagpur), R. K. Rai (NEHU), L. N. Ram (Patna), R. Ramachandran (Delhi), A. Ramesh (Madras), M. Raza (J.N.U.), Mehdi Raza (Aligarh), N.B.K. Reddy (Sri Venkateshwar), B. K. Roy (Census of India), H. N. Sharma (Gauhati), R. C. Sharma (J.N.U.), G. B. Singh (Panjab), Jagdish Singh (Gorakhpur), Jasbir Singh (Kurukshetra), K. N. Singh (Banaras), L. R. Singh (Allahabad), B. N. Sinha (Utkal), N.K.P. Sinha (Banaras), K. V. Sundaram (Planning Commission), and R. Vaidyanadhan (Andhra). In the 1960s, 1970s and 1980s many Indian Geographers [1] received their doctorate degree from either American or Australian /N.Z. universities and many of them took over charge of departments and guided the course of their development. The emphasis shifted from land use studies and urban morphology to quantitative and applied aspects of geography. While the early pioneers laid emphasis on education and teaching, the new comers tried to put a new vigour in geography as a research discipline. Geographical research, both under American and Indian - trained geographers, appeared more analytical and scientific with the introduction of the new quantitative and theoretical procedures that originated in America and Britain. Four geographers, namely, V. L. S. Prakasa Rao, R. P. Misra, R. Ramchandran and L. S. Bhat were the important leaders of this new movement who played a major role in stimulating the younger generation to experiment with innovations. In most universities undergraduate, postgraduate and research students are now given introductory courses in statistics and computer. The seventies were a judicious blend of pioneers like S. P. Chatterjee, George Kuriyn, C. D. Deshpande, R. L. Singh, V.L.S. Prakasha Rao, M. Shafi and P. Dayal who put geography on the academic map of India and trail blazers like Moonis Raza, Satyesh Chakravorty, Manzoor Alam, R. P. Misra, A. B. Mukerjee, K. R. Dikshit and C. R. Pathak who injected a new life and organised national and international research and training in such fields like quantitative geography, regional planning, regional analysis, industrial location, growth centre planning, area development, urban social area analysis etc.

A number of societies and journals were also founded in 1970s and 1980s to promote teaching and research at national, regional and local levels in the country. They were Analytical Geography (Delhi University, 1971), Indian Geographical Studies (Geographical Research Centre, Patna, 1972), Indian Geography (Raipur, 1972), Geographical Bulletin of India (Association of Geographers, Patna University, Patna, 1977), Indian Journal of Landscape Systems and Ecological Studies (Calcutta, 1978),

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1. S. K.Aggarwal (Kent State), M. Anas (A.N.U.), S. Ansari (Ottawa), S. M. Bharadwaj (Minnesota), S. S. Bhatia (Kansas), S. G. Burman (Clark), A.K. Chakravarti (Wisconsin), S.K. Davgun (Kent State), A. Desai (Maryland), R.C. Dhussa (Kent State), R.D. Dikshit (A.N.U.),k G.S. Gosal (Wisconsin), D. Goswami (Johns Hopkins), B. Hyma (Pittsburgh), P. P. Karan (Indiana), G.S. Kulkarni (Pittsburgh), A. Lal (Indiana), P.D. Mahadev (Pittsburgh), B. S. Marh (Indiana State), R.B. Mathur (Minnesota), R.P. Misra (Maryland), S. Mookerjee (Indiana), D. Mookherjee (Florida), A. B. Mukerjee (louisiana State), B. Mukherjee (Iowa), V. Nath (Wisconsin), K> Pandit (Ohio State), C. R. Pathak (North Carolina), R. Ramachandran (Clark), H. N. Sharma (Syracuse), K. K. Sharma (Indiana), Harbans Singh (Rutgers), G. S.Singh (Clark), N.K.P. Sinha (Mc Gill), H.P. Srivastava (Florida), B.L. Sukhwal (Oklahoma), M. Taher (N.Z.), R. Tirtha (North Carolina), G. Venugopal (Indiana State) and K. N. Verma (Clark).

phers (University of Poona, 1979), Association for Geographical Studies (Delhi University, 1979), Population Geography (Association of Population Geographers of India, Chandigarh, 1979), Annals of the National Association of Geographers, India, Delhi, 1980), Annals of the Association of Rajasthan Geographers (The Rajasthan Geographical Association, Bhilwara, 1980), Doab Geographer (Meerut University Geographers Assocaition, 1981), The Hill Geographer (Geographical Society of North Eastern Hill Region, NEHU Shillong, 1982), Vikassheel Bhoogol Patrika (Basti, 1982), Rural Systems : An International Quarterly Journal (Varanasi, 1983), Journal of Marketing Geography (Gorakhpur, 1983), The Indian National Geographer (Association of Geographes, India, Lucknow, 1986), The Ganges Geographical Journal of India, (The Ganges Geographical Society of India, Rishikesh, 1986), Bhu Vigyan (National Geographical Society of India, Varanasi, 1986), Geographical Perspective (Geographical Society, Patna University, 1987), the Brahmavart Geographical Journal of India (Kanpur University Geographical Association, Kanpur, 1989), Globe (Madhya Bharat Bhoogol Parishad, Indore, 1989), Bhuvid (Udaipur, 1990), The East-West Geographer (International Geographical Society, Munger, 1990), and Regional Symbiosis (Institute for Regional Development Studies, Kanpur, 1993).

TRENDS IN GEOGRAPHICAL RESEARCH

Research work on different aspects of geography in the last forty years has expanded enormously and therefore it is quixotic to summarise all the research interests and publications. The most notable trend has been the increasing interest and research productivity in human geography as compared to physical geography. From a review of literature it is evident that the economic and social fields have pushed physical geography to relative insignificance and the ratio of publications is roughly about eighty to twenty (Ahmad and Raza, 1988, i).

GEOMORPHOLOGY

Among physical geographers in India, geomorphologists have shown an increasing interest in the evalution of landforms, fluvial geomorphology and basin morphometry (R. P. Singh, 1983, 7-46; Vaidyanadhan, 1983, 47-60; Kar and Ghose, 1983, 61-74). In this context, special mention has to be made of the work of Sinha (1968) tracing the geomorphic evolution of the Rupununi basin of the Amazon - Essequibo divide (South America) based on mapping and analysis of surficial deposits, erosion surfaces and Recent and Pleistocene vegetational and climatic changes. The delineation of denudation chronology and identification of erosional surfaces have been major fields of interest. This is revealed in studies on denudation chronology of the Chotanagpur plateau (R. P. Singh, 1969), polycyclic landscape and the surfaces of erosion of the Deccan plateau around Pune (Dikshit, 1970), granite - gneissic tors of the Ranchi plateau (S. Singh, 1977), Simdega and its adjoining area (Kumar, 1979) and a host of others. The study of evolutionary history of rivers, behaviour of streams, drainage networks, draingage patterns and their tectonic control has received much attention in the past twenty years after the publication of Fluvial Processes in Geomorphology by Leopold, Wolman and Miller (1964) and the advent of airphotos and landsat imagery as tools. S. P. Chatterjee's (1946) article. ' Is the Damodar River Changing Eastward? ' is the first systematic contribution to fluvial geomorphology. Also, Chibber's (1951) contribution to the evolution of radial drainage pattern of Parasnath hills and the

westerly drift of the Son river in Bihar (1952) are most notable. Some authors, notably the geologist - cum - geomorphologists, thought more in terms of hydrography than fluvial processes. Chatterjee dwelt on river problems of Bengal and subsequently in collaboration with Bagchi (1960) on the hydrographic features of the Ganga Delta, particularly its south-western part. They have pointed out that the formation of moribund channels in the Ganga delta led to floods in West Bengal rivers.

A few studies have shown adequate concern in trying to understand the relationship between landforms and geomorphic processes, taking the drainage basin as a unit of study. Among such studies, mention may be made of the study of the Subarnarekha basin (Mukhopadhyay, 1980), the Tista basin (Mukhopadhyay, 1982), the Sonar - Bearma basin (Rai, 1980), the Sarda basin (Prudhvi Raju and Vaidyanadhan, 1981), and the Ravi river (March, 1986). The use of landsat imagery has also aided the location of ancient channels or tracing the earlier courses of rivers in Rajasthan, including reconstruction of a sequence of events through which the Saraswati swung gradually from south to west by encroachment of aeolian sand on its channel from the southwest (Ghose, Kar and Hussain, 1979). However, lack of essential data base related to channel geometry and morphology has put severe limitations in the understanding of channel processes and morphology. The paper by Kale, Karlekar and Deodhar (1986) is a good example of understanding changes in the channel morphology in the lower valley section of the Vashishthi river, illustrating braided channel pattern. Choe terraces have assumed great importance in the understanding of changing relationships between the environmental setting and fluvial morphological processes. Interest has been shown in the origin of choe terraces in the vicinity of Chandigarh in the Siwaliks as related to Pleistocene climatic instability (Mukerjee, 1976); and between the gravel terraces along the Alaknanda Valley and their tectonic character (Pal, 1985). More substantial work is being undertaken into climatic and tectonic characteristics of alluvial fans of the Chandigarh Dun (Mukerjee, 1990) and the Darjeeling Himalaya (Basu and Sarkar, 1990). Thus, Indian research in the field of fluvial geomorphology is concerned essentially with the observation and interpretation of the recent development of river channels.

Greater attention is now being paid towards quantitative evaluation of topographic expressions based on analyses of topographical maps, aerial photographs and landset imageries. This has led to the study of slope, drainage morphometry, landform classification and geomorphic features of certain areas within the structural frame developed by Horton, Strahler, Schumm, Chorley and others. A number of articles have appeared on lengths, breadths, areas, application of formulae and drawing of graphs relating to the Luni basin (Ghose et al., 1967), Dhund basin (Padmaja, 1975), Morel basin (Sharma and Padmaja, 1977), Burha nadi (Kumar and Pandey, 1975), small drainage basins of the Ranchi plateau (Singh 1979), Dhauli Ganga (Kumar, 1986) and Sarju (Pandey, 1986). In these studies, hardly any attempt has been made to assess the significance of the results obtained within the parameters of theoretical geomorphology as it stands today. There is much scope, however, for the development of theoretical geomorphology, emphasizing forms and the processes of their formation as revealed in the field. Several lineaments, such as fractures and faults have also been recognised and delineated, using remote sensing techniques, to reveal the shape and orientation of the drainage basins of North

Konkan (Arunachalam, 1981) and Rajasthan (Sharma and Bakliwal, 1983). Of late, there has been an emergence of subfields like genetic geomorphology along with climatic, fluvial, arid, periglacial, quantitative and applied geomorphology. Studies on applied geomorphology grew in importance after the Govt. of India initiated several projects on terrain evaluation. These studies further strengthened the rural - urban land use planning, planning of infrastructure for development, exploration for mineral ores, environmental monitoring and protection as in the case of landslides, ravines, soil erosion, and for finding hydrocarbons and ground water. Considerable progress has also been made in the field of regional geomorphology. Quite a number of publications dealing with mapping of alluvial morphology of the Indo-Gangetic Plain (Geddes, 1960), coastal geomorphology of India (Ahmad, 1972), geomorphological evolution of the Chotanagpur highlands (Singh, 1969), forms and characteristics of Konkan drainage basins (Dikshit, 1976), geomorphology of Rajasthan desert (Ghose, Singh and Kar, 1977) appeared. However, there is a tendency to apply western concepts and approaches which are often less relevant to the Indian situations. Nevetheless, Indian geomorphologists have shown adequate concern in trying to understand the relationship between geomorphic processes and associated landforms across varied physical landscapes of the country. Prospects for the development of process geomorphology are visualised at Jodhpur, Pune, Waltair, Calcutta, Jaipur, Bhagalpur, Allahabad and Delhi where young research workers have shown keen interest in the field of study.

ENVIRONMENT AND RESOURCE STUDIES

The concern and apprehension about ecology and environment in the physical sciences in the last thirty years is a historical phenomenon. They should form a crucial guiding dimension for plans and programmes in geography and they must be considered another sector of national development. Environmental geography emerged as a new branch during late 70s (Tej Bir Singh, 1990; R. B. Singh, 1990; Kayastha, 1992). As a popular and rapidly growing sub-field this encompasses a wide array of research themes : pollution, deforestation, soil erosion, flood hazard and human responses, waterlogging and geographical monitoring and forecasting. Kayastha and his students at the Banaras Hindu University have shown keen interest in the growth of this subfield by initiating studies on urban pollution, flood plains and human adaptation, impact of development on environment, and environmental policies (see, H. Singh et al; 1986). Similarly, Burman and her students at the University of Delhi have evinced keen interest on methodologies of economic development and their impact on the ecology in the Himalayan Region (Burman, 1990). She also emphasized on the interlinkages of natural and human resources together with their economic uses in the Kali River Wastershed. Mehdi Raza and his students at the Aligarh Muslim University stressed on man-land relationship in prehistory, ecological analysis of tribal societies, ecological impact of different land use practices, and pollution stress on river ecosystems (Raza, 1992). Mountain regions have received considerable attention and it has been noted that they are being subjected to population pressures. A most welcome addition to the literature on mountain environments is the recent book by Karan (1984). This book discusses patterns of economic and social development in Sikkim Himalaya and addresses questions, such as what kind of economic patterns can a small mountain territory develop and what are the environmental consequences

of the development of mountain areas? The work by Ives and Ives (1987) was devoted to an analysis of the theory of Himalayan environmental degradation and explored whether current mountain land use practices produce the downstream destruction, and if so, what mitigation measures can be pursued. Ives and Messerli (1989) have also stressed that the various processes of environmental degradation were due to the comulative effects and practices; and with better technology and improved agricultural and forestry practices, development can be reconciled with conservation in the Himalayas. There is considerable literature on pollution and their deleterious impact on man and environment (Desai, 1982; Kumra, 1982; Murthy and Bhargavi, 1984; Noble, Dutt and Venugopal, 1985; Karan, Bladen and Wilson, 1986); but very little has been done by way of research for understanding spatial aspects of pollution (for example, see, Sivagnanam and Kumaraswamy, 1983; Sivagnanam and Kumaraswamy, 1987; Subbaiah, Panneeraselvan, Arumugam, 1990; Panneerselvan and Arumugam, 1991; Thakur and Balaseetha, 94). There is also a need to understand processes of environmental and ecological degradation, especially looking at their spatial aspects.

Rapid population growth and indiscriminate application of technology especially in the past few decades have had far reaching impact on the ecological balance. Various aspects of anthropogenic impact have been taken up for study. Owing to the fragile character of their ecology, the impact of such activity has been severe in many parts of the country especially in the Himalayas, desert and coastal areas. A number of studies highlighted the ecosystem degradation problems and their management (Sinha, 1988). Among the issues taken up for research were the environmental impact of road construction, growth of highland tourism (Tej Vir Singh, 1989), entrophication of Dal Lake, mining and derelict land (Prasad) and inadvertent impact of human activities on climate.

Another fruitful area of research is the assessment of occurrence of natural hazards and the problems of disaster preparedness and mitigation and their management. Geographical research into the flood, drought, cyclone and landslide hazards has focussed upon the interaction between the human - use system and the physical processes operating in riverine, coastal, desert and mountainous environments. Questions dealing with how humans adjust to the flood hazard have been the research priorities of many geographers (Ramachandran and Thakur, 1974). Concerns have also been expressed regarding the nature and possible causes od drought, delimitation of drought prone areas and their planning (Reddy, 1979). Cyclones and landslides (Mukerjee, 1984) are both the least studied and the most fertile area in which geographers may make a major contribution. But, overall this subfield of environment of geography is young, and so it is not surprising to find many of the studies descriptive. Comparative analyses of environmental problems in time and space are very few and so is the lack of theoretical base.

On the other hand, at a larger scale, geographic research on resources has been diverse. Studies are associated with natural resource endowment and inventory and appraisal of useful environmental products, resource development and utilization regional framework or resource development, impact of resource development on environment, economy and society, and resource conservation and management (Shafi, 1972, 51-62; Ahmad, 1979, 9-20; Arunachalam, 1983, 125-139 and 210-240; Kayastha, 1984, 51-63; Ramesh, 1984). Ge-

ographers interest in methods for the estimation and appraisal of resources embraces ground and air surveys, remote sensing and geographic information systems. Remote sensing technology plays a key role in the exploration and analysis of resources of underdeveloped regions. But the application of this technique has barely begun. The National Remote Sensing Agency at Hyderabad and Indian Institute of Remote Sensing at Dehradun and other three centres located at Bangalore, Nagpur and Kharagpur are providing regional services and training to the users of this region. They can provide the geographer with significant improvements in the quantity, quality and timeliness of data required. As more geographers become aware of the significant implications of this technique, the true impact of this will be felt in the development of resources and environmental management. Geographers for the past four decades have been involved in particular resource studies (Dayal, 1977; Dayal, 1983; Gautan and Narayan, 1988; Gautan and Narayan, 19ii; Roy, 1991) and there is a lack of detailed regional studies in understanding the spatial distribution, utilisation and to suggest measures for a rational use of the resources for an integrated regional development. Similarly, geographical analysis of the impact of resource development has been completed both at a macro economic level and also with reference to individual sites. Such studies are in tune with nature-society relationship.

HUMAN AND ECONOMIC GEOGRAPHY

Within human geography, by the farmost important subfield has always been economic geography; and within economic geography, studies relating to agriculture are much more numerous. Land use studies and studies relating to regional imbalances in levels of agricultural productivity are many (Chatterjee, 1963 and 1968; Shafi, 1972, 3-38; Shafi, 1979, 21-36; Siddiqui, 1979, 37-48; Shafi and Singh, 1984, 3-25; Shafi, Singh and Quareshi, 1984, 19-37; Ahmad and Raza, 1988 and Mohammad, 1992). An important study based on field work in twelve selected villages of Eastern Uttar Pradesh highlighted the land utilisation pattern, crop yields and assessment of the caloric intake per head per day in varied environments (Shafi, 1960). This pioneering work in a microlevel regional framework set the trend for research in the country during the sixties. In another valuable regional study at the macro-level, Singh (1974) discussed regional diversities in the physical complex, imbalances in irrigation facilities, disparities in land use, cropping pattern and agricultural and livestock production. He also divided the country into agricultural regions for the implementation of agricultural development plans. In his study on determining the agricultural productivity index of the Great Plains of India, Shafi (1972) proposed a formula for the productivity coefficient of a crop. Using three different and more comprehensive indices covering the entire country, Dayal (1984) attempted to explain regional vaiations in productivity through the application of regression models based on environmental and socio-economic variables.

URBAN GEOGRAPHY

Urban geography has registerred rapid progress and has developed as a major sub-field. A noticeable development in urban geography in this period is the increasing application of statistical methods in studies pertaining to patterns and trends of urbanisation, influence areas of markets, locational analysis of central places, settlement dispersion, internal structure of cities and towns, and urban social ecology (Chatterjee, 1963 and 1968; Gosal, 1972, 203-225; Singh, 1972, 226-233; Singh, 1973, Krishna, 1979, 190-196; Alam, 1984,

129-146; Aziz and Pandey, 1984, 38-46; Yadav, 1986-88 and Ahmad and Raza, 1988; Thakur and Parai, 1993). Singh's book on Banaras (1955) is a unique and pioneering contribution to the growth and development of urban geography. His book has provided new guidelines to hundred of geographers to carry such research on individual towns and cities. He emphasized the historical, morphological and functional aspects of urban geography of individual cities and towns based on field work and archival data. In terms of content and methodology, however, Alam's work on Hyderabad - Secunderabad (1965) represents a departure from Singh. Similarly, notable contributions are found on spatial structure of cities (Brush, 1968), growth of presidency towns (Brush, 1970), factorial ecology of Calcutta (Berry and Rees, 1969), pattern of socio-economic structure in cities (Singh, 1975), intra-city hierarchy of central places (Dutt, 1969), and internal structure of city in transition (Ramachandran, 1976). A cartographic and statistical analysis of city structure based on simple survey of Bangalore undertaken in the seventies is remarkable for its methodological contribution (Prakasa Rao and Tewari, 1979). The pattern of town and village settlements in Eastern Uttar Pradesh, believed to have developed from medieval Rajput - oriented territorial units, is still another good work (Singh, 1968). It is argued that the pargana and tappa headquarters evolved as quasi-urban places and gaon became the basic settlement unit. These settlements expressed, from the very beginning, spatial and hierarchical organisation, and they remained so until the beginning of the twentieth century. The conditions underwent drastic changes in the colonial era and significant departures occurred (Raza and Habeeb, 1976; Habeeb 1981). The regional settlement systems in India became distorted under the prevalent politico - economic system, selective exploitation of natural resources and level of economic development (Alam, 1981, 305-322 and Alam, 1984, 453-472). A fruitful attempt at marrying inter-relationship of micro-level studies and macro-level generalisation to the study of urbanisation and structure of urban system has been made by Ramachandran (1989). His substantive contribution focuses on the processes of urbanisation and the nature of interdependence among urban centres and between urban centres and their hinterlands. Such studies in other branches of geography are necessary for the evolution of an indigenous geographical base.

One is struck by the relatively little attention paid to rural settlement geography. However, the sixties and seventies witnessed quite a few remarkable studies on types and pattern, histogenesis and morphogenesis, spacing of rural settlements, spatio - functional organisation and rural dwellings (Gosal, 1972, 188-202; Singh, Singh and Singh, 1975; Mukerji, 1979, 177-189; Mukerji, 1984, 119-128; and Ahmad and Raza, 1988). Studies of house types processes of settling and field patterns have been largely ignored. Ahmad's (1952) most detailed and systematic study on rural settlements types in the state of Uttar Pradesh is first of its kind in India. On the other hand, Singh (1955), regarded as the founder of Banaras School of Rural Settlement Geography, initiated the genetic approach and developed the concept of 'sequence of change in the cultural landscape' selecting the Middle Ganga Valley for a case study. K. N. Singh (1972) introduced the concept of social and economic space in the interpretation of settlement morphology and developed a religio-ritual and secular - dominance model. Similarly, the role of Rajput landlords in generating centripetal and of the stratified rural society in centrifugal forces has been emphasized by Ram B. Singh (1975) and Rana P. B. Singh (1976). In a

series of papers, Mukerji (1972, 1974 and 1976) has applied a morphogenetic approach within the framework of the cultural landscape school, to the study of rural settlements in the Chandigarh Siwalik Hills. He has proposed a dominant clan model for explaining the internal morphology and the collinear fission model for rural settlement patterns.

Population studies dealing with growth and migration, spatial distribution and patterns of change, sex composition, literacy, occupational structure, female participation in labour force and religious composition have been studied in the macro, meso and micro regional context and are scattered in nature (Gosal, 1972, 173-187; Gosal and Chandna, 1979, 170-176; Gosal, 1984, 103-115; and Ahmad and Raza, 1988). A concentrated effort has been made by the Chandigarh School of Population Geography in a series of joint collaborations under the guidance of Gosal and his students. This School focussed mainly on regional aspects of population growth (Gosal, 1962; gosal, 1974; and Krishan, 1975), rural literacy (Gosal, 1967; and Krishan and Shyam, 1973), urban literacy (Krishan and Shyam, 1974), religious composition of population (Gosal and Mukerji, 1970), scheduled castes and scheduled tribes (Chandna, 1989), changes in the demographic character of Punjab's border districts, and population - resource relationship. They have shown a keen interest in the cartographic representation of demographic phenomenon particularly in relation to the analyhsis of census data and through the use of quantitative methods.

Studies in Industrial Geography dealing with regional industrial development, manufacturing, location and development of individual industries, small scale and cottage industries are sporadic in nature (Shafi, 1972, 63-79; Chaudhury, 1972, 80-83;. Chaudhury, 1979, 49-52; Pathak, 1984, 27-39; and Ahmad and Raza, 1988). A number of geographers have undertaken such studies, for example, Chaudhury (1971) traced the history of industrialisation in India and critically assessed theories of industrial location. Dayal (1964) analysed the role of geographical factors in the location of iron and steel, and cement industries in India. Trends in industrial location in India have been looked at in detail by Karan (1964) and Chaudhury (1978). A thematic study on the industrial geography of India has been presented by Sinha (1971). This book presents a large amount of data and information on Indian industries, but a comprehensive treatment either on an area basis or at the industry level is lacking. Likewise, there is a need to study the growth, regional pattern, development of industrial complexes and industrial linkages for a clue to the formation of locational policies.

Trade and transport geography, unfortunately, have received scant attention although they play an important role in the economic and social development of the country (Shafi, 1972, 84-95; Singh, 1979, 53-60; Jayashankar, 1984, 41-50; and Ahmad and Raza, 1988). However, modest attempts were made in the mid sixties at the Banaras Hindu University. J. Singh (1964) studied the transport system in South Bihar, R. B. Singh (1966) in Uttar Pradesh and D. N. Singh (1970) in North Bihar, keeping in view the geographical setting of each region. A more remarkable study is the geography of transportation in eastern India under the British Raj by Munsi (1979). This kind of investigation is certainly not an easy task. At the macro level, Berry's (1966) analysis of commodity patterns reveals the dominance of colonial primates that are simultaneously the principal manufacturing areas of the country. On the other hand, at the micro level, Reed (1967) has provided an in-depth

analysis of commodity flows in the Bengal - Bihar industrial belt. But, surprisingly, research into transport networks and traffic and commodity flows, which started flourishing between 1964 and 1970, has fallen out of use in recent years. Raza and Aggarwal (1986) took the initiative to fill this gap by their substantive study of commodity flows in relation to the regional structure of the Indian economy by analysing point to point flow data generating flow matrices. An alternative to circular - dynamic relations between transportation and urban attributes, a three-way linkage model, incorporating lateral, vertical and leap-frog adjustments between the two aspects of the space economy has been introduced by Ramachandran (1981).

During the past few decades, studies in historical geography have increased considerably, although perhaps the rate of increase has not been so great as that in some other branches of geography (Raza and Ahmad, 1972, 147-169; Ahmad, 1979, 133-142; Ahmad and Raza, 1984, 85-100; and Ahmad and Raza, 1988). Interest in historical research stemmed from varied sources such as religious texts (the Vedas, Upanishads and Puranas), epic sources (the Ramayana, Mahabharata and works of Kalidas), travel accounts (religious, commercial and expedition), classical geographies, dynastic archives and chronicles, revenue records and old maps. These sources form a rich repository of knowledge of all types including cosmography, chorography, topography, physical and human geography and provide meaningful representations of geography of various regions at different points of time. Such sources sprouted significant contributions in the field of man-environment relationship, changes in river courses, delimitation of Mughal Subha, origin and evolution of towns, regional geography of Vedic India and economic processes during the colonial period. Three names dominate in contemporary historical geography : Ali (1966), Chattopadhyay and Raza (1975) and Schwartzberg (1978). Ali's monumental work seeks to reconstruct the world of the Puranics, their notions about the earth and the universe on the basis of the geographical data and ideas contained in the Puranas. Chattopadhyay and Raza developed a model of India's colonial / dependent economy with a view to linking dependent enclaves of the hiterland areas to the British metropolitan economy. This model is a significant contribution to the understanding of the colonial spatial processes causing regional disparities in India. Schwartzberg's Atlas of south Asia is a new synthesis of geographical and historical knowledge embracing a time span from the Stone Age to 1977. It includes maps, associated notes and graphics covering cultural, social and economic evolution as well as dynastic succession and political events. This study is based on original soruce materials, as also the modern distribution of religions, languages, castes, tribes, agriculture and manufacturing based on statistical data, and displays superbly the dimensions of Indian historical geography. But historical geography per se of any region of India, based on intimidating mass of historical data is yet to be attempted. Interest in historical geography is on the decline as evident from a survey (Ahmad and Raza, 1984, 85-100) and this field is slipping out of the geographer's grip. However, it seems to have survived under the narrow banner of colonial geography at the Centre for the Study of Regional Development, Jawaharlal Nehru University, that is trying to understand the structure of economy during the colonial period.

Political geography has also remained a neglected field in India and has had a very small

number of followers in the last four decades. As a result, it has not produced an effective body of literature (Chatterjee, 1963 and 1968; Mookerjee, 1972, 255-270; Dikshit, 1979, 142-156; Sharma, 1979, 157-166; and Ahmad and Raza, 1988). In many geography departments the subject still does not have a place, and in only a few is it taught in a systematic manner. Immediately after the partition of India and Pakistan, a few Indian political geographers placed their interest in frontier problems and continued publishing in this field (Karan, 1951 and 1953; Nandan, 1960; Janaki, 1977). At the beginning of the seventies emphasis was given to developing the theoretical side of the Indian political geography (Dikshit, 1970). The Political Geography of Federalism by Dikshit (1975) presents a geographical analysis of origins, stability and patterns of federalism of many conutries including India and is a substantial contribution to the field. Similarly, Political Geography of India (Sukhwal, 1980) and Modern Political Geography of India (Sukhwal, 1985) provide a comprehensive analysis of the changing political map of India, particularly since partition. Recent research in political geography focuses on the nature of federalism (Adhikari, 1986), geography of international relations, administrative geography, electoral geography of the modern ecological type (Amani, 1970 and 1972; Dikshit and Sharma, 1981; Dikshit and Sharma, 1982; and Srivastav, 1982; and ethnoregionalism (Corbridge, 1987, 225-240); while Sukhwal (1987) provides an analysis of the Indian resource base and political patterns.

Compared with other sub-disciplines of geography, notably economic and urban, social and cultural geographic research in India can be traced back to only a comparatively short period of twenty years (Singh, 1979, 66-96; Mukerjee, 1979, 97-107; Ahmad, 1979, 110-114; Raza and Ahmad, 1984, 67-83; and Ahmad and Raza, 1988). Cultural geographic studies, dealing with material expressions (observable), have not been paid due attention inspite of our rich cultural heritage and diversities, nor is Cultural Geography taught in all Indian Universities. Nirmal Kumar Bose, an anthropologist by training, made some original contributions to the understanding of spatial - cultural patterns, both in inter-regional and intra-regional studies (Dutt and Noble, 1982). He observed, "In spite of the fact that the languages of India are many, and there are well marked differences between one regional culture and another, yet there is an over-all unity of design which makes them all members of one family. Bose's ecological study of Calcutta (1968), one of the most important available to date, was phrased in terms of ethnic variability and cultural differences. Among geographers, the work of A. B. Mukerji on cultural rural landscapes in the Outer Himalaya (Mukerji, 1982) and dispersal and resettling of refugees in independent India (Mukerji, 1983 and 1985) stand out as singular contributions. An Exploration of India by David Sopher (1980) is an initial attempt to bring together several diverse aspects of Indian society and culture into a single volume. Similarly, A. G. Noble's and A. K. Dutt's (1982) book on `India : Cultural Patterns and Processes' addresses both the diversity and unity of India's culture, emphasizing the spatial distribution of cultural forms. Likewise, A. B. Mukerji's and A. Ahmad's (1985) book on `India : Culture, Society and Economy' provides excellent material to further our understanding of India. Karan and Mather (1976) have performed enlightening research on the geographical patterns of art in the Himalayan region. They view the aspects of the art forms of painting, dance, music, embroidery, architecture and sculpture as regionally distinct.

Recently, cultural geographers in India have

turned their attention to social geography and rapid progress is observed in this field because of social concern in national planning on caste, tribes, nutrition, housing, poverty, women and crime. Studies in Social Geography can be categorised into those dealing with structural elements of Indian society and those dealing with social indicators. A classic work on caste deals with the analysis of some selected castes in North Indian Plain and also with the delineation of socio-cultural regions based on the numerical strength of castes that comprise more than 10 percent of each district's population (Schwartzberg 1964 and 1968). This study reflects the significance of caste analysis in regional organisation, occupational structure, socio-cultural behaviour and their regional moulds. In another study on caste in the Middle Ganga Valley (the Saran Plain), Rana P. B. Singh (1977) formulated a correlative, geo-economic attributive theory of caste ranking in the context of the changing distribution patterns of caste groups. A tribal population, belonging to different ethno-lingual groups and professing diverse faiths is an important part of Indian society. An analysis of the ecological and socio-economic attributes of their lives may be considered a crucial input in the interpretation of the regional dimensions of contemporary social reality of India. An Atlas of Tribal India by Moonis Raza and A. Ahmad (1990) is the first of its kind in India. Considering child as a social group, Moonis Raza and Sudesh Nangia (1988) have brought out Child Atlas of India. Religion, despite being the most pervasive element within the cultural landscape of India, has rarely attracted the attention of geographers. Bharadwaj (1973) has identified places of Hindu pilgrimage or sacred sites, succinctly skeched their distribution, empirical attributes, routes of pilgrimage, hierarchy and their role in the diffusion of religious beliefs. In addition, the relationship between caste composition of pilgrims and the level of pilgrim places visited and the distance travelled by them has also been analyzed. Siddiqui (1976) looked into the historical factors in understanding the pattern of concentration of Muslims in India. Recently, Raju (1991) has proposed a model to study women as a part of a larger socio-economic and regional context. Nuna (1990) has attempted to determine the levels of social well-being of women in different parts of the country and mapped it to bring out an atlas on women's development.

The other promising area of research relates to the analysis of regional disparities in social factors such as education, health and nutrition, housing and crime. Studies in the field of education are increasingly focussing attention on the deprived sections of society. In particular, work has been carried out to explain the present state of educational backwardness among tribals by measuring the physical accessibility to schools (Raza, Ahmad and Nuna, 1985), evaluating the process of change in educational development among the tribal population (Ahmad and Nuna, 1987) and examining the disparity in literacy rates between the Scheduled and non-Scheduled elements of the population in Maharashtra (Ahmad and Nuna 1987). Geographical research being carried out in the fields of health and nutrition is developing in India and medical geographers appear to have established a separate identity in their search for a comprehensive analysis of health problems (Chatterjee, 1963 and 1968; Bhat and Learmonth, 1972, 244-251; Akhtar, 1983, 66-77; Akhtar and Learmonth 1986; and Ahmad and Raza, 1988). A.T.A. Learmonth commands an important position in the history of Medical Geography in India having encouraged many Indian researchers in this field. The geographical contributions in this field mainly focus on nutrition and deficiency diseases in relation to

environmental factors (Shafi, 1960, Chakraborty, 1982, 301-323), disease ecology, especially of cholera (Dutt, 1973, 243-262; Hyma and Ramesh, 1976, 1-32), malaria (Akhtar and Learmonth, 1977, 69-80; Learmonth and Akhtar, 1984, 23-64; Dutt, Akhtar and Dutt, 1980, 317-339), and leprosy (Banerjee and Hazra, 1982, 26-58), health care, and evaluation of family planning programmes from spatial perspectives (Blaikie, 1975). In many geography departments Medical Geography still does not have a place, and in only a few is it taught in a systematic manner. Similarly, both housing and crime have received scant attention in social-geographic research though Dutt and Venugopal (1983) have made an attempt to identify spatial patterns of crime in Indian cities. Recently Dayal (1985, 369-81; 1989, 87-98) has made an attempt to identify the regional patterns of rural poverty in India and suggested policy measures for its alleviation.

During the last four or five decades only a few regional geographers have paid their attention to the delimitation and analysis of regions (Deshpande, 1972, 273-287; Deshpande, 1979, 199-203; Bhatt, 1980, 35-61; Deshpande and Sita, 1984, 149-154. The Indian weakness in this area is all the more surprising in view of the exceptionally vast and complex country with many regional diversities in the physical, economic and societal structures. Work on regional geography has developed from three main concerns. The first relates to the division and delimitation of Indian space into discrete regional units, each with its characteristic assemblage of physical and human phenomena. This idea was taken up by a number of authors, such as Spate (1954) and Singh (1971) who proposed methods of regional delimitation assigning considerable significance to features of natural environment. While Spate's division is empirically derived; Singh's division, apart from physiography for macro regions, is based on historicocultural organisation of space for the meso and lower order regions. However, the regions created are treated as separate and closed territories with no interconnections between them (Sopher, 1973, 122). The second is concerned with the description of certain regional units of Indian space. Spate (1954) and Singh (1971) have also provided detailed description of various parts of the region. Under this category are also included many state geographies produced by the National Book Trust of India. The third is related to those in which an individual attempted to understand a particular area in depth. Deshpande's (1948) pioneering work on Western India brings out the uniqueness of this meso region, synthesising the phusico - climato botanical framework and the human responses within it. This work brings out the geographic personality of Western India as an entity and the regional diversities within it. It represents the best regional study of a part of India yet written. However, true a la tradition Vidalian regional monographs both at the meso and micro levels are still few and far between.

REGIONAL DEVELOPMENT AND PLANNING

In the post-Independence period research in the field of regional development and planning has developed tremendously due to the British legacy of a highly distorted spatial economic structure characterized by a generally thwarted growth and large inequalities in the levels of socio-economic development in the country (Prakasa Rao and Bhat, 1972, 108-133; Dayal, 1972, 134-144; Singh, D.N. 1973, 121-141; Bhat, 1979, 204-211; Bhat, 1984, 157-172; Ahmad and Raza, 1988; and Raza, 1988). Geographers have been able to strengthen their identity by playing an increasing role in prob-

lem detection, problem solving and support for policy making in the regional and national context. Thus, the position of geography within the social sciences is reinforced. Research pursuit was rooted in the conviction that macro-economic planning was inadequate in the face of vast regional diversities in the sub-continent. Three broad approaches are discernible in the research literature on the theme. The initial approach has been to identify regional units for planning or regionalisation for purposes of planning. This phase continued from the mid-50s to the late 60s. Studies at the Indian Statistical Institute, Town and Country Planning Organisation, Planning Commission and Census of India carried out among others, by Learmonth and Bhat (1960 and 1962), Prakasa Rao and Bhat (1964), Sengupta and Sdasyuk (1968), Sengupta (1966) also promoted and refined techniques of regionalisation, and also provided formats for regional resource appraisals. While many of these were born out of the reality of regional diversity, a subsequent stream of research focussed attention on regional disparities (Mitra, 1961; Chattopadhyaya and Raza, 1975; Kundu and Raza, 1982; Krishan, 1989). Two major issues that dominate such studies are the measurement of regional disparities and the explanation for the emergence and continuation of regional disparities. While the former led to an advancement in methods of meaurement, the latter sought to provide explanatory systems. This theme has been studied at the Centre for the Study of Regional Development, Jawaharlal Nehru University by Moonis Raza and his students, selecting suitable indicators of development and mapping them through space. The process of emerging metropolitan dominance in shaping regional patterns becomes quite clear (Chattopadhyaya and Raza, 1975; berry, 1966; Chakraborty, 1987). While these conceptual and academic advancements were taking place, a pragmatic approach to a strategy for balanced regional development, particularly by providing access to infrastructure and diffusion of economic activities in backward areas, tribal areas and hinterlands also emerged when the growth centre approach to regional development was mooted (Misra, Prakasa Rao and Sundaram, 1974; Sen, Tripathy, Misra and Thaha, 1975; Bhat, 1976; Fisher and Rushton, 1977; and Wanmali, 1983). Their pragmatism necessitated a gentle replacement of the traditional regional framework by district and area planning. To complete the circle, the emerging ecological issues as well as agro-climatic phenomenon and their crucial relevance to an essentially agrarian society, has regenerated research interest in agro-climatic regionalisation, and regional resource base with which the pursuit of regional planning started in Indian Geography some four decades ago.

Planning is fundamentally a political process. The emphasis is on social change. Political decision making is a process that identifies a problem and produces a limited number of alternative solutions. Underlying this concern is a philosophy that policies and programme should be based on the realities of the society and the main justification for the existence of government programmes is to provide citizens with goods and services. Geographers have not played an important role in the political decision making process in India although this decision making is exclusively geographical at the national level (Thakur, 1987). They have apparently tried to ascertain collectively the way they can best participate in this game.

It should be recognised that commensurate with the nation's commitment to utilize the state political apparatus for mobilising the natural resources for planned economic devel-

opment, many geographers have, individually and collectively, contributed their professional knowledge. The use of quantitative and cartographic methods has significantly improved methods of analysis of complex regional patterns that have emerged after Independence. The concept of growth poles has become an important instrument in regional development under national policies of area development. Credit goes to Misra, Prakasa Rao and Sundaram (1974) for suggesting interwining of the sectoral and the regional approaches to planning in order to optimize rates of economic growth and simultaneously minimize regional disparities in a vast country like India. The concept of Standard Urban Area (S.U.A.) is a geographic one which has got a place in the national census. Sundaram was associated with the working group which worked out details for operationalizing the concept and undertook the delimitation exercise in the field.

Raza, Ahmad and Nuna's (1990) study have made a significant contribution towards the realisation of the need for developing and much-needed regional dimension of education in our education policy. According to them, the system of higher education in India today is basically a blend of moribund tradition and spurious modernity, and much of our higher education's present ailments are unfortunate legacies of colonioalism.

At the state leve, Alam's (1972) work on the Hyderabad Metropolitan Region; Burton, Dutt and other geographers work on the Calcutta Metropolitan Planning Organisation; Learmonth's and Bhat's (1960 and 1962) work on Mysore State; Chatterjee and Dayal's work on the Damodar Valley Diagnostic Survey have a prized place in the formulation of regional and local policies.

Having recognised the piece meal contributions of geography to the mainstream of policy making, there is, in fact, much evidence that geographers have been influenced by the political decision makers as well. In the First Five-Year Plan (1951-56), agriculture, irrigation and power generation were given top priority and many geographers studied the regional impact of Kosi Project, Damodar Valley Project (Saha, 1979) and Hirakud Project. The Second Five-Year Plan (1956-61) laid emphasis on the development of basic and heavy industries and defined the key role which the public sector was to play in the economic development of the country. Transport and communication was supposed to provide an infra-structural base for the nation's industrial development. A number of geographers undertook studies on concentration and dispersal of industries and emphasized the role of geographical factors in the location of industries (Patni, 1970). The third Five-Year Plan's (1961-66) emphasis on self-sufficiency in foodgrains stimulated Chatterjee, Kuriyan and Shafi (1973) to work on population growth and food supply, requirements of foodgrains and problem of food shortage (Chakravarti, 1970). This plan also recognised the housing policies and decided that Master Plans for capital and other rapidly growing cities be prepared. The emphasis on maximisation of agricultural production by high yielding varieties of crops, fertilizers and irrigation in the Fourth Five-Year Plan (1969-74) stimulated many geographers including Chakravarti (1973), Jasbir Singh, and Dayal (1983) to work on the Green Revolution. The thrust of urbanisation policy in the Fifty Five-Year Plan (1974-79) was to increase the rate of grwoth of small and medium towns, and Mathur and Vishwakarama and Jha (1983) contributed significantly. This culminated in the form of integrated area development studies in which R. L. Singh and his studentsat Banaras contributed tremendously. Stimulated by slum improvement and

resettlement programmes, Misra and Gupta (1981) studied resettlement policies in Delhi at the micro level. The Sixth Five-Year Plan (1980-85) made a significant point that the articulation of national urbanisation policy should involve rural service provision. Rushton, McNulty and Tewari (1982) and Wanmali (1983) worked on the provision of social services and development strategy. Nath (1986) discussed development strategies for management of rapid urban growth and made suggestions for planners and policy makers. The Seventh - Five - Year Plan (1985-90) stressed on wasteland development, social forestry and water quality management with special reference to the long sewage, the Ganga river. This trend is illustrated by geographers' participation in mapping of wastelands in India by using satellite imagery from the National Remote Sensing Agency, Hyderabad (Gautam and Narayan, 1988) and compilation of Ganga water quality monitoring data by the Central Board Act on prevention and Control of Water Pollution, New Delhi in 1985. The Eight Five-Year Plan (1990-95) has stressed on regional approach to agricultural planning - an emphasis on physical factors like land, water management, rainfall, irrigation, soil fertility, temperature etc. The new agricultural strategy divides India into 15 agro-climatic regions and on this basis further policies would be enunciated for different regions. Stress has, therefore, to be laid by Geographers on evolving regional policies and making evaluation studies.

(To be concluded)