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Environmental transformations in developing countries: hybrid research and democratic policy

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This paper introduces a special edition of *The Geographical Journal* on the theme of 'environmental transformations in developing countries'. Geographical research into human-environment relations is well established. However, many recent studies of political ecology or constructivist approaches to environment either overlook biophysical aspects of environmental change, or uncritically accept 'orthodox' explanations of physical degradation without appreciating the social and political construction of such models. This paper, and those following, attempt to outline ways in which environmental research may remain sensitive to political and cultural debates, yet also give insights to practical environmental management of biophysical resources 'externally real' to human experience. It is argued that understanding human impacts on environment may only be achieved through long-term environmental histories compiled using locally-based 'hybrid' social and physical research methods; plus an awareness of the social and political construction of environmental 'orthodoxies' by powerful domestic and global agendas. As such, 'transformations' may be viewed as both physical changes in factors such as land cover or health hazards; but also as the socio-economic transitions in the driving forces of environmental degradation and perceptions of risk which in turn fuel new orthodoxies in research and policy.

KEY WORDS: environmental management, environment and development, desertification, deforestation, industrialization, environmental policy.

BURNING FORESTS, ERODING farmland, advancing deserts: images such as these once conjured up a picture of environmental crisis in the developing world, where growing populations, entrenched poverty, and fragile, uncontrollable ecosystems presented a potentially fatal threat to citizens disempowered by modernization and inequitable growth. Today, researchers realize these claims were exaggerated, and environmental change is complex, variable, and highly disputed. But as this special edition of *The Geographical Journal* on 'Environmental Transformations in Developing Countries' is introduced, we still seek to ask how far our assumptions about environment and development are based on an accurate understanding of biophysical processes and awareness of problems experienced by disadvantaged groups. How may research be conducted that seeks to challenge threats to ecosystems from economic growth, but also leads to policies which improve the quality and relevance of 'development' of those affected?

The papers in this issue were presented at a conference convened by the Environment and Developing Areas Research Groups of the IBG at the Royal Geographical Society (with the IBG) on 16 October 1996. However, the themes they illustrate are wide-reaching and relevant to many contemporary debates. At the conference, speakers analysed how far researchers can collect information about environmental change and physical processes in a manner which allows researchers to be aware also of their own social and cultural settings. Secondly, speakers questioned how far the current arena for environmental research and policy can be redesigned to enable new agendas to emerge, that might support previously unrepresented groups. This paper attempts to summarize the background to these two questions as a Preface to the individual approaches adopted in the following papers.

The theme of human impact on physical environment has been long-established in Geography. However, in this issue the term 'transformation' is

considered to summarize a physical transition in land use and cover and associated hazards resulting from human action over time; and as a social or political transformation in the causes of degradation, and perceived objectives of environmental research and policy. Initially, the ability to separate natural and social impacts on environment is considered. Following this, the paper offers suggestions about widening the potential directions of research. Finally, a summary is presented, and the papers themselves are introduced.

The agency of nature in environmental change

The human imprint on the earth could be described as unmistakable, were it not often mistaken for the work of nature or natural phenomena for human impacts.

Meyer, 1996: 1

In the late 1990s, it appears that overturning orthodox explanations of environmental change is both popular and necessary. Ever since Blaikie's *The political economy of soil erosion in developing countries* (1985) and the influential *Uncertainty on a Himalayan scale* (Thompson *et al.*, 1986), which turned around orthodox thinking about the degrading impacts of deforestation and soil erosion in the Himalayas, it has since been realized that much work on environmental change in developing countries is based on outdated, partial, or erroneous accounts of change. Ives and Messerli's *The Himalayan dilemma* (1989), Thomas and Middleton's *Desertification: exploding the myth* (1994), and Leach and Mearns' *The lie of the land* (1996) are good examples of iconoclastic works which have stressed the political and historical constructions of supposed environmental crises.

Such works presented evidence to show how environmental problems in developing countries are not the result of short-term impacts of rising population or economic growth, but instead the result of complex long-term human-environment interactions (Turner *et al.*, 1990; Simmons, 1993; Morse and Stocking, 1995). Yet although it may now be fashionable to condemn simplistic crisis-driven explanatory models as 'myths' of the North, criticizing such orthodoxies may be counterproductive if this denies the existence of real environmental problems or human impacts. As Leach and Mearns do identify, the pendulum can swing too far towards debunking orthodoxy. There is now a need for research which attempts to identify the nature and causes of environmental degradation for people in need, but which does not reiterate such pervasive assumptions about crisis as we have seen in the past.

Part of the problem lies in the origin of Northern concerns about environmental degradation in the developing world at a time when positivism (the 'scientific method') was the main model of scientific

explanation. Since the 1970s, researchers have increasingly moved away from seeing environmental degradation as a measurable 'fact', to the understanding that it is a 'conjunctural' association of environmental and socio-economic processes that may not be revealed by the scientific method alone (Blaikie, 1985; Blaikie and Brookfield, 1987). This has coincided with advances in debates about the causation and impacts of natural hazards which have latterly placed more importance on understanding the vulnerability of human communities than on the supposed uncontrollability of physical processes (Blaikie *et al.*, 1994; Watts, 1991).

Such work reiterated, and to some extent overlooked, existing research from the cultural ecology tradition such as Netting's work on indigenous African farming systems (Netting, 1993) or Conklin's work on shifting cultivation in South East Asia (Conklin, 1954). These, and other writers indicated the complexity and ingenuity of dynamic human adaptations to environmental change, and how these social responses shaped the environment in turn (Zimmerer, 1996). Cultural ecology helped counter suggestions that degradation was the result of poor land management by farmers, or the result of short-term increases in population or economic activity (see Tiffen *et al.*, 1994; Turner *et al.*, 1993). For example, anthropological research in the Himalayas overturned the orthodox view about landslides by revealing that some farmers actually triggered landslips themselves as a way to improve soil fertility, rather than seeing them as degrading forces lying outside human control (Kienholz *et al.*, 1984; see also Chapman and Thompson, 1995).

Cultural ecology stresses the importance of local knowledge. A poststructuralist or postmodern research agenda has been proposed by those who stress the uniqueness of environmental perception by individuals, or the inability of others – such as Northern scientists – to understand environmental problems experienced by local groups (e.g. Gare, 1995; Escobar, 1996; Peet and Watts, 1996). However, these theoretical debates, which are based in the belief that each individual has an independent experience of events, may be insufficient when considering biophysical processes such as plant growth and water flows which have an 'external reality' to human experience (Soule and Lease, 1995; Gandy, 1996). Despite the existence of plural rationalities about environmental change (Thompson, 1993), and the different values placed on different aspects of environment by separate groups, policy-makers still need some realist understanding of environmental change in order to enforce effective management techniques.

Research, therefore, needs to appreciate both the biophysical 'reality' of environmental change, and the myriad ways in which this may provide problems

for different cultures or social groups. But can nature and society be separated in this way? Baudrillard (1975) described nature as the 'mirror of production' (in Escobar, 1996: 56), and the well-established debate since the time of Marx about the inter-relationships between nature and culture has strongly argued that both environmental perception and scientific approaches are actually socially produced (Castree, 1995; Harvey, 1996). These critical views of science have indicated that supposedly neutral positivism creates empirical evidence according to the agenda of research or perceived needs of the time (Latour and Woolgar, 1986; Wright, 1992). As a result, Latour (1993) has argued that all attempts to understand externally-real biophysical processes are selective and constructed, whether they be from qualitative perceptions or quantitative testing of hypotheses.

Such statements have important implications for current research directions. There is clearly a need to democratize the definition of environmental problems. However, some recent approaches to the politics of environment have sought to represent ecological movements without integrating this with concurrent research on long-term biophysical change (Taylor, 1995). Some new work in political ecology stresses the vitality of political movements formed around environmental issues (Wapner, 1995; Bryant and Bailey, 1997). This work complements new interests in environmental change and landscape histories (Leach and Mearns, 1996). Research projects may, therefore, acknowledge the constructed nature of all environmental knowledge, but also seek to reveal biophysical processes by using hybrid sources (qualitative and quantitative information from several sources) to investigate concerns which are locally defined as well as globally acknowledged (Scoones and Thompson, 1994).

Hybrid research – like the 'actor-oriented' approach of sociologists Long and Long (1992) – may consider knowledge claims from varied sources, but also acknowledge that its subject (environmental degradation) is variously constructed from physical and social viewpoints. Its aim is to identify information about externally-real biophysical processes, yet also democratize the identification of environmental problems. Hybrid research on landscape change, therefore, does not only record physical aspects of change as conducted in, say, the Forest Transition work of Mather (1992) and Grainger (1995), but also seeks to define how far physical change such as deforestation may form a problem for local communities. As discussed above, orthodox approaches to deforestation have suggested local farmers cause forest loss and that deforestation increases soil erosion. However, hybrid research on this theme in West Africa and Thailand has indicated that forest areas have actually increased under local management,

and that some erosion processes predated forest clearance (Leach and Fairhead, 1996; Forsyth, 1996). Yet the belief that local groups caused these problems has been used to justify harsh penalties and control by the state in these areas.

Environmental orthodoxies are, then, the result of historic experience and scientific information that were collected and amplified according to the perceived needs and agendas of past regimes and societies. As a result, there has been a rise of so-called 'new ecologies' which, like the Foucaultian 'new kind of history', makes a link between the origin of data to support one explanation with the social and political regimes of the time (Murdoch and Clark, 1994; Hoben, 1995; Leach and Mearns, 1996). New ecology – and we may include feminist political ecology here (see Rocheleau *et al.*, 1996) – is distinctive because it considers the historic sociology of scientific knowledge; proceeds to develop complex and long-term environmental histories through hybrid techniques; and only then judges short-term changes in human impacts using participatory research techniques (see Johnson, 1992; Batterbury and Warren, 1997). Yet although these attempts to maximize information about externally-real biophysical processes in a reflexive (or self-critical) way, the identification of alternative agendas and new knowledge sources require a critical approach to environmental debate itself.

The emergence of an equitable debate

Environmentalists need to pay greater attention to the character of knowledge-making institutions and may in future need to grant demands for the redesign of such institutions a prominent place in their list of campaign objectives.

Yearley, 1996: 151

One consequence of the above debate about the agency of nature in environmental change is the view that environmental *processes* are external to human experience, but environmental *problems* are perceived differently and at varying rates by different communities according to varying intended land uses or development aims. Furthermore, vulnerability to these hazards is differentiated and socially constructed (Blaikie *et al.*, 1994). Environmental orthodoxies such as desertification and Himalayan degradation have tempted observers to see environmental change as requiring large-scale intervention. The result may be to misdirect Aid and policy to ineffective forestation or dune stabilization projects – rather than reducing human exposure to hazards through better housing, new income sources, or improved healthcare (Harvey, 1996).

The institutionalization of supposed problems within domestic or global communities influences the direction of research and Aid money. Recent work

on the sociology of environmental discourse has suggested many problems, such as deforestation or declining biodiversity, are assumed to be 'global' when in fact they are challenged by the South, or even by some Northern researchers (Buttel and Taylor, 1994; Yearley, 1996). A more equitable identification of problems, therefore, would allow new agendas to emerge to initiate the collection of environmental knowledge for more development-oriented objectives; plus the greater communication of alternative environmental knowledge to the policy arena.

However, the desire to allow new voices to enter the arena has to be tempered with concern that these voices do not simply reflect existing power divisions and similarly institutionalized environmental perceptions. Social movements, NGOs, and writers in developing countries may be composed largely of domestic élites, or be allied with international NGOs which reflect Northern orthodoxies (Jamison, 1996). The statement of Princen *et al.* (1994: 226), for example, that 'NGOs are increasingly prominent forces in framing environmental issues. They help establish a common language and, sometimes, common world views' should be treated cautiously if reiterating environmental orthodoxies is to be avoided.

Furthermore, as developing countries become more industrialized or urbanized, the perception of wilderness and wildlife ('green' agendas) becomes more powerful, at the expense of 'brown' concern over urban and industrial risks, and associated poverty and health hazards (Hardoy *et al.*, 1992; Satterthwaite, 1997). As a result, the so-called local knowledge coming from emerging social movements or NGOs may not represent the perceptions and experience of disadvantaged groups.

However, it is also important not to romanticize local knowledge, or to believe that alternative perceptions from disadvantaged groups may necessarily lead to better understandings of environmental change. The common association of 'local' or 'indigenous' knowledge with a better form of development than that associated with 'Northern' or 'scientific' knowledge is increasingly criticized, and linked more to the imposition of social categories on people than the technical expertise of either knowledge system (Hobart, 1993; Agrawal, 1995; Jewitt, 1995). In one outspoken criticism, Jackson (1995) accused researchers of enhancing romanticist Northern notions of ecofeminism through the politically-correct mentioning of 'Third World feminists' such as Vandana Shiva, rather than seeking locally-defined agendas. Similarly, Scoones and Thompson (1994) have urged that researchers should not always seek out unrepresented groups in the rigid belief they exist, although Chambers (1997) has stated that the poorest people will always be unrepresented without intervention.

Consequently, development projects should seek to empower disadvantaged groups, rather than enforce current social categories by overtly representing them in existing power structures. For example, some argue that the World Bank has coopted ecofeminism by promoting women-centred projects rather than attempting a deeper re-gendering of power relations (Harvey, 1996: 181). However, the search for local agendas must not denigrate the role of outsiders. In cases of new, high-technology risks such as solvent poisoning in factories, local groups may still need alliance with expert bodies to gain protection or change in state policy.

Research may form part of the democratization process if it can identify local agendas or carry less powerful, or local knowledge to the policy arena. Reij *et al.*'s (1996) work on soil and water conservation in Africa, for example, 'democratizes' experience gained by local people and by development workers (see also Turner, M. 1993). It deliberately privileges African accounts of cheap yet proven conservation techniques, yet shows when Aid, or Western expertise, become necessary to implement or test these. In effect, this is an acknowledgement that research is not politically neutral, and that agendas from less powerful groups are unlikely to reach the policy arena through social movements alone. However, the representation of 'local' agendas will inevitably involve some transformation from a local to a wider linguistic structure (Castree, 1995: 40). 'Fieldwork stamina' and long-term commitment to those groups may be able to lessen this (Spivak, 1988; Turner, B.L., 1989).

Establishing democratic identification of environmental problems, and effective management of externally-real biophysical processes, therefore, is neither an exclusive top-down process from state and science, nor an optimistic bottom-up faith in local knowledge and social movements. 'Reflexive institutions', or local governance structures seeking to represent local agendas whilst utilizing global environmental knowledge have been proposed in the North as a means to achieve more democratic environmental management (Irwin, 1995; Wynne, 1996). Local expert knowledge may lead to such institutions in the developing world, as shown by research on desertification or Himalayan degradation. However, as traditional organization and economic activity change, structures have to be sought to achieve the successful blend of 'local' and 'global' knowledge and agendas. Increasingly this may also involve public-private synergy, or joint ventures between government agencies and private industry, as a way to provide rapid environmental protection at the same time as industrialization. The challenge, then, is not just to construct a more informed and democratized explanation of externally real biophysical change; but also to ensure this knowledge is used to influence policy at

various spatial scales to enable practical and equitable environmental management.

Conclusion and introduction to the papers

This paper is an introduction to wider themes discussed in more detail in the following papers which illustrate and expand many of these themes. The authors' arguments may be summarized as follows:

(i) *Environmental research which does not question physical and human factors simultaneously may reiterate environmental orthodoxies* Physical explanations of environmental change are not neutral from society, but reflect the needs and agendas of societies and regimes that constructed them. The uncritical acceptance of orthodoxies such as Himalayan environmental degradation theory or desertification is unhelpful to communities living in those areas. However, replacing orthodoxies does not always require new knowledge, but may highlight local expertise that has been known for centuries. Furthermore, we must resist replacing one orthodoxy with another: there must be no Orwellian insistence that agroforestry (for example) is good, but plantations bad; community good, state bad; public ownership good, private ownership bad; (four legs good, two legs bad).

(ii) *The identification of environmental problems needs to be democratized at several scales* Many so-called 'global' environmental problems may only reflect the globalization of environmental discourse rather than the actual existence of global threats. Similarly, the identification of environmental problems in developing countries may only reflect the experience and knowledge created by select groups or institutions past or present. Researchers should, therefore, contextualize evidence for problems according to the agendas of the regimes that established it. Secondly, they should also seek to represent alternative definitions of problems from developing societies as equally worthy of research as those identified in the North or by domestic élites.

(iii) *The formulation of environmental management requires a critical stance to knowledge claims* The need to democratize the definition of environmental problems, however, does not mean the uncritical acceptance of all knowledge claims as valuable for managing externally-real biophysical processes. Each knowledge source will be partial and constructed. Increasing the relevance of knowledge sources to wider time and space scales will need a commitment to hybrid research and an acknowledgement that different knowledge sources will unmask various aspects of the same process.

(iv) *Seek local governance based on the reflexive identification of expert knowledge* An uncritical view of ecological movements may not aid the representation of localized

expertise in environmental policy, and may even reiterate Northern environmental orthodoxies. Researchers should seek to publicize knowledge gained from hybrid research, and where local communities are not experts in understanding processes, institutions may disseminate environmental knowledge from other sources to address local concerns.

It is hoped these themes may enable local people to define environmental problems, and then have access to available science and expertise to overcome these at a wide variety of spatial scales. The current definitions of environmental problems may unwittingly reflect agendas of the North, or of historic regimes and the research they created.

The following papers illustrate the diversity of viewpoints from which 'transformations' in developing countries may be approached. Bill Turner discusses the possibilities for integration of global and local research on environmental transformations, and challenges entrenched viewpoints. Michael Thompson presents a Cultural Theory overview of environmental perception and response, and provides examples from the Himalayas and European Alps. His paper reiterates the social construction of environmental knowledge, and the need for policy which does not identify one path to sustainable development, but instead reflects plural rationalities.

Bill Adams and Mike Mortimore present the first of three papers on social and environmental change in the drylands of Africa by discussing the interface of local knowledge and agricultural modernization in the Nigerian Sahel. Their paper adds to existing literature that questions the nature of desertification and agrarian change. Ian Scoones presents a discussion of soil fertility in Zimbabwe, and the ways in which conclusions about environmental change may be influenced by research scale and methodology. He concludes that environmental degradation of pasture lands has been overestimated. Phil Woodhouse *et al.* look at social conflicts over land generated by the rapid transformation of wetland resources in Mali, showing how swift technological change may yield different social and economic responses.

Oliver Coomes and Brad Barham question environmental orthodoxies in Amazonia, by analysing development policies which overlook the diversity of local knowledge and ethnic groups, and miss the heterogeneous impact of humans on forest. He argues that the forests have never been pristine, and that research based on this falsehood may overlook more urgent and achievable livelihood projects.

Tony Bebbington explores the role of local governance and social capital in environmental management by discussing various institutional forms in the Andes. He argues locally-determined environmental management may produce 'islands of sustainability' which allow dissemination of global agricultural

modernization techniques in keeping with local agendas. David Preston *et al.* compare local and national discourses of soil erosion in Bolivia. They show that the problem of erosion is overstated and that state policies restrict upland agriculture because of misplaced fears about lowland sedimentation.

For urban and industrial areas, Rick Auty discusses the likely impacts of globalization of investment and environmental standards on industrial pollution in the developing world. His work marks the growing importance of global investment and regulation of industrial hazards, and he argues that countries currently undergoing industrialization may experience less pollution than those currently industrialized. As a comparison, David Satterthwaite summarizes domestic environmental hazards as cities become larger and richer; demonstrating that international predictions of environmental change may be foiled by transitions within governments that seek alternative policy agendas as development proceeds, leading to enhanced urban poverty. The two papers may be read together

to gain insights of global and national aspects of change.

These papers provide important and timely discussions of environmental transformations in developing countries. They form part of a growing interest in critical analysis and debate over the nature of change, research and policy agendas, and methodologies.

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