

Exploring cultural dimensions of adaptation to climate change

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Introduction

The latest report of the IPCC states that ‘Warming of the climate system is unequivocal’ and that most of the warming over the past half-century is ‘*very likely* due to the observed increase in anthropogenic [greenhouse gas] concentrations’ (IPCC, 2007a, pp. 1, 4). A range of potentially damaging impacts of climate change are anticipated, some of which may be abrupt and irreversible, with potentially severe impacts on human and natural systems (IPCC, 2007b). It is a reasonable proposition that, in light of these conclusions, ethically responsible decision-makers ought to take appropriate action, be it in terms of prevention, mitigation or adaptation (see Gardiner, 2004; Jamieson, 2001).

Though anthropogenic climate change may be new, significant local and regional variations in climate have occurred throughout the historical period, and prehistoric modern humans lived through repeated periods of abrupt and severe climate change that was often global in nature, responding and adapting to environmental change and variation with varying degrees of success, and a variety of different outcomes (for example Roberts, 1998; Brooks, 2006).

In this chapter, we propose that culture plays an important role in mediating human responses to environmental change. In particular, we argue that these responses depend heavily on the extent to which societies see themselves as separate from or part of the wider physical or ‘natural’ environment. A detailed discussion of the social construction of nature is beyond the scope of this chapter (but see Heyd, 2007). The term ‘nature’ is used here to refer to the suite of biogeophysical and biogeochemical systems and processes that serve to regulate the physical environment over a wide range of spatial and temporal scales. These systems are not isolated from human influence, but may be viewed as autonomous in relation

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to human beings (i.e. they are not dependent on human intervention for their continued functioning). Many 'natural' systems are manipulated by human beings to a greater or lesser extent, and even heavily managed or 'artificial' (for example, agricultural) 'human' systems depend on natural processes (for example, hydrological and geochemical cycles).

The difficulty in defining what is 'natural' merely serves to highlight the problems with discourses based on rigid distinctions between the realms of humanity and nature, discourses which are the subject of this chapter. Here we discuss the influence of culture on conceptions of, and behaviour towards, natural systems and processes in a non-Western context, and compare this example with the mainstream of Western societies. Next, we illustrate how certain conceptions of the relation of human beings to the natural environment may lead to serious policy errors, with disastrous effects for human populations. We follow this up with a discussion of the role of culture both as a source of 'maladaptation' and as a generator of useful coping strategies, in the context of environmental change and variability. We sum up by noting that culture may serve as a resource in two ways, in relation to the 'management' of the non-human sphere and in relation to the development of governance processes, and conclude that a deeper understanding of the cultural mediation of responses to environmental dynamism may be of significant value in the development of resilience to accelerating climate change.

The role of culture

In addition to prevention and mitigation, adaptation increasingly is becoming the focus of discussions of human responses to climate change. Most of these discussions, however, focus on physical, economic or managerial options (for example IPCC, 2007b). We propose that the effectiveness of these ways of addressing adaptation to climate change may be crucially dependent on the underlying cultural fabric of the human groups involved for their successful implementation.

The notion of culture, and how to understand it insofar as it contributes to our adaptation to the environments in which we live, is itself a debated topic (see for example Ingold, 1994). For the limited purposes of this chapter we will speak of culture as comprising the ways of living involving values, beliefs, practices and material artefacts that condition the production of tangible as well as intangible goods and services needed for the satisfaction of a human group's needs and wants. Certainly, we should not think of cultures as neat, homogeneous, isolatable units that can be apportioned to discrete human groups. The culture of any group has to be conceived of as dynamic, subject to constant transformation and in regular interaction with that of other groups, especially given the interrelationship of human populations in today's increasingly globalising context. Moreover, any set

of values, beliefs or practices common to a human group is mediated by power relations, and is not simply the result of adaptation to objective conditions of the natural environment. Nevertheless, particular cultural patterns are among the factors that distinguish human groups, and may play a crucial role in the ability of these groups to cope with (sometimes severe) environmental changes (for example, driven by changes in climate).

In the following section we introduce one account of responses to natural phenomena that illustrate an alternative cultural pattern to those prevalent in contemporary Western societies. This account is then contrasted with certain Western cultural approaches to the natural environment, and followed by an example of how the importation of certain Western cultural values has led to maladaptation in a globalised context.

Sentient landscapes

The noted Canadian anthropologist Julie Cruikshank writes about cultural responses to natural phenomena during a period of important changes in climate of north-western North America, recounting some of the oral traditions of the coastal Alaska Tlingit and the Yukon First Nations (Cruikshank, 2001, 2002). She retells stories about glaciers that swallow up whole villages, while their icy surfaces also served as virtual 'highways' that the intrepid travelled between the interior of the continent and the coastal areas (which enjoyed a more moderate climate), beyond the glaciated mountain ranges. These oral traditions show that glaciers were not merely conceived as inert masses of ice but as entities that pay attention and respond to human behaviour patterns, such as speaking carelessly, spilling blood, making noise and cooking with grease in their vicinity (Cruikshank, 2001, pp. 385, 387, 388).

Cruikshank describes these peoples' way of conceiving the ensemble of animate and inanimate beings using the term 'sentient landscapes'. This term takes note of the assumption that, from the perspective of the Alaska Tlingit and Yukon First Nations, the land is not merely inert matter but alive, capable of something akin to perception and action. It also means that the diverse animate and inanimate components of land are not treated as mere resources (or mere obstacles, as the case may be) but, in some way, as *active counterparts* to human beings (also cf. Ingold's (2000) notion of 'sentient ecology'). Cruikshank describes the type of relationship between people and land exhibited in these oral traditions as involving 'social responsibility', which for these people arises from 'the social nature of all relations between humans and nonhumans, that is, animals and landscape features, including glaciers' (2001, p. 382). She argues that this 'local knowledge embedded in oral traditions' displays 'commitment to an active, thoroughly positioned human

subject whose behavior is understood to have consequences' (2001, p. 391). In her analysis, the type of relationship displayed in these approaches to landscape underscores 'the social content of the world and the importance of taking personal and collective responsibility for changes in that world' (2001, p. 391). The idea that is expressed in the relationship with natural processes discussed here is that these components of the natural landscape have their own kind of *agency*.¹

To people who have not been raised in the cultural *milieux* where these stories originate, the notion of sentient landscapes, and the accounts on which it is based, may seem irrational, belonging to the realms of myth and superstition. However, the idea that the natural environment is home to a variety of forces that somehow perceive and respond to human actions, and that impose constraints on human activity and act to shape human society, is 'wide and persistent from Plato and Aristotle to Lovelock's Gaia hypothesis' (M. Chase, pers. comm.). The animistic beliefs of hunter-gatherer groups, the naturalistic polytheism of many non-Western and pre-Christian European societies, and some contemporary environmentalist discourse, all conceive of the natural world as active and to a certain extent sentient, capable of influencing and limiting human activity.

Nature and culture in Western societies

We might contrast belief systems that treat landscapes as sentient entities that interact with human beings with the post-Enlightenment Western tradition which views humanity and nature as essentially separate (Merchant, 1980; Horigan, 1988; Peterson, 2001). The distancing of humanity from nature, and the separation of the natural and cultural spheres, has been viewed by many thinkers as a prerequisite for the smooth functioning of society, with civilisation serving to elevate us above nature. Hobbes (1651/1985) famously credited the institutions of government and the state with preventing humanity from existing in a 'state of nature' in which life would be 'solitary, poore, nasty, brutish and short'. Freud (1930/2002) similarly viewed civilisation as being in beneficial opposition to humankind's 'original, autonomous disposition' towards violence and aggression. The psychoanalyst Erich Fromm (1955/2002) wrote about human beings 'falling out of nature' as the result of an 'awakening' from an unthinking animal state driven by biological and cultural evolution. To Fromm, humanity's subsequent cultural evolution 'is based on the fact that [humanity] has lost [its] original home, nature – and ... can never return to it' (Fromm, 2002, p. 24).

¹ This aspect of their approach to landscape, of course, is not unique to Alaska Tlingit and the Yukon First Nations, but common to many peoples who have deep roots in their lands, including the Inuit and the Indigenous People of the Russian North, as well as the Mapuche and Quechua, of South America's Andes mountain ranges.

In the Western, and particularly the Anglo-Saxon, world, a belief that humanity is separate from nature has played a major role in influencing attitudes towards, and interactions with, the wider physical or 'natural' environment. On the one hand, this point of view has fostered a view of nature as a resource to be exploited for the material benefit of human beings, and/or preserved as a luxury valued for its aesthetic and therapeutic qualities (for example Merchant, 1980). On the other, a lack of appreciation of the extent to which the cultural and natural spheres are linked, and the prioritisation of culture (that is, the human-produced) over nature (or the non-human), has acted to diminish (i) the perceived importance of the environmental consequences of human activity, and (ii) our grasp of the power of the natural environment to exert its influence on human affairs. Even when adverse impacts of *human activity* on the environment are identified, this limited view of the relationship between culture and nature downplays the complementary role of the *agency of the non-human*, and its potential for adverse impacts on human systems via environmental pathways (see Heyd, 2005).

Separation and maladaptation

The failure to recognise that human systems are embedded within the wider physical environment (comprised of a variety of 'natural' systems that interact with each other and with human systems), and that our actions have consequences that are mediated through that environment, can have profound developmental consequences. The African Sahel provides an example of how development can result in the exacerbation of vulnerability to climatic change and variability, when this development is decoupled from considerations of environmental agency and limits, and when – as a result – the environment is implicitly treated as if it were static.

The Sahel is the semi-arid transition zone between humid tropical Africa and the arid Sahara desert, characterised by a high degree of temporal and spatial variability in rainfall, and by alternating periods of relative humidity and aridity which may last from years to centuries (Brooks, 2004). Traditional methods of subsistence in the Sahel developed to accommodate climatic variability, with mobile pastoralism allowing nomadic groups to exploit changing patterns of resource availability over a range of timescales, and reciprocal arrangements between nomadic pastoralists and settled farmers providing mechanisms for coping with periods of hardship (Swift, 1977; Thébaud and Batterby, 2001). However, throughout the twentieth century, colonial and post-colonial governments sought to move away from traditional land and resource management systems, in favour of intensive, 'modern' food production systems aimed at delivering rapid economic growth and based on Western developmental models. The result was the commercialisation of agriculture and

the marginalisation and settling of nomadic populations in the name of progress and modernisation – a recurring theme in African ‘development’ (Cooper, 1997).

Of particular note within the context of this paper is the fact that ‘modernisation’ of food production systems accelerated in the Sahel during the 1950s and 1960s, a period of unusually high rainfall (at least within the context of the period of meteorological records: Brooks, 2004). This process involved the introduction of modern infrastructure, for example boreholes and cement-lined wells, the rapid expansion of agriculture northwards into areas that previously had been unsuitable for agriculture, the adoption of sedentary agriculture by some pastoral groups, the privatisation of common rangelands, and the restriction of pastoralists’ movements (Swift, 1977; Thébaud and Batterby, 2001). This process of modernisation undermined traditional mechanisms for coping with drought, and resulted in increased competition for resources, also contributing to conflict. Increased stocking levels, agricultural intensification, and particularly the northwards expansion of agriculture into areas that were productive in the anomalously wet 1950s and 1960s but which were historically marginal, resulted in a large increase in exposure and vulnerability to drought. This exacerbation of vulnerability led to disaster when rainfall declined dramatically in the early 1970s. During the severe drought of 1972–73, hundreds of thousands of people, and millions of livestock, are estimated to have died across the Sahel as a result of famine (Sheets and Morris, 1976; Hill, 1989).

The initial response of the international research community to the Sahelian drought and famine of the early 1970s was to blame environmental degradation caused by overgrazing and inappropriate land use practices (for example Charney et al., 1975). It was suggested that there was a need for Western development agencies to educate the inhabitants of the Sahel about the detrimental effects of their traditional methods of resource management, and the need to adopt ‘modern’ techniques (Lamprey, 1975). What was lacking from the discourse in the 1970s (and in much of the subsequent literature) was an understanding of disaster risk resulting from the complex interaction of a suite of socio-economic factors with climatic and environmental change and variation, and of how traditional systems of resource management had evolved within the context of environmental change and variation in this marginal region characterised by extreme rainfall variability on multiple timescales. It is now accepted that there was no region-wide, systemic land degradation or desertification in the Sahel, and that the apparent desertification of the region in the 1970s and 1980s was simply a manifestation of the natural (and historically common) oscillation of the ‘desert boundary’ associated with multi-decadal scale rainfall variability (Brooks, 2004).

The Sahelian famine of the 1970s appears ultimately to have been driven by the pursuit of development policies that paid little or no attention to the environmental

context in which they were implemented. In the pursuit of 'progress' and economic growth, colonial bureaucrats, development agency staff and post-colonial governments assumed that the technocratic approaches to development pursued in the 'more advanced' societies of Europe and North America were by definition superior to 'primitive' traditional African systems of resource management and could be applied universally. The demands and constraints of the very different Sahelian environment were not considered; nor was the sustainability of development policies in the event of future episodes of increased aridity, which were inevitable given the nature of the Sahelian climate. Foreign agencies and colonial and African governments alike adopted a Western European developmental paradigm which implicitly viewed the natural environment as static and ignored the *agency* inherent in natural systems, even as it saw nature as something to be overcome.

The result was that fragile, unsustainable development was unable to accommodate natural decadal-scale variations in climate, which triggered a highly disruptive regional socio-economic transition which is still being played out today. The Sahel teaches us how our perceptions of nature and the culture in which they are embedded can lead to maladaptation – the pursuit of policies and practices which make people more vulnerable to changes in the natural environment in which human systems are embedded.

Cultural sources of maladaptation

While Western attitudes to nature conditioned by Enlightenment rationalism have downplayed agency in natural systems, partly as a reaction against 'irrational' myth and superstition (Merchant, 1980), rational scientific enquiry in the Enlightenment tradition actually has supported the assumption of agency inherent in natural systems, particularly since early geological studies demonstrated that the environment has changed on long timescales. It must also be recognised that the Western cultural perspective outlined here, in which human beings are seen as separate from nature, has always been the subject of 'internal' challenges, for example from the Romantic and environmental movements. Consequently, we do not propose to revive the dichotomy between 'Western' culture, based on ideologies of progress and separation from nature and a denial of agency in natural systems, on the one hand, and 'non-Western' or 'traditional' cultures espousing a harmonious coexistence with a sentient environment, on the other.

Nonetheless, the assumption that humanity is separate from or 'above' nature, and the dominance of ideas of social (as opposed to environmental) agency in the social sciences, have resulted in developmental models that pay little or no attention to how human systems affect and are affected by the behaviour of natural systems,

particularly on timescales longer than a few years. Linked with an ideology of progressive social evolution that legitimises the social and economic restructuring of societies along Western lines in the name of progress, these models have been spread across the world through the vectors of European colonialism (Conklin, 1997), economic globalisation (Gray, 1995), international development programmes (Cooper and Packard, 1997; Ebrahim, 2001), and political ideology: in her seminal account of the many adverse environmental impacts of the Chinese Cultural Revolution, Shapiro (2001, p. 3) states that ‘The Maoist adversarial stance towards the natural world is an extreme case of the modernist conception of humans as fundamentally distinct and separate from nature.’ While ideas of progressive social evolution were discredited in academic circles in the twentieth century, they persist in the language of politics and development (for example Gray, 2007). While China is not a Western country, Maoist ideology was based on Marxist–Leninist ideology, and Chinese communism was essentially a Western import, albeit one that took on a distinctive character once coupled with Chinese culture and Mao-era politics (Shapiro, 2001).

While awareness of the potential for changes in natural systems (for example, driven by human impacts on the environment) to affect human societies is growing, and despite the growth of environmental and ecological economics as academic disciplines, the dominance of economics as a framework for decision-making means that the translation of concerns about phenomena such as climate change into meaningful policies or actions is extremely limited.² The primacy of ideas based on progressive economic development is evident in the prioritisation of economic growth over concerns about environmental degradation and anthropogenic climate change. In the context of climate change, current development policies act as obstacles to both mitigation (for example, the reduction of greenhouse gas emissions) and adaptation (for example, the adoption of practices that reduce exposure to risks associated with existing or anticipated climate-related hazards). This is the case not only in wealthy Western nations, but also in rapidly developing countries likely to be worst affected by climate change. China, beset by environmental problems and vulnerable to the impacts of climate change, now matches the United States in its total greenhouse gas emissions (*Nature*, 2007; Zeng et al., 2008). In Mexico, agricultural restructuring associated with market liberalisation has reduced the resources at farmers’ disposal, decreasing flexibility and adaptive capacity at a time of increasing climatic variability and uncertainty (Eakin, 2005).

² Greenhouse gas emissions are rising faster than projected even under the most pessimistic scenarios used by the IPCC, and there is little hope of stabilising concentrations of CO₂ at or below 450 parts per million, the figure usually associated with the 2°C ‘guardrail’ value of maximum advisable increase in global mean surface temperature.

The pursuit at the macro-scale of policies that amplify exposure and vulnerability to natural hazards (a trend we might label as unsustainable development, or maladaptation) is echoed at the local scale. Examples include: the rebuilding of settlements along low-lying coasts devastated by the 2004 tsunami in Sumatra (Steinberg, 2007); the degradation of systems that protect coastal areas from flood and storm hazards (for example Gössling, 2003); the rebuilding of houses and settlements in areas damaged by floods in 2003 in Central Europe and then devastated again in 2005 (Leroy, 2006); the expansion of settlements into low-lying flood plains in the United Kingdom (IPPR, 2005).

Explanations for these patterns of maladaptation must involve various social, political, geographical and economic factors. For example, people often end up rebuilding devastated settlements in the same places and exposing themselves to the same risks that led to earlier episodes of destruction as a result of social and economic marginalisation, the imposition of restrictions on their activities by government, the opportunity costs associated with relocation, a lack of support for adaptation measures by government, or because of the perception that risks are balanced or outweighed by benefits such as access to resources (Leroy, 2005). However, more generally, the failure to deploy more effective coping and adaptation strategies, particularly by governments and individuals in wealthy nations, suggests that there is a fundamental and broadly based *cultural inadequacy*, characterised by an inability to fully comprehend or act on certain risks associated with environmental variability and change even when information on these risks is widely available. Put another way, a lack of certain cultural resources leads to a reduction of the adaptive capacity of individuals, groups and societies which otherwise seem to possess adequate resources and mechanisms for adaptation.

Cultural mediation of adaptive strategies

It is instructive to contrast cultures that view landscapes as sentient entities that respond to human actions with those that view nature as passive and occupying a separate space to human social life. In many 'traditional' societies, the conception of nature as a sentient force which actively and constantly interacts with human beings provides a framework through which considerations of human–environment interactions are internalised within social discourse.

There is considerable research being carried out into the coping behaviours and other cultural consequences, if any, engendered by 'natural' disasters in various societies. It seems that such events typically will persist in the cultural memory of cohesive social groups for a time-span equivalent to one lifetime. This is the case with regard to awareness of the signs of impending tsunamis and volcanic eruptions among some populations living in Papua New Guinea and the Solomon Islands, for

example (Davies, 2002, pp. 37–38). Other adaptive behaviours following natural disasters may be directed more toward the long term, such as the permanent relocation of villages or cities (Davies, 2002, pp. 39–40; also see Fagan (2000) on the Moche relocation of their capital after its first-time near-total destruction). Such experiences may also lead to more indirectly adaptive behaviours, such as the creation of myths and the establishment of taboos about occupying certain areas of the land (Lowe et al., 2002, p. 138). In those cases the direct, concrete cultural memory of the disastrous effects of the event may become lost but not before leading to an adaptation that exhibits respect for the natural phenomena at issue through habitual, ritual or mythical means.

In contrast, the marginalisation of nature in many ‘modernised’ societies mitigates against such modes of internalisation. As a result, measures to address environmental problems often end up as ‘add-ons’ to existing policies and plans that have been developed with little or no consideration of the wider environmental contexts within which they must be implemented. This is evident in the increasing use of the concept of ‘climate-proofing’ by governments and development agencies, aimed at ‘protecting’ existing developmental practices and infrastructure from climate change (for example Asian Development Bank, 2005). The acknowledgement that such existing developmental models and systems might be fundamentally unsustainable in the face of climate variability and change, that protection might not be possible, and that climate change might require the abandonment of existing developmental goals, strategies and policies, and also of some geographical areas, is resisted in developmental contexts. Adaptation is seen as a means of securing economic development and growth within existing developmental frameworks, rather than a process through which the relationship between humanity and nature may be redefined in order to develop systems that can accommodate the variability inherent in a fundamentally dynamic environment, which is become more dynamic as a result of anthropogenic climate change.

Where Western societies, and the international institutions they dominate, do attempt to address adverse anthropogenic impacts on natural systems, existing economic frameworks tend to limit the scope for action, mitigating against remedial actions aimed at sustaining or restoring natural systems and processes where such actions incur costs in the societal sphere. Studies such as the Millennium Ecosystem Assessment Program (2005) have explicitly addressed interactions between human and non-human systems, and their mutual dependency. However, the primacy of economics as a basis for decision-making, and the development of concepts of ecosystem goods and services, means that the preservation of natural systems tends to be justified (at least at the policy level) only insofar as these ecosystems can be (passively or actively) exploited in order to deliver developmental and economic benefits for human beings.

Culture as resource

The dominant approach in Western societies that treats 'nature' and 'culture' as separate spheres represents a formidable obstacle to adaptation and sustainable development, preventing the internalisation of relations with the non-human environment into everyday life, political discourse and policy formulation. Nonetheless, Western societies do possess two broad types of 'cultural resource' with which they might address these issues. On the one hand, scientific descriptions that increasingly characterise natural systems as having a kind of self-organisation or agency that may be controllable or predictable *only to a very limited extent* provide potential frameworks within which to interrogate our conceptions of the relations between human and non-human systems (Maturana and Varela, 1973/1980; Prigogine and Stengers, 1984; Kaufmann, 1995, 2000). Such perspectives may lead to policies that accommodate and cope with climatic and environmental change by making adjustments to human systems, which in turn allow natural systems and forces space and time for their own expression. Such an approach is already being implemented in some instances, for example in coastal management schemes in countries such as the UK, and on river systems in Central Europe (Ledoux et al., 2005).

On the other hand, new systems of governance may provide a means of internalising human–environment interactions into policy formulation and implementation. Western (and many non-Western) societies traditionally have been highly centralised, meaning that policies have been formulated by decision-makers who are often remote from the realities of the localised contexts within which human–environment interactions are played out. An increasing emphasis on decentralisation and participatory decision making involving local stakeholders may provide a context in which the consideration of relations between human and non-human actors can be internalised in policy development. This 'localised' approach will be particularly relevant to issues of adaptation to environmental change, while the scientific understanding of human–environment interactions on a planetary scale will feed into systems of global environmental governance to address issues such as climate change mitigation. Insofar as governance fundamentally has to do with 'the manifold ways in which humans regulate their affairs to reach common goals and react to a changing environment' (Pattberg, 2007, p. 1), and normally involves the institutionalisation of rules and general norms (Pattberg, 2007, p. 14), it will be of key importance in the transformation of our societies in preparation for climate change. The evolution of governance institutions is dependent on cultural preconditions that either favour or undermine the institutionalisation of rules and norms (Jaeger et al., 1993; Macnaghten and Jacobs, 1997; Bulkeley and Mol 2003; Ostrom, 2005; Bromley, 2006). Coupled with a wider awareness of the interdependency of human and non-human systems (for example through science, public debate

and a questioning of the supposition that humans are separate from nature), the involvement of citizens in governance may generate new institutions and influence decision-making bodies in favour of more environmentally sustainable approaches to the global environment.

Conclusion

The challenges posed by phenomena such as climate change certainly call for the scientific and technological innovations that will enable us to develop appropriate physical and socio-economic modifications to our environment. However, true resilience may also require more fundamental changes in our modes of living (see for example Homer-Dixon, 2006). We argue that the readiness to make the necessary modifications, and to fundamentally change our common patterns of living, may be best understood as dependent on the complex that we refer to as *culture*. In a world of intensifying environmental risks, determining the ways in which human values and practices are mediated by ideas about the relationship between humanity and the wider 'natural' environment, and how adaptive (or maladaptive) cultural patterns come about, are fundamentally important steps that can complement the development of technological, engineering and managerial coping and adaptation strategies. Cruikshank encapsulates this perspective in her statement that 'our human ability to come to terms with global environmental problems will depend as much on human values as on scientific expertise' (Cruikshank, 2001, p. 390).

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