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Land, limits and sustainability: a conceptual framework and some dilemmas for the planning system

Susan Owens

This paper explores the opportunities and contradictions in applying concepts of sustainable development to land use policy. The conceptual framework is provided by 'stock maintenance' models of sustainability and a distinction is made between material, postmaterial and non-instrumental dimensions of sustainability which relate in complex ways to the use and development of land. Though concepts of sustainability are gaining ground in planning and related disciplines, translating theory into policy remains problematic. Principles of sustainability challenge the presumption in favour of development and sit uneasily with the utilitarian notion of 'balance'. They require an alternative ethical basis and, especially in the postmaterial realm, are inherently bound up with value theory. These issues are illustrated by the problem of defining 'critical natural capital'. Political commitments to sustainability were made, and to some extent encoded in planning policies, before the challenge to a demand-led economy was fully grasped. Far from effecting reconciliation, defining what is sustainable will expose conflict more starkly and at an earlier stage in the planning process. As environment-led plans and decisions are challenged by development interests, there will be opportunities to test these conclusions in specific empirical contexts.

key words sustainability land use planning environment value theory

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The sum total of decisions in the planning field, as elsewhere, should not deny future generations the best of today's environment. (Department of the Environment 1992b, para 3)

The picture is a particularly confusing one, because some aspects of the argument involve . . . life threatening considerations at a global scale, whereas others are matters of qualitative judgement at a local level. (County Planning Officers' Society 1993, 37)

Planning is being asked to fight the battle of 'Sustainable development' with no weapons and with very little strategic direction. (Welbank 1992)

Equo ne credite, Teucri! (Virgil, Aeneid, Book II, line 48)

Introduction

The use and development of land is related in fundamental ways to environmental change. It follows that policies which influence land use can themselves become, either directly or indirectly, important instruments of environmental policy. The significance of these interactions and their implications for land use policies are increasingly acknowledged. In particular, the potential for land use planning to contribute to sustainable development has aroused intensive interest at all levels of government.¹ A great deal is now expected of the planning system: it is seen as a means of reducing emissions from transport (Department of the Environment

1993a), promoting sustainable use of water, minerals and energy resources (Rees and Williams 1993; H Jacobs 1993; Owens 1991), providing 'sound stewardship of wildlife and key natural features' (Department of the Environment 1992c, 2) and protecting what is most valuable in the cultural environment (Countryside Commission *et al.* 1993).

All of this comes at a time of renewed interest among geographers in land use planning and environmental change.² This is not surprising. As Millichap (1993) observes, planning and sustainability share two fundamental perspectives – the temporal and the spatial. Both are concerned with future impacts on and of particular localities. Furthermore, the planning system constitutes the political process through which many land use decisions are made and therefore represents 'important institutional terrain for the contestation of the meaning and relations of the "natural environment"' (Whatmore and Boucher 1993, 168). Myerson and Rydin (1994) argue that the greening of the planning system is 'a significant test of commitment to environmental protection, at least, or sustainability at most'. Whilst acknowledging its significance, however, it is important not to overstate the role of planning as an instrument of environmental policy; planning is contained within, and constrained by, economic and political forces and priorities on a wider stage.

This paper explores the opportunities and contradictions in applying concepts of sustainable development to land use policy. The conceptual framework has two parts. The first is an increasingly influential, economic model of sustainability, requiring definition of a 'stock' of environmental assets whose value is to be maintained (or enhanced) over time. The second involves identification and separation of different dimensions of environmental concern – instrumental and non-instrumental, material and postmaterial – which are often elided under the general heading of 'sustainability'.

These constructions of sustainable development are already having a significant impact on planning rhetoric. Indeed, the motivation for setting out the issues here is that rhetoric is moving rapidly ahead of rigorous development of theory in this field. Paradoxically, where principles of sustainability are easiest to grasp – in relation to pollution, for example – the role of the planning system has not always been legitimized or even recognized. In contrast, where the planning system has a long-

established 'traditional' remit, particularly in relation to amenity, the concept of what is sustainable is inherently problematic. In both cases, but more obviously in the latter, there is a need for an explicit theory of value. Thus the interpretations of sustainable development explored here raise familiar issues of value relativity as well as more novel ones about incorporation of non-instrumental values into planning theory and practice (H Jacobs 1993; Beatley 1989). They challenge the presumption in favour of development and sit uneasily with the utilitarian ethos of 'balance' that has dominated planning decisions. This model of sustainability owes much to environmental economics, but ethics and politics emerge as central issues in applying its principles to land use change.

Three agreements follow from these considerations and a preliminary review of experience in practice. First, attempts to define and implement policies for sustainable development – hailed as a reconciliation of environment and economy – lead rapidly to the more familiar discourse of limits. Secondly, far from reducing conflicts as some have suggested, defining sustainability exposes conflict more starkly and at an earlier stage in the planning process. Thirdly, the depth of the challenge to current political economy represented by sustainable land use policies has scarcely been grasped. Underlying this discussion is the question of whether sustainability offers a genuinely novel framework for planning or simply provides fashionable language for a recasting of enduring conflicts.

The next section considers recent developments in UK planning practice. The conceptual framework is developed in Section 3, before addressing substantive issues of application in Section 4. This is followed by a more general discussion and some conclusions. This paper is concerned mainly with the British land use planning system³ which uses a relatively restrictive definition of 'development'. However, many of the principles could be applied in a more general sense to land use change. Indeed, new interpretations of sustainability challenge boundaries between the planning system and other regimes involved in the use and development of land.

Planning and sustainability: recent developments

Concepts of sustainability have struck a chord within the British planning system which has

responded with a rash of conferences, papers from key institutions⁴ and extensive activity in practice. Much of this has been stimulated by local authority green initiatives, in particular by the adoption of 'Local Agenda 21' (LGMB, 1993). Wilson and Raemakers (1992) report that 74 per cent of councils in England, Scotland and Wales have a 'green plan'⁵ in effect or in preparation and the key role played by land use planning departments emerges clearly from their survey. Many local planning authorities have embarked on a reappraisal of their policies, with sustainability as a key issue; about a quarter are involved in 'state of the environment' reports (Wilson and Raemakers 1992) and nearly a fifth⁶ have conducted environmental appraisal of development plans.⁷ It is important to note that the new wave of environmental concern 'affects urban areas as much as rural, and local councils of all political persuasions' (Blowers 1993, 24); it also extends to the Regional Planning Conferences (Countryside Commission *et al.* 1993). Not only planning authorities but statutory and non-governmental organizations with a strong interest in planning outcomes – such as English Nature, the Royal Society for the Protection of Birds (RSPB) and the Council for the Protection of Rural England (CPRE) – have been quick to interpret recent thinking to their own advantage.⁸

Central government guidance

This activity has been encouraged and legitimized by planning policy guidance notes (PPGs) issued following the commitment to sustainable development in the 1990 Environment White Paper (Secretary of State for the Environment 1990). Planning authorities are urged to take environmental considerations comprehensively and consistently into account in development plans, and to 'integrate environmental concerns into all planning policies' (Secretary of State for the Environment 1992, 65). The revised PPG 1, setting out the intent and scope of the land use planning system, maintains that the government 'will continue to develop policies consistent with the concept of sustainable development' (Department of the Environment 1992b, para 3) and, in a much-quoted passage, states unequivocally that:

The planning system and the preparation of development plans in particular, can contribute to the objectives of ensuring that development and growth are sustainable.

PPG 12, on development plans and regional planning guidance, reiterates these points and raises three issues of fundamental importance: the 'value' that people attach to environmental quality; the interests of future generations; and the balance between economic growth and environmental protection:

Increased public awareness is coupled with strong evidence of *the value that people place on the environment* . . . Attention must also be given to the *interests of future generations*. Thus, those impacts on the environment which may be irreversible or very difficult to undo should be treated with particular care in the preparation of plans . . . At the same time, the interests of those future generations require continuing economic growth . . . Development plans have an essential role in *achieving the appropriate balance* . . . (Department of the Environment 1992a, para 6.8) (emphases added)

The new rhetoric in planning policy guidance is accompanied by reiteration of the necessity and desirability of economic growth, exhibiting a confusion which will inevitably manifest itself in the planning process. Its significance, however, lies not so much in clear policy direction – for that is noticeably absent – but in a commitment to sustainability which, in subsequent policy conflicts, cannot lightly be denied or overturned.

'Traditional' and new concerns

One effect of the new thinking has been an extension of the conceptual remit of land use planning to encompass 'the wider environment'. A distinction between 'traditional' and emergent issues has been made by a number of authors and is explicit in guidance urging planners to take account of the environment 'in the widest sense'. Traditional issues are defined in PPG 1 (Department of the Environment 1992b, para 6.3) as

Green Belt, concern for landscape quality and nature conservation, the built heritage and conservation areas . . . [and] pollution control planning for healthier cities.

'Newer' concerns are exemplified by global warming and the consumption of non-renewable resources (*ibid.*, para 6.3). Other commentators include agricultural policy, industrial pollution, the wider impacts of transport (Hall *et al.* 1993) and 'safeguarding the natural world' (Breheny and Rookwood 1993, 9) amongst the issues linking planning to the environment in ways which transcend specific localities.

While the precise boundaries of the planning system may be debated, there is little dispute that 'traditional' concerns with the environment have focused on essentially local aspects of amenity. Recognition that the use and development of land is connected to the environment 'in the widest sense' is much more recent and as yet has had little impact on practice (Hall *et al.* 1993). In environmental appraisal of development plans, for example, there is only a partial reflection of a broader agenda:

... traditional environmental aspects such as landscape, nature conservation and heritage were the most frequently used criteria for measuring environmental impacts. Air quality and climate were the least utilized. (University of the West of England and Baker Associates 1993, 3.6)⁹

It would be unrealistic, however, to expect current plans and policies to reflect concerns which have become prominent only during the past five years. What is significant is that the links between land use and a broader conception of 'environment' have been made. This has important implications for interpretations of sustainability in the planning system.

There is clear evidence that planning, like most other institutions, was swept along in the environmental euphoria of the late 1980s, but this conclusion begs questions about the depth of commitment to sustainability. A cynic might interpret recent developments as 'rhetoric plus business as usual'. The nature of some initiatives suggests more than this, however, and the forces unleashed may be surprisingly potent: policies and principles on paper provide powerful ammunition in land use conflicts. An alternative view is that recent changes reflect genuinely heightened environmental awareness but extend to little more than giving the environment increased weight in planning decisions. A third interpretation acknowledges both greater environmental awareness and a genuine desire to implement principles of sustainability; but it suggests that advocates of these principles have failed to grasp how radical a challenge to the *status quo* they represent. Evidence for these different views will be examined later, when the fate of emerging 'sustainable' policies is explored. First, however, it is necessary to interpret concepts of sustainability and relate them to different dimensions of environmental concern.

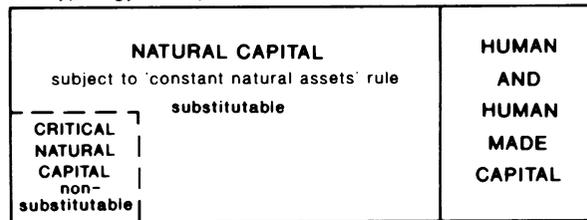
Interpreting sustainability: a framework

Sustainable development has been the subject of extensive comment and analysis.¹⁰ It is not an entirely new concept. Antecedents may be found in models of the steady state economy developed in the 1960s (Boulding 1966; Daly 1973) and in the well-established concept of 'prudent resource use' (Evernden 1992). Even in the context of planning, it has been claimed that the fundamentals of sustainability are already familiar (Hall *et al.* 1993; Millichap 1993). It is not particularly helpful, however, to set up a dichotomy of the old and the new: the concept of sustainable development is both constitutive of, and responsive to, changing social and political relations with the environment. The very lack of a simple operational definition is a sign of new ideas being conceived (Meine 1992). Not surprisingly the Brundtland definition – meeting the needs and aspirations of the present without compromising the ability to meet those of the future (WCED 1987, 40) – has been used 'as a device for mobilizing opinion rather than as an analytical concept for developing specific policies' (Blowers 1993, 5). However, recent attempts to develop principles of sustainability, drawing on the work of Pearce *et al.* (1989) and other environmental economists, have been more structured and have particular relevance for land use planning policy. A summary will show that they take us beyond Brundtland but leave a number of difficult questions unresolved.

Two broad themes may be distinguished in the literature – a weak definition of sustainability, which amounts to giving environmental considerations greater weight, and a strong definition, in which environmental capacities are regarded as placing some ultimate constraints on economic activity (Collis *et al.* 1992).¹¹ The former implies that environmental considerations must always be balanced against the benefits of economic development; the latter that certain environmental constraints must 'trump' all other considerations.

The central concept is that of 'natural capital'. In the weak sense, the requirement for sustainable development would be the standard one of passing on to the next generation an *aggregate* capital stock (comprising human-made, natural and human capital [knowledge and skills]) no less than that which now exists. As long as roads, say, conferred greater benefits on society than the Sites of Special Scientific Interest (SSSIs) lost in their path, future

1A: Typology of capital (after Bateman 1991)



1B: Dimensions of sustainability

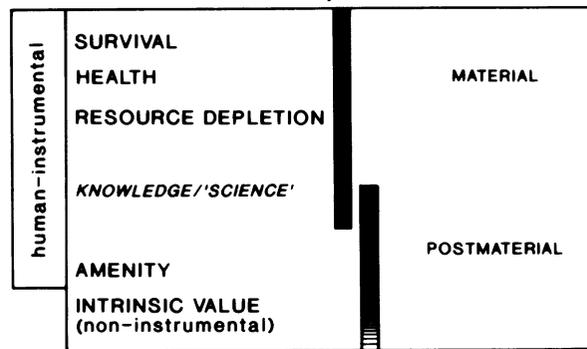


Figure 1. Planning and sustainability: a framework

generations would be at least as well off. However, the strong interpretation of sustainability challenges the view that all forms of capital are substitutable: some aspects of the environment are seen as essential to human survival, and irreplaceable – the ozone layer and biogeochemical cycles are typically cited as examples.¹² These constitute critical natural capital. Significantly for planning, there is some consensus that environmental assets can be critical when they are vital not to survival but to human well-being. So we might define as critical 'those elements which have the highest value, whose loss or damage would be very serious' (Collis *et al.* 1992, 25) or environmental assets which are 'unique, so that once destroyed they are gone forever' (Blowers 1993, 81).

Three interpretations of sustainable development may now be distinguished:

- (i) Development that passes on at least the same total capital stock to future generations;¹³
- (ii) Development that achieves (i) but passes on at least the current stock of critical natural capital intact; otherwise different types of capital may be traded off against each other to maintain at least the same total stock;¹⁴

- (iii) Development that keeps critical natural capital intact as well as handing down *no less natural capital* than current generations enjoy.¹⁵

It is not always clear whether authors are adopting (ii) or the more demanding (iii). Both embody the 'critical natural capital' rule. The latter also implies a 'constant natural assets' rule – the total value or worth of all non-critical natural elements must be maintained – but within this total value individual elements are 'compensatable'. Collis *et al.* (1992, 7), for example, maintain that '[t]here should be no net loss of environmental capital as a result of development'.

This neat categorization (Fig. 1A) raises innumerable problems. At a fundamental level, the 'ruling metaphors' (Evernden 1992, 91) of the framework may be as much a part of the problem as part of the solution. Its very terminology – 'capital', 'assets' and 'compensation' – implies a proprietorial and instrumental interest in the environment, and 'stock' is a peculiarly inappropriate term for a dynamic set of processes and relations.¹⁶ For critics who see subject-object dualism and anthropocentrism as important sources of ecological crisis, such

interpretations of sustainable development remain unconvincing.¹⁷ The difficulties of defining critical natural capital and constant natural assets in the context of planning can be seen as symptomatic of these fundamental problems. However, it is clear from the enthusiasm with which these ideas have been seized upon that they are intuitively attractive to many involved in land use planning and related activities. At first sight, at least, they provide a coherent and potentially powerful strategic framework for conservation and compensation. More significantly, they promise an intellectual justification for the status of inviolability which has eluded the conservation and planning lobbies for so long. They are certain to be tested in the context of land use policy decisions.

A number of problems can be anticipated. Definition of what is critical is central to this construction of sustainable development, as is the question of what constitutes adequate 'compensation' when decisions involve non-critical capital (Cowell 1993). Furthermore, the constant natural assets rule implies that additions to human-made capital must have zero non-compensatable environmental costs. The practicality of this formulation must be seriously open to question. Choice of the current 'stock' of natural assets is also somewhat arbitrary: if we conceive of a duty not to pass on *less* natural capital than we now enjoy, why is there not a duty to pass on more? Certainly, in many instances it could be held that the current generation should be responsible for repairing any degradation it has caused (Blowers 1993). The concept of intergenerational equity inherent in these definitions is itself far from straightforward (Norton 1982; Parfit 1984). These problems are best illustrated by specific planning issues. First, however, it is necessary to complete the conceptual framework.

Dimensions of sustainability

Difficulties of interpreting the above concepts in planning derive in part from elision of different meanings of environment and lack of clarity about their relation to principles of sustainability. In particular, much of the rhetoric fails to distinguish between the human instrumental values which dominate the discourse on sustainable development and non-instrumental values which have been a powerful constituent of environmentalist thought. Further, environmental issues with a clear material basis differ in kind and implication from those based on postmaterial values (Fig. 1B).

Blowers (1985), drawing on earlier work of Goodin (1976), distinguishes four familiar components of environmental concern: amenity, public health, survival and resource depletion (see also Secretary of State for the Environment 1994). These are useful divisions, though they are not mutually exclusive – survival and resource depletion are clearly linked, for example. We should also include the health of ecosystems ('health' would then overlap with both amenity and survival) and assume that amenity has generous interpretation embracing, but not restricted to, aesthetic considerations. But something is still missing.

These categories are all human instrumental and fail to encapsulate a powerful ecocentric perspective which refuses to see the non-human world merely as a repository of resources, albeit ones which should be used wisely (Sessions 1992, 21). Reminiscent of Leopold's (1949) 'land ethic', ecocentrism reflects a belief that non-human entities – animals, plants and, in some theories, species, ecosystems or even the biosphere as a whole – have 'goods of their own' independently of their instrumental value to human beings (Johnson 1991). In a vigorous and ongoing debate in environmental ethics, some environmentalists have sought to define moral or legal rights for non-human nature,¹⁸ while others have focused on concepts of non-anthropocentric intrinsic value.¹⁹ Some philosophers, finding these positions problematic, develop a theory of value which, while necessarily human-centred, is not human instrumental. In Goodin's green theory of value, the value-imparting characteristics of natural objects are to do with their 'being part of something larger than/outside of ourselves' (Goodin 1992, 45), and Hargrove (1992) draws on similar concepts in his theory of 'weak anthropocentric intrinsic value'. However they arrive at the conclusion, most of these authors would extend the moral universe to encompass the non-human world.

It is impossible to do justice to these issues here – indeed this is relatively new terrain and many questions remain unresolved. They cannot be ignored, however, because they frequently lie at the root of development conflicts. Intrinsic value has ambiguous status in relation to sustainable development which, on many interpretations, involves a distinctively human instrumental discourse. But if we omit bioethics from concepts of sustainability we will, in many development issues, simply end up with a conflict between sustainable development

and intrinsic value. One of the most significant implications for planning is that

reduction of intrinsic value to instrumental terms demeans and trivialises it, giving a counterintuitive advantage to [instrumental] resource exploitation . . . Maintaining the distinction between intrinsic and instrumental value, in contrast, allows us to set certain things aside and *exempt them from use*. (Hargrove 1992, 161) (emphasis added)

The material and the postmaterial

Within the dimensions of environmental concern, an important distinction must also be made between the material and postmaterial which, though recognized by Brundtland, has been obscured in much of the rhetoric on sustainable development. In social and psychological theory, modern (Western) environmentalism has been interpreted as a collective expression of postmaterial values by an affluent postwar generation whose basic material requirements are satisfied (after Inglehart 1977; Maslow 1987). In contrast, Brundtland (WCED 1987) and, earlier, the World Conservation Strategy (IUCN *et al.* 1980), portrayed environmental protection as a *basic* need providing the necessary conditions for health, survival and economic development. One of the lasting contributions of the sustainable development literature of the 1980s was to dispel the view that the environment was a luxury which only the rich could afford. Environmental protection acquired a neo-material rationale. Politically, this proved a powerful argument for, as Norton (1982, 326) observes, '[i]f present behaviours soon lead to an interruption of production, then utilitarianism will be able to generate an argument against their conduct'.

But if a functioning biosphere is no longer dismissed as a luxury, we should not slip into the assumption that all environmental protection is a prerequisite for material well-being. Important post-material dimensions feature strongly in environmental conflict, especially in affluent economies. Many aspects of amenity and respect for nature 'for its own sake' fall into this category.²⁰ These are postmaterial issues because they 'reflect concern about the value and meaning of life' (Goodin 1992, 56); they are not mere optional luxuries. It is not surprising that such concerns are expressed by the more affluent. Logically, as Goodin (1992, 56) points out, 'living comes before living well. It makes little sense to worry about the quality of life before we are reasonably certain of life itself'. For similar

reasons, concern for the material wellbeing of future generations might be classed as a postmaterial value. Postmaterialism is inherently bound up with value theory. It is therefore of profound significance for planning policy.

In summary, we can identify instrumental and non-instrumental, material and postmaterial components of environmental concern. There is some overlap (Fig. 1B) but material concerns are by definition instrumental whereas non-instrumental values tend to be postmaterial. One further issue should be mentioned to complete the framework: this is the 'scientific value' of nature, often employed as a rationale for conservation both on material grounds (nature as 'warning' and repository of unknown future wealth) and as a key to the postmaterial and non-instrumental appreciation of the natural world.²¹ All six dimensions have important implications for sustainable development. But they represent different challenges for translating abstract concepts of sustainability into policies for real geographical areas. As the following sections will show, when these concepts are tested in practice, the fragility of the models on which they are based is soon revealed.

Planning and sustainability: material dimensions

Though the planning system can trace its roots to Victorian concerns with health and sanitation, ways in which planning might contribute to sustainable development in the material sense are not immediately apparent. Survival, resource depletion and more diffuse risks to health have not traditionally fallen within its remit but are increasingly identified as aspects of the 'wider environment' with which planners are urged to engage. Paradoxically, it is in these areas that the central concepts of sustainability are easiest to grasp. We have come to accept in principle limits based in scientific concepts of damage thresholds, critical loads and maximum sustainable yields; it is not difficult to relate these to critical natural capital and constant natural assets. Since the science itself exists in a 'social space' (Oelschlaeger 1992, xiii),²² limits are inevitably contested and environmental standards emerge out of conflict and compromise rather than consensus. Nevertheless, images of thresholds in nature have a powerful appeal reflected in public consciousness and political action (Harrison and Burgess 1994). While we may not agree that '[f]ully developed sustainability is

already accepted in ... air and water quality standards' (Countryside Commission *et al.* 1993, 10), it is clear that the *concept* of limits has been adopted even if the limits themselves cannot be objectively defined.

For the planning system, the question remains of how land use and location decisions relate to thresholds for pollution and resource depletion. With the current fragmented system of control over land use change in Britain, the planning system has only tenuous links with the management of renewable resources. Water resources, for example, are not a central consideration in strategic or local planning (Rees and Williams 1993) and, in a situation of agricultural surplus, protection of high quality agricultural land has actually been weakened (Owens 1989). Attempts by planners to promote the 'efficient' use of mineral resources are held by developers to be *ultra vires* (for example ARC 1993). The literature on planning and sustainability urges that all such resources should be enumerated in state of the environment reports and 'environmental capacities' defined in development plans, but there is little advice for planners on how to manage ensuing conflicts with market-led development pressures.

One of the clearest links between land use and sustainability is through the impacts of pollution on local, regional and global environments; here the remit extends to the 'new concerns' for planning identified earlier. But here too there are significant problems and inconsistencies. Established orthodoxy holds that local authorities should not seek to pursue through the planning system objectives considered to be the territory of other agencies such as Her Majesty's Inspectorate of Pollution. Attempts to influence pollution levels in planning policies or development control have been firmly resisted.²³ This attitude has curtailed the role of planning authorities, even when pollution might impinge directly on the local environment; impacts on environments more distant in space and time have hardly been considered in planning deliberations at all. Some relaxation of attitudes evidenced by recent case law seems to have been shortlived (Miller 1993) and, while draft planning policy guidance on pollution acknowledges that '[t]he dividing line between pollution and planning controls is not always clear cut' (Department of the Environment 1992d, para 3.13), it largely reaffirms the orthodox view.

It is ironic, therefore, that in another field – transport – land use planning should be singled out

as a means of reducing emissions and protecting the environment, even at the global scale. Since this connection exemplifies the links between land use and sustainability and illustrates the challenge of moving beyond the rhetoric to define a clear role for planning, it is worth considering in more detail.

Concern with the impacts of traffic emissions is both material and human instrumental: it relates directly to health and survival. Planning, through its influence on land use and travel patterns, is among the determinants of levels of emissions. Only recently, however, have these interactions been viewed in an holistic way.²⁴ A perceived crisis in transport and the new emphasis on sustainable development have transformed the rhetoric. Draft planning policy guidance on transport, drawing on commissioned research (Ecotec 1993), legitimizes the use of land use planning as an instrument of wider environmental policy.

... development plans can be used to reduce the need to travel, especially by car ... land use planning can help to reduce transport emissions of carbon dioxide and local air pollution as well as reduce other impacts on the environment. (Department of the Environment 1993a, para 1.17)

Though recognition of these links has been broadly welcomed,²⁵ the policy implications remain obscure. How are sustainability constraints to be defined in a way that is meaningful for the planning system? How do plans and development control relate to other instruments of transport and environmental policy? Will the context within which planning policies operate be supportive or obstructive?

One problem is that there are neither well-defined targets nor appropriate institutional structures within which local planning authorities can locate and defend specific policies. Policies to control pollution from the transport sector tend to be articulated at polarized spatial scales – objectives set at national or international level on the one hand (stabilizing carbon dioxide emissions, for example) and standards affecting individual vehicles on the other. With some exceptions, it has not been the style of UK policy to set firm targets for reducing particular emissions by specific dates or to disaggregate targets sectorally. Still less has there been any attempt to disaggregate targets *spatially* in ways which make it easier to relate them to land use policies (Rookwood 1993), as is the case in several North American cities (Gilbert 1991).²⁶ A further

difficulty in the UK is that pollution control is not fully integrated within particular geographical areas (Haigh and Irwin 1990) so that emissions from transport and other sources cannot be considered as a whole. To disaggregate targets and integrate control at regional or sub-regional level would have a number of interesting implications.²⁷ But one would be that planning and pollution control authorities could decide how different sectors should contribute to regional emissions reductions. Targets for transport would then provide the framework for application and monitoring of appropriate land use policies. Existing institutional structures do not encourage such coordination and local government reorganization seems set to make it even more difficult to achieve.

A second obstacle, barely acknowledged in draft PPG 13, is that there are limits to what planning can accomplish in isolation. It makes little sense to use the planning system – a relatively blunt and long-term instrument – if it is undermined by conflicting signals elsewhere. Yet a wider framework, including appropriate pricing and public investment to discourage car-based transport, has been largely absent; PPG 13 leaves the roads programme unscathed. Similar confusion is exhibited by recently published draft Regional Planning Guidance for the South East (Department of the Environment 1993c). The guidance recognizes that it would be ‘unrealistic’ to increase the capacity of the road network to match all projected demand throughout the region – an implicit acceptance of demand management within the limits of environmental capacity – and sees a role for land use planning in ‘minimizing the need to travel’; it then fails to grasp the implications of putting these elements together, maintaining that planning policies should not seek to set limits to economic activity at a regional level. If planning is to identify and work within environmental capacities, however, that is precisely what it will need to do. The suspicion must be that rhetoric about planning to reduce emissions is easier than direct confrontation with patterns of production and consumption that inexorably lead to more travel and more pollution. As a result, though a potentially important contribution of planning to environmental sustainability is recognized, policies are likely to be ineffective and possibly counter-productive. There is a need to test this prediction in future research, to examine interpretations of PPG 13 by local planning authorities and to monitor any changes in appeal decisions and actual outcomes.

This example suggests that even when there is a clear conceptual link between planning and material dimensions of sustainability, the principles are difficult to operationalize. Limits are contested and rarely spatially disaggregated; different policy instruments are not coordinated; and we have not faced the fundamental conflicts between economy and environment which underlie many development issues. Such conflicts are, if anything, even more clearly exposed when we consider the relation of the planning system to postmaterial dimensions of sustainability.

Planning and the postmaterial

In contrast to the new remit touched upon in the previous section, planning has enjoyed a relatively well-defined role in relation to amenity and, more tenuously through its links with nature conservation, to bioethics. This role has traditionally been interpreted as one of balancing protection of the cultural and the natural environments with the benefits to be derived from development.²⁸ Though some important issues – for example habitat loss – are also material concerns (through cumulative impacts on biodiversity and potentially on human health and survival), their postmaterial dimensions lie at the root of much environmental conflict. The widely shared sense of violation at the impact of the M3 extension on Twyford Down, for example, was not primarily about health or survival; it was an expression of the amenity and intrinsic values of the cultural and environmental assets loss. These dimensions of environmental concern are centrally about what we value and why and, in this context, it is particularly challenging to conceive of what is ‘sustainable’. Defining a ‘stock’ of cultural landscape and semi-natural habitat whose ‘value’ is to be maintained raises problems enough, including the thorny issue of equivalence for environmental compensation.²⁹ Defining critical natural (or cultural) capital in the postmaterial domain is even more intractable.

This section focuses on the dilemma of defining critical capital in the context of nature conservation. Here the problems are at their most acute because critical natural capital, once defined, must be passed on intact to future generations and thus constitutes an absolute constraint on development. This implies that whatever the aggregate benefits of doing so, it would be *wrong* to modify or destroy the asset in question – it is in effect removed from the ‘arena of

trade offs' (Collis *et al.* 1992, 20). Yet, insofar as what is critical includes the postmaterial and the non-instrumental, such decisions have to be defended against the benefits of development on grounds which are strongly value-laden. The way in which we identify critical natural capital is therefore an issue of central importance. Three questions in particular will be explored. What is the ethical rationale for criticality? Do existing designations provide a basis for what is critical? And what are the respective roles of public, political and professional judgement in deciding what is critical and why? As concepts of sustainability begin to be articulated in planning practice, there is evidence that such issues will be strongly contested in the formulation of policies and criteria for development control.

An ethical basis

If the (instrumental) value of an environmental asset to the present generation exceeds the benefits of development, there is a clear case for protection on utilitarian grounds, though deciding *whether* there are net benefits raises difficult (and familiar) problems of measurement and value relativity. Decisions about what is *critical*, however, must transcend even this delicate balance; they require an ethical basis which goes beyond maximizing the utility of the current generation. When the benefits of development for 'today's generation' appear to exceed the utility of the asset in its current form, an alternative rationale for protection is required. Planners then find themselves trying to defend the 'intuitive ethic' that human beings should protect the ongoing, holistic integrity of nature (Norton 1982, 319).

The most familiar argument is that we have a duty to future generations. Though such a duty has become received wisdom, it tends to be asserted rather than defended. Some commentators have argued that appeals to the interests or rights of future generations, if construed in the usual individualistic manner, fail to provide a theoretically sound basis for conservation (Norton 1982; Parfit 1984).³⁰ If we accept a generalized obligation, we still need to make judgements about what will be of value to future human beings, judgements which will be open to even stronger contestation in the planning process than those restricted to the present. Sagoff (1988, 63) suggests that since future generations will not miss what they have never had

good is an obligation not necessarily to those individuals but to the ideals themselves.

Planners, in this formulation, still find themselves defending 'what we know to be good'.

An alternative is to resort to intrinsic value theory. Proponents of non-anthropocentric intrinsic value accept that human-centred values change; indeed their case derives in part from 'the specter of cultural (and historical) relativity' (Hargrove 1992, 151), which may leave nature defenceless. Unfortunately for planning, which is an exercise in practical reason, these theories fail to tell us how to recognize intrinsic value or how to take account of it in decisions. If intrinsic value is acknowledged to be human centred but non-instrumental, then it must be part of a set of culturally-evolved held values (Brown 1984), a belief that what is intrinsically valuable in nature is good. Even so, the effect of acknowledging non-human interests may, as Norton (1982, 333) points out, be one of 'paralysing rather than guiding decision making'. Regan (1981) wonders whether conflicts arising between human and non-human interests admit, even in principle, of rational adjudication.

Though these issues are exhaustively debated in environmental ethics, they are largely ignored in recent literature on planning and sustainability. The ethical basis for preservation is taken as given, while consistent and defensible criteria for deciding which natural assets are critical seem not to have been defined. Identification of such criteria, as well as exploration of the links between environmental ethics and planning theory and practice are important areas for future enquiry.

Criticality and scale

It is usually assumed that designated sites of international and national importance constitute at least a starting point for critical natural capital. In effect, the concept has been seized upon to provide the rationale for absolute protection which has always been lacking in the past. This is understandable, but it raises two interesting issues. The first concerns what exactly it is that is critical. It is widely acknowledged that site protection is necessary but not sufficient to preserve habitats, species and ecosystems, so criticality may have to be more holistically defined. Of equal significance for planners is the dilemma of hierarchical protection. Designation of nationally and internationally important sites is based on established, 'scientific' criteria

[o]ur obligation to provide future individuals with an environment consistent with ideals we know to be

(see, for example, NCC 1989, 1990),³¹ exogenous to the land use planning system and therefore seen as a prior determinant of environmental capacity. Planners have greater discretion over assets of less than national significance. Could development plans define highly valued Local Nature Reserves or regionally important habitats as 'critical'? Can there be 'less important' critical assets?

We might envisage a system in which only those pro-development interests significant at the same or higher level as that of designation (local, national or international) could be weighed against conservation in any particular case (Bain *et al.* 1990; Countryside Commission *et al.* 1993). But this is a hierarchy of scale, not of value. It still fails to tell us how to weight different *kinds* of interests against each other. The Leybucht Judgement³² seemed to go some way towards this, by ruling that in Special Protection Areas the interests of conservation could be weighed against considerations of human life and safety, but not against economic interests. The Habitats Directive applies a similar test to sites which host priority habitats and species (O'Sullivan *et al.* 1993). These are useful criteria for, while they retain a concept of balance, they imply a lexicographic ordering in which not everything can be weighed against everything else (Neuburger and Fraser 1993). Nevertheless, if plans encode a hierarchy of protection policies, it is difficult to see how the inexorable erosion of 'less important' sites is to be avoided. Given the potential for cumulative and indirect impacts, and the role of 'local nature' in people's quality of life, there is a need for careful reappraisal of the relationship between significance and scale.³³

Deciding what is critical

Beneath all this lurks the difficult question – one which has a familiar ring for planners – of who decides what is critical and why. Some believe that the values underpinning preservation (when this is not a matter of material welfare) are widely shared, if not widely articulated (see, for example, Hargrove 1992; Lowe and Goyder 1983). Indeed, it is taken for granted in much advice on planning and sustainability that an 'open and democratic procedure' (Jacobs M 1993, 15) would lead to policies and decisions favouring conservation. But this is not self-evident. It is well known that environmental attitudes vary between social groups and some conclude from these findings that protectionist policies are elitist. In this view, if policies were

really based on maximizing the pleasures of all, the case for conservation would crumble (Krieger 1973; Regan 1981; Sagoff 1981). Interestingly, in their study of the Rainham Marshes controversy, Harrison and Burgess (1994, 308) found no automatic public acceptance of the 'warrant' of designation used in the conservation case: '... lay audiences cannot see how SSSIs "improve" the quality of their own lives'. If conservation values are *not* widely shared, there is a dilemma:

... should policy favour the preferences of the young, whom surveys reveal to be more pronature, over those of older persons, who are more prodevelopment and less naturalistic? Should we favour the pronature preferences of the better educated over those of the less educated? In social justice, politicians try to favour the disadvantaged ... But in environmental ethics, this view can weight the prejudices against wildlife and preservation. (Rolston 1988, 8)

While it is unlikely that this issue will be quickly (or ever) resolved, to designate natural assets as critical requires *someone* to judge what is so important that it should be preserved intact, whatever the weight of other considerations. A role for professional judgement, with its particular claims to scientific validity, is generally taken for granted (for example, Countryside Commission *et al.* 1993) and it would be difficult to argue that in nature conservation this should not be the case. At the same time, there are extensive references to participation but with little guidance as to how this might be effected; its resource implications or what to do if the result is a rejection of conservation values, conflicting with the very notion of criticality. Views are not necessarily wrong because they are held only by a few, nor right because they are shared by many members of society. Sagoff (1981, 307) believes that the charge of elitism can be refuted by showing that so-called elitist values 'have a basis that all of us can recognise and respect'. Planners may feel uncomfortable with such a prescription but defining what is critical will require them to take a stand. In any case, the respective roles of public, political and expert judgement in applying the principles of sustainability require more rigorous analysis.³⁴ This might usefully be conducted in specific geographical contexts. For example, English Nature (1993, 3) suggests that the 'Natural Areas' on which it is basing a new framework for conservation reflect 'a widely shared sense of place'. They might also provide a focus for research on the values

underlying popular and professional judgements of what is 'critical' and the processes through which they are expressed and mediated.

We can predict that identification of critical natural capital will be strongly contested. Similar issues will arise over landscapes and cultural assets and in applying the constant natural assets rule. As with pollution control standards, designation of critical landscape and habitats, as well as the degree of protection afforded to them, must ultimately reflect a distribution of power. Whereas in the case of pollution it is scientific uncertainty that provides ammunition in the contest, in the case of amenity and intrinsic value, recourse will be made to accusations of arbitrary and subjective judgements. There is not so much 'a risk' that sustainability limits will be politically determined (Collis *et al.* 1992, 26), but an inevitability.

When fundamental issues are unresolved, they tend to be rehearsed at different stages in the planning process. This is confirmed by recent experience of planning and nature conservation. It is proving very difficult to grasp the nettle of sustainability constraints at any level, from designation of internationally important sites to approval of local plans. Candidates for Special Areas of Conservation under the Habitats Directive, for example, are being scrutinized minutely for potential conflict with social and economic objectives, including outstanding planning permissions which might involve expensive compensation. Where collision seems inevitable, as was the case with Cardiff Bay, sites may simply be excluded (Pritchard 1994). Limited experience to date also suggests that 'environment led' plans are open to concerted challenge from economic interests; draft structure plans for Berkshire and for Surrey were both criticized by their examination in public panels for being 'too green'. Furthermore, Berkshire's draft minerals local plan, carefully constructed around the concept of environmental capacity, faced a powerful coalition of minerals interests at inquiry. Although the Department of the Environment (1993b, para 1.18) has acknowledged that 'there are times when a feature of the environment needs to be treated as inviolable', it has nevertheless been removing 'presumptions against' development from draft plans. When it comes to development control, though protection has been strengthened, the philosophy of balance still dominates. Even development which might damage an internationally important nature conservation site might proceed if

there are 'imperative reasons of overriding public interest' (Department of the Environment 1992c, para 22) – a justification which has provided an elastic expedient for pro-development interests in the past.

A number of observations may be made in conclusion. First, it seems that applying the principles of sustainability in the postmaterial realm will involve the very trade-offs that they are meant to pre-empt; conflict will be shifted from the arena of development to the arena of designation. Secondly, the evidence suggests that gains in the strength of protection afforded to natural and cultural capital may be offset by limitations on its geographical extent. Thirdly, the effect of designation as 'critical capital' is to trigger a particular set of considerations when damage is threatened, rather than to afford absolute protection. Finally, in a broader sense, it is clear that definitions of environmental capacity will be contested, for they are quickly recognized by developers as limits to growth.

Discussion and conclusions

It would be surprising if the planning system, with its central role in conflict over land use change, were not caught up in a rethinking of human relations with the natural world. Emerging principles of sustainability, especially those based in concepts of environmental capital, have proved seductive to the planning system and related institutions. We should not lightly dismiss the new environmental emphasis in planning as rhetoric, for rhetoric is both a product of, and reinforces, social change. But this paper suggests that we should be cautious in welcoming sustainable development as a new paradigm within which planning policies and decisions can be made. Though clear links between land use and the wider environment can be demonstrated, institutional structures are often not conducive to the development of appropriate planning policies and planning can achieve little in isolation. Further research to test preliminary conclusions in specific geographical contexts is urgently required. We need a better understanding of ways in which sustainability is interpreted in the context of land use change (building, for example, on Healey and Shaw's (1994) analysis of policy discourses), of the values embedded in these interpretations and of the effects on planning outcomes. This represents a substantial agenda for linked theoretical and empirical research, and it may not be appropriate to draw

firm conclusions from the initial exploration of theory and practice in this paper. Nevertheless, three interconnected issues merit further comment: the re-emergence of limits to growth; the centrality of value theory; and the often unacknowledged challenge to market-led development pressures represented by sustainability constraints.

Limits

It seems that principles of sustainability, applied to land use change, return us rapidly to the familiar discourse of limits. Limits are inherent in the concept of sustainable levels of pollution and resource depletion; and they rapidly manifest themselves in the definition of environmental capacities in both the material and the postmaterial realms. There is a clear expectation that limits, 'derived from the requirements of the natural environment', should establish the 'solution space' within which development proposals will be generated and contained (Kozłowski and Baranowska-Janota 1993, 10 and 13). Indeed, the concepts of constant and critical natural assets are endorsed precisely because of the constraints that they imply. So, for example, the Countryside Commission *et al.* (1993, 27) wish to see recognition that:

... there are real limits to the amount of development that can be accommodated in regions without unacceptable impacts on key environmental resources. There must, at some stage, be accepted *limits to growth* ... (Emphasis added)

In similar vein, M Jacobs (1993, 22) argues that planning 'should define environmental capacities and prevent them being breached', while Kozłowski and Baranowska-Janota (1993, 14) see such definition as 'one of the major responsibilities of planning'.

Values

This paper suggests, however, that even where there is a clear material basis for environmental concern, establishing 'environmental capacities' and relating them to planning policies is no easy matter. When – as is frequently the case in planning conflict – our concern is with postmaterial and non-instrumental dimensions of sustainability, prior identification of limits raises even more complex issues. The explicit (collective) judgments required, especially in the designation of

critical natural capital, challenge the view that aggregate consumer preferences, whether revealed in real or surrogate markets, constitute the most relevant expression of value or need. Whilst recognizing that held and assigned values vary between individuals (and indeed within them (Brown 1984; Sagoff 1988)), it becomes necessary to identify and defend what is right and what is good. Exactly how this should be achieved prior to, or as part of, a participatory planning process remains one of the least well-defined areas of current theory and practice.

Politics

It is not difficult to see in the concept of environmental capacities, especially when defined on the basis of non-utilitarian ethics, a fundamental challenge to a market-led political economy, with development pressures strongly based in consumer preferences. In this sense, it might be claimed that 'sustainability' merely provides a new framework for what Wright (1985) see as an enduring conflict between capital and preservation, continually re-enacted as new accumulative cycles demand transformation of both urban and rural environments. What distinguishes the new context from the more familiar arena of land use conflict is a set of political commitments to 'sustainable development' which may prove difficult to abandon when their more uncomfortable implications become clear. Sustainability, eagerly endorsed by governments and at least partially encoded in legislation, may yet prove to be a Trojan horse admitting radical environmental values.

For all these reasons, it is highly unlikely that applying principles of sustainability 'will greatly reduce the conflict between conservation and development' (Countryside Commission *et al.* 1993, 9). This prediction needs to be tested in a variety of empirical contexts but to date there is little evidence of conflict resolution. What seems to happen is that conflict is shifted to an earlier stage of the planning process and more fundamental questions about ethics, values and political priorities are exposed. But if planning is to contribute to sustainability, such clarification is to be welcomed, for as Leopold (1937, quoted in Meine 1992, 40) pointed out more than half a century ago: 'Conservation, without a keen realisation of its vital conflicts, fails to rate as authentic human drama; it falls to the level of a mere Utopian dream'.

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Notes

1. See UN 1992; CEC 1992; Secretary of State for the Environment 1994; LGMB 1993.
2. See Boucher and Whatmore 1993; Breheny 1992; Harrison and Burgess 1994; Murdoch 1993; Myerson and Rydin 1994; Whatmore and Boucher 1993.
3. For reasons of space and simplicity, most of the institutions and legislation referred to apply to England and Wales.
4. See County Planning Officers' Society 1993; Blowers 1993; Welbank 1993.
5. Defined as an environmental charter or statement setting out general principles, an environmental action plan or programme, an internal environmental audit or a state of the environment report.
6. The quarter refers to all British authorities; the fifth to planning authorities in England and Wales.
7. See University of the West of England and Baker Associates 1993; other useful surveys are reported in Bain *et al.* 1990; Countryside Commission *et al.* 1993; Marshall 1992; Myerson and Rydin 1994; Owens 1991; Raemakers 1992, 1993.
8. See Collis *et al.* 1992; Countryside Commission *et al.* 1993; Jacobs M 1993; RSPB 1993a, 1993b.
9. See also Myerson and Rydin 1994.
10. For useful overviews see Murdoch 1993; Pezzey 1992; Redclift 1990.
11. Some authors make a distinction between sustainability and sustainable development, the latter incorporating a social and economic dimension (for example Collis *et al.* 1992). However, the terms are frequently interchanged.
12. See CSERGE 1993; Pearce *et al.* 1989; Kozlowski and Baranowska-Janota 1993.
13. See, for example, Hartwick 1978; Hicks 1946; Solow 1992.
14. Implied, for example, in CSERGE 1993; Countryside Commission *et al.* 1993.
15. Implied in Bateman 1991; Blowers 1993; Collis *et al.* 1992; Pearce *et al.* 1989; Secretary of State for the Environment 1990.
16. Collis *et al.* (1992, 30) suggest that 'environmental capacities' is preferable, but this does not quite meet the ontological point.
17. See, for example, Evernden 1992; Harvey 1993; Jacobs H 1993; Zimmerman 1992.
18. See, for example, Regan 1981; Singer 1975; Stone 1972; Varner 1987; Watson 1979; for discussion see Ehrenfeld 1978; Passmore 1974; Nash 1989.
19. See Callicott 1979; Rolston 1988; Taylor 1984, 1986.
20. There is a sense in which amenity is a material concern, in as far as uneven economic *and environmental* development reinforces economic, social and political peripherality. While areas suffering degradation have to accept further environmental risks to ensure economic survival, a high quality environment is increasingly regarded as a stimulus for economic development and diversification (Blowers and Leroy 1994; Clark *et al.* 1993; Countryside Commission *et al.* 1993). Recognition of this aspect of amenity, however, still begs the question of its growing social significance.
21. See Leopold 1949; NCC 1990; Whatmore and Boucher 1993.
22. See also Weinberg 1972; Wynne 1992.
23. See Hall *et al.* 1993; Miller 1990, 1993; Miller and Wood 1983; Wood 1989.
24. Though the energy crisis of the 1970s prompted concern about resource depletion (Owens 1986), the notion that planning might contribute to an environmentally sustainable transport system in a wider sense was largely absent.
25. Quinn M, Department of Environment, pers. comm.
26. Spatial variation in *emission* limits to meet environmental quality standards is a well-established approach, especially in water pollution control, which allows for different assimilative capacities in different environments (see Haigh 1987).
27. More stringent emissions control might be required in regions whose topography, industrial structure or modal split leads to relatively high concentrations of urban air pollutants, or which lie upwind of ecologically sensitive areas. Even for global pollutants such as carbon dioxide, it might make sense for different regions to make different contributions to meet national targets.
28. Distinctions between the natural and human environments are not helpful in all contexts. In countries like the UK, all conservation interests are concerned with 'the complex environment that has evolved over the centuries through the creation and modification of natural habitats and landscapes by natural processes and evolving patterns of human land use and management' (Countryside Commission *et al.* 1993, 16). According to this view, the natural and cultural environment should be viewed as a single entity.
29. See Cowell 1993; Kayes *et al.* 1993; Whatmore and Boucher 1993.

30. Parfit (1984) raises the 'non-identity' problem – policies adopted now affect not only the state of the environment but also the *identity* of people living in the future: in a sense, therefore, whatever choices we make will 'benefit' these people, because alternative choices would have meant that they did not exist.
31. Nature conservation interests accept that 'the process of site selection can never be completely objective' (NCC 1990, 14).
32. This refers to the Leybucht-Dykes case in European Court of Justice concerning the provisions of the Wild Birds Directive.
33. This question is also important in application of the constant natural assets rule: the larger the spatial scale over which 'constant value' is defined, the greater the potential there will be for compensation. This may be of little consolation to those who lose a valued local amenity.
34. Faced with these issues, some find refuge in the prospect of monetary valuation of environmental assets. The merits of attaching prices to the natural environment are intensely debated in a large but polarized literature (for different views see Cropper and Oates 1992; Kelman 1990; Sagoff 1988). Critics such as Kelman and Sagoff maintain that attempts to derive values relating to moral and ethical judgement from aggregation of individual preferences constitute a 'category mistake'. There are also problems, acknowledged by many economists (Cropper and Oates 1992; Price 1993), of dealing with intrinsic value in revealed preference theory. Nor do valuation techniques circumvent the need for information and expertise in relation, for example, to species, habitats and ecosystems (Blowers 1993). It is not possible to do justice to this very complex debate here.

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