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Sustainable adaptation to climate change

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The term 'sustainable adaptation' has emerged with the realization that while adaptation to climate change will be increasingly required over the next decades, we know little about the wider or longer term impacts and implications of adaptation itself. To date there is no certainty that our responses to climate change are sustainable either socially or environmentally, nor how they are likely to contribute to human well-being and poverty alleviation. Previous studies have highlighted how climate change represents both a threat (Yohe et al., 2007) and an opportunity (Commission on Climate Change and Development, 2009) for sustainable development. Only recently have there been attempts to document and compare the experiences of both externally and internally initiated, planned and autonomous, adaptations and their impact in developing countries (McGray et al., 2007; Below et al., 2010; Mearns and Norton, 2010). From these and other studies, there is emerging evidence that many of our responses run counter to principles of sustainable development. This suggests that adaptation policies and interventions that focus on reducing specific climate sensitivities such as predicted changes in precipitation or hydrological regimes, can, even if benefiting some interests, at the same time adversely affect vulnerable groups and create social inequity, as well as unintentionally undermining environmental integrity (Barnett and O'Neill, 2010).

In this special issue of *Climate and Development*, we argue that radical change is required in order to push for strong sustainability in responses to climate change. Eriksen and O'Brien (2007) highlighted the importance of ensuring that adaptation is socially and environmentally sustainable, contributing to poverty reduction as well as confronting the socio-environmental processes driving vulnerability. To ensure this, and in order to respond to climate change in ways that contribute to sustainable

development, there is an urgent need to integrate the relatively well-established understanding of sustainable development with the more recent concerns of vulnerability to climate change. Academic thinking and scientific analysis are now taking up this challenge, and a double session at the Human Security in an Era of Global Change Conference in June 2009 was devoted specifically to presentations and discussions on 'sustainable adaptation'.

This issue synthesizes this discussion, bringing together a collection of articles – originally presented at the 2009 conference – that discuss the challenge of ensuring that we respond to climate change in a way that contributes to sustainable development, in terms of both equity and environmental integrity in the long term. The theme that we wish to highlight is that how we adapt to climate change – in terms of the types of measures, policy frameworks and local household strategies – matters for future development, and particularly for social and environmental sustainability. This has been largely overlooked, and adaptation is normally assumed to be benign for development. The articles explore some of the problems with such an assumption, and what directing adaptation towards principles of sustainability would mean in practice, as well as the conceptual and practical challenges inherent in trying to make adaptation sustainable. The articles develop our understanding of sustainable adaptation by both including conceptual discussion and drawing on empirical research from diverse geographical contexts, including Kenya, Vietnam and the UK. This collection hence addresses a shortcoming in adaptation literature so far; that is, the tendency to consider adaptation in developing and developed countries as very separate issues, when human responses are in fact closely interlinked through their direct and indirect effects on other groups and regions.

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The first article (Eriksen et al., 2011) discusses the conceptual underpinnings of the term sustainable adaptation and its practical implications. Initially, sustainability was associated with emission reductions (Markandya and Halsnaes, 2002). With the realization that we need to be critical of *how* we adapt in terms of consequences for poverty and environmental challenges facing the world, sustainability has also been linked to adaptation. Few studies or projects so far have paid explicit attention to what the implications of climate responses will be for social equity and justice and environmental integrity, whether these responses are local and autonomous in nature or planned policy initiatives. Eriksen et al. argue that not every response is necessarily a good one: trade-offs and the potential for negative outcomes over space and time must be recognized. Furthermore, adaptation is a process rather than a list of actions and measures, and consequences of actions and measures must be considered within the much broader social and environmental context. Fundamental societal transformations are required in order to achieve sustainable development pathways and avoid adaptation funding going into efforts that exacerbate vulnerability and contribute to rising emissions. Sustainable adaptation is likely to entail forms of societal organization that are flexible in the face of changing climatic conditions, while at the same time minimizing greenhouse gas emissions. Eriksen et al. outline four principles as a first step in guiding climate responses towards principles of social justice and environmental integrity: first, recognize the context for vulnerability, including multiple stressors; second, acknowledge that differing values and interests affect adaptation outcomes; third, integrate local knowledge into adaptation responses; and fourth, consider potential feedbacks between local and global processes.

Brown's article continues in a more conceptual vein and explores the relationship between sustainable development and adaptation. It questions whether sustainable adaptation may be criticized on the same grounds as sustainable development (Brown, 2011). Are sustainability and adaptation really compatible and can we find policies and measures that will effectively integrate them? It reviews some of the evidence for 'unsustainable adaptation' and discusses how poverty reduction and adaptation goals may be incompatible. These issues pose serious challenges to successful implementation of sustainable adaptation. Furthermore, the article argues that there is a real danger that sustainable adaptation might be co-opted, as sustainable development has been, to promote 'business as usual' rather than to challenge dominant, modernist and technocratic approaches to

development. In effect, can the promotion of sustainable adaptation help in shifting attention to the causes of vulnerability and hence the more comprehensive form of climate responses that are now required?

The next three articles present empirical evidence exploring some of the tensions and complexities, competing interests and knowledge, and winners and losers inherent in adaptation and offer perspectives on how we can understand adaptation through a lens of sustainability. As the sustainable development literature has shown, and as these articles demonstrate, ensuring social equity and environmental integrity is not an apolitical or straightforward process, and this has important implications for governance at many scales (Adger and Jordan, 2009). Beckman (2011), writing about Vietnam, considers how different interests may converge and conflict in adaptation to environmental change. The article focuses on policies for adaptation and mitigation that, while increasing resilience at one scale may cause increased vulnerability at other scales. Policies on forest protection and the construction of hydroelectric dams regulate flooding and prevent salt water intrusion into lowland areas and are being justified in part from the perspective of increased awareness of risks associated with climate change. However, the policies also result in severe constraints in access to land for the mountain population, which impacts on their capacity to manage risk and adapt to environmental change. It is argued that these effects are further reinforced by policies of privatization of forest land, reducing the access of the poor to common property resources. Such resources have previously had an important buffer function when coping with crises like serious floods. The resulting difference in adaptive capacity between groups with different access to resources is a critical issue for equity and social sustainability in adaptation. The article represents an important problematization of adaptation, showing that some adaptation may even lead to loss of adaptive capacity in the long term.

Using a case from eastern Kenya, Owuor et al. (2011) demonstrate that sustainable adaptation can be undermined by formal policies and state practice. They investigate how the pastoral and agropastoral populations interact in adapting to climate variability and change, and to drought in particular. They show that interactions in terms of trade and mobility and accessing forest resources are important components of sustainable adaptation in drylands, in terms of reducing the vulnerability of both pastoral and agropastoral groups. However, formal policies and informal governance are impeding these strategies, contributing to conflict between and within agropastoral and pastoral groups, hindering access to

natural resources critical for managing drought, hence exacerbating vulnerability and undermining sustainability. The case demonstrates that the extent to which social inequities are created or reinforced through adaptation depends on local politics and governance issues as well as the type of interventions by governmental or non-governmental interventions. Sustainable adaptation for the case of Endau would imply a fundamental change in governance regime from one of imposing punitive measures to stop dynamic interactions to one through which, instead, interactions between the various groups are strengthened.

Adaptation is also a matter of interaction between local strategies to manage change and policies and decision making that may favour particular strategies and developments over others. Exploring some of the local mechanisms, in particular use of indigenous plant resources in dryland areas in Kenya, Gachathi and Eriksen (2011) argue that some of these local practices may represent more environmentally sustainable forms of adaptation to drought and climate change than external or exotic solutions. However, they give very low income and become mechanisms of the poor rather than being able to address existing social inequity. The paper exemplifies the role of indigenous knowledge and resources in striving towards more sustainable forms of adaptation, as well as some of the challenges with achieving this. In particular, it suggests that building on local knowledge, the third principle of sustainable adaptation identified in Eriksen et al. (2010), does not effectively lead to sustainable adaptation unless other principles are also addressed at the same time, such as targeting the vulnerability context and multiple stressors marginalizing dryland populations.

The space and interpretation of sustainability in adaptation and development discourse may be critical for what types of adaptation responses and development paths are supported. Understanding discourse provides important insights into how governance and policies are framed and is as important for developed countries as for developing countries. The final article in the collection, by Opperman (2011), distinguishes the space for sustainability in the discourse of adaptation to climate change in the United Kingdom. She investigates how adaptation is conceptualized in the UK, and that particular framings can limit the possibilities of understanding adaptation more substantively in terms of internal connectivity and complexities. The argument is important for understanding how adaptation can contribute to sustainable development, and that 'sustainable adaptation' in terms of social equity, environmental integrity and conflicts of interest

between different actors may in fact not be possible unless existing policy discourses are challenged.

Sustainable adaptation is essentially a global issue since social equity and environmental integrity are important for all populations in order to achieve sustainable responses to climate change. The environmental integrity of adaptation actions in one area also has a bearing on populations elsewhere, for example, through the effect of such actions on emissions and hence on the climate change problem itself. In this rapidly evolving area of both policy and science, the inter- and intro-generational dimensions of climate change responses must be thoroughly and critically interrogated. For sustainable adaptation to avoid becoming another buzzword and for it to meaningfully integrate social, environmental and economic concerns, we should learn from the experiences in different contexts. In documenting the winners and losers, the multi-dimensional trade-offs, and highlighting the competing understandings, meanings and political contestations, this collection of articles is an attempt to initiate learning on sustainable adaptation.

The articles here present a series of important challenges to evolving knowledge, policy and practice on adaptation. Clearly, many current adaptations are far from sustainable. Achieving sustainable outcomes requires that wider social, political and cultural issues are taken on board and that adaptation cannot just be about finding technical solutions or 'fixes' to specific climate impacts. Sustainable adaptation necessitates understanding the role of climate change risks and impacts in the context of other societal and environmental changes. For adaptation to be sustainable it cannot just be about projects, nor can it be about amending current action by adding more tick boxes to a screening process. Sustainable adaptation means we must shift the boundaries of current adaptation and address the underlying causes of vulnerability and poverty in devising responses to climate change.

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