

Climate change

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Climate Change

Chukwumerije Okereke and Mark Charlesworth

Introduction

Climate change is clearly a quintessential environmental issue of the late twentieth century and the twenty-first century. It is in many ways the most significant concept to permeate environmental politics, raising 'critical' questions and challenges in all types of ways. The significance of climate change as a scientific and socio-political challenge lies in its key attributes as follows: first, the causes are global and implicated in virtually every human activity, even breathing. Second, the impacts are equally global and wide reaching with no jurisdiction exempted from its potential negative consequences. The ubiquity of climate change causing activities entails that a huge effort in technical, social and economic terms is needed in order to achieve meaningful reduction in GHG emissions. Indeed, the structural and social reorganization required by societies to effectively mitigate and adapt to climate change has been described as unprecedented in human history (Newell and Paterson 2010). The third unique attribute of climate change is the massive inequity in its causes and impacts both within and across states. Essentially, the poor, who have been least responsible for causing climate change, are the ones most affected by its negative impacts (Okereke 2008; 2010a; 2010b; 2011). Fourthly, the problem is long term but also could be abrupt, at least regionally. This not only complicates questions of responsibility; it also means that there are few, if any solutions with immediately evident effects. If tipping points are excluded from analysis, the long time span between action and results creates a dis-incentive for action but

also raises difficult moral questions about responsibility to future generations. To wit, what moral status should we accord future generations and to what extent should moderation or sacrifice be expected of current generations when they will not be alive to reap all the material benefits of their actions? These challenges are further compounded by the fifth unique attribute of climate change. This is the fact that there remains so much uncertainty about the effects, if less so the causes – a fact which can be used as a basis for more precaution and radical action or conversely an excuse for delay or inaction (Charlesworth and Okereke 2009).

It is easy to see from the above why climate change has been described as a super-wicked problem (Levin et al 2010) – one which poses significant challenges to environmental public policy making. At the same time climate change has also resulted in some of the most significant challenges but also important new concepts, policies and institutions in environmental co-operation at the international level (Okereke et al 2012). For these reasons, it will be difficult to imagine any discussion on critical environmental politics that would not place climate change at the centre of analysis.

Climate change challenges business-as-usual politics and poses intractable problems for long-standing approaches to economic management, regulation, commerce, ethics, and international co-operation. We trace the transformation of climate change from purely an objective phenomenon to an idea interpreted and contested through a variety of political, economic, cultural and ethical prisms. While climate change may have provided the best inspiration and platform for critical environmental politics yet, it has also revealed the considerable embeddedness of prevailing managerialist socio-economic ideologies and practices. Building in particular on the analysis of MacIntyre (1990) on virtue ethics we

indicate a way for research and real climate politics to go beyond the sterility that has beset climate governance and negotiations.

Core ideas

As stated, climate change implicates a large number of different concepts. A few of these are relatively new but the majority are pre-existing ideas which are amplified. Below, we elaborate on some of these concepts indicating the contestations associated with them, and how these have been used in relation to climate politics.

A key concept in climate politics is *attribution*. The central question is how much of climate change can be attributed to human activities rather than being 'natural' variation? This question is significant and has implications for other dimensions of climate change, not the least because if climate change is mostly naturally induced rather than anthropogenic, then both response strategies and politics are principally around adaptation, rather than reducing emissions.

Experiments demonstrate that more greenhouse gases such as CO₂ and methane increase the greenhouse effect already present in the atmosphere (IPCCWG1 2007). Direct measurements since the 1950s demonstrate the amounts of greenhouse gases have been increasing (ibid 2007). There is little controversy until this point. The controversy of climate science centres on the wider consequences of these increases in gas concentrations, including on the global temperature. Broadly two approaches are taken to resolve this question. The first is to look at records such as the concentrations of gases trapped in air bubbles in ice cores and correlating these to data that indicate temperatures at these times in the past (ibid 2007). Some of this research indicates perhaps as much as an 18 degree Celsius change in average temperature in

as little as ten years regionally, when a tipping point is crossed to a new state that then persists for 1000s of years (Steffensen et al 2008). This is less controversial, though interpretation of the data is not without its difficulties (e.g. Tingley et al 2012). The second, more controversial approach is using models of the climate or planet to predict what temperatures will be in the future (IPCCWG1 2007). Some of this research suggests that existing emissions already commit the climate system to perhaps thousands of years of human created change (inertia) (IPCCSR 2001, 16-21; Armour and Roe, 2011) with unimagined tipping points (Charlesworth and Okereke 2010) potentially being crossed at any moment. The two approaches combined have so far provided the basis for much of the climate stabilization targets at the various regimes of climate governance, across geographical scales.

Both climate sceptics and believers in man-made climate change recognise the ultimate importance of the debate around attribution and have made it a key focus in advancing their arguments for and against climate action. Years of painstaking work has been done by independent researchers, national academies of science and international scientific bodies to establish exactly how much of global warming and climate change is due to human activity. The results of these works are scrupulously scrutinised and regularly deployed in the debate about climate change. These works have caused an overwhelming consensus among the scientific community that man-made climate change is a reality. However, climate sceptics continue to contest the methodology and validity of dominant scientific opinion about attribution. They argue that natural sources of change including changes in energy from the sun have far more influence on climate change than mainstream climate science indicates (Booker 2009; Durkin 2007; Meyer 2012). They also argue that climate change is within normal climatic variation and that talk of catastrophic climate change is fictional and

unjustified (Booker 2009; Durkin 2007; Meyer 2012). It should be noted that tipping points and their policy implications are typically barely considered by sceptics – indeed even in mainstream climate literature the consideration of tipping points is minimal.

Many people in Europe believe that climate change is man-made, signifying that the climate sceptics have lost the debate in these countries. In North America however, these ‘Merchants of Doubt’ (Oreskes and Conway 2010) have had more success as perhaps up to half of the population does not believe in anthropogenic climate change (ibid 2010). Even in Europe, climate scepticism was temporarily revived in the wake of ‘climategate’ which involved the hacking of emails of the Climate Research Unit at the University of East Anglia, and the allegation that scientists manipulated climate data and attempted to suppress critics (Scruggs and Benegal 2012). Although hardly any credible science now denies man-made climate change, raising doubt about attribution remains the key point of attack in popular media and political circles by those wishing to challenge radical and urgent action against climate change (Latour 2004; Oreskes and Conway 2010, Scruggs and Benegal 2012).

Next, in the discussion we turn to two other concepts – *robustness* and *prediction* – both of which are closely linked to attribution. Here, the first key question is how robust is the Earth System; to what extent can it withstand stress from human activities and can science effectively predict the limits of stress that the Earth will withstand? There is a lot of literature that questions the extent to which climate modelling can be relied on to provide an accurate account of the complex global climate system with all its feedback mechanisms (Knutti 2008; Myanna 2005). Drawing from this literature, some climate sceptics argue that the Earth System is far more robust and able to cope with climate variations than is suggested by mainstream science (Goklany 2008). But while climate sceptics criticize dominant climate

science for going too far, there are others who argue that mainstream science does not go nearly far enough (Anderson and Bows 2008; Schneider 2008). These scholars argue that mainstream prediction and probabilistic science makes unwarranted optimistic assumptions about the robustness of the Earth System; for example in presuming that the Earth System will continue to absorb the large amounts of greenhouse gas emissions provided for in the lax stabilization targets agreed within institutions of global climate policy making such as the Kyoto Protocol and the UNFCCC (Anderson and Bows 2008; Harvey 2007; Oppenheimer 2005).

One of the main reasons for establishing the IPCC in the late 1980s had been to provide conclusive scientific statements about these controversial issues and serve as a definitive voice in communicating the science of climate change (Agrawala 1998). The basic process that the IPCC has followed is reviewing the vast body of published evidence, in five year cycles. Because of the political sensitivity of IPCC documents, painstaking care is taken to calibrate the language of the reports. But while the IPCC has indeed become the authoritative voice in defining the standard view of climate science, controversy remains over its findings and recommendations (see Forsyth, this volume). Some continue to insist that the IPCC is nearly as much a political as it is a scientific body (Gough and Shackley 2001; Grundmann 2007). A frequent point of attack is usually the Synthesis Reports or Summaries for Policy Makers (SPM), the wording of which many argue are determined by politicians rather than scientists (Grundmann 2007; Miller and Edwards 2001). It is indeed a fact that some governments such as Saudi Arabia have in the past been known to engage in 'wording wars': tactics aimed at watering-down the tone of urgency in the SPM (Depledge 2005; Paterson 1996). Yet even the IPCC itself admits that many of its recommendations are based on

probabilistic evidence and that many important questions about climate change may never be conclusively answered.

A key concept that emerges in the context of the impossibility of absolute certainty about the robustness of the Earth System is that of *risk* (Oppenheimer 2005; see also Pellizzoni this volume). If indeed science is unable to determine precisely the capacity or limits of the Earth System, then what is the safe level of risk that should be permitted in climate policy making and on what basis should such a decision be made? Many economic libertarians have argued that the negative economic implications of huge cuts in carbon emissions far outweigh potential environmental benefits (Goklany 2008; Michaels 2012). They point to the strong links between carbon emissions and economic development and argue that the inconvenience of climate change is a rational price to pay for continued economic success and the improvement of the material quality of life for millions around the world (Goklany 2008). As the argument goes, even if global warming is caused solely by the burning of fossil fuels, restricting their use would have more damaging effects on the world economy than the increases in global temperature. Of course this argument is opposed by many who argue that early action to reduce emissions would help avoid much greater economic costs later, and would reduce the risk of catastrophic, irreversible change (Stern 2007). Governments have tended to rely on economists, with their standard techniques such as cost benefit analysis and contingent valuation, to work out the economic risks and benefits of tackling climate change now as opposed to deferring action to the future. But among economists, there is serious disagreement about what scale of effort is needed, the time for deployment of actions that makes the most economic sense, and how to allocate resources for climate mitigation and adaptation. The key issue in this debate is about the discount rate that should be used in economic and contingent valuation of climate change, which in ordinary terms quite simply

boils down to differing views about the costs, risks and benefits of taking early action versus delaying action to a future date (Ackerman et al. 2009; Barker 2008; Nordhaus 2007; Pielke 2007; Stern 2007; Tol and Yohe 2009).

It turns out then that debates about risk, regardless of the technical jargon involved, are essentially managerialist disputes about how to resolve different conceptions of value (Adger et al 2011; Neumayer 2007). It is basically about how much of climate and broader environmental governance should be predicated on precaution or utility; the basis on which utility should be calculated and how to reconcile different notions of utility. As stated, these are fundamental normative questions which neither climate science nor economic valuation can answer (see Wapner, this volume). As a no less eminent person than the IPCC chief scientist, Dr Pachauri admits, 'dangerous climate change is no doubt a question that must be decided on the basis of value judgment'. 'What is dangerous', he says, 'is essentially a matter of what society decides' (Pachauri 2006: 3). Hence even among believers in man-made climate change, there are deep disagreements about what scale of effort is needed and the best approach to addressing the risks imposed by climate change. One manifestation of this disagreement at the international regime level is the politics around stabilization targets. The Small Island States are aggressively pushing for a 1.5°C target as the official goal of international climate policy (Farbotko and McGregor 2010). The EU supports a 2°C target (which some argue is actually a political rather than scientific target) (Anderson and Bows 2008). Meanwhile, many of the climate laggards and their demagogues would prefer that international climate policy documents make no reference at all to stabilization targets (Cato Institute 2009).

Differences of this nature, which are underpinned by different perceptions of risk, account for much of the misunderstanding, wrangling and recrimination in international climate politics (Bodansky 2010, 2011; Death, this volume; Okereke and Dooley 2010; Okereke 2008; Rajamani 2011). For example, on Saturday 17 October 2009, in the run up to the Copenhagen meeting, the government of the small island of Maldives stunned the world by holding a cabinet meeting underwater, to highlight the threat of global warming to the low-lying Indian Ocean nation (BBC, 2009). Soon after the meeting the president accused the West of looking idly on while the Maldives and other Small Island States faced extinction as a result of climate change. Many other poor and climate vulnerable countries have also consistently argued that whilst they are already suffering massive impacts of climate change, much of the population and governments of the rich West continue to treat climate change as a future threat (Methmann and Oels this volume).

A fundamental weakness of the climate regime frequently noted by scholars is that mainstream policy 'underemphasizes, or more often ignores completely, the symbolic aspects of settlements, places and risks to them' (Adger et al 2011: 2). The mainstream approach also 'discounts the ethics of intergenerational equity' (Barker 2008:173), and tends to 'reduce all risks to aggregate measures of human welfare' (Adger et al 2011: 2). This approach, moreover, it is argued, cannot deal with the risk of irreversible changes nor the incommensurability of market and non-instrumental aspects of environmental and social change (Ackerman et al 2009; Neumayer 2007)

But it is not strictly speaking correct to say that climate policy ignores non-instrumental components of the environment. Rather, it would be more accurate to say that mainstream frameworks ignore these components and risks, so long as they are being borne by the poor

and underprivileged groups in the global community (see Bond, this volume). These are mostly the ones that have no power to press their claims in national and international policy making arenas. Norms and rules about what and how to conserve are after all not pre-ordained choices governed by rigid technical science. They are ultimately political decisions over which the powerful regularly exert influence at both national and international levels (Roberts and Parks 2007). In the final analysis then, climate change is about fairness, justice and equity (Okereke 2008). These concepts are more pertinent to climate politics when one recalls that the people who are primarily responsible for causing the problem are not the ones that are bearing much of the negative impacts of the change.

Key thinkers

The first important set of thinkers are those who highlighted the anthropogenic nature of climate change and took the call for urgent action into the mainstream political space, popular media and public consciousness. Here, a leading figure is NASA scientist James Hansen. Hansen helped to raise the profile of climate change and catalyze political action when he testified to a committee of the US Senate in 1988, claiming in his testimony that 'the abnormally hot weather plaguing our nation' was clearly due to global warming. Another leading voice was the then-Prime Minister of the UK, Margaret Thatcher, who in her address to the UN General Assembly, long before climate change became an issue fought from behind fixed ideological lines, described climate change as a challenge that in 'future is likely to be more fundamental and more widespread than anything we have known hitherto' (Thatcher 1989). The prospect, she said, 'is a new factor in human affairs... comparable in its implications to the discovery of how to split the atom. Indeed, its results could be even more far-reaching.'

Thatcher's speech helped galvanize action in United Nations including the establishment of the IPCC and the UNFCCC. Other advocates who helped embed the notion of anthropogenic climate change into public consciousness include Sir John Houghton who was the co-chair of the IPCC scientific assessment working group and the lead editor of the first three IPCC reports. Sir David King (2004), then the Chief Scientific Adviser to the UK government, attracted widespread attention to the issue when he said that climate change was a more serious threat than terrorism. He continues to be a powerful voice, galvanizing action on climate change at national and international levels. Professor Mike Hulme was one of the first to highlight the impact of climate change on the social and agricultural systems in Africa. His work (2001) showed that climate change was probably already having a far-reaching impact and increasing the vulnerability of those exposed to a host of other socioeconomic problems.

But the works of these scholars have not gone unchallenged. A leading climate sceptic was Bjørn Lomborg. His argument was that climate change was a real problem but that others are more important on the basis of his cost-benefit analyses (CBAs) (Lomborg 2001; c.f. Goklany 2008). Lomborg campaigned against the Kyoto Protocol and other measures to cut carbon emissions in the short-term, and argued that money should instead be spent on research and development for longer-term environmental solutions, and on other important world problems such as AIDS, malaria and malnutrition. His limited treatment of how CBA handles thresholds in the Earth System, and the fact that other CBAs reach different conclusions, limits the usefulness of this research. However, this and similar CBAs have been influential in affecting the views of public figures such as Nigel Lawson (2009), George W Bush, and companies that oppose action to reduce CO₂ emissions (Friel 2010).

Although as stated, there remain some voices against the need for global action on climate change, in fact the vast majority of academic discourse has long moved beyond questioning climate change to focusing on what the best approaches are for addressing the challenge. One can therefore organise the key thinking around the three main broad approaches or areas of focus: (i) institutionalism; (ii) critical perspectives; and (iii) ethical approaches. The rest of the section discusses these perspectives and highlights the works of key scholars.

The first is the institutionalist or managerialist approach which focuses on the mechanisms and procedures through which nation states and other key actors (e.g. corporations) in the absence of a world government can best co-operate to address the problem of climate change. Two leading thinkers on the institutional dimensions of climate change are Frank Biermann (2001; 2007; 2012; Biermann and Bauer 2005) and David Victor (2001).

Institutional scholars view climate change as an international problem that is best tackled through inter-state co-operation. They take the view that climate change is a collective action problem and that the most rational course of action is, therefore for states to collaborate to share the burdens and benefits of the cooperation entailed in addressing the problem. Institutionalists emphasize the prevalence of inter-state co-operative arrangements and the tendencies of states to regulate their practices in a fairly well co-coordinated manner given the right incentive structure (Keohane and Victor 2011; Young, 1994). The focus therefore is mainly on exploring ways to make international institutions for climate governance more effective both in terms of emission reduction and the allocation of costs (Keohane and Victor 2011; Oberthür and Gehring 2006; Victor 2001). Because states are seen as the main actors or

agency for governance as well as the primary locus of authority, there is less emphasis on the needs and potential agency of individuals, communities and other sub-national entities. Critically, the managerialist approach emphasizes the preeminence of economic efficiency as the central guiding principle in climate policy making (Victor, 2001). Economic efficiency is in turn mostly sought through reliance on the capitalist free market system. Biermann (2001; 2007; 2012, Biermann and Bauer 2005) has authored several highly influential contributions focusing on various aspects of institutions for international climate governance. He is well known for pioneering the concept of 'earth system governance' in 2005, which has evolved into a major global research programme in this field. His research identifies issues of architecture, regime interplay and fragmentation, allocation and regime stability as some of the key aspects needing more attention in order to advance effective international cooperation on climate change and other environmental problems. Some of his more practical recommendations which have inspired much debate in the literature include strengthening the UN system through the creation of a UN or world environmental organization, the creation of a UN Parliamentary Assembly and empowering existing bodies like the United Nations Environmental Programme with monitoring and sanctioning abilities (cf. Ivanova 2012) (see Death, this volume).

David Victor is renowned for his argument that the best way for nation states to deal with climate change is through the use of market instruments especially emission trading (Victor, 2001). This view, supported by many liberal economic scholars, has been heavily influential in climate policy making at global, regional and national levels with a lot of focus given to market instruments such as cap and trade (EU, Australia, group of states in the US), the clean development mechanism and international carbon offset (Barker 2008; Nordhaus 2007; Pielke 2007; Stern 2007). More recently and especially following the perception that the

Kyoto Protocol has not been effective in helping states reduce emissions, some institutionalists have begun to call for less “top down” and more “bottom up” approaches to global climate policy (Rayner 2010; Verweij et al 2006). The idea here is not to abandon states and the market as the key institutions for climate action. Rather, it is de-emphasize target-setting at the UN level and to encourage a raft of voluntary actions at the state level including especially green technology innovation and emission trading.

The managerialist approach to climate change governance is criticized by scholars from the Marxist inspired critical perspectives with Mathew Paterson (2000), Peter Newell (2001), and Larry Lohmann (2006; 2010) as some of the key thinkers. Here, the starting point is to highlight the relationship between the dominant capitalist economic system and climate change. Furthermore, critical scholars question the suitability of the state-based system as the main platform for addressing the problem of climate change. Paterson and Newell have argued in several places that “a perspective which starts from the role of the state in promoting capital accumulation can much better explain the content both of state policies and of particular international agreements” on climate change (Newell and Paterson 1998: 679; cf. Paterson 2000; 2007; Newell 2001; Newell and Paterson 2010). Critical voices also emphasize the structural power of capital, the role of historical materialism and the incredible ability of business to influence prevailing approaches to climate governance at both state and the international levels (Clapp 2005; Levy and Egan 2003). In addition to pointing out that a capitalist or market-oriented approach to climate change is ineffective in achieving realisable emission reduction and addressing the long term challenge of climate change, Larry Lohmann is noted for his emphasis that the core market instruments for climate governance such as carbon trading results in the further dispossession of the poor and the transfer of wealth from the global South to richer global North (Lohmann 2006; 2008; 2009; 2010). The

conclusion is that climate change is caused by the competition for resources engendered by the interstate system and the values underpinning the consumer capitalist economy. Hence, that it is futile to expect that climate change can be solved through the same system and processes and that caused it. But while critical scholars are very insightful in their critique of “climate capitalism” and the managerislist approach, they are less clear about the alternatives for addressing climate change.

An important apparent shift of emphasis has been made by key authors Newell and Paterson in their book entitled *Climate Capitalism* (2010). While acknowledging the problematic relationship between capitalism and climate change, they nonetheless suggest the dominance of capitalism makes it difficult to see how else to deal with climate change. They argue that the best chance to address climate change lies in mobilising and greening capitalist institutions and instruments such as the carbon market, and they conclude that ‘[c]apitalism of one form or another will provide the context in which near-term solutions to climate change will have to be found’ (p.161). In contrast, authors like Larry Lohmann (2010) remain adamant that it is inherently impossible to reorganise capitalism to accommodate genuine environmental solutions, because capitalism depends for its survival on primitive accumulation and in externalizing the environmental cost of production.

The third main approach is the more overt discussions of the distributive and ethical aspects of climate change. Leading thinkers here include Andrew Dobson (1998), Benito Muller (2001; 2002), and Dale Jamison (1992). Authors on the distributive dimensions of climate change focus on the differentiation in the cause and impact of climate change both within and across states. As stated in the previous sections, the core argument is that climate change is essentially a justice problem because it involves the rich imposing their burden on the poor.

Following, it is argued that questions of justice are imperative both in finding effective solutions to climate change and in getting an agreement that will be widely acceptable internationally. The works of Andy Dobson (1998; 1999) on the relationship between various notions of sustainability and different conceptions of justice have inspired a generation of scholars to explore equity implications of prevailing climate policy and alternative arrangements for achieving climate justice at domestic level at the realm of global climate regime, with emphasis on North-South climate justice (Garvey 2008; Okereke 2008; 2010a, 2010b; Gardiner 2011).

While a lot of work focuses on temporal and inter-temporal distributional implications of climate change, others highlight the general limitations of the dominant utilitarian economic philosophy and values that underpin conventional climate policy (Attfield 2003; Earth Charter 2000; Engel and Engel 1990; Palmer and Finlay 2003; Sandler and Cafaro 2005). The core argument is that drastic changes in the global environment raise fundamental questions about the dominant modes of relationship between human beings as well as their relationship to the environment and its non-human content. Specifically, it is argued that climate change is fundamentally caused by the quest for economic growth, and associated values such as greed, consumerism, competition and man's intent to dominate nature. The suggestion is to replace these utilitarian ethics with a broad range of other cultural and spiritual perspectives especially those that privilege precaution, moderation and sacrifice (Shaw 2009).

To be clear, climate ethics scholars do not contest the importance of economic information or effective legal frameworks in environmental decision-making. Nor is it suggested that rational self-interest is not a strong motivation for individual and public action. What is

contested is the 'more grandiose claim' (Jamieson 1992: 143) that utilitarian economics provides the most important benchmark for environmental policy decision-making. In other words, that an exclusively managerialist approach to climate change is bound to fail in that such an approach avoids a critical engagement with the underlying values and systems – e.g. greed, consumerism, unequal resource distribution, unfettered capitalism and economic liberal individualism, etc.—that are at the heart of current drastic changes in the environment.

Critical potential

Climate change offers much in the way of critical potential. Conceptually, it is perhaps the paradigm case which challenges the prevailing view of 'nature' as something that can and should be dominated to provide maximum material comfort. It presses the case for a more humble outlook or enlightened anthropocentrism that was dominant in society before *New Atlantis*. This view recognizes the need for moderation, humility and precaution (Charlesworth and Okereke 2010). Climate change has raised serious questions about the extent to which humans can externalise the cost of economic production and consumption without undermining the very basis of human existence itself.

Unimagined tipping points in the Earth System and climate system raise profound questions about the notion of risk. Where there is not actual data from experience (and perhaps even where there is), basing policy decisions entirely on utilitarian cost benefit analyses entails a significant leap of faith. Although nearly all political decisions entails some form of uncertainty and risk calculation, the prevailing approach which privileges market economics over intrinsic value of nature constitutes a major hindrance to addressing long term climate change.

In general, contemporary policy processes tend to have very short time horizons related to elections, media attention and perhaps most importantly the quarterly financial returns of stock-market listed companies and the instantaneous whims of financial speculation. It is instructive that calls for urgent action on climate change have all but been put on the back burner since the onset of the global economic crisis in late 2008. Recent events in Canada, Australia and the United States demonstrate clearly that government policies and action on climate change is contingent on political expediency. Canada pulled out of the Kyoto Protocol and has aggressively encouraged oil mining from tar sand in a bid to boost its flagging economy. The Australian government had its proposals for a carbon tax drastically altered, following campaigns and threats from the coal industry. The first Obama administration had to 'park' proposed legislation on climate change to secure the support of the Republican-dominated senate for his financial and economic reforms. The long-term nature of climate change makes short-term approach to policy very unsuitable and ineffective (Anderson and Bows 2008). Even if an assumption is made that there will be no abrupt climate changes, it should be noted that the burdens of increases in global mean temperature, droughts, floods and other extreme weather events are already on many of the current global poor who have contributed the least to climate change (Oppenheimer 2005; Sundaraman 1995). Given the actual harm occurring now, which is attributed to climate change, the wealth of literature that discusses questions around climate change and future generations is perhaps intrinsically 'academic', and is even more so when the literature tends to use lack of knowledge of future generations' preferences almost as an excuse to maintain their own ideological positions – often little more than business as usual (c.f. Böhm and Dabhi 2011; Harvey 2006, 2010; Lohmann 2006; 2008).

As we have already seen, the conceptual questions raised by climate change immediately raise ideological questions. In particular, difficulties in framing markets make the marketization of carbon difficult to justify unless substantial emission reductions can be unquestionably demonstrated prior to that marketization (Böhm and Dabhi 2009, 2011; Bumpus and Liverman 2008). The experience of carbon marketization only reinforces these issues (see Paterson, this volume). There are indications that existing carbon markets have made rich people richer and not reduced emissions (Böhm and Dabhi 2009; 2011; Lohmann 2006; 2010). Questions related to other markets are more complex, but unless they are local exchange subsistence markets there is a likelihood they end up promoting increased resource consumption and associated emissions (Lohmann 2008; 2009). These observations further reinforce the importance of questions of justice (see Bond, this volume). If justice is not seen as to each according to what the capitalist market dictates, then the rich getting richer through relatively little work, whilst the poor and vulnerable get more exposed to climate risks, must surely be unjust (Okereke and Schroeder 2009; Okereke 2011). Henry Shue puts it aptly when he said, 'whatever justice entails, it is clearly not justice to ask the poor to sell their blankets so that the rich can keep their jewellery' (1992: 453). Yet it needs to be acknowledged that while the intuitive appeal to climate justice at the global level is strong, outlining what exactly it entails and how that might be achieved in the anarchical inter-state system is a very challenging task.

Arising from all of this, there has been much discussion of how relevant states are for a global issue such as climate change (Okereke et al 2009; Paterson, 2000; see Kuehls, this volume). As stated, the competition for resource accumulation engendered by the logic of the state and the related imperative to protect domiciled companies has been identified as a major cause of global environmental degradation (Paterson 2000). However, states can set a legal

(soft or hard law) framework in which companies and capitalism work, in a way that no other actor can (Barry and Eckersley 2005; Eckersley 2004). Yet, since state authorities achieve their mandates to govern through democratic elections and are mostly interested in their re (elections), it is evident that states' ability and willingness to challenge vested interests will depend to a large degree on the measure of support they get from citizens. Hence a critical question is really to what extent climate change can serve as a mobilizing force for global citizens to press for fundamental changes in the structure and functioning of the prevalent economic order (see Price et al, this volume).

If the underpinnings of such utilitarian economics struggle to provide a basis for effective climate policy, to what else can we look? MacIntyre (1990) powerfully argues that virtue provides a better approach to dealing with complex political and environmental problems than dominant free market capitalism and associated economic cost benefit analysis. Developing from MacIntyre, one approach could be the elevation of virtue ethics which emphasizes precaution, moderation and sacrifice (Shaw, 2009). One common criticism is that ideas of virtue vary widely between cultures (e.g. Statman 1997: 20-23; Loudon 1984). However, for environment and development questions the Earth Charter (2000), Engel and Engel (1990), Palmer and Finlay (2003) among others suggest sufficient similarity to enable talk of a global virtue tradition. This tradition sees greed, selfishness, gluttony vices and justice, wisdom, courage and moderation as cardinal virtues that resonate across cultures (cf. Sandler and Cafaro 2005). Yet, even on a broad level translating these virtues into practical policy making at the global level cannot by any means be seen as an easy task.

Conclusion

Climate change raises critical questions that much theoretical and practical (environmental) politics tends to ignore or under emphasize. Firstly, despite widely appreciated shortcomings, much of climate discourse and policy continues to elevate probabilistic prediction science as the basis for global climate public policy (see Forsyth, this volume). To worsen matters, the blind faith in prediction is matched by a strong ideological commitment to utilitarian economic tools as the basis for deciding environmental value and actions that are worthwhile in saving the planet. Despite ample evidence of poor performance, governments are fixed on the idea of commodifying carbon and constructing different types of carbon market as inevitable tools in solving climate change (see Paterson, this volume). As ever, conventional wisdom remains that there is no alternative to markets. The result appears to be little more than business as usual with plenty of rhetoric and little in the form of adequate action.

Moreover, the four or five year perspectives promoted by electoral cycles means that representative democracy has difficulty taking a long term perspective, particularly when the purchase of media coverage to engage voters means that candidates literally owe a debt to the large corporations that tend to have sufficient disposable income. Thus forms of democracy that can take a longer view and are also better able to deal with difficulties in predicting climate change appear to be needed. Such forms of directly democratic policy making have received extensive attention (Dryzek 1987, 1990; see also Hinton, this volume). That participative policy processes are mandated by international agreements including *Agenda 21* (United Nations 1992) adds to the impetus for these processes to complement existing representative (electoral) democratic processes.

But in the absence of strong global institutions for governing sustainability (see Baker and Death, this volume) the burden of climate change continues to fall disproportionately on

those that have least caused it. Climate change thus brings questions of global justice to the fore (see Bond, this volume); it also suggests the need to go beyond utilitarian ethics and unbridled anthropocentrism (see McShane, this volume). While the suggestion to accord non-human nature moral rights as implied in ecocentrism may be going too far, there is certainly the need to embrace ethical approaches that emphasize the unity of all beings. Some form of cautious anthropocentrism or of what Welchman calls 'enlightened anthropocentrism' (Welchman 1999), should be sufficient to promote more care and prudence in our dealings with nature (see Wapner, this volume).

Further reading

Mike Hulme (2009) *Why We Disagree about Climate Change Understanding Controversy, Inaction and Opportunity*, Cambridge: Cambridge University Press.

Newell Peter and Paterson Matthew (2010) *Climate Capitalism: Global Warming and the Transformation of the Global Economy*. Cambridge: Cambridge University Press.

John Dryzek, Richard Norgaard and David Schlosberg (2011) *The Oxford Handbook of Climate Change and Society (Oxford Handbooks in Politics & International Relations)*, Oxford: Oxford University Press

Frank Biermann and Philipp Pattberg (2012) *Global Environmental Governance Reconsidered (Earth System Governance)*. Cambridge, MA: MIT Press.

Victor David (2001) *The Collapse of the Kyoto Protocol and the Struggle to Slow Global Warming*, Princeton: Princeton University Press.

Anthony Giddens (2011) (2nd ed.) *The Politics of Climate Changes*, Cambridge: Polity

Useful websites

Authors' final version after peer review corrections

Intergovernmental Panel on Climate Change <http://www.ipcc.ch/>

United Nations Framework Convention on Climate Change <http://unfccc.int/>

The 350 campaign: <http://www.350.org/>

A commentary site on climate science by working climate scientists
<http://www.realclimate.org/>

Global Governance Project: <http://www.glogov.org/>

Earth System Governance Project: <http://www.earthsystemgovernance.org/>

Climate Ethics blog: <http://rockblogs.psu.edu/climate/>