

Environmental Change and Policy

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Introduction

The driving force behind much environmental policy in Africa is a set of powerful, widely perceived images of environmental change. They include overgrazing and the ‘desertification’ of drylands, the widespread existence of a ‘woodfuel crisis’, the rapid and recent removal of once-pristine forests, soil erosion, and the mining of natural resources caused by rapidly growing populations. So self-evident do these phenomena appear that their prevalence is generally regarded as common knowledge among development professionals in African governments, international donor agencies, and non-governmental organizations [(NGOs)]. They have acquired the status of conventional wisdom: an integral part of the lexicon of development. Yet as shown by accumulating research [...], these images may be deeply misleading.

The resurgence of concern over the global environment in international development during the late 1980s and early 1990s has given such images a new and vigorous lease of life. *Agenda 21*, the global plan of action adopted at the 1992 Earth Summit in Rio de Janeiro, claims that desertification affects “about one sixth of the world’s population, 70 per cent of all drylands, amounting to 3.6 billion hectares, and one quarter of the total land area of the world” (UN, 1992, 98). A result is “widespread poverty” (UN, 1992, 98). A prestigious article published in *Science* claims that “[a]bout 80 per cent of the world’s agricultural land suffers moderate to severe erosion” (Pimentel et al., 1995, 1117), leading to the destruction and abandonment of

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arable land attributable directly to unsustainable farming practices; and that “more than half of the world’s pasturelands are overgrazed and subject to erosive degradation” (Pimentel et al., 1995, 1117). And research carried out by the World bank in western and central Africa finds that under conditions of rapid population growth, “traditional farming and livestock husbandry practices, traditional dependency on wood for energy and for building materials, traditional land tenure arrangements, and traditional burdens on women ... became the major source of forest destruction and degradation of the rural environment” (Cleaver, 1992, 67).

Such views of environmental change in Africa are not restricted to professional circles. They are also popularized in the news and current affairs media in developed and developing countries alike, and help to build support among the general public for the field operations of charitable organizations, designed to halt the forces of environmental destruction. Images of starving children, and the attribution of blame to natural environmental causes, have become an integral part of the way Africa is perceived in the North. They are signposts to the lie of the land: the reasoning behind them is taken for granted and rarely questioned.

These orthodoxies assign to Africa’s farmers, hunters and herders a particular role as agents, as well as victims, of environmental change. If current trends are to be reversed, it is implied, local land-use practices will have to be transformed and made less destructive. Yet the development policies and programs that result commonly prove to be at best neutral and at worst deleterious in their consequences for rural people and for the natural-resource base on which their livelihoods often substantially depend.

Take the notion of the “fuelwood crisis” as an example (Leach and Mearns, 1988; Mearns, 1995). Felling trees for firewood and charcoal is often assumed to be a prime cause of deforestation in Africa, which thus presents a classic case of demand for fuel outstripping supply. It has been conventional to assess the scale of the problem by comparing current woodfuel consumption with current stocks and annual growth of trees. Typically, this comparison identifies a shortfall, which is assumed to be made up by depleting the standing stock of trees. The supply “gap” is then projected into the future, often in direct proportion to population growth, so that it widens even faster as sustainable yields diminish. There is a crisis. The logical solution is also implicit from the starting assumptions: namely, to plant trees on a colossal scale to close the woodfuel supply gap, and to introduce more efficient cooking stoves to reduce demand. As the “woodfuel crisis” is or will be so severe, so the argument goes, trees must be planted on a scale far in excess of the capacity of rural people themselves to respond. Government forestry departments, with financial and technical support from aid agencies and NGOs, must intervene.

By re-framing the problem, however, many authors have now shown such solutions to be inappropriate. They point out that even when projections are made more “realistic” by correction to allow for factors such as tree re-growth after cutting, as long as the basic assumptions remain intact, three important factors are overlooked.

One is that most woodfuel in sub-Saharan Africa does not come from cutting live trees for fuel, but from surplus wood left over from clearing land for agriculture, or from lopping branches off trees standing on farms that are valued for many purposes besides fuel supply (e.g. shade, fruit, or building poles). Second, wood supply as conventionally defined by foresters greatly underestimates the woody biomass resources available to people as fuel, for example from smaller trees, brushes and shrubs. Third, where people really do perceive a physical shortage of woodfuel, or a need for trees for other reasons, they tend to respond in various ways, whether to reduce fuel consumption, or to plant or encourage the natural regeneration of trees.

Seen from this broader perspective, there is not just one, very big problem of energy supply, but many smaller problems of command over trees and their products to meet a wide range of basic needs, including food, shelter, income and investment. Since these problems take different forms for different people in different places, the range of potential solutions is equally diverse. Rather than simply planting trees for their own sake, the focus shifts to intensifying agricultural production so that output per unit area is increased, but in ways that enable people to better integrate trees with crop production.

The way in which problem and solution are framed in the case of the woodfuel crisis offers a classic example of how “received wisdom” about environmental change obscures a plurality of other possible views, and policy in Africa. A sustained challenge to received wisdom about the woodfuel crisis has been built up through careful research, but this case is far from unique. Similar challenges to many other orthodoxies concerning African environmental change have been mounted over the last decade or so. [...]

While the debates represented here have been building for some time, challenges to received wisdom have now, by the mid-1990s, reached a critical mass which for the first time permits comparative analysis. Such an exercise is, we argue, not only timely but of critical importance, because [...] the insights to be gained from reflecting on these cases together add up to far more than the sum of their parts.

One common denominator of the received ideas considered here is that they rest on neo-Malthusian assumptions² concerning the relationships between society and environmental change. The symbolism of neo-Malthusian images is deeply embedded in Western popular culture and religion (Hoben, 1995). With the advent of space travel in the late 1960s, the newly projected image of the earth from space gave rise to the icon of “spaceship earth,” which so emphatically conveyed the impression of a fixed natural-resource base and inspired the 1970s environmental movement. But as Grove shows, pre-Sputnik, “island” and even “gardens” provided equally potent “global

² A school of thought that sees improvements in standards of living as impossible without reducing population size.

analogues ... of society, of the world, of climate, of economy” (Grove, 1995, 13) which helped shape European attitudes towards nature.

Some of the case studies [...] demonstrate that orthodox evaluations of environmental change, and hence of local-land practices, are demonstrably false. The land – or rather, certain representations of it – can indeed lie. Other cases do not fundamentally challenge received wisdom, but do show how it has exaggerated the magnitude of problems such as forest or soil loss. We want to ask why, if the received wisdom can be shown to be misguided or just plain wrong, is it so pervasive and resistant to change? In this [essay], we argue that the answers to this question are to be found in the sociology of science and in the sociology of development; in other words, in the broader historical political and institutional context of science and policy. An inextricable part of this nexus – and the reason why it is so important – are the profound practical implications for farmers, herders, and other land users in Africa. [...]

Contradictory evidence from a single case study cannot, of course, entirely refute an orthodoxy. The fact that forest loss or range degradation may have been misinterpreted everywhere. But the fact that contradictory cases exist certainly casts doubt over the general applicability of received views, and calls for a more critical examination of the evidence that supports other cases, in case they too prove to counter dominant opinion. The received wisdom under scrutiny [...], then, is the product of particular interpretations of the relationship between environmental change and people’s behavior. [...]

Challenging Received Wisdom

The exposure of the lie in the land [...] comes from three principle angles: history, ecology, and social anthropology, as well as recent fruitful cross-fertilization between them in the analysis of African environments.

A number of popular myths about environmental change have their origins in attempts to infer process from form; that is, to make assumptions about the history of a given landscape on the basis of a “snapshot” view of its current state or on data gathered over a few years at most. Several case studies here, however, demonstrate the importance of using historical and “time-series” data sets of various types to study processes of landscape change more directly; documenting history rather than inferring it (cf. Fairhead and Leach, 1996).

The science of ecology itself has helped turn attention to time-series analysis by questioning the validity of baselines such as “climax vegetation community,” or static concepts such as “carrying capacity” – notions which have hitherto been integral to the scientific validation of orthodox views of environmental change. Older theories are now yielding to a greater pluralism in ecological thinking (cf. McIntosh, 1987).

Attention to historical detail, and the shedding of theoretical straitjackets in ecology, have converged with a better understanding of the land-use practices of Africa's farmers and herders, and of their own ecological knowledge and views of landscape change. This is amply provided in recent works by social anthropologists and others (e.g. Chambers et al., 1989; Croll and Parkin, 1992; Ellis and Swift, 1988; Fairhead, 1992; Richards, 1985; Warren et al., 1995), following some notable precedents (e.g. Alan, 1965; De Schlippe, 1956). Indeed, the application of recent approaches in ecological history often reveals the logic and rationality of "indigenous" knowledge and organization in natural resource management. By contrast, received wisdom would have much of the blame for the vegetation change perceived by outsiders as environmental "degradation" rest with local land-use practices, whether labeled them as ignorant and indiscriminate or – more commonly – as ill-adapted to contemporary socio-economic and demographic pressures. In such accounts, rural people's ecological knowledge is notable mostly by its absence, silenced before it is investigated.

But the reasons why received wisdom has proved so resistant to change have to do with more than simply "getting the facts wrong," or "ignorance" on the part of outsider observers of African environment and land users. Particular readings of history and of African land use, particularly notions within ecology, and so on, have attraction beyond their own claims to "truth value." Their claims to "truth" may rest on the application of particular methods and theories. They may be shown to serve the purposes of particular institutions, or political or economic interest groups; or to appear logical given the cultural backgrounds of their opponents. But as the cases in this collection demonstrate, such "truths" may serve to obscure quite different readings of environmental and land-use history. The sustained critique running through these contributions clearly denies the value-neutrality both of the methods employed in the study of environmental change, and of the conclusions derived from them. Before we are able to judge between alternative conceptions of environmental and land-use change, then, we need to be able to specify the conditions of their production.

Bringing together a range of cases therefore allows [...] to address three central questions. First, how does received wisdom about environmental change in Africa become established, get reproduced, and in some cases persist even in the face of strong counter-evidence? Second, how is it put to use and with what outcomes? And third, what alternative approaches for policy and applied research are suggested by countervailing views? In the remainder of this [essay], we begin to explore some partial answers to these questions; but first it is necessary to clarify what is meant by received wisdom, by outlining several approaches to theorizing the production of knowledge in public policy.

Theorizing “Received Wisdom” in Development Policy

At the most general level, all the contributors treat received wisdom as an idea or a set of ideas held to be “correct” by social consensus, or “the establishment.” Within this broad characterization, there is scope both for more “structural” explanations, which in emphasizing how conspiracy theories, and for those emphasizing human agency, which at their own extreme may appear excessively voluntaristic. The kinds of explanation [...] inevitably vary in emphasis, given the predilections of individual authors, differences in [...] case material, and differences in the tenor of the debates their work has engaged with [...], but most nonetheless tend to combine structural and actor-oriented forms of explanation.

In his seminal study *Development Projects Observed*, Hirschman (1968) showed that “effective development policies and programs (i.e. ones that succeed in mobilizing funds, institutions, and technology) depend on a set of more or less naive, unproven, simplifying and optimistic assumptions about the problem to be addressed and the approach to be taken (Hoben, 1996). [...]

Clay and Schaffer (1984) extend Hirschman’s work in the field of development sociology and policy studies by questioning the normal premise of policy and planning activities: “That there is something to be done. Policies make a difference. Different policies could be chosen. There is room for maneuver” (Clay and Schaffer, 1989, 1). They argue that the mainstream approach to public policy actually “reduces the margin of maneuver towards alternative and better policies” (Clay and Schaffer, 1989, 11), owing to structural factors that “box in” (Long and Van der Ploeg, 1989) individual policy makers within particular institutional establishments and preconceived agendas.

One of the means by which policy makers “box themselves in” is through labeling (Wood, 1985), referring particularly to “the way in which people, conceived as objects of policy, are defined in convenient images” (Wood, 1985, 1). Labels are put on “target groups” as passive objects of policy (e.g. the “landless”, “sharecroppers”, “women”), rather than active subjects with projects and agendas of their own. The disarming shorthand of labeling constructs a problem in such a way as to prescribe a predetermined solution, and legitimizes the actions of development agencies and other public bodies in intervening to bring about the intended results (cf. Long and Van der Ploeg, 1989). Such classifications are “represented as having universal legitimacy, as though they were in fact natural” (Wood, 1985, 9). Wood argues further that “labels misrepresent or more deliberately falsify the situation and role of the labeled. In that sense, labels ... in effect reveal [the] relationship of power between the giver and the bearer of a label” (Wood, 1985, 11)

In a similar vein, Roe (1991) has shown how the simplifying assumptions that enable policy makers to act is frequently encoded within “development narratives”. As a “story,” these have “a beginning, middle, and end (or premises and conclusion, when cast in the form of an argument) ... development narratives tell scenarios not so much

about what should happen as about what will happen – according to their tellers – if the events or positions are carried out as described” (Roe, 1991, 288).

Nowhere is the power of policy narratives and paradigms illustrates more clearly than in environmental planning in developing countries, as Hoben argues:

The environmental policies promoted by colonial regimes and later by donors in Africa rest on historically grounded, culturally constructed paradigms that at once describe a problem and prescribe its solution. Many of them are rooted in a narrative that tells us how things were in an earlier time when people lived in harmony with nature, how human agency has altered that harmony, and of the calamities that will plague people and nature if dramatic action is not taken soon (Hoben, 1995, 1008).

Whatever their truth-value – and as Roe points out, this may be in question – narratives “are explicitly more programmatic than myths, and have the objective of getting their hearers to believe or do something” (Roe, 1991, 288). By making “stabilizing” assumptions to facilitate decision-making, narratives serve to standardize, package and label environmental problems so that they appear to be universally applicable and to justify equally standardized, off-the-shelf solution.

Whether understood in terms of labeling or narratives, what is happening here is the representation of the experiences of those who are seen to be “the problem” outside their specific historical and geographical contexts. The stabilizing assumptions of policy makers thus substitute for the rich diversity of people’s historical interaction with particular environments. Even when they embrace debate, such debates often reduce the world to two dimensions in a simplified and ultimately unhelpful way. Environment and development discourse is replete with examples, frequently taking the form of “bad/good” dichotomies: “tragedy of the commons” versus common property resource management; farmer’s ignorance versus “indigenous technical knowledge”; Malthusian degradation versus Boserupian intensification, and so on.

Hoben (1996) highlights more cultural dimensions of this issue, arguing that “the power of development narratives is enhanced through the incorporation of dominant symbols, ideologies, and real or imagined historical experience of their adherents. In this sense they are culturally constructed and reflect the hegemony of Western development discourse” (cf. Hoben, 1995). He suggests that as narratives become influential within environment and development practice, so they help shape their own “cultural paradigm”: namely, specific development programs, projects, packages and methodologies of data collection and analysis. The “cultural policy paradigm” thus builds its own foundation, being “based on concrete exemplars as well as on a set of ideas.”

By received wisdom as applied in African environment change and policy, then, we mean an idea or set of ideas sustained through labeling, commonly

represented in the form of a narrative, and grounded in a specific cultural policy paradigm. It can be understood as a form of “discourse”, in the sense meant by Foucault (1971; 1980) to draw attention to the way it embodies relations of power that are constituted through everyday, familiar acts that go unnoticed because they are taken for granted (cf. Milton, 1993). The fact that received wisdom as discourse is embedded in particular institutional structures, active on the ground, not only accounts for its tenacity, but enables it to have real practical consequences, or “instrument effects” (Foucault, 1979; cited in Ferguson, 1990) that reveal the underlying exercise of power.

Keeping in mind the structure-agency axis referred to earlier, it is important to be explicit about the degree of intentionality at work in producing and reproducing received wisdom and its actual consequences once put into policy. Representations of environmental change and the role of assorted people and organizations in bringing it about are rarely contested. Received wisdom should not be conceived of as somehow autonomous, with a life of its own, independent of human agents. Rather, it is at the same time a product of the unintended and intended consequences of the actions of individual human agents, and a part of the structure within which they act and which shapes future possibilities for action (Giddens, 1984; Long and Long, 1992).

[... T]he influence of African land users over the way in which environmental change is conceived in the development process appears rather small. In the case of desertification, for instance (Swift, 1996), received wisdom pays little heed to the perceptions of indigenous herders, but rather represents a hegemonic, “totalizing discourse” (Peet and Watts, 1993) in which their position is often relegated to that of resistance to projects imposed. In other cases, however, local land users have had much greater influence over received news of environmental change. There is evidence of considerable interaction between different knowledge systems, which gives rise to new strands of knowledge at their interfaces (Long, 1989; Long and Long, 1992). This certainly seems to have been the case at certain times in parts of the West African forest zone, for example. Fairhead and Leach (1996) describe how farmers in Guinea have contributed to the State’s discourse concerning forest loss when attempting to secure development benefits, for example, despite the very different environmental options and experiences they express in other contexts.

The Origins and Persistence of Received Wisdom

The received wisdom [...] is by no means new. In many cases, the ideas that drive contemporary environmental policy in Africa can be traced back to early colonial times. But the reasons for their origins and persistence are to be found at different levels. It might seem reasonable to assert that received wisdoms are held because, at a first approximation, they capture realities important to people’s lives and problems. Certainly, their substantive messages, the underlying theories which lend them

scientific credibility, and the methodologies from which those messages are derived all merit close attention and critical evaluation in their own right. [...] However, it is striking that recourse is taken to the same substantive messages, theories and methodologies, time after time, even in situations where they have been shown to hold little validity. To explain this we need to consider the broader social and historical context within which science is used in the service of public policy (Coolingridge and Reeve, 1986). Here we consider each of these levels in turn, first examining issues of scientific theory and methodology, and then issues in the sociology of science and of development, and finally the role of popular culture in the construction of environmental meaning. [...]

Scientific Theory

Only a small number of ideas and theories have been truly pivotal in debates about environmental change and human-environment interactions in Africa, but their influence has been enormous. One has been the notion of a “climax vegetation community”: the vegetation that a given climatic zone would support in the absence of disturbance. Another pervasive idea has been the supposed causal link between devegetation and declining rainfall. This was strongly evident in nineteenth-century thinking (Grove, 1995), and has been as influential in theories of the derivation of savanna from forest in Africa (Fairhead and Leach, 1996) as in those of desertification further north (Swift, 1996). A third is the idea of carrying capacity: that every set of ecological conditions can support a given number of people and/or livestock which, once exceeded, will lead to a spiral of declining productivity.

Many of these sets of ideas or theories, dominant in ecological science since its inception (Clements, 1916), have their foundation in some notion of equilibrium. This could be the equilibrium between environmental factors (e.g. climate, soils, and vegetation) that would prevail in the absence of people, as in the notion of vegetation climax. Or it could be equilibrium between certain sorts of society and environment (e.g. “traditional” society in culturally regulated harmony with “nature”, remaining within carrying capacity). In each case, environmental change could be projected as a linear departure from the ideal.

Recent thinking in ecology questions these ideas of equilibrium, instead emphasizing the inherent variability of many ecosystems. In space, assemblages of biotic communities are increasingly thought to resemble more of a patchwork, controlled by edaphic and abiotic factors often on quite a small scale, than mere variants on some presumed ideal “climax” community. In time, variability frequently takes the form of state-and-transition dynamics, rendered complex by spatial variation. There is not one unique, ideal state which is “deflected” into an inferior state upon disturbance. Rather, historically specific conjunctures of conditions may determine unique pathways of transition from one state to another, and may even give the appearance of “chaotic” fluctuation. This has led ecologist Robert May to comment on

“the ineluctable contingent nature of such rules and pattern as are to be found governing the organization of communities’ (cited in McIntosh, 1987, 322). Sometimes heralded as the “new ecology” (Botkin, 1990; Worster, 1990a), or ecological pluralism (McIntosh, 1987), such perspectives are certainly opening new ways of conceptualizing the dynamics of ecological systems whether in drylands (Behnke et al., 1993; Dublin et al., 1990; Scoones, 1996) or forests (Fairhead and Leach, 1996; Sprugel, 1991).

More broadly, the message contained within the scientific theories that underpin received wisdom can be seen to reflect culturally and historically specific representations of “the environment.” The very concept of an external “environment,” analytically separable from society, can be traced to post-Enlightenment thought in the North (Glacken, 1967; Worster, 1977). Western science rests on the basic assumption that “natural” phenomena can be investigated separately from human society, except inasmuch as people and their social world are subject to “nature” and act on “it.” Such a distinction is, of course, alien to many African societies, in which categories of thought are structured in very different ways and cut across a nature-culture divide (Croll and Parkin, 1992; Fairhead and Leach, 1996; Gottlieb, 1992).

The assumptions of post-Enlightenment science are manifested in several different ways in the received wisdoms explored here. On the one hand, they are evident in views which seek out untouched, pristine nature against which to assess human impact, whether in undisturbed, climax forest vegetation (Fairhead and Leach, 1996); or in the wildlife-rich wilderness of Southern and Eastern Africa as represented in northern colonial and popular imaginations (Anderson and Grove, 1987; Brockington and Homewood, 1996). Human impact is portrayed in terms of “anthropogenic disturbance” to an otherwise stable nature.

On the other hand, post-Enlightenment thought is also evident in the view – held from Francis Bacon’s time onwards – that society can and should use the technology at its disposal to achieve mastery or dominance over nature so as to satisfy human needs and wants. Others highlight the ideological character of such a view, suggesting that it serves to disguise the real form of domination which is between classes in society (Leiss, 1972). [...] Scoones (1996) describes how imperatives of administrative control and surveillance underlay the attempts of colonial and post-colonial administrators to impose order and straight lines on the rangeland landscape in Southern Africa. Similarly, in Northern Nigeria, expatriate foresters have been convinced that only trees planted in lines and orderly plantations constitute a “proper” use of the drylands (Cline-Cole, 1996). What masquerades as environmental control is often more correctly seen as social control.

Implicit in culturally specific representations of the environment are particular notions of its “value,” as derived from prevailing priorities in natural resource exploitation, or from the biases of particular scientific disciplines. A good example concerns the way professional foresters and ecologists in Africa have conventionally valued closed-canopy or gallery-forest – so that any conversion of such a vegetation

community is seen to constitute “degradation.” Yet such conversion may be viewed positively by local inhabitants, for who the resulting bush fallow vegetation provides a greater ranger of gathered plant products and more productive agricultural land (Davies and Richards, 1991; Leach, 1994). Thus the same landscape changes can be perceived and valued in different ways by different groups; what is “degraded and degrading” for some may for others be merely transformed or even improved (cf. Beinart, 1996).

Ideas and theories in social science have often converged with those in natural science in the production of received wisdom about environmental problems. Indeed in some cases, social science has provided supporting narratives that reinforce demonstrably false analyses of the nature and cause of environmental change. Hoben (1996), for instance, describes how a neo-Malthusian narrative concerning the impact of population growth has supported the orthodox view of recent environmental collapse in highland Ethiopia. He counters this with an alternative analysis that suggests there is nothing new in environmental “flux, crisis and calamity” in that setting, and that it should more properly be attributed to the political economy of the state and its influence over natural-resource use than to demography. While the alternative view does not deny that there are serious problems of soil erosion in highland Ethiopia, it certainly provides a counterweight to the neo-Malthusian narrative that “exaggerates the rate and magnitude of degradation and misrepresents the role of human agency in causing it” (Hoben, 1996).

Perhaps the best known supporting narrative from social science is the so-called “tragedy of the commons” argument, used to support received wisdom about drylands environmental changes. It runs as follows:

Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible in the commons. Such an arrangement may work reasonably satisfactorily for centuries because tribal wars, poaching, and disease keep the numbers of both man and beast well below the carrying capacity of the land. Finally, however, comes the day of reckoning, that is, the day when the long-desired goal of social stability becomes a reality. At that point, the inherent logic of the commons remorselessly generates a tragedy ... Ruin is the destination towards which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons (Hardin, 1968, 1244).

This argument, used as a metaphor by Hardin and others (e.g. Ehrlich and Ehrlich, 1990) to account for population pressure on resources in general, has been critically analysed as a development narrative by Roe (1991; 1994). A strong counter-narrative refutes it, arguing that Hardin confused “common property” with open access; that in a true common situation, local institutions facilitate cooperation between users such that resources can be managed sustainably; and that “tragedies” are a result of the breakdown of such arrangements, for example through state intervention (e.g. Bromley

and Cernea, 1989; Bromley, 1992; Ostrum, 1990; Shepherd, 1989). Yet Swift (1996) shows how the “tragedy of the commons” has been marshaled consistently to support the conviction that the world’s deserts are “on the march,” in spite of an absence of reliable empirical evidence to support that view. He finds the explanation of its persistence in the fact that it serves well the interests of donor agencies and national government in perpetuating various forms of planned development. The finger of blame has been pointed in a different, but perhaps equally misleading, direction in the case of South Africa, described by Beinart (1996). Here, rangeland degradation was said to have been caused by the destructive farming practices of white settlers; a view which conveniently suited the political agendas of those opposing the apartheid regime. Yet time-series evidence tells a rather different story of general stability in grassland composition over the period in question.

The persistence of received wisdom may also depend on what is left out of the analysis; on the way that dominant ideas serve to highlight certain aspects of local farming and environmental management while excluding others. Tiffen (1996) gives several examples of such “blind spots” on the part of outsider observers of smallholder agriculture. Researchers and others working in Kenya’s Machakos district, for instance, failed to “see” farmers’ investments in soil conservation and farm landscape improvement (cf. Chambers, 1990). Farmers’ investments in enriching their local environment tree regrowth were also invisible to, or ignored by, outsiders and government officials in Guinea’s forest-savanna transition zone of Nigeria (Cline-Cole, 1996). While in Tiffen’s work, the “blame” for these biases and omissions tends to be laid at the feet of individual economists and anthropologists who are seen to be responsible, the problem may be broader. Below we examine why such blind spots exist by focusing on the context within which science operates.

Scientific Method

Theoretical issues in science are frequently inscribed in the methods which generate supportive data; as such, theory and methodology are hard to distinguish. Nevertheless, a more specific focus on methodological question is also helpful in comprehending the persistence of orthodoxies about African environmental change. In virtually any discipline particular methods come to acquire credibility and authority, and it can be the inheritance of such methods – as much as of the actual messages they generate – that explains the persistence of some received ideas. By defining what is acceptable as evidence, certain privileged methods also act to exclude other sorts of data. It is in this way that certain questions remain unasked, and certain types of evidence are ignored or dismissed as invalid.

The exclusion of historical data from much ecological science as applied to Africa is a case in point. Orthodox views are often based on speculative projection backwards from the present time, in which present landscapes are presumed to be changed – or degraded – versions of those supposed once to have existed. The

“snapshot” methods on which such views are based came to dominate at a time when time-series data, from air photography and satellite images, for instance, were unavailable to researchers. Now they are increasingly obtainable for periods stretching back several decades, and researchers are becoming increasingly aware of their value. [... Such] historical data sets – often combining photographic with official written records, early travelers’ accounts, and ethnographic research methods such as oral history – call into question conventional views of environmental change and their methodological underpinnings.

Take the example of botany. The possibility and validity of “reading” historical process from present form has been strongly developed in “phyto-sociology”; an approach which uses the present species composition structure and boundaries of vegetation communities as a basis for deducing the processes which have led to this form. Yet, as Fairhead and Leach (1996) show with reference to the “derivation” and savanna landscapes, the assumptions about process in these deductions may prove unfounded. Rather than regarding the mixed forest-savanna species composition of forest-patch boundaries as evidence of “savannization” and forest degradation, as many botanists in forest Guinea have assumed (e.g. Aubreville, 1949), Fairhead and Leach show it to be the outcome of forest expansion into savanna, resulting from deliberate management of soil, trees and fire by local farmers. Time-series aerial photography comparisons support farmer’s own oral-historical explanations that their strategies serve to increase forest cover over the longer term.

Another type of methodological blind spot has been mistakenly to assume conditions at a particular time to be representative of an enduring state of affairs. Brockington and Homewood (1996), for example, describe how colonial administrators interpreted the low population levels prevailing at the turn of the twentieth century as the norm for East African savannas, when in fact they were the result of the decimation of human and livestock population by war, famine and disease in the late nineteenth century. Not only did this convey a misleading impression of unpopulated “wilderness” to early European settlers (cf. Anderson and Grove, 1987), but it also fuelled anxieties about African population growth later in the twentieth century, which proved expedient in politically motivated arguments that the “carrying capacity” of the land would quickly be exceeded.

An equally common methodological error has been to take short-run observations as evidence of a secular, long-run trend, when they may simply describe one phase in the cycle. The clearing phase in a fallow cycle, for example, need not imply the long-term removal of vegetation. Swift (1996) describes how received ideas about desertification have rested a little more on the observed expansion of desert margins over periods of little more than a handful of years. Analysis of the data for several decades usually reveals that such observations capture only a small wobble in the long-run fluctuation of the desert margin, driven by outside observers’ impressions of range condition at a given point in time. Taking the case of South Africa, Beinart (1996) shows the significance of the chosen observation period in relation to the long-

run dynamics of livestock herd build-up and decline, determined largely by political and economic conditions.

An analogous type of error is the scale problem discussed by Stocking (1996) in relation to the measurement of soil erosion. Just as short-run observations may give a poor indication of long-run trends over time, so extrapolation from the small-scale erosion plot to an entire catchment area, region or even country gives a wildly exaggerated impression of the real severity of soil erosion. [...] This is just one of a number of methodological traps commonly encountered in the measurement of soil erosion, which combine to give a highly misleading impression of its rate and severity in Africa. Yet, as they are lent professional authority by the scientific establishment, such assessments have come to represent a chief source of legitimacy for orthodox soil conservation programs in Africa, such as those carried out in Ethiopia (Hoben, 1996).

[...S]cience and methodology, and the selective use and misuse of the resulting empirical evidence, form central props to received wisdom about environmental change in Africa. This is based not on ignorance [...] but on particular forms of “knowledge,” and what is taking place is the exercise of power through subtle but effective instruments for the formation and accumulation of knowledge, including “methods of observation, techniques of registration, procedures for investigation and research, {and} apparatuses of control” (Foucault, 1980, 102). The power relations embodied in the production of knowledge are reinforced by the ideas, values and methods of “normal professionalism” in rural development (Chambers, 1993). It is not merely that “knowledge itself is power” (Francis Bacon, cited in Davies, 1994, 1), but that “what constitutes knowledge, what is to be excluded and who is to be designated as qualified to know involves acts of power” (Foucault, 1971; cited in Scoones and Thompson, 1994, 24). In the following sections we examine how the embedding of such knowledge/power relations in the institutions of science and of development help account for the persistence of received ideas about African environmental change.

Sociology of Science in Public Policy

We noted in the previous section that the origins of many of the orthodoxies we are concerned with here can be traced back to the early colonial period. Both distance and recent research make nineteenth and early twentieth-century imperialism a good choice of historical period for the purpose of illustrating how the broader economic, political and institutional context shape the manner in which science is put to use in public policy.

The political and economic context, for example, helps to explain the differences in the kinds of conservationist policy adopted in the settler colonies of British East and Southern Africa, and those adopted in the trading colonies of British West Africa (Anderson and Millington, 1987). An overt, social control agenda lay behind policies in East and Southern Africa that places physical restriction on African

farming activities, supposedly in the interests of European settlers (Anderson, 1984; Beinart, 1984). These restrictions included, for example, the prohibition of farming on slopes claimed to be too steep for cultivation (Showers, 1989), the relegation of African farming to designated reserve areas, and restrictions placed on the crops African farmers were allowed to grow, especially with respect to export crops such as coffee (Tiffen et al., 1994). In all these cases, conservationist arguments were made to justify those policies. By contrast, in the trading colonies of West Africa where African cash-cropping and gathering were important to colonial economic interests, conservationist policies to restrict these activities were much less prominent (Millington, 1987). Thus, in selective ways, received ideas about environmental change were marshaled to justify one or another type of public policy.

Colonial science, as it came to be applied in Africa, was strongly influenced by scientific ideas and debates originating elsewhere. The influence of the North American dustbowl in the 1930s on thinking about soil erosion in Africa has been well-documented (Adams, 1996; Anderson, 1984; Beinart, 1984; cf. Brockington and Homewood, 1996), but there were much earlier precedents. A coherent interpretation of environmental degradation attributed to the economic demands of colonial expansion emerged in the island colonies of St. Helena and Mauritius as early as the mid-seventeenth century (Grove, 1995). The notion of a causal link between deforestation and declining rainfall already held wide currency among the medical surgeons, botanists and other scientists employed by trading companies such as the East India Company by the mid-nineteenth century and through them came to play a decisive role in shaping India's forest conservancy system (Grove, 1989). The Indian system, in turn, provided a model for those in Africa and, much later, North America (Grove, 1995). And early in the twentieth century, the scientific study tours of the Indian-trained Stebbing were particularly influential in emergent African debates about desertification (Swift, 1996).

The extent to which colonial scientists were part of a "global" network or community was echoed even more strongly within the African continent itself. Scientific tours and visits, as well as regional commissions and conferences, created a context in which individuals were often able to influence entire regions and generations. For example, Pole-Evans influenced a whole generation of rangeland scientists in Southern Africa and beyond (Scoones, 1996); and the interactions of the francophone botanists and foresters, particularly Thompson and Unwin, ensured that their analyses of vegetation were carried over the Anglophone-Francophone divide in West Africa (Fairhead and Leach, 1996). The written texts and maps of such influential figures frequently became key reference works in subsequent generation of scientists in comprehending African environments. It is little surprise, then, that a remarkable consistency in ecological analysis often emerged and persisted across whole ecological zones.

While the terms of scientific debate during the colonial period appear to exhibit remarkable consistency, it would be misleading to portray scientific opinion at any

given moment as homogeneous. For example, Beinart (1996) describes the strong debates around assessments of grassland condition in South Africa between the 1930s and the 1950s. Unlike his contemporaries, the botanist C. E. Tidmarsh was rather cautious about the orthodox view of continuous grassland degradation, and attributed grassland composition more to climate and available moisture supply than to the nature of grazing treatment. Tidmarsh's arguments predated the recent literature on non-equilibrium range ecology (Behnke et al., 1993) by some forty years. However, although Tidmarsh served on the Desert Encroachment Committee, his ideas had lasting influence on public policy. Similarly, in the context of Southern U[nited] S[tates] agriculture between the seventeenth and nineteenth centuries, ideas about environmental change, agricultural innovation and the role of indigenous farmers appear to have fluctuated on a cycle of several decades (Earle, 1988). Although the mainstream view of agriculture during the period is characterized by the notion of the southern farmer as "soil miner," Earle seeks to explode this myth by highlighting those periods in which "folk" innovations in agriculture were viewed positively by outside observers, in a manner reminiscent of contemporary "farmer first" paradigm in agricultural development (Chambers et al., 1989).

The financial and bureaucratic structure of scientific establishments and public administrations strongly influence these processes, shaping debate – and freedom to pursue it – at any given moment. In many cases, those whose ideas posed a significant challenge to the prevailing orthodoxy found their views either suppressed or unable to influence higher levels in the institutional hierarchy. For instance, Fairhead and Leach (1996) show how much constraints have operated through colonial, post-independence and recent times to stifle challenges to the dominant view of vegetation dynamics in Guinea's forest-savanna zone.

Even changing and contested views of environmental change in Africa may have posed little real threat to the continuity of policy and practice. Adams (1996) suggests that changing sets of ideas originating at the center may, in the course of their transmission to the more distant outposts of public administration, "sediment down" more slowly and adapt themselves to preceding thinking. There can, therefore, be a remarkable degree of continuity in what happens on the ground, as he shows with reference to the rationale for external intervention in irrigation in a Marakwet district of Kenya from the 1930s onwards. Adams describes how colonial administrators could at the same time be impressed by indigenous irrigation furrows, yet regard them as a cause of soil erosion and local irrigators to be incapable of managing them properly. Whatever view prevailed of indigenous irrigation practice was consistently manipulated in order to justify European intervention and imposed change.

Many of the colonial scientists to whom we have referred as having a disproportionate influence over the early origins of received wisdom about African environmental change were not only scientists. In most cases, they were employed as public servants, and played decisive roles in colonial policy formation and administration. The botanist Pole-Evans, for example, is also credited with having

shaped the draconian Natural Resources Act (1942) in Rhodesia and the Swynnerton Plan (1954) for agricultural intensification in Kenya (Scoones, 1996). In French West Africa the botanist Aubréville eventually rose to become *Inspector Général des Eaux et Forêts des Colonies* in French West Africa (Fairhead and Leach, 1996). And in Nigeria, the forest conservation enthusiast Moloney came to be Governor of Lagos Colony (Grove, 1994), while Lugard (Cline-Cole, 1996) established a regional forest service in Northern Nigeria.

Early in the colonial period, these individuals had little evidence to support their hypotheses about African environments. Nevertheless, these hypotheses became institutionalized in colonial agriculture, forestry, livestock and wildlife departments, forming the rationale for intervention. Thus, even if the scientific analysis to provide empirical support to early contentions about the relationships between rainfall and deforestation, or stocking density and range condition, had not yet been carried out, the agenda of such analyses had already been set through the establishment of these institutions. And in turn, the persistence of these institutional structures provided a context in which their analyses could remain dominant, and be further elaborated.

At least in some parts of Africa, the colonial legacy in environmental institutions was directly inherited by post-independence governments, helping to account for the persistence of received wisdoms. Furthermore, by comparison with the colonial period, some notable similarities can be observed in the relationship of contemporary expatriate scientists and academic advisers to the process of public policy formation in Africa. One is the exchange of ideas within a network or community of like-minded individuals; a second is the tendency for scientists to be more or less directly “in the pay” of policy institutions.

Sociology and Practical Effects of Development

The foregoing arguments begin to suggest how received wisdoms about environmental change are institutionalized. We now turn more directly to institutional issues, and examine how structural factors in the contemporary development process itself help explain the persistence and power of particular views of African environments. Of key importance here are the inextricable links between development institutions, their analyses and the effects “on the ground” of the policies they promote, effects which have proven detrimental from the perspectives of local land users.

It is possible to show that the interests of various actors in development – government agents, officials of donor agencies, the staff of Northern and Southern non-governmental organization, and independent “experts” – are served by the perpetuation of orthodox views, particularly those regarding the destructive role of local inhabitants. Pejorative attitudes and repressive policies towards pastoralists, for example, have been well-served by the view that they cause desertification, or bring about a tragedy of the commons (Scoones, 1996; Swift, 1996). And in East Africa, it

suited the land-expansionist concerns of white settlers to attribute soil erosion to the “primitive” practices of indigenous farmers (Anderson, 1984; cf. Adams, 1996).

Throughout the colonial period, received wisdom about environmental change served to justify the formation and funding of national-level executive agencies with responsibility for environmental management. This has continued to the present day. Government departments with responsibility for forest and wildlife protection and management, in particular, are often heavily reliant on revenues received from fines and the sale of permits. The underlying premise on which the continued flow of such revenues rests is that stewardship over natural resources is properly the responsibility of the state. It depends on and serves to perpetuate the conventional view that local inhabitants are incapable of acting as resource custodians. In order to justify the existence and expansion of natural resource departments as an arm of state administration, therefore, there are strong vested interests on the part of the government agents in maintaining received wisdom about the instrumental role of local inhabitants in bringing about environmental degradation (Fairhead and Leach, 1996; Tiffen, 1996).

[A common view is] that received wisdom about African environmental change has had the instrumental effect of promoting external intervention in the control and use of natural resources. In a bold statement of this position, Roe states that:

... crisis narratives are the primary means whereby development experts and the institutions they say are under crisis (Roe, 1995, 1006).

He goes on to argue that shifts in narratives can reinforce, rather than undermine this process, since

... the more crisis narratives generated by an expert elite, the more the elite appears to have established a claim to the resources it says are under crisis ... whether right or wrong, the claims, counter-claims and changing claims of experts serve principally to reinforce and widen the belief that what they, the experts, have to say really matters and matters solely by virtue of their expertise (Roe, 1995, 1066).

More broadly, others suggest that particular kinds of development discourse serve to justify the expansion of bureaucratic power in rural areas. For example, Ferguson (1990) documents how the bureaucratic logic of the Thaba-Tseka Development Project in Lesotho served to depoliticize poverty and powerlessness so that they could be portrayed as a set of “technical problems” awaiting solution by “development” experts. Drawing on the work of Foucault, but sharing much with the analysis of Wood (1985) and others, Ferguson reveals the planning apparatus and the conceptual system on which it rests as mere cogs in the development “machine”, linking up with social institutions in such a way as to shape outcomes without actually determining them (cf. Long and Long, 1992). The principle outcome, Ferguson argues,

is to promote, almost unnoticed, the pre-eminently political operation of strengthening the state presence in rural Lesotho.

The process Ferguson describes is not uncommon in planned interventions in natural resource management. His analysis gives an insight into the seemingly inexorable way in which it is convenient for government and donor agencies to promote particular, off-the-shelf intervention “packages” which frame problems and solutions in technical terms, obscuring alternative analyses such as those which might lie in the realm of political economy. Amanor (1994a), for example, described how in the forestry “sector” such packages may take the form of replicable “green technologies” such as alley cropping, or of organizational packages such as those promoted under the tropical Forestry Action Plan (FAO, 1985). [...]

[... S]uch external claims over resource management and control can have deleterious consequences for local livelihoods. They can marginalize and alienate people from natural resources over which they previously enjoyed access and control, perhaps directly undermining their ability to secure food or income. This has sometimes been the case, for instance, with policies to exclude people from externally managed forest or wildlife reserves, or to confine pastoralists to fenced paddocks. Where inhabitants must, out of necessity, continue to use resources claimed by external agencies, they often find themselves subjected to taxes or fines which render them more resource-poor. Even when inhabitants retain rights to use resources, the imposition of external regimes or “packages” for their management can impose unwelcome demands on their labor and resources. [...]

In some cases, the assertion of professionalized claims over land and resources has also had adverse ecological consequences. For example, Fairhead and Leach describe how external prohibitions on the setting of bush fire undermines inhabitants’ early-burning strategies, risking greater fire damage by late dry season fires. By contrast with negative effect on local populations, which may be of little concern to – or even in the interests of – certain state agencies, such counterproductive environmental effects might be thought to throw policy approaches and their supporting analyses into question. Yet an effect of labeling in the framing of technical problems, as Wood (1985) notes, is to contribute to a self-fulfilling cycle of policy failure which deters such questioning. As Scoones (1996) shows with reference to rangeland management in Zimbabwe, if a given policy or intervention package fails or is resisted by the “target group,” it is implicitly assumed to be because the “target group” is recalcitrant or ignorant, rather than because the problem was misconceived in the first place. As a result, efforts are redoubled on the part of the implementing agency to bring about the same desired outcome, but with the use of greater force, which merely serves to worsen the initial “policy” failure.

In this light, it is not surprising that policies have often been resisted by local people. Such resistance needs to be interpreted both as a response to social repression, and to inhabitants’ understanding that policies were often inappropriate to local ecological conditions. Resistance sometimes takes “everyday,” covert forms (Scott,

1985), including coping and adaptive strategies to carry on with customary practices regardless of the consequences, and sometimes takes more overt forms of political expression.

Nevertheless, it would clearly be wrong to portray local inhabitants only as victims of repressive colonial conservation policies. Evidence from West Africa, for example, suggests that local elites, at least, were quite successful in subverting external forest policy agendas, and turning them to their own advantage (Grove, 1994). Furthermore, [one ought to be] careful not to overplay the significance of planned development in analyzing the practical effects on the ground and in people's lives of the received wisdom [...]. Changes in people-environment relations certainly do not come about only through development policy, while planned interventions are simply part of a chain of events within a broader framework of activities of the state and various interest groups (Long and Van der Ploeg, 1989) [...]. Heeding Clay and Schaffer's (1984) warning on the artificial separation of policy and implementation in development practice, Long and Van der Ploeg (1989, 228) remind us that interventions merely "come to form part of the resources and constraints of the social strategies" devised by individuals and "target groups" affected by development.

If orthodox thinking about natural resource stewardship provides the *raison d'être* for certain state institutions, it is relevant to ask whether it might change along with a change in political context. How much room for maneuver is there to shift the environmental agenda? Periods of transition from one political regime to another may provide an opportunity for [...] resistance to be voiced more strongly. During pre-election periods in West Africa, for example, opposition parties commonly attempted to gain support by expressing discontent with repressive natural-resource "policing" activities on the part of the state, as illustrated for Nigeria by Cline-Cole (1996) and for Guinea by Fairhead and Leach (1996). The question remains, however, to what extent this actually affects the substance of environmental debate. In the case of South Africa, for example, Beinart (1996) argues that in reversing the direction of blame from African farmers to white farmers, anti-apartheid literature merely turns conventional arguments about environmental degradation on their heads. It thus reinforces dominant readings of environmental history, rather than begins to challenge them.

In contemporary development practice, other actors and institutions have joined the state and national elites in perpetuating received thinking about environment-society relationships[, such as] donor agencies. Hoben (1995, 1009) suggests that, "regardless of its merit, an environmental paradigm is transferred to aid recipient countries through training, institutional building and investment. These activities attract and create elite interest groups which, in turn, become its constituency, making it politically difficult to discard." He adds to this a number of other conditions relating to donor agencies which contribute to the entrenchment of a given environmental narrative. They include the dependence on the weak African government departments on official development assistance; and the political and moral pressures on donors to be seen to respond to their domestic constituencies and to act quickly (Hoben, 1996).

These conditions create a policy-making environment within which neo-Malthusian, “crisis” narratives, in particular, can flourish.

The reliance of African governments on foreign assistance for environmental-related “development” activities is by no means new. In the colonial period, for example, following the attention generated by Africa-wide environmental conferences, funding envelopes often became available for which colonial administrators could apply. But the late 1980s and early 1990s saw the onset of “green conditionality” (Davies, 1992) as donor agencies began to use environmental goals as a form of leverage over national governments in the process of “policy dialogue” (Davies and Leach, 1991; Leach and Mearns, 1991a,b).

Since the 1992 Earth Summit new international financial mechanisms have emerged to address environmental problems conceived at a global level. The Global Environmental Facility, for example, jointly implemented by the World Bank, UNDP [United Nations Development Programme] and UNEP [United Nations Environment Programme], is concerned with the loss of biodiversity, climate change, the pollution of international waters and ozone layer depletion. In this context, conformity to globalized, commonly held conceptions of environmental problems has become important for local environmental activities to attract funds.

At the same time, NGOs have become increasingly important actors in the international development community, and have also contributed to the “greening of aid.” Although in the 1990s multilateral and bilateral donor agencies are channeling an increasing volume of official development assistance through NGOs, the activities of many Northern-based charitable organizations have long relied on fund-raising from the general public. Their campaigns must therefore appeal to and elicit a response from a wide audience. Ironically, this often serves to reinforce stereotyped images which, in their development education mode, the very same organizations may wish to challenge. The Northern popular perception of famine as evidence of a Malthusian crisis in Africa with an environmental dimension, for example, played an important role in sustaining aid flows in Ethiopia in the mid-1980s (Hoben, 1996), but arguably did little to further understanding among the general public in the North of social and political realities in Africa.

These contradictory relationships are replicated in the alliances between Southern NGOs and the Northern NGOs on which they are financially dependent (Hudock, 1995). In order to attract funding, Southern NGOs must respond to and comply with an environmental agenda set by their Northern partners and, in so doing, can reproduce a view of local land users which denies the perceptions and interests of their local constituencies. They tend to internalize the specific discourse used by Northern NGOs to justify funding environment-related activities, and in many cases even owe their very existence to it. For example, Fairhead and Leach (1996) suggest that the emergence of the urban-based “Friends of Nature” societies in Guinea, or at least the discourse they adopt, can be attributed to the availability of wisdom about

environmental change and human agency and the *raison d'être* of many Southern NGOs can therefore be mutually reinforcing.

Another relative newcomer to the contemporary international development community is the independent consultant “expert,” whose influence over the shape of development policies, projects and programs in Africa is now indisputable. This actor plays a unique role in the reproduction of environmental orthodoxies which has to do, we argue, with the nature of accountability. As Tiffen (1996) remarks, academics and civil servants who advise donor agencies and African governments on agricultural and other forms of development policy are accountable not to those who are the intended beneficiaries – Africa’s farmers – but to public sector agencies as their paymasters. This kind of “backwards accountability” has its origins in colonial service, since colonial scientist-administrators were similarly accountable to the higher echelons of the civil service to which they aspired. The independent consultant of today, however, is faced with rather different incentives and pressures.

The reduction of international aid budgets in the 1990s has led donor agencies increasingly to use independent consultants rather than those from public bodies and private firms whose fee rates are inflated by institutional overheads. Independent consultant, it can be argued, are accountable only to their own [careers]. The terms of reference for short-term contracts tend to be pre-set so that, for example, the consultant is required simply to describe the social causes and consequences of a particular environmental problem without ever questioning its existence. Under strong time pressure, an analysis is produced which tacitly confirms and further reinforces the conventional wisdom embodied in the original terms of reference. Even if consultants are well aware that the underlying premises of their work may be called into question, the incentive structure is unlikely to lead them to operate differently. Indeed, the market for consultancy services is so segmented that even the risk of a damaged reputation in one field or geographical area, or with one multilateral or bilateral agency, need not unduly hinder an individual’s chances of winning new contracts elsewhere in future. None of these remarks are intended to suggest that all independent consultants behave irresponsibly, or to deny instances where committed consultants have strongly criticized conventional views. There seems to be little doubt, however, that this new group of actors can play a significant role in fixing environmental narratives.

Popular Culture and the Social Construction of Environmental Meaning

We do not suggest that received wisdom can be explained simply in terms of the interest of these or any other individual set of actors. It is not the case that any single group deliberately conspires to engender environmental or other messages that best suit their interests. It is more that through their continuing interactions with others, individual actors can unwittingly participate in the social construction of particular forms of environmental meaning. Here we explore further how such meanings can

resonate with existing symbols and meanings in popular culture such as to produce and reinforce received wisdom.

The “environment” constitutes not one single issue, but many diverse ones which “do not ordinarily articulate themselves” (Hansen, 1991, 449). Claims therefore have to be made by various actors about what constitutes environmental issues for public concern. This process often begins in the scientific forum, but its subsequent inflection takes place through complex interaction with other arenas for public debate, including courts of law, formal politics, and other mass media. The mass media do not simply transit messages to their audiences about “the real world.” Rather, they participate in the social construction of environmental problems by articulating culturally specific and encoded “messages,” which are subsequently decoded and given meaning by their audiences within existing frames of reference (Burgess, 1990). Environmental understanding is continually being transformed by the interactions of all the participants in this process.

Research on the role of the media in shaping environmental understanding has addressed both the volume of environmental coverage in the mass media (e.g. Lacey and Longman, 1993), and the character of that coverage (Lowe and Morrison, 1984). While noting “the journalistic preference for the negative and the dramatic” in news in general, Lowe and Morrison point out that “it is especially difficult to feature the positive within environmental reportage” (Lowe and Morrison, 1984, 78). There appears to be an inbuilt tendency for the media to generate “crisis” narratives with respect to environmental issues.

Owing to the globalization of information flows in recent years, the range of actors who now play a role in producing and consuming ideas about environment and development is historically unprecedented. The rapid technological development of communications media, including satellite television and the internet as well as more conventional forms of mass media such as terrestrial television, radio and newspapers, means that the global circulation of information has never been greater or accessible to a wider audience (Davies, 1994). This has led to new and complex forms of claims-making for environmental issues, in which popular culture and the mass media play especially important roles. As Burgess argues,

The power to define the meanings of landscapes and places, plants and animals, renewable and non-renewable resources is being contested in new and fascinating forms of cultural politics conducted primarily through the mass media: take, for example, the alliance between actors, musicians, Brazilian Indians, pop music promoters, conservation organizations, the media industry and the mainly young consumers who buy records to support the campaign against the destruction of the Amazonian rainforest (Burgess, 1990, 141).

Paradoxically, this more rapid circulation of information may actually increase the tendency towards simplification and convergence in the substance of popular discourse

about environment and development, as a way of dealing with information overload. Public debate about environment and development issues necessarily involves other actors in the development process too, and contributes to the construction and simplification of environmental messages. Political pressure is brought to bear on multilateral and bilateral donor agencies through NGOs and other domestic constituencies, but the terms of debate are increasingly global and symbolic. The same images, the same often-repeated statistics that define environmental change, are frequently internalized and reproduced by scientists and administrators working at the local level.

While the inhabitants of local African environments may themselves participate in the production of ideas about environmental change, they do so with less power to define the terms of debate. As token participants in global and national fora, they may have little chance to express alternatives to the dominant viewpoint. But equally, it is not uncommon for rural inhabitants in their interactions with development fieldworkers to confirm outsiders' preconceived ideas, given the power relations which operate at such "interfaces" (Long, 1989; Long and Long, 1992). Such confirmation may arise out of fear, suspicion, or a desire to remain on good terms by accepting what is being offered, as well as the relations of authority and the memory of past experiences which structure these interactions. All too often, the power relations which shape such encounters remain invisible to the outsiders involved, leading them blindly to accept local accounts as indisputable. By attempting to increase dialogue with local people, some efforts to enhance "participation" in development may, ironically, contribute to the very conditions which permit such misunderstanding to occur.

More significantly, farmers and herders may also selectively adopt outsiders' environmental idioms and turn them to their own advantage in struggles over identity and resource control. Such expressions of "environmental" discourse may bear little relation to local people's own practical ecological knowledge. For example in Guinea, Fairhead and Leach (1996) describe how externally derived images of forest loss are invoked by Kissi and Kuranko villagers in discourse about ethnicity, to identify themselves respectively as "forest people" or "savanna people" in ways which – in colonial and now modern Guinea – have political significance. Thus "there is no way of keeping the conceptual apparatus of the observer ... from appropriation by lay actors" (Giddens, 1987, 19; cited in Long and Long, 1992, 39), although such appropriation may respond more to other pressing concerns in popular culture than to "environmental" concerns *per se*.

To summarize, we have argued that the reasons for the origins and persistence of received wisdom about environmental change in Africa lie in the substance of science, on the one hand, and in its social and historical context, on the other, including the effects that it has through development in practice. To the extent that science is often the "primary definer" (Hansen, 1991) of what constitute environmental problems, it is relevant to ask how that science is carried out. Brockington and Homewood (1996) suggest that "good" natural science can be used to judge between

competing social science explanations for dryland degradation. Swift (1996), on the other hand, asks why it is that in the debate about desertification the results of “poor” science tend to be picked up and used more often than those of “good” science. Sometimes the orthodox view appears to persist because it is politically expedient to suppress or ignore evidence to the contrary. From this viewpoint, science and the broader political economy are regarded as distinct from one another. Alternatively, “evidence” itself is seen to be produced through a discursive process in which scientists are just one set of actors among several. This view, held by sociologists of science, emphasizes the simultaneous construction of knowledge and social commitments.

[...] On the one hand, there are structuralist explanations, within a rational choice or “political economy” framework. The perpetuation of received thinking about desertification, for example, seems quite clearly to serve the agencies and recipient governments, with the tacit support of sections of the scientific community (Swift, 1996). On the other hand, there are “actor-network” explanations (cf. Long and Long, 1992). In these cases, the “stickiness” of received wisdom is explained by the convergence of ideas and social commitments on the part of various actors, including local inhabitants, at particular historical moments (Fairhead and Leach, 1996). An additional layer of such analysis suggests that there are hierarchical relations of power between various participating actors, which leads such convergences of commitments to coalesce in certain, dominant directions (cf. Foucault, 1980). It is this, we argue, that accounts for the remarkable historical continuity in received wisdom about environmental change in Africa.

Ways Forward in Research

[... P]olicies founded on environmental orthodoxies have often proved not merely harmful to African farmers and herders, but ineffective in ecological terms as well. Given the power relations through which, as we have argued, orthodoxies are produced and sustained, there is clearly no simple remedy for this state of affairs. Nor is it likely that “more and better research” could improve the outcomes of policy for Africa’s farmers and herders without more fundamental changes in the relationship between research and development policy-making, and between the diverse institutions which influence policy processes. The issues involved here extend far beyond the scope of this [essay]. Nevertheless, [...] in this last section we reflect on some of these research implications, moving from the level of place-specific analyses of society-environment relations, to broader issues concerning the role of research in the policy process.

Numerous [scholars] show how alternative analyses of environmental change and people’s roles in it imply very different kinds of policy from those suggested by received wisdom. For example, Scoones (1996) and Swift (1996) [...] join a major rethinking of pastoral development policy which has followed new understandings of

rangeland ecology (Behnke et al., 1993; Scoones, 1995). If pastoralists' herd and land-management strategies are not, in fact, precipitating overgrazing and linear degradation, but instead are making the most of productive opportunities in highly variable and patchy dryland environments, then there are good grounds for adopting policies that support those strategies, for instance through flexible land-tenure arrangements which allow herders to maintain mobility.

[...]

In their implications for policy, these countervailing analyses [...] share certain common elements. One is that they emphasize working with and building on the ecological knowledge and skills of Africa's farmers and herders; the very skills often rendered invisible by neo-Malthusian degradation narratives. In particular, they suggest that local inhabitants may have long been practicing "opportunistic" resource management attuned to non-equilibrium ecological conditions. A second, related emphasis is on creating the enabling conditions under which local resource-management strategies can be pursued effectively. [...]

Many [researchers] are careful to note the place-specificity of their alternative analyses, and would therefore make no claims that their policy implications necessarily extend throughout the ecological zones or natural-resource management sectors in question. However, it would seem unwise to treat these cases as exceptions until it has been proved that their analyses do not apply elsewhere. In vast areas of Africa's drylands, highland and forest margins, similar investigations have yet to be carried out. To date, received wisdom about environmental change has been so taken for granted that deeper interrogation has seemed unnecessary. The cases thus imply an urgent need for further research elsewhere to explore findings such as these in a comparative way, research that makes use of historical and time-series data sets, which pays serious attention to inhabitants' own experiences and opinions, and which opens its questions to issues in "new" ecology.

There are research implications here too for ecological science, in which theory as well as empirical tenets have begun to re-cast in recent years with the adoption of historical approaches. [Recent] insights [...] invite more widespread studies of ecological history that tests alternative theoretical propositions even where issues may seem cut and dried. This, in turn, demands openness and willingness on the part of scientists not only to explore radical counter-hypotheses about environmental change – including those which stand conventional wisdom on its head – but also to the possibility that indigenous ecological knowledge and opinion might provide methodological challenges, especially to use the historical data sets now available in innovative ways. [...]

Yet, as [our] analysis [...] indicates, "better scientific research" is unlikely to have practical impact on orthodox thinking and practice without more fundamental changes in the institutional structures through which environmental problem-claims are made, solutions elaborated, and translated into policy and practice. [...]

It is not merely the case that received wisdom and challenges to it draw different conclusions about environment and people's interaction with it; they also uphold different social and political commitments and claims. Even in the cases where received wisdom can be shown to be demonstrably false, there will not necessarily be a single alternative analysis which can be shown to be "truer" to all parties involved, nor policy solutions derived from it which all would find acceptable. As Wynne (1992a) suggests, reflecting a view now widely held by philosophers of science, all knowledge is conditional, in the sense that it reflects the institutional context in which it was produced. Specific readings of environmental change should therefore be treated less in terms of their claims to "truth," and more in terms of the implicit social commitments that underlie them and on the validity of which they depend. Several such readings or "plural rationalities" may thus co-exist, and it is the job of good policy research to make them explicit enough to debate (Thompson, 1993). This task, however, requires a radical shift in the relationship between "research" and "policy-making" as conventionally conceived.

Many authors have made the case for such a re-conceptualization of the policy process in complex situations characterized by insurmountable uncertainty (Thompson et al., 1986) or indeterminacy (Wynne, 1992a). The analyses [...] of changing environment-society relations in Africa reveal similar degrees of uncertainty associated with knowing the character, direction and strength of causal linkages, and with designing policies that achieve their stated objectives once put into practice (cf. Mearns, 1991). Under such conditions of uncertainty, conventional, managerialist policy blue-prints are of questionable validity. This is especially true in cases of epistemological uncertainty, or "ignorance-of-ignorance" (Funtowicz and Ravetz, 1992, 259), in which policy makers are unaware that there are things of which they are unaware, including the unintended consequences of a given policy instrument.

From this perspective, the task of linking research into policy-making shifts to one of broadening the range of problem-definition claims, and negotiating outcomes among an extended peer group of actors. These may include scientists, policy makers in governments and donor agencies, local administrators, others such as NGOs with a stake in environmental protection, the mass media and, of course, local inhabitants themselves. This is tantamount to a "democratization of expertise" (Funtowicz and Ravetz, 1992). This reconceptualization of the research-policy process is very much a frontier in the contemporary practice of development. The line taken in work on science and public policy is kindred with the agendas of political ecologists, who express the need "to help uncover the discourses of resistance {to received wisdom}, put them into wider circulation, create networks of ideas" (Peet and Watts, 1993, 247). There are not yet any proven models for practical success in such a reconceptualization, although a powerful case in its favor has been made in a number of contexts. Among these, for example, are the reinterpretation of the causes of environmental degradation in the Himalayas by making plural rationalities explicit (Thompson et al., 1986), and the lessons learned from community-based approaches to wildlife management in Africa, emphasizing an action-research approach to program

design involving local communities, national research institutions, local and national government, and NGOs (Thompson et al., 1994).

Three types of criticism of a more pluralistic, or democratic, approach to the research-policy process may be anticipated: that it is methodologically weak or unproven; that it is populist or politically naïve; and that it generates findings that are too complicated to be of practical use to policy makers (cf. Wynne, 1992a).

While allowing for serious consideration of the knowledge, experience and opinions of “lay” actors in the development process, those advocating the “democratization of science” do not imply that “anything goes,” or that the value of conventional scientific research is thus contested. The findings from such research are merely placed on a more provisional footing (Funtowicz and Ravetz, 1992; Pretty, 1994).

On the charge of populism or political naivety, it may be argued that building consensus among actors whose world views and political interests are incommensurable is impossible; that exchanges between policy actors with radically different endowments of power and resources could never be politically neutral. The “democratization of the policy process” calls to mind the metaphor of an African palaver tree, in whose shade scientists, policy makers, donors and farmers or herders would argue their respective cases, and attempt to come to some agreement. But as participants in African palavers are well aware, such fora are neither open nor neutral; cases are expected to invoke particular interpretations of history in their favor, and “consensus,” if reached, may be in little more than outward appearance (cf. Murphy, 1990). Furthermore the real history of political interaction between different actors would certainly condition any attempt to foster more “democratic” encounters. And in many cases, fundamental differences of environmental change may be so deeply rooted in their social and cultural contexts that participants in such encounters would be likely to be defeated in their attempts to comprehend and respect each others’ perspectives. It is difficult, for instance, to imagine how consensus might be reached where Northern conservationists aspire to empty high forest, and farmers to convert the same land to the bush fallow they value as more productive. All groups of actors, whether scientists, policy makers or local inhabitants, may be expected to resist such a pluralistic – even relativistic – view of knowledge. Yet a “democratic” approach to the research-policy process aims precisely to reveal the hidden social and cultural assumptions underlying apparently incommensurable world views. Rendering such conflicts explicit may enable them to be addressed more openly, rather than remain concealed in hegemonic environmental readings and policy.

The third charge against a more “democratic” approach to the research-policy process is that such an exposure of plural viewpoints would serve to replace a simple received wisdom with excessive complexity. In this context, Roe (1991, 1995) argues, pragmatically, that simplified but compelling narratives are in fact necessary to the policy process as currently existing. The challenge is thus to create equally compelling counter-narratives which better fit the claims of a different set of stakeholders,

preferably counter-narratives with equally attractive slogans and labels. In this context, it is recommended that researchers consider ways of working more closely with the mass media in trying to counter received wisdom about environmental change in Africa. A further justification for generating counter-narratives is that excessive plurality or complexity could leave the door open for either no policy at all or for politically motivated, draconian measures, in the absence of other clear guidelines. While devising counter-narratives may seem expedient, given the current nature of much development policy-making in Africa, it tends to perpetuate the binary-oppositional type of policy debate which has so frustrated attempts to move beyond received wisdom. [...]

These arguments suggest the strong need for changes in the policy process and its institutions, as well as in research. If scientists, policy makers and local inhabitants are genuinely to comprehend each other's perspectives and exchange viewpoints, then innovative institutional arrangements will be needed. If research which reveals a plurality of perspectives is to be useful in the policy process, that policy process and its institutions have simultaneously to change. [...]

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