

Trends in Environmental Valuation: The Challenge to Nigerian Geography and Sustainable Development

B. A. Chokor

Department of Geography & Regional Planning, University of Benin, Nigeria

Environmental valuation, which is interdisciplinary in scope and practice, has a considerable role in natural resource management. This paper contends that assessment studies required to prioritize and preserve the ecological integrity of Nigeria's varied environments have been limited in geography and argues the need to realign with newer perspectives. The review problematizes the relative value of the seemingly more robust, precise but conventional quantitative tools of assessment widely deployed in the discipline and the efficacy of the experiential perspectives espoused by humanistic geographers, whose impetus comes from conceptual borrowings. The propriety of these borrowings is evaluated. The paper then suggests that while the increasing interest in valuation has largely been spurred by the need to establish criteria for minimizing and managing the impact of human activities on the environment, the validity of much of the methodologies adopted has been far from clear, although a notable contribution in Nigerian geography is the attempt at reducing a composite or aggregate index of environmental quality. While this approach has benefits for environmental planning and design, the paper also outlines new directions for more impactful research, especially against the backdrop of the upsurge of interest in environmental or resource economics.

Introduction

Environmental valuation is key to natural resource management for sustainable development. While geographers have shown interest in environmental valuation over time, the major challenge lies in developing pragmatic frameworks/methodologies for assessment studies that are directly relevant to public policy, especially by establishing criteria for minimizing and managing the impact of human activities on the environment in order to combat the growing crisis of environmental degradation globally. Although the development of public policy in managing built environments such as cities is often a contentious and political one. Geographers, it is argued, can still push for more innovative assessment techniques to enhance the quality of our environment as succinctly reasoned by Filani (2008) in his keynote address to Nigerian geographers on greening the Nigerian urban space.

What is valuation and why is it a recurrent theme in geography? Although majority of geographical studies may not have set out directly to assess the attributes of the environment, the characterization and description of geographic

space using various qualitative and quantitative techniques and theories, from ancient geography to the post-modern period, reflect aspects of the geographers' interest in environmental valuation. It might be desirable to overview first, methodological and philosophical changes in environmental assessment in geography before exploring developments in related fields and the broad implications for Nigerian geography and sustainable development.

Three major frameworks for environmental assessment in geography

Essentially, three major philosophical cum methodological perspectives dominate modern geography, which have also influenced valuation research. First, the scientific-positivist framework provides a common basis for ascribing objective measures to environmental objects or attributes, with its emphasis on replicable and verifiable results and generalization. Second is humanistic geography driven largely by phenomenological and existentialist philosophies; it explicates the nature of human environmental experience, feelings and

values with regard to the world. Third is Structural Marxism in which geographical distributions and variations are seen as the outcome of production and accumulation processes shaped largely by both historical and contemporary societal forces, especially the unequal relations in the economic exchanges between people, groups, interests, regions, nations etc. These three perspectives do not discount the growing role and influence of structuration theory, realism, postmodernism and feminism in geographic analysis of the environment (see Peet, 1998). A central thrust of all the perspectives, however, is the elucidation of the qualities embedded in environments, space, place, landscapes and regions. In view of the diverse meanings, which these terms often connote in geographic thought, it might be desirable to provide some definitional clarification, including the word valuation, in order to put the paper in a clearer perspective.

Ordinarily “space” (see Tuan, 1977) may be seen as any segment of the world that analytically could be described in abstract three-dimensional references with qualities, features and attributes including length, breadth, height, volume, shape, size etc. Scientific positivist analyses of spatial qualities in geography are abstract and preclude consideration of human intentions and values as apparent in the analyses of cities in terms of concentric shapes or zones. The term “place” by contrast, is taken as a segment of the world suffused with human meanings, values and significances while the work environment is usually associated with natural and human resource endowments; the environment provides the setting for human activities and natural processes. Landscapes on the other hand are the countless visual cues; panoramic scenes defined by our senses that are continually changing before us as we explore the physical environment (see Meinig, 1979). On valuation, the definition by Costanza (2000) and Farber *et al* (2002) offer some valid insights. Value is seen as the contribution of an action or object to user-specified goals, objectives or conditions while a specified value of an action is closely tied to a user’s value system – “value system being the intrapsychic constellations of norms and precepts that guide human judgment and action”. ‘Valuation’ by extension is the process of expressing a value for a particular action or object

(see Farber *et al.*, 2002). Beyond the assignment of attribute value to an environment, valuation should also encompass an appraisal of motifs behind preferences for environments.

Growth and transformation in valuation perspectives in geography

Valuation in geography in the 19th and early 20th showed elements of environmental determinism (see Semple, 1911). The environmental analysis was characterized by a desire to describe various kinds of human societies imprinted in different natural and climatic settings or regions. Sauer (1963) was a moderating influence, with a ‘possibilist’ frame on how cultural processes led to the “transformation of natural landscapes into cultural artifacts” (see Peet, 1998, p. 15; Sauer, 1963; Livingstone, 1992, p. 292-300) which drew from the late 19th and early 20th Century French School of Geography led by Vida de la Blache. The environment was seen as the interplay between nature and society that create some distinctive landscape regions or places that could be ‘scientifically’ studied, described and generalized, although each region was seen as “a product of local circumstance, both social and physical” (Wrigley, 1970, p. 8). The work of Hartshorne (1939) formally established an idiographic tradition in geography from 1939–1952 founded on the description of unique environmental qualities, with geography as an exceptional discipline that synthesizes regional uniqueness (see Peet, 1998, p. 19) until he was assailed by Schaeffer (1953) who argued within an incisive nomothetic framework that geography ought to concern itself as a scientific discipline, a spatial science that explores environmental attributes with truth seeking scientific tools, including hypotheses, models and theories in order to identify a spatial pattern and relationships, spatial order and regularities.

With the onset of the scientific framework for assessment, some attention was given to the ecosystem and system approach in valuing environments because of its potential in integrating more holistically environmental elements and in identifying the changes taking place. But as Chorley (1973, p. 164) clearly stated: “systems are too complex and structurally rich to be conveniently analysed, particularly when inputs are continually changing; ...real systems are neither

strictly in equilibrium nor time-bound, but ...lurch from one state of disequilibrium to another". Thus, many geographers became impatient with systems approach to environmental assessment, especially those concerned with prediction and planning (Chorley, 1973, p. 165-6).

Unsurprisingly, from the 1970s social/humanistic geography emerged offering some alternatives to address environmental issues from the perspective of those impacted by the environment, resource planning and policy decisions. As argued elsewhere, researchers became spurred by a desire to move from abstract, sterile approach of scientism where the "environment is treated as an object of analysis or an explanatory variable" (Castree, 2004, p. 80) to a more humane one, which explores contextually nature-society interfaces (see, for example, Harrison *et al.*, 1996). The purpose as argued by Tuan (1976) was to reflect "upon geographical phenomena with the ultimate purpose of achieving a better understanding of man and his condition" (p. 266). Five broad groups of methods have generally been employed to explore and to achieve this, namely, cognitive mapping (Lynch, 1960), rank ordering/rating scales, literary/biographical accounts, group discussion and participatory assessments most of which are reflexive in nature and explore experiential and socio-historical associations of people with the environment and the worth to the person or group.

Humanistic perspectives have been criticized by Marxist geographers for ignoring the material imperatives and consequences of social actions as well as the external constraints which are imposed on or flow from them (Gregory, 1978, p. 139; Duncan and Sayer, 1977); or what Gregory long described as a "persistent weakness. an unwillingness to ground 'subjectivity', and to recognize that, for all the importance of actor's own understanding of" their environment (1982, p. 255-256), you cannot glorify human experiences at the expense of the structure of society and other determinations (Gregory, 1978, p. 163). There is thus the inevitable "need to develop a 'spatial dialectic' as a means to understanding the uneven development of capitalist landscapes" or environments (see Elliot Hurst, 1985, p. 74; Peet, 1977). In spite of this sharp criticism, cognitive geography has persisted since the 1960s in

environmental valuation. This forms the theme of the next section.

Cognitive assessment of environments and landscapes

The development of perception/environment-behaviour-design research in geography, environmental psychology and the landscape/architectural fields has offered some bridges between scientific and non-scientific approaches and provided more pragmatic avenues for building peoples' values and experiences into environmental assessment. It counters for example the professional landscape architects' and natural resource managers'/ planners' approaches which are not people-centered, "using assessment models based on the assumption of a normative aesthetic landscape standard" (see Zube, 1984, p. 107). Two major shortcomings were in fact identified by Chokor (1990, p. 265) in professional landscape architects' environmental assessment. First, those preference measurements were too often associated with impersonal, objective and quantifiable factors inherent in landscapes, for example, the interaction between natural environmental elements and other properties inherent in landscapes such as colour, form, shape and lighting (Dunn, 1976), while people-related values were de-emphasized. Another criticism pertains to the conflict often experienced in translating preference evaluation studies into a readily utilizable set of information and criteria for landscape management (see also Gold and Burgess, 1982); whereas by contrast, the cognitive behavioural approach from the viewpoint of people may "increase sensitivity to the range meanings and values associated with landscapes" (1984, p. 109). In this context, in spite of heavy borrowings and issues of originality, cognitive studies (see Castree, 2004), by adopting pair-wise judgments, 5-point or 7-point rating scales and triadic comparison judgments of environments have enabled assessors to assign numerical values to environments on the basis of perceived attributes, which has offered geographers and natural resource managers new windows for articulating and incorporating peoples' environmental values into planning and policy (Kaltenborn, 1998).

The last decade has also witnessed increasing reliance on more participatory methods by geographers further improving the humanistic content of assessment studies. The adoption of

group discussion and participatory learning and action (PRA/PLA) together with semi-structured and in-depth interviews (see Aitken, 2001; Burgess *et al.*, 1988a; 1988b; Burgess *et al.*, 1990; Kneale, 2001; Chokor, 2004) have offered geographers opportunities for a closer dialogue on environmental issues, in understanding several transgenerational eco-thoughts and eco-fantasies embedded in social practices with significant bearing on sustainable environmental conservation and for developing more socially constructive and responsive policies to address community pattern of attachments to and use of environmental resources and space in Africa (see Pain, 2004). PRA/PLA using a collage of community mapping, semi-structured interviews, group discussion etc. has had diverse applications in managing African countries' developmental issues, including assessing the quality of agricultural extension (Osborn, 1995), evaluating issues amongst programme beneficiaries, implementing staff and donors' funds (Harnmeijer *et al.*, 1999); formulating and implementing community-based wildlife conservation (Williams *et al.*, 1998); assessing the performance and impacts of watershed development projects in India (Shah, 2001) and farmers' involvement in agricultural research under schemes supported by international agencies (Fujisaka, 1994).¹

Cognitive assessments in Nigeria and implications for environmental planning

Traditions in geographical research and training in Nigeria have relied heavily on the positivistic/scientific mode in environmental analysis. In addition, landscape assessment studies which explore those visible attributes of the environment that create aesthetic beauty and quality or impact negatively on them have been few and far between. Yet issues of widespread urban aesthetic blights and environmental decay from the chaotic pattern of development that plague Nigerian cities

and which require urgent critical information on peoples' landscape tastes, values and environmental attitudes to restore good order and character to cities and lay the path for more harmonious physical development stare us in the face. Chokor and Mene (1992) had in fact long argued that a major gap in urban environmental sustainability was landscape quality evaluation for environmental planners to make meaningful management decisions. By presenting surrogate stimuli of varied environments to assessors, it was possible to establish the pattern of preference for urban, rural and natural landscapes in Warri and to infer that a broad spectrum of nature scenes, planned orderly urban settings, open spaces and greenery were vital to the urban quality and environmental aesthetics improvement; indigenous fruit-bearing tree species were also preferred for street trees, parks, gardens and landscaping.

Another innovative study employing the method of triadic judgements of Ibadan landscape sceneries by residents and a vote count of their judgements and analyzing the structure of assessments made using multidimensional scaling (MDS), demonstrated that the pattern of both high and low value landscapes were tied to varied and distinctive socio-physical attributes that can be used as criteria for environmental quality improvement and at the same time for preserving those historic-symbolic valued characters of landscapes that elicited cultural attachments at the core of cities (see Chokor, 1990). However, unlike British and other European studies (Lowenthal and Prince, 1965; Lowenthal, 1978; Morris, 1981; Relph, 1976, 1981) which demonstrated a generally high preference for picturesque and historic landscapes, Nigerians appear to value newer modernistic suburban landscapes with sophisticated designs while core traditional historical scenes were least desired because of congestion, low amenity value, reduced level of comfort, spaciousness, order and regularity in planning, all which pointed to the need

¹ Some of the critical issues raised about the approach include role of micropolitics in participatory action research (Braun, 2004; Maycroft, 2004); credibility of accounts, transferability of materials, dependability of interpretations, confirmability of materials and information (see Crang, 2002; Baxter and Eyles, 1997). Some of the limitations may be overcome by adopting

appropriate interpretive and diagnostic skills, coding responses and providing structured code or mind maps or charts of responses (see Crang, 2001; Bedford and Burgess, 2001).

for greater public investment in maintaining the integrity and physical character of cities while embarking on urban renewal schemes.

Towards a search for a composite environmental index

Because of the varied nature and attributes of environmental quality, as well as assessors/valuers, studies have worked towards developing an aggregate or composite index of quality that may be more suitable to planners and policymakers. While some studies have attempted to combine the varied measured indicators and dimensions of quality using the eigen values obtained from factor analyses in weighting the contributors to quality in order to obtain an aggregate index (see for example, Omuta, 1988), others have extended this from a slightly different angle using different sources of weightings to build in both professional and non-professional assessors of environmental quality in addition to the dimensional attribute scores to obtain an overall aggregate index of quality (Odemerho).

Some studies in geography and ecological economics have also attempted to use composite environmental index to explore the rate of environmental decay and the efficacy of policies to contain them in various national and city settings. In this wise, a composite index is seen as a vital instrument in monitoring changes in environmental indicators in the course of development, especially by comparing annualized economic growth rate and annualized deterioration rate in the environment (see Kang, 2002; Jollands *et al.*, 2004). One key argument of Kang was that since it was difficult evaluating environmental performance with so many indicators, aggregating them into composite indexes made them more accessible and useful for environmental management. Critical queries have however been raised regarding the validity of combining weights or measures from factor analysis, MDS and ranked scores into an aggregate index since they may not reflect in any way the original views expressed by assessors (see Carley, 1981). As argued by Yu *et al.* (1998), a major drawback in using principal component analysis

(PCA) in dimensionalizing environmental quality indicators has to do with the fact that the interpretation of the components is often less than precise because it is possible for a component to be comprised of mainly dissimilar or conflicting original variables. Indeed, it is difficult to determine whether a large score indicates a desirable or undesirable outcome making it difficult to use PCA scores as a composite environmental index given the ambiguity associated with the meaning of the scores (see Yu *et al.*, 1998, p. 118).

Emergence of ecological economics in environmental assessment

As already evident, the environment has both scenic and time-bound economic value to society which should not be ignored. Contemporary developments in environmental economics have thus offered some alternative frameworks for putting economic and social values on the environment or ecological assets which hitherto had no market value or were grossly undervalued. Economists by adopting market and non-market values in assessing environmental or natural resources provide some contributions which should be of interest to geographers, especially since geography deals with multifaceted aspects of the environment while ecological economics offers directions on how the use/non-use value, option value, altruistic/bequest value, existence value and intrinsic value of the environment can be addressed (see More *et al.*, 1996). Since there are no direct or explicit markets for environmental goods and services, economists resort to indirect means of assessment, including the use of contingent valuation.² Some values have typically been measured using travel-cost or hedonic models while non-use values have generally been assessed through contingent valuation (Moore *et al.*, 1996, p. 398). As Farber *et al.* (2002) stated when services or utilities are measurable in monetary Willingness to Pay (WTP) to obtain the services or Willingness to Accept (WTA) compensation to forego them, these represent marginal monetary value of each characteristic which form the basis for hedonic pricing models in valuation (Farber *et al.*, 2002, p.

² Use values include functional and nonfunctional uses including recreational, aesthetic appreciation and spiritual benefits of environments while nonuse benefits encompass existence value (value associated with share

knowledge of a resource existence); altruism (value derived from having other contemporaries use of resource) and bequest value (preserving a resource for future generations).

378), thus providing the indicative value or worth of a particular environmental resource or service.

Farber *et al.* (2002, p. 388-389) identified six major ecosystem service economic valuation techniques that employ WTP or WTA compensation, where market valuation does not adequately capture social value to include: Avoided Cost (AC) e.g. waste treatment avoids health cost; Replacement Cost (RC) e.g. natural waste treatment being replaced with costly treatment plant; Factor Income e.g. enhanced income for fishermen from water quality improvement; Travel Cost (TC) e.g. access to environmental services gauged in terms of travel cost to the service which in turn offers some indication of WTP; Hedonic Pricing (HP) of service demand – seen as the WTP to have access to associated goods e.g. housing cost at beaches may exceed inland homes; last, Contingent Valuation (CV) where services demand may be elicited by posing hypothetical scenarios that involve some valuation of alternatives, e.g. how much people would be willing to pay for increased fish catch using environmental protection measures. The challenges and weaknesses inherent in these various valuation approaches and the individualistic focus of the methods have led to efforts at aggregating economic values or even the adoption of a group approach where small groups of citizens can be brought together to deliberate on the social value of public goods and the ‘consensus’ used to guide public environmental policy (Jacobs, 1997; Farber *et al.*, 2002, p. 390).

The separation between use economic value of natural resource and non-use intrinsic value of resource may be seen as an attempt to strike some balance if not resolve the conflicts between economic and ecological measures of value, since as Farber *et al.* (2002, p. 387) argued, “humans are only one of many species in an ecosystem, the values they place on ecosystem functions, structures and processes may differ significantly from the values of those ecosystem characteristics of species or the maintenance (health) of the ecosystem itself”. However, the reliance on, and the argument that group consensual discussion could be employed to assign value to resources or environmental goods rather than a reliance on individual technical or professional valuation, represents some methodological meeting point between ecological economics and humanistic

geography, in which opportunities for cooperation could be explored in environmental assessment. Indeed, as Veisten *et al.* (2004) argued while defining CV as a method which enables the valuation of non-market goods by surveying a representative sample of the population and eliciting their *ex ante* WTP for specific changes is suggestive of such a framework for cooperation. While CV may have limited validity when applied to goods with predominantly passive-use (non-use) value the major criticism of the approach is that WTP assessment does not relate to economic choice behaviour but rather reflects good cause dump based on a purchase of moral satisfaction. In order words, respondents may dump their mentally constructed choices in CV when faced with real economic options (see Veisten *et al.*, 2004). Another major shortcoming of economic valuation is that very few studies covered a range of interdependent ecological functions, uses and values at a given site; or tracked site changes in value across different states of ecological disturbance; whereas, these are viewed as critical to decisions on resource management including, the tradeoffs and options to be adopted. Further, aggregate (global scale) estimates of ecosystems value remains problematic (see Turner, 2003 *et al.*, p. 508).

Conclusions and future directions for research in geography

In this paper, I have reviewed the historical and contemporary interests of geographers in environmental valuation, the changes in perspectives and prospective linkages to other disciplines. The review shows that more recent developments in cognitively-derived measures provide opportunities for engaging ordinary people in the task of environmental assessment with wider benefits to environmental planning and sustainable environmental management. The employment of more humanistic/anthropocentric methods that promote dialogic and participatory involvement in assessments accords with everyday life choices as well as recent developments in environmental economics. There should be a review of Nigeria’s geography university curriculum and training to reflect a greater balance between the three fundamental philosophical and methodological strands of environmental analysis, namely,

positivism (scientism), humanism and structural Marxism and blend with other indigenous methods of environmental assessment, to make training more relevant to planning and environmental management, in line with the global quest for socially sensitive methodologies to gather environmental data for public policy decision making. This is critical because environmental issues are complex and interwoven and very often solutions lie in understanding human attitudes/values as well as the societal and political forces that shape environments, which call for greater integration in fields and approaches, since no single field can achieve much working in isolation, as the issues are crosscutting and transcend disciplinary boundaries.

The review points to three future directions for environmental valuation research and teaching in geography. First, is the need for greater interest in environmental cognition and landscape research in Nigeria, which is very weakly developed. Second, given the growing interest in environmental sustainability globally, as evident in the number of regional and international institutions and environmental treaties, conventions etc., there is also a need for geography which deals traditionally with the environment to explore its own well-defined niche for empirical, conceptual and theoretical contribution to make it more relevant, as done by environmental economics within its short life. In this regard, the discipline must focus on people and spatiality as key defining factors that could be applied to both environmental and social impact assessment studies. Finally, geography must reach out to other disciplines, for example, environmental economics in sharing thoughts and ideas of common interest.

References

- Aitken, S. (2001). "Shared lives: Interviewing couples, playing with their children" in: M. Limb and C. Dwyer (Eds.). *Qualitative Methodologies for Geographers: Issues and Debate*. London, Arnold; pp. 73-86.
- Baxter, J. & Eyles, J. (1997). "Evaluating Qualitative Research in Social Geography: Establishing 'Rigour' in Interview Analysis". *Transactions, Institute of British Geographer, New Series*, 22, 505-525.
- Bedford, T. & Burgess, J. (2001). "The Focus Group Experience" in: M. Limb and C. Dwyer (Eds.). *Qualitative Methodologies for Geographers: Issues and Debate*. London, Arnold, pp. 121-135.
- Braun, B. (2004). "Querying posthumanisms". *Geoforum*, 35, 269-273.
- Burgess, J., Harrison, C. & Goldsmith, B. (1990). "Pale Shadows for Policy: the Role of Qualitative Research in Environmental Planning" in: R. Burgess (ed.). *Studies in Qualitative Methods, II*. London, JAI Press, pp. 141-168.
- Burgess, J., Limb, M. & Harrison, C. M. (1998a). "Exploring Environmental Values through the Medium of Small Groups: 1. Theory and Practice". *Environment and Planning A*, 20, 309-326.
- Burgess, J., Limb, M. & Harrison, C. M. (1998a). "Exploring Environmental Values through the Medium of Small Groups: 2. Illustrations of a Group at Work". *Environment and Planning, A*, 20, 457-476.
- Carley, M. (1981). *Social Measurement and Social Indicators: Issues of Policy and Theory*. London, George Allen & Unwin.
- Castree, N. (2004). "Environmental issues: signals and noise?" *Progress in Human Geography*, 28, 79-90.
- Chokor, B.A. (1990) "Urban Landscape and Environmental Quality Preferences in Ibadan, Nigeria: An Exploration" *Landscape and Urban Planning* 19, 263-280.
- Chokor, B. A. (2018). "Cultural ethics and social mediation of environmental action and use of space in Nigeria". *Environmental Ethics*, 40, 325-342.
- Chokor, B. A. & Mene, S. A. (1992). "An Assessment of Preferences for Landscapes in the Developing World: Case Study of Warri, Nigeria and Environs". *Journal of Environmental Management*, 34, 237-256.
- Chorley, R. J. (1973). "Geography as human ecology" in R. J. Chorley (ed.) *Directions in Geography*. London, Methuen, pp. 155-169.
- Costanza, R. (2000). "Social goals and the valuation of ecosystems services". *Ecosystems*, 3, 4-10.
- Crang, M. (2001). "Filed work: making sense of group interviews" in: M. Limb and C. Dwyer (Eds.). *Qualitative Methodologies for Geographers: Issues and Debate*. London, Arnold, pp. 215-233.
- Crang, M. (2002). "Qualitative methods: the new orthodoxy?" *Progress in Human Geography*, 26, 647-655.
- Duncan, S. & Sayer, A. (1977). "The 'new' behavioural geography – a reply to Cullen". *Environment and Planning A*, 9, 230-232.
- Dunn, M. C. (1976). "Landscapes with photographs: testing preference approach to landscape evaluation". *Journal of Environmental Management*, 4, 15-26.

- Eliot Hurst, M. E. (1985). "Geography has neither existence nor future" In: R.J. Johnston (ed.). *The Future of Geography*. London, Methuen, pp. 59-91.
- Farber, S. C., Costanza, R. & Wilson, M. A. (2002). "Economic and ecological concepts for valuing ecosystem services". *Ecological Economics*, 41, 375-392.
- Filani, M. O. (2008). *Greening the Nigerian urban space*. Keynote address at the 50th Annual Conference of the Association of Nigerian Geographers, University of Calabar, 25-29 August.
- Fujisaka, S. (1994). *Will Farmer Participatory Research Survive in the International Agricultural Research Centers?* Gatekeeper Series No. 44, International Institute for Environment and Development, London.
- Giddens, A. (1979). *Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis*. Berkeley, University of California Press.
- Giddens, A. (1984). *The Constitution of Society*. Berkeley, University of California Press.
- Gold, J. R. & Burgess, J. (1982). *Valued Environments*. London, George Allen & Unwin.
- Gregory, D. (1978). *Ideology, Science and Human Geography*. London, Hutchinson.
- Gregory, D. (1981). "Human Agency and Human Geography". *Transactions, Institute of British Geographers, New Series*, 6, 1-18.
- Harmmeijer, J., Waters-Bayer & Bayer, W. (1999). *Dimensions of Participation in Evaluation: Experiences from Zimbabwe and the Sudan*. Gatekeeper Series No. 83, International Institute for Environment and Development, London.
- Harrison, C. M., Burgess, J. & Filius, P. (1996). "Rationalising Environmental Responsibilities: A Comparison of Lay Public in the UK and Netherlands". *Global Environmental Change*, 6, 215-234.
- Hartshorne, R. (1939). *The Nature of Geography: A Critical Survey of Current Thought in the Light of the Past*. Lancaster, Penn., Association of American Geographers.
- Holmes, T. & Scoones, I. (2000). *Participatory Environmental Policy Processes: Experiences from North and South*. Institute of Development Studies Working Paper 113, University of Sussex, Brighton.
- Jacobs, M. (1997). "Environmental valuation, deliberative democracy and public decision-making". In: Foster, J. (Ed.) *Valuing Nature: Economics, Ethics and Environment*. Routledge, London, UK, pp. 211-231.
- Jollands, N., Lermitt, J. & Patterson, M. (2004). "Aggregate co-efficiency indices of New Zealand – a principal component analysis". *Journal of Environmental Management*, 73, 293-305.
- Kang, S. M. (2002). "A sensitivity analysis of Korean composite environmental index". *Ecological Economics*, 43, 159-174.
- Kaltenborn, B. P. (1998). "Effects of sense of place on responses to environmental impacts". *Applied Geography*, 18, 169-189.
- Kneale, J. (2001). "Working with groups" in: M. Limb and C. Dwyer (Eds.). *Qualitative Methodologies for Geographers: Issues and Debate*. London, Arnold, pp. 136-150.
- Livingstone, D. (1992). *The Geographical Tradition*. Oxford, Blackwell.
- Lowenthal, D. (1978). "Finding valued environments". *Progress in Human Geography*, 2, 373-417.
- Lowenthal, D. & Prince, H. C. (1965). "English landscape tastes". *The Geographical Review*, 55, 186-222.
- Lynch, K. (1960). *The Image of the City*. Cambridge, Mass: MIT Press.
- Maycroft, N. (2004). "The objectiveness of everyday life: disburdenment or engagement". *Geoforum*, 35, 713-725.
- Meinig, D. W. (ed.). (1979). *The Interpretation of Ordinary Landscapes: Geographical Essays*. Oxford, Oxford University Press.
- Moore, T. A., Averill, J. R. & Stevens, T. H. (1996). "Values and economics in environmental management: a perspective and a critique". *Journal of Environmental Management*, 48, 397-409.
- Morris, C. (1981). "Townscape image: a study in meaning" in R. Kain (ed.). *Planning for Conservation: An International Perspective*. London, Mansell.
- Odemerho, F. O. & Chokor, B. A. (1991). "An Aggregate Index of Environmental Quality: An Example of a Traditional City in Nigeria". *Applied Geography*, 11, 35-58.
- Omuta, G. E. D. (1988). "The quality of urban life and the perception of livability: a case study of neighbourhoods in Benin City, Nigeria". *Social Indicator Research*, 20, 417-440.
- Osborn, T. (1995). *Participatory Agricultural Extension: Experiences from Africa*. Gatekeeper Series No. 48, International Institute for Environment and Development, London.
- Peet, R. (1977). "The development of radical geography in the United States". *Progress in Human Geography*, 1, 240-263.
- Peet, R. (1998). *Modern Geographical Thought*. Oxford, Blackwell Publishers.
- Relph, E. (1976). *Place and Placelessness*. London, Pion.
- Relph, E. (1981). *Rational Landscapes and Humanistic Geography*. Beckenham, Kent: Croom Helm.

- Sauer, C. (1963). *Land and Life* (ed.). J. Leighly, University of California Press.
- Schaeffer, F. K. (1953). "Exceptionalism in geography: a methodological examination. *Annals of the Association of American Geographers*, 43, 226-49.
- Semple, E. C. (1911). *Influence of Geographic Environment on the Basis of Ratzel's System of Anthro-geography*. New York, Henry Holt.
- Shah, A. (2001). *Who Benefits from Participatory Watershed Development? Lessons from Gujarat*. India Gatekeeper Series No. 97, International Institute for Environment and Development, London.
- Smith, N. (1981). "Degeneracy in theory and practice: spatial interactionism and radical eclecticism". *Progress in Human Geography*, 5, 111-118.
- Tuan, Yi-Fu (1976). "Humanistic Geography". *Annals of the Association of American Geographers*, 66, 266-276.
- Tuan, Yi-Fu (1977). *Space and Place: The Perspective of Experience*. London, Edward Arnold.
- Turner, R. K., Paavola, J., Cooper, P., Farber, S., Jessamy, V. & Georgiou, S. (2003). "Valuing nature: lessons learned and future research directions". *Ecological Economics*, 46, 493-510.
- Veisten, K., Hoen, H. F., Navrud, S. & Strand, J. (2004). "Scope insensitivity in continent valuation of complex environmental amenities". *Journal of Environmental Management*, 73, 317-331.
- Williams, A., Masoud, T. S. & Othman, W. J. (1998). *Community-Based Conservation: Experiences from Zanzibar Gatekeeper*. Series No. 80, International Institute for Environment and Development, London.
- Wrigley, E. A. (1970). "Changes in the philosophy of geography" in: R. J. Chorley and P. Hagget (eds.). *Frontiers in Geographical Teaching*. London, Methuen, pp. 3-20.
- Yu, C. C., Quinn, J. T., Dufournaud, C. M., Harrington, J. J., Rogers, P. P. & Lohani, B. N. (1998). "Effective dimensionality of environmental indicators: a principal component analysis with bootstrap confidence intervals". *Journal of Environmental Management*, 53, 101-119.
- Zube, E. H. (1984). "Themes in landscape assessment theory". *Landscape Journal*, 3, 104-110.