



International Dimensions of Climate Change

Report 1.3: Ethical, Social and Behavioral Impacts of Climate Change

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Executive Summary

1. There is a complex relationship between social, behavioural and ethical aspects of climate change. Policymakers have become increasingly concerned to understand the factors that can influence the behaviour of citizens, in order to improve the targeting of messages to individuals and households concerning 'pro-environmental' consumption and to supplement policies for supply-side change (new technologies and infrastructure). Research into behaviour change has highlighted numerous barriers to individual action and demonstrated that there is a need to understand far better the social and structural factors at work in influencing attitudes and behaviour. People respond not only to individualised messages and incentives but also and decisively develop their choices, practices and attitudes in relation to social norms and networks.

2. The ethical aspects of the climate issue need to be approached in two ways. First, there is the normative discussion of principles, choices and consequences: how *should* we act on climate change? We are not primarily concerned here with this vital question, though we draw attention below to the major normative issues that are thrown up by climate change and climate policy and to the large emerging literature on the ethics of climate disruption and policymaking.

3. Second, there is the descriptive sociology and psychology of moral behaviour, values and attitudes: here the question is not how we should behave but how we come, as a result of social relations and systems, to hold the normative views we do. In this context, research indicates once again the power of social networks, and also the importance of overall worldviews and exposure to discussion of values in media and other settings. It is also important to note the 'embeddedness' of ethical positions in everyday life - in the assumptions, default stances, taken-for-granted positions and values inherent (explicitly or implicitly) in particular communications, policies, regulations, negotiations, media representations, advertisements, and so on.

4. Ethical issues pervade the field of climate change policy. These principally concern the balance of responsibilities for action and questions of justice arising in relation to impacts on people who have little or no role in creating the problem. Other major ethical considerations include:

- questions of fairness and justice within countries;
- empathy, justice and fairness between countries;
- justice and fairness between generations, including the question of the social discount rate to be applied in assessment of costs and benefits in economic calculations;
- historic responsibility and 'reparations'
- procedural justice ;
- human rights;

- ethical implications of technological policies;
- connections between climate change and other issues raising deep questions of equity and human rights;
- the status of non-human life

5. Key points for scenario development from conceptual and empirical research to date on social, behavioural and ethical dimensions of climate change include:

- environmental issues in general and climate change in particular are marked by a *value-action gap* among citizens and organisations: stated beliefs, attitudes and values are imperfectly (or even not at all) translated into practical action commensurate with the views held, or with willingness to pay and make perceived sacrifices;
- priority attached to environmental issues and action is reduced (though not removed) by experience of economic downturns'
- priority increases when high-profile events occur, but sustaining this depends on supportive social and infrastructural frameworks;
- some attitude surveys post-Copenhagen indicate a decrease in 'belief' in climate change and less acceptance of the full expert analysis, ie it is happening and is largely or wholly driven by human action; these trends seem to reflect a) economic pressures, b) 'culture war' disagreements in mass media, c) scandals and errors affecting IPCC and UEA, and d) some forms of 'fatigue' in hearing about climate threats; however, majorities still consider climate change to be real and serious, reflecting a long period of developing expert and wider social and political consensus and growing salience of climate issues in mass media;
- public sense of agency (ie, personal capacity to act and efficacy) in relation to climate change is low, reflecting the scale of the issue, mixed messages from policymakers, and lack of economic and social incentives for change in outlook and action; government and business are expected to take the lead;
- a minority of citizens has internalised an ethical 'green' outlook and takes action accordingly (though still subject to a value/action gap), but is not yet politically, culturally or socially influential and 'aspirational' enough to exert much influence among the rest of the public. However, this outlook has had considerable 'osmotic' effect over the past 40 years and can be expected to gain ground unevenly;
- citizens form their attitudes and values from a complex and shifting mix of mediated 'testimonial knowledge' that is a blend of information from many sources, attitudes and outlooks shaped by local context, wider culture and peer cues, incentives and pressures, mass media, advertising, the arts, official information and so on. While increasing coverage of scientific consensus on climate in media and politics has contributed to majority acceptance of the case that climate change is real and man-made, provision of factual information *on its own* may make little difference to attitudes, values and knowledge: these will

shift as a result of many other factors, above all changes in social pressures, cues and incentives that integrate new behaviour with a socially acceptable set of activities, identity and stories; and it seems likely that those with worldviews disposed against the perceived implications of climate policy will remain resistant to the weight of evidence from the IPCC;

- segmentation analysis, public opinion surveys and social science research and models underline these points and highlight the persistence of clusters of attitudes and values hostile or indifferent to climate change messages, alongside a substantial body of opinion that has accepted the diagnosis of change to differing degrees;
- there is considerable questioning by citizens and ‘contrarian’ campaigners, and by many scientists and activists on the ‘other side’ too, of the frequent use of ‘apocalyptic’ language and imagery in relation to climate change, with criticism of such discourse from NGOs and governments ranging from the argument that it induces fatalism to the view that it goes beyond what is warranted by the established body of climate science and modelling evidence;
- changes in these clusters of opinion and values will take place as a result not only of increasing evidence and political consensus but also of changes in social incentives, infrastructure, authoritative agenda-setting bodies and networks (employers, religious communities, educational bodies, mass media, celebrities, local neighbourhoods, communities of interest, etc);
- in the absence in some scenarios of significant change in climate in the UK in coming decades, much will depend on the methods and metaphors used to communicate the probable and possible changes that need to be averted through costly and controversial action now. This means that ‘culture war’ conflicts over the validity of the science and risk assessments deployed by government and other authorities are likely to continue and indeed could intensify;
- ethical aspects of the climate change debates have been highlighted consistently by NGOs (environment, anti-poverty, human development and rights) and faith communities, and by vulnerable developing countries; the extent to which ethical arguments make a difference to public opinion and action will vary depending on the trust inspired by those making the case, the relevance felt by sections of the public to their own outlook, and the exposure of people to convincing evidence and empathy-inducing experience and information;
- human rights and other ethical issues will continue to be highlighted by NGOs and churches/other faith communities, and are also likely to be magnified by diaspora communities of immigrants (and not only first generation) in the West, an issue of particular relevance to the UK and especially to London and other big multicultural cities.

6. Impacts on community cohesion in the UK are difficult to assess and would be hard to distinguish from the effects of other developments, such as increased economic migration from across the EU. The possibilities range from increased tension and conflict at domestic as well as global level, to heightened empathy and cooperation at domestic and potentially global level. Greater migration from the global South and the EU could - especially if it occurs in pulses that bring many people at once - lead to political and cultural tensions. More gradual change brings fewer risks of unrest and could enable a rise in empathy and understanding, and consequent pressure for more radical policies on climate from UK Government, business and other actors.

7. Government approaches to behaviour change and influence have been dominated by the model of information provision, with the assumption of a chain of influence from information to awareness to changes in behaviour. It is now recognised that a much more complex and sophisticated approach is needed, drawing on understanding from social science of the sources of behaviour change and motivation. It seems likely that approaches to public attitudes and action will be increasingly informed by social science and by opportunities for influencing via social network media, community groups and trusted peer networks. In scenarios in which public trust in government messages and authority remains relatively low, we might expect to see more effort put into indirect influencing via trusted third parties in civil society, through new forms of public engagement and policy dialogues.

8. This points to a probably enhanced role for civil society actors (community associations, social networks, NGOs, faith communities, and so on) as convenors of debate and experimentation about lifestyles, consumption and responsibilities in the light of climate change and related issues.

9. It is suggested that in the light of the social and ethical dimensions of climate change, more needs to be done to develop such finer-grained narratives and models of social change. It is proposed that richer scenarios for international dimensions of climate change would need to include consideration of the following:

- the impact of potential changes in citizens' capacities for taking action to modify consumption behaviours;
- Changes in cultural norms: these could include consideration of the role of faith traditions globally, and of civil society in UK and beyond;
- reflection of the extent to which changes in values and behaviour are driven by *group-based shifts and changes in enabling infrastructure* allowing changes in practices of consumption and related values;
- the operation of worldviews and implicit value orientations in climate change negotiations and development of policies and priorities in the UK and beyond;
- the consequences of the mismatch between probable UK and Western climate impacts and those forecast for many regions in the global South: this increases the potential for conflict and tensions based on perceived impacts and responsibilities

- the development of political and social ‘niches’ and processes for debate about climate justice, distributional issues and procedural justice in mitigation and adaptation
- the connection of climate change politics to wider shifts in attitudes, values and the strengths and weaknesses of solidarity (cooperative attitudes and values) within society by contrast with ‘zero-sum’ attitudes and values.

10. Scenario frameworks have been developed that have begun to reflect some of these factors in more detail than has been done for the SRES series and other major scenario sets. Examples are outlined below in section 8, and we recommend that IDCC scenarios take account of these.

11. As an illustration of what could be developed, a scenario model for international implications of climate change that incorporated factors relating to values, political responses and pressures from civil society could be generated as follows:

- An axis opposing Zero-Sum approaches to justice, ethics and dilemmas with Rules-based Cooperative approaches to mitigation and adaptation;
- An axis opposing global negotiation and frameworks for action to fragmented patterns of bi- and multi-lateral and multi-level cooperation;
- This would generate a four-fold set of scenarios to the 2030s on these lines:
 1. Ethically informed global deal in a rules-based system developed coherently by state and private/NGO actors
 1. A Realpolitik-based global deal imposed by major powers in a zero-sum system
 2. A fragmented Realpolitik approach to bi- and multi-lateral deals in a zero-sum system
 3. An ethically informed mosaic of bi- and multilateral / multi-level deals in rules-based systems developed by a fragmented set of partners across sectors and levels

1. Introduction

1.1 Overview

This working paper reviews issues concerning social, behavioural and ethical dimensions for Work Programme 1.3 of the IDCC project on climate change. The Work Programmes themes are summarised in the box below.

WP1.3 issues

What could climate change mean for human rights in the future?

How might the UK's policy on international development and assistance be affected by climate change (e.g. future of Millennium Development Goals (MDG)). How might this affect how the UK is viewed by the international community?

How might social and non-material impacts of climate change (i.e. those that can not be given a price in financial terms) be valued?

How might community/social cohesion be affected?

This may include the effect upon the UK public's:

- Level of awareness and actual knowledge of climate change;
- Degree of concern of climate change;
- Perceived risk of climate change and confidence in science;
- Willingness to pay/sacrifice to mitigate or adapt to negative impacts;
- View on who is responsible for climate change (e.g. government, business, individual, etc).

How may climate change impact upon the role of governments, organisations and communities in changing/controlling public attitudes and behaviour?

1.2 Structure

This second version is organised as follows:

- section 2 outlines methodology and assumptions;
- section 3.1 summarises the major ethical issues arising in relation to climate change and climate policymaking ;
- section 3.2 reviews the main issues arising in relation to understanding behavioural, attitudinal and social aspects of climate change;
- section 3.3 outlines a framework for understanding the interaction of behavioural, social and ethical dimensions of climate change;
- section 3.4 outlines a 'narrative' of possible developments as climate change affects the role of governments, organisations and communities in changing and controlling public attitudes and behaviour;
- section 3.5 draws on this framework in outlining potential developments in relation to human rights, international development, valuation, public awareness and political actors;
- section 3.6 comments on the treatment and implications of social, behavioural and ethical aspects in a range of climate change and climate policy scenarios.

2 Methodology and Assumptions

2.1 Methodology

The method for the study was:

- desk review of literature on social, behavioral and ethical aspects of climate change;
- discussions with a small number of expert informants
- analysis of specific questions and scenario studies in the light of literature review

Our approach draws on available evidence bases in academic, opinion research, scenario analysis and policy literatures relating to each of these areas, and to focus also on major recent debates and framings of the issues in academic and policy circles on the ethics of climate change, intergenerational equity, and equity between affluent and disadvantaged people and states. We also make connections between the social and ethical dimensions and discuss the policy implications of these interactions. In doing this we have drawn in section 3.4 on latest research into the social psychology of environmental concern, action, values and behavior change, and in particular on the multidisciplinary programme RESOLVE funded by the Economics and Social Research Council (ESRC) and led by Professor Jackson. RESOLVE focuses on the values, attitudes and behavior changes associated with sustainable consumption and low-carbon living, and on barriers and incentives to action among communities and households. We comment on the social and behavioral aspects of the IPCC scenarios framework known as SRES (IPCC, 2000) as specified in the brief, and also we have commented on other scenarios in relation to ethical, social and behavioral implications. We conclude with an outline of a scenario framework that reflects the social, behavioral and ethical factors discussed in the paper.

2.2 Scope

We focus on the central questions posed for the project concerning implications for:

- public understanding, behavior change and attitudes;
- human rights
- social cohesion
- weight given to social and non-material impacts of climate change
- implications for development policy, aid and trade and perceptions of the UK's role and standing in the international community

We outline and explore in the sections below:

- connections and tensions between ‘consumer’ and ‘citizen’ identities in the UK and beyond;
- current best understanding of the motivations for and against sustainable consumption and lifestyle changes;
- current best understanding of the ‘value-action’ gap evident from opinion research and in-depth studies of consumption changes;
- the social, ethical and political factors influencing varying responses from citizens to the diagnosis of climate change and prescriptions for action calling for ‘behavior change’;
- dependence of changes in lifestyles not only on articulation of countervailing values but also on development of supportive and attractive social frameworks for lifestyle change;
- reasons for resistance to climate policy and science, and to lifestyle change;
- potential developments that could reinforce resistance or promote willingness to change consumption patterns and support more radical changes in policy.

2.3 Assumptions

Understanding of social, behavioral and ethical change

The paper draws on a wide range of literature and attempts to outline the implications of recent research for understanding of the processes of behavioral change, how individual behavior is linked to wider social patterns and influences, and how these could interact with ethical perspectives and positions. In doing this we summarize a highly complex set of fields that are not connected by well-defined general theories. A great deal of work remains to be done to develop generally accepted theoretical models in psychology, sociology and the emerging field of ‘behavior change’ studies relevant to policymaking. Much remains to be done also to apply insights from these fields to climate change issues, although it can be expected that the major research efforts underway in the UK and beyond on social scientific understanding of environmental change, behavior and values (such as the Research Councils’ Living with Environmental Change programme and the new Sustainable Lifestyles Research networks) will add considerably to theoretical work and the evidence bases needed by policymakers.

Treatment of ethical issues and positions

The terms ‘ethical’ and ‘ethics’ can be used in both normative (or prescriptive) and neutral (or descriptive) ways. The first in effect advocates a particular ethical position, whereas the second simply reports on ethical positions held, without making any judgment about them.

This distinction is an important one. In this paper we are commenting on the ethical stances that might be adopted by particular actors and organisations, and on the ways in which ethical disputes and claims might play a role in the politics and psychology of climate change. We are not concerned to advocate any particular position.

A further important point to make is that ethics do not come into play only at the level of individual decision-making and attitudes but are also, and unavoidably, embedded in social, political and economic processes and structures.

3 Analysis

3.1 Context

3.1.1 Ethics and international climate policy

The recent UN conference on climate policy at Copenhagen highlighted fundamental problems in the framing of climate policy debates and in the integration of ethical, social and behavioural factors in the development of policy:

- Explicit normative framings of the issues at stake were presented by various groups - such as the alliance of small island states, and the numerous NGO campaigners meeting alongside the Conference of the Parties. These positions emphasised arguments that assign ethical responsibility primarily to the industrialised countries to take urgent action for mitigation, assistance in adaptation to developing countries, and so on;
- The Kyoto framework assumes and includes an ethical stance in which primary responsibility for emissions reduction falls on the industrialised countries, via the policy of common but 'differentiated' responsibilities among nations;
- Alternative frameworks proposed for mitigation - such as Contraction and Convergence (Meyer, 2000) or Greenhouse Development Rights (Baer et al, 2008) - also represent distinctive ethical stances, emphasising the need for and right to increased energy use for development for the poor world, with attendant demands for change in industrial world consumption patterns as a matter of perceived social and ecological justice;
- The complex ethical dimensions of climate change mitigation and adaptation, in particular those relating to contested ideas of justice and responsibility, were not highlighted in the Copenhagen conference's final outputs. Nevertheless, positions that are unarguably ethical in the neutral descriptive sense - and often problematic - were present throughout the negotiation in multiple contexts;
- For example, the implicit ethical model at work in the negotiating stance of the major powers: this was utilitarian and abstract, geared to assessment of a calculus of costs and benefits specified in economic

and cash-value terms. Yet this is vulnerable, as noted in section 3 below, to criticism on grounds of inability to handle major issues raised by climate change, such as historic 'ecological debt' and responsibility among developed nations and sectors; responsibilities towards future generations; the value to be placed on non-human life and avoidance of mass extinctions; and inability to motivate major change by citizens;

- The scale of the ecological, economic, political and ethical issues at stake generated a high degree of rancour, resentment, frustration and distrust. This was evident at Copenhagen in the tensions between states and leaders; between and within blocs of states; between and within NGOs and other lobbies; between mass media and the scientific community; and between citizens and decision-makers.
- This has been reinforced since Copenhagen in the arguments over the University of East Anglia (UEA) emails, the location of blame for perceived failings of the Copenhagen process and outcomes, the quality control in the IPCC process and the prominent presence in mass media and the Internet of 'climate scepticism' promoted via networks of highly motivated 'contrarians' and 'deniers'. Although there is little evidence that scepticism has grown significantly (see Upham et al, 2009; Spence et al, 2010), the access of 'contrarians' to many media outlets can give the impression of much more balance between their views and those of the IPCC consensus than is the case. Climate change is profoundly contested, caught up in ethical and cultural disputes between particular worldviews and values, and the science and policy assessment processes are inherently political and cannot be divorced from wider questions of values and priorities (Hulme, 2009).

3.1.2 The ethical, social and behavioural dimensions of policy

Policymakers and politicians concerned with climate change have focussed attention for many years on the technological possibilities for mitigation and adaptation. There is no doubt that new technologies, and more efficient generations and use of existing technologies, are essential for effective mitigation and adaptation strategies. However, while technological measures are necessary and will be a major contributor to state and business policies in coming decades, they will not be sufficient. The reasons for this are clear from research and policy analyses noted in later sections and are summarised below:

- if we are to sustain a rising population, increased consumption in poorer countries, and high consumption in the West, while avoiding a dangerous rise in global temperature, efficiency gains in energy use on an heroic scale are needed. These are of the order of at least a 21-fold and potentially (in an equitable scenario) a 55-fold decrease in carbon intensity of the economy by 2050; it must be questionable whether this is achievable in time, even if it is practicable at all (Jackson, 2009);
- this is taken by many campaigners to indicate an urgent need to rethink current, high consumption models of 'progress' ; of what is meant by having 'a high standard of living' and of being a 'developed' country – and the values and worldviews that underpin these models. This stance is highly contested by those who see advances in science

and technology as capable of dealing with climate change, thus avoiding the need for changes in consumption and related values. But policymakers in the West frequently accept that alongside large-scale technical innovations for climate change mitigation and adaptation, there will need to be changes in consumption patterns and values;

- rapid development and diffusion of new technologies and infrastructures need social consent and public understanding of the balance of risks and benefits, and of the potential impacts of use - such as rebound effects;
- consent and understanding depend in turn on the political, cultural and social 'framings' of the issues at stake, and the inadequacy of these to date is clear from the persistence (and even increase in some segments and countries) of public resistance to the diagnosis of climate change as real, anthropogenic and demanding urgent and costly action;
- limits on consumption required by climate policies (for example, via price rises in fossil energy supplies) raise issues of social equity and justice: who decides, and what provisions are made for the poor in relation to new scarcities and price increases?;
- effective action for climate change mitigation and adaptation must be sustained over decades and across sectors, states and levels of governance: this all requires high levels of trust, cooperation, accountability and mutual understanding of the issues and principles underpinning long-term strategies;
- it seems unlikely if not impossible for climate action to be motivated solely by appeals to long-range self-interest or even prudential reason: if some forms of 'sacrifice' and restraint are needed in the West and beyond, then appeals also need to be made to values and ethical frameworks consistent with these.
- a large and growing literature here (summarised in Jackson, 2009) strongly suggests that, after a certain point, increased consumption does not need to increased happiness or well-being, and may even decrease it. Under certain conditions it appears that we can increase well-being while decreasing consumption – the so-called 'well-being dividend'. Clearly there is opportunity here; not just the cost of sacrifice and restraint.

3.1.3 Understanding the social and ethical elements of climate policy

There is a complex and close relationship between social, behavioural and ethical aspects of climate change. Policymakers have become increasingly concerned to understand the factors that can influence the behaviour of citizens, in order to improve the targeting of messages to individuals and households concerning 'pro-environmental' consumption (DEFRA, 2008) and to supplement policies for supply-side change (new technologies and infrastructure). Research into behaviour change (summarised in section 3.3 below) has highlighted numerous barriers to individual action and demonstrated that there is a need to understand far better the social and structural factors at work in influencing attitudes and behaviour. The 'framing' of climate change messages as exhortations or incentives aimed at

individuals is called into question, as people respond not only to individualised messages and incentives but also and decisively develop their choices, practices and attitudes in relation to social norms and networks (see for example Shove, 2003; Jackson, 2005; Crompton, 2008).

Moreover, as already indicated above, there is a need to consider the ethical dimensions of climate change in this context. The ethical aspects need to be approached in two ways. First, there is the normative discussion of principles, choices and consequences: how *should* we act on climate change? We are not primarily concerned here with this vital question, though we draw attention in section 3 below to the major normative issues that are thrown up by climate change and climate policy, and to the emerging literature on the ethics of climate disruption and policymaking. Second, there is the descriptive sociology and psychology of moral behaviour, values and attitudes: here the question is not how we should behave but how we come, as a result of social relations and systems, to hold the normative views we do. In this context, research indicates once again the power of social networks, and also the importance of overall worldviews and exposure to discussion of values in media and other settings.

It is also important to note the 'embeddedness' of ethical positions in everyday life - in the assumptions, default stances, taken-for-granted positions and values inherent (explicitly or implicitly) in particular communications, policies, regulations, negotiations, media representations, advertisements, and so on. An obvious example is the assumption made explicitly and implicitly in most of these institutions and practices of the desirability and feasibility of indefinite growth in the economy, and the marginal status of critiques of this view (see for example Jackson, 2009). Another example is the embeddedness of a large range of assumptions about *costs, benefits and acceptable levels of potential loss and damage* in the acceptance of the 2 degree C upper limit on tolerable global average temperature increase. Numerous delegations from vulnerable developing countries pointed out that there were ethical issues at stake in the rejection by the majority of 1.5C or 1C as 'target' temperature increases, given the projected impacts around the world expected if the temperature rises by 2 degrees overall.

3.2 Ethical issues arising from climate change

3.2.1 Overview of challenges

Ethical issues pervade the field of climate change policy (Gardiner et al, 2010). These principally concern the balance of responsibilities for action and questions of justice arising in relation to impacts on people who have little or no role in creating the problem. The Copenhagen Accord acknowledged key issues relating to equity and justice in the Kyoto framework, principally the idea of 'differentiated responsibilities', relating the burden of emissions reduction to the very different capacities of the developed and developing country groupings. Moreover, ethical aspects were raised by the civil society delegations attached to the COP and also by numerous developing country

delegations. Bolivia has since convened an 'alternative COP' that focused on civil society, human rights, perceived injustice in the treatment of developing countries, and so on. Climate change raises complex ethical considerations - Gardiner (2006) sees the combination of dispersion of causes and effects, across both time and space, and the lack of an adequate moral theory in the face of climate change and its implications, as creating a 'perfect moral storm' that makes ethically legitimate action very difficult. On the other hand, Singer (2006), Garvey (2008) and Harris (2010) argue that basic and widely accepted principles of distributive justice (for example) clearly apply to climate change and have significant and clear implications for action.

Other major ethical considerations include:

- questions of fairness and justice within countries;
- empathy, justice and fairness between countries;
- justice and fairness between generations, including the question of the social discount rate to be applied in assessment of costs and benefits in economic calculations;
- historic responsibility and 'reparations'
- procedural justice ;
- human rights;
- ethical implications of technological policies;
- connections between climate change and other issues raising deep questions of equity and human rights;
- the status of non-human life.

3.2.2 Fairness and justice

The key issues at stake concern fairness and justice within and between countries: how should the burdens and incentives associated with changing behavior be allocated, and how can the needs of the worst-off be met at all scales from local to global? Should there be 'compensatory' payment to vulnerable countries, and on what basis? Should and could climate policy aim to support some form of global redistribution to enable poorer countries to adapt to changes and to mitigate their own emissions while still being enabled to grow their economies? What, if anything, is 'owed' by the industrialized countries to the developing world, and in particular to the worst-off people and places who stand to lose most from projected changes? What is the relationship between climate change and human rights (see section 7 below)? Climate change raises the issue of 'double disadvantage' (Walker, 2009) at domestic and international levels: the poorest will tend to be disadvantaged or harmed 'first and worst' by climate change impacts, despite having the least responsibility for the emissions causing the damage and despite having the least resources for mitigation and adaptation (see Adger et al, 2006). Walker (2009) illustrates the point with evidence from the UK: the lowest two deciles of the population in terms of income are at much greater coastal flood risk (35%) than highest two (4%); and the lowest two deciles account for lowest CO₂ emissions, whereas highest two deciles account for most. This problem applies at scales all the way to the global level. The issues raised are closely bound up with the ethics, politics and psychology of policy towards the poor

generally: who counts as 'deserving' for assistance within welfare states in the West (see Horton and Gregory, 2009, chapter 5) and within the framework of international aid policy? Note that the particular normative and political stance assumed by many campaigners - attributing overwhelming responsibility to the West, and focusing most criticism on the West, and especially on the USA - will become harder to maintain as emissions and impacts grow from the industrialization of much the developing world, and as developing countries use climate change negotiations to advance particular national interests. For example, China is now the largest emitter by volume (though of course not on a per capita basis) and its stance at Copenhagen was rooted in perceived national economic self-interest and Realpolitik, arguably at the expense of the most vulnerable developing states.

3.2.3 Intergenerational issues

Questions of justice and fairness also arise in relation to time, given the need to consider climate change impacts over decades and centuries. Most interpretations of sustainable development suggest that the reach of environmental impacts in the past and present into the far future implies a need for policies for inter-generational equity, enabling those unborn to inherit ecological services at least as resilient and healthy as those we have enjoyed (World Commission on Environment and Development, 1987). But the status of future generations is unclear in law and still more so in politics and policymaking. Can people 'in' the future be said to have rights and claims on the present? How does the demand for intergenerational equity fit with demands for intra-generational equity within and between countries in the present day? And how far into the future would responsibilities of present-day people be reasonably thought to extend, given that it is often argued that we might reasonably expect future generations to have access to new technology and more wealth with which to deal with the problems they face? The issues come sharply into focus in relation to the social discount rate to be applied to calculation of costs and benefits and impacts on future people (see Caney, 2008). A high discount rate reflects assumptions about the needs, significance and probable capacities (wealth, technology) of future people such that people in the present are given more weight. A low or zero discount rate reflects an assumption of equal weight for different generations and also takes into account the need in future generations for unsubstitutable natural capital that could be undermined seriously by climate change, weakening the conventional argument that it is reasonable to assume greater wealth and technological capacities in the future. The Stern Review (Stern, 2007) makes clear the ethical dimensions of this discussion: it is not simply a technical issue in economic theory and measurement, as it depends on assumptions we make about human needs, justice, risk and degree of dependence on the natural environment. The issue remains highly controversial, with critics such as Nordhaus (2007) rejecting Stern's argument for a social discount rate of (effectively) zero.

3.2.4 Non-human life

More problematic still are issues of equity across species. Given the risk that climate disruption will accelerate and exacerbate the existing profound problems of biodiversity loss due to human action, is there a duty on humans to protect other species from the impacts of climate change? And, in addition to the instrumental or anthropocentric reasons for accepting such a duty (because, for example, of the critical role of biodiversity and ecological systems in providing 'ecosystem services' such as clean water, breathable air, soil fertility and so on, that are fundamental to human needs and wellbeing) there are also notable arguments that other species also have intrinsic value. It has also been argued that the instrumentalisation of other forms of life is a root cause of our current environmental challenges (Rawles 2007, 2009, 2010). How would an accommodation of our duties toward other beings fit with demands for equity between countries, within countries, and between generations? The issues here are almost entirely outside the normal framework of climate change negotiations and policymaking, although they are likely to be raised increasingly by NGOs concerned with biodiversity and animal welfare as well as with climate change, and by voices from religious traditions as these become more attuned to and active in environmental advocacy (see also 4.12 below) and as these groups become increasingly alert to the relationships between climate change, biodiversity loss and our ability to meet our own needs, to tackle poverty etc. Questions of individual animal welfare and rights, and questions about whether species, ecosystems, habitats or other 'ecological groups' have rights, have featured in the environmental ethics literature for a long time (see for example DeGrazia, 1996; Midgley, 1983; Rolston, 1989; Singer, 1990; Rawles, 2002) and in NGO campaigns. They have yet to be systematically connected to the climate agenda, though some attempts at a general level have been made (Rawles, 2007, 2009, 2010). This could happen given the linkages between loss of habitat and climate disruption the impact on protected areas such as national parks of human displacement and demand for food, fuel and shelter if scarcities and climate change push people into conservation zones. More attention is likely to be given to climate-wildlife-biodiversity connections also in the light of plans to establish an equivalent body and process to the IPCC in relation to evidence on biodiversity loss and conservation of ecosystem services and species (www.ipbes.net). This will, like the IPCC, very probably become a major conduit for controversies about the interpretation of evidence, the assessment of risks and priorities, and divergent worldviews in relation to risks, values and policy goals.

3.2.5 Responsibility and justice

Issues of justice and fairness also raise problems of historic responsibility and restorative justice for the present and future effects of past consumption by the industrialized world. These are partly recognized in the Kyoto principle of common yet differentiated responsibilities. However, the 'grandfathering' of emission allowances in emission trading regimes, and the refusal in the USA to consider any acceptance of historic responsibility for damages from greenhouse gas emissions in previous decades and centuries, indicate

resistance in developed countries to the idea that some forms of 'reparation' are owed on the basis of past emissions. Arguments for this stance include the view that past emissions were produced in ignorance of eventual impacts on climate; counter-arguments include the view that once there was international acceptance of the scientific consensus (say, 1992 at the UN Earth Summit in Rio) then subsequent emissions cannot be considered 'innocent'. Note that this applies as much to emissions from developing countries as to developed ones. The debate here raises complex issues of liability, attribution and accountability within and between nations. Climate change litigation has grown in the USA and attempts have been made to lodge suits against the USA and US corporations for damages relating to climate change (for an overview see Meltz, 2008). It seems very unlikely that developed nations will concede any liability, but it is conceivable that further attempts will be made to make a case in international law as and when climate impacts begin to be felt in developing countries and can be plausibly attributed to the effects of human forcing of climate. Legal challenge is likely to continue to be important in the USA, and perhaps in international law, as a means for campaigners to highlight perceived injustices and sufferings of vulnerable groups and nations. Legal challenge is perhaps more feasible on the basis of human rights frameworks, as noted below.

3.2.6 Procedural justice

The climate change agenda also raises issues of procedural justice - the criteria, fairness and norms applied to inclusion and exclusion in assessment, decision-making processes at different levels within and between countries. There have been controversies over the scientific peer review procedures of the International Panel on Climate Change (IPCC), the access of civil society organizations to the process of the UN Framework Convention on Climate Change (UNFCCC), and the capacity of poorer developing country governments to have sufficient voice and negotiating power in Conferences of the Parties and preparatory meetings. Copenhagen displayed the capacity of major UNFCCC events to bring together a huge variety of viewpoints and interests and at the same time the tendency of the process as it has evolved to narrow down to a zero-sum game of big power politics. Alex Evans and David Steven of New York University's Centre on International Cooperation sees post-Copenhagen geopolitics as divided between those actors (within and among states) committed to a collaborative, multi-lateral and consensus-seeking model of climate policy and those who see it as a zero-sum game connected to increasing competition for strategic resources at different scales between self-interested powers (see Steven, 2010). In this respect the model of ever-present overlapping and competing worldviews or 'solidarities' proposed by Michael Thompson (2008) is relevant to scenario-building and to questions of procedural justice and effectiveness. Thompson argues that the four or five basic worldviews he and his collaborators claim to have identified in all organizations and cultures are perennial features of human organization and sense-making. Any attempt to sweep all but one or two aside in the name of decisive policymaking, optimal efficiency or imposition of values is bound to end in failure sooner or later. Accordingly, processes for collective decision-making should instead embrace complexity and what Thompson terms 'clumsiness' (enabling all the voices to be heard and to adjust to each other's

perspectives), as this will achieve a greater degree of resilience and long-run effectiveness, even if the solutions and process look (and are) ungainly and sub-optimal. The implications here concern the design of processes for multi-stakeholder negotiation and decision-making: on Thompson's theory the Kyoto process, for all the problems at Copenhagen, was not 'clumsy' enough, and the final phase of reduction of the actors to the few big-power brokers of the Accord was a recipe for unsustainable policy, leaving aside the normative questions of fairness and equity. A recent widely discussed critique of the Copenhagen outcomes and Kyoto framework by Prins et al (2010) draws on this theoretical framework in calling for a pragmatic set of overlapping policy systems and arrangements at different levels, on the grounds that a 'silver bullet' global deal is likely to be unobtainable.

3.2.7 Technology and climate change ethics

Particular technology policy responses to climate change raise complex ethical issues. An obvious case is nuclear power as an energy source that can contribute to decarbonisation – though arguably considerably less than is sometimes maintained, if a whole life-cycle analysis is taken into account – but that imposes considerable costs on future generations and contains risks that are low in probability but high in impact. The ethics of geo-engineering have been questioned by numerous authors (see for example Jamieson, 2009): is it justifiable to resort to geo-engineering of the atmosphere and biosphere in order to mitigate and adapt to climate change? How should such policies and technologies be governed? Can we accept risks of perhaps very low probability but potentially irreversible severe impact if realized? How would rights and vulnerable groups be safeguarded or compensated? It can be expected that major technological innovations proposed as significant contributions to mitigation of and adaptation to climate change will raise ethical questions as to unwanted impacts, access to technology, decision-making and voice, and so on.

3.2.8 Salience of ethical issues

Although ethical factors have not been at the forefront of climate change policy, negotiations or political identities, it can be expected that their salience will increase as and when climate impacts become more visible and damaging. So far, issues of justice and fairness have not featured strongly in political 'narratives' about the need for change in developed or developing countries; the emphasis has been on framing climate change as a security risk, a threat to living standards and economic growth, an opportunity for new technological development and competitiveness, and so on (Retallack et al, 2007; Rowley, 2010).

However, ethical 'framing' of the issues can be expected to become more prominent, since a wide range of actors, channels and spaces exist for ethical deliberation, demonstration of and incentives for behavior change, generation of empathy and personal commitment concerning climate change. These include:

- a) government and political actors (leaders, parties, commentators in the mass media);
- b) Educational institutions: schools, universities aiming for sustainable practices and raising ethical issues in the course of curriculum delivery and relations with partners in developing countries. There is evidence from recent attitudinal research by Development Education Association and others (Hogg and Shah, 2010) that exposure to information and education for 'global learning' (about global poverty, environmental issues and trade etc) increases individuals' sense of agency in taking action, empathy for people in the developing world and for diversity at home, confidence in seeking solutions to global problems, and support for international aid policies. In addition, more thinkers and opinion formers in universities are likely to take up issues relating to climate change. Already there is a growing literature in ethics and applied philosophy concerning the environment and climate change, and this is likely to become more widely known and connected to economic and political thought and public debates (see for example Gardiner, 2006; Singer, 2006; Northcott, 2007; Garvey, 2008; Rawles 2007, 2009; 2010);
- c) employers, product and service providers in business: those committed to corporate responsibility, codes of conduct at national and international level; multi-national corporations experiencing climate change impacts in particular regions and seeking a consistent approach to the issues across their territories, operations and stakeholders;
- d) civil society: faith communities, campaigners, development/environment charities, trade unions, community bodies: more is said below about these;
- e) mass media;
- f) immigrant / refugee communities, and diaspora communities in the urban West: these can be seen as 'transmission belts' for information, arguments, protests and (potentially) militant action against Western societies and institutions as and when climate impacts appear that many attribute (rightly or wrongly, and perhaps unknowably) to actions and failings of the developed world;
- g) debates sparked by experience of climate impacts in UK and overseas: natural disasters affecting tourists, etc; legal challenges from global South based on human rights law (see section 7 below), liabilities for damage.

3.2.9 Civil society organizations and communities

Important sources of ethical debate and 'niches' of alternative consumption practices framed in ethical terms are trusted agencies in civil society. These include environmental and development NGOs, churches and faith communities, and 'ethical enterprise' initiatives such as Fair Trade. These have proved influential in highlighting the ethical dimensions of globalization and environmental damage in recent decades. An explicit ethical 'framing' of climate change is provided in campaigns, reports and advertising of organizations such as WWF, Oxfam, Christian Aid and Tearfund, emphasizing what they see as the responsibilities of the developed world in mitigation and adaptation aid and the human rights dimension of climate change (see for example Shaw, 2009) and the contrast between developed country indifference and skepticism about climate change and the claimed impacts

occurring now in developing states (as for example in recent Christian Aid advertising). Environment and development NGOs can provide a 'transmission belt' for pressure on ethical issues from the global South to the developed world. However, as industrialization proceeds in the South, as southern NGOs grow in influence, and as interests and development standards diverge in the developing world, framing of messages and brokerage of relationships will become more complex for Western NGOs.

3.2.10 Religious organizations and communities

The role of religious organizations and communities is likely to become more salient and influential in relation to environmental action and climate change in particular. The great majority of the global population is associated in varying degrees with a faith, and the faith traditions represent one of the major sources of social capital, networks, services to the poor and transmission vehicles for ethical debate on behavior, values and ends; moreover they also hold substantial assets (investments, media outlets, schools, colleges, buildings, farmlands, forests, procurement budgets) that can be directed towards climate change mitigation, adaptation and education and advocacy (www.arcworld.org; Christie et al, 2009; Gardner, 2010). There is a growing literature of 'eco-theology', advancing arguments for environmental action and values rooted in faith traditions' teachings and practices (see for example Gottlieb, 2006; Spencer and White, 2007). There is also growing interest from international agencies and governments in the potential of faith communities as partners in catalyzing pro-environmental behavior, values and action on climate. The UN Development Programme (UNDP) has been in partnership with the Alliance for Religion and Conservation (ARC) to encourage the major global faith communities to develop 'Plans for Generational Change', strategies rooted in faith traditions and setting out principles and action plans for climate mitigation, adaptation and environmental protection (see www.arcworld.org; ARC, 2009). Training for faith communities has also featured in Al Gore's recent work on developing community champions for advocacy on climate change (Gore, 2009).

These developments represent a benign and collaborative model of religion. However, it should be noted that many conflicting views remain within the faiths on the priority to be given to environmental issues, and on the policies to be endorsed (Hulme, 2009). Climate disruption of abrupt and damaging kinds could, moreover, encourage not only new forms of cooperation and advocacy but also more extreme forms of faith drawing on resentments and desperation, as has been the case with extremist 'Islamism' in response to resentments concerning the political and military conflicts in the Middle East. Climate disruption could encourage both benign and extremist forms of religion at different times and places. Note that it need not be the case that climate change be demonstrably the 'cause' of particular local disasters or declines in prosperity and stability; the point is that it could be plausibly invoked from the point of view of those affected, and added to a list of resentments felt to justify militant action against the perceived sources of injustice in the West. A counter-argument here would be that climate change may not take place in a way that enables 'climate disasters' to be identified in

a clear way, distinct from 'normal' extreme weather patterns or incidents (such as avalanches), and that existing and emerging economic, political and cultural grievances are likely to be dominant as causes for resentment and extremism in vulnerable places and states.

3.2.11 Climate change and other policy areas

In conclusion, it is important to note that the ethical dimensions of climate change are hard to disentangle from other aspects not only of climate policy but also of environmental, social, political and economic development. Climate change is connected to and exacerbates problems of biodiversity loss, global poverty and the problems of meeting the Millennium Development Goals (MDGs), water scarcity, food security, domestic and international stability and security, economic and cultural globalization, human rights and governance, and so on. Scenarios and forecasts need to be clear about the practical difficulty of distinguishing climate issues from other problems and changes and about the large scope for the use of climate change as a vehicle through which other grievances, agendas and ambitions can be pursued by diverse actors.

3.3 Fundamentals of social and behavioural dimensions of climate change

3.3.1 Introduction

This section summarises major findings, issues and developments in the study of the social and behavioural dimensions of climate change. We outline key issues and research results in relation to:

- Public awareness and engagement in 'pro-environmental' behaviour;
- Public awareness and attitudes concerning climate change;
- Basic issues and questions in relation to motivating behavioural change among citizens.

3.3.2 Awareness and engagement

Evidence over recent years shows a consistent pattern in UK (and elsewhere in West) of gradual gains in environmental awareness and values, and of significant levels of concern about climate change; these developments go hand in hand with tendency of environmental concern to be given lower priority in times of economic downturn, and with persistence of a minority of disengaged and uninterested citizens (see for example Christie and Jarvis, 2001; Dowling and Ballatyne, 2007). The DEFRA segmentation of public attitudes concerning 'pro-environmental behaviours' (DEFRA, 2008), derived from opinion survey research, illustrates the broad pattern of engagement: this study indicates 18% of citizens can be characterised as 'Positive Greens', with 18% 'honestly disengaged'; the majority show varying degrees of sense of agency (capacity to act) and motivation (willingness to act). Those resisting

'pro-environmental' messages as a matter of conviction and worldview are in a minority.

The effect of economic turmoil and anxiety, as at present, is not as marked as is sometimes assumed in media coverage of the fate of 'Green issues' in recessions. Overall there is a tendency for pro-environmental attitudes to 'plateau' (as in the early 1990s in the UK) but then to resume a gradual upward trajectory as a result of exposure to scientific evidence, public debate, media coverage, incentives (such as price or new infrastructure) and shifts in norms in peer networks (more is said about this below; and note that awareness and attitude shifts do not imply commensurate changes in actual behaviour). Flatters and Willmott (2009) conclude from analysis of attitudinal trend data and changes in demand that 'green consumerism' will resume a slow rise following the end of the current recession and financial crisis, and that the downturn since 2007 is likely to reinforce potentially supportive attitudes and values, in particular a desire to economise in the household and simplify one's lifestyle, and a gradual rise in reported demand from citizens for more 'ethical business governance'.

The attitudinal evidence from the UK and other developed countries indicates a 'ratchet effect' of gradual 'greening' of reported values, attitudes and claimed behaviour. This suggests a process of public collective and personal response to increasing salience of environmental issues in general over the past two decades, although numerous caveats must be entered, as noted later. Attitudes towards climate change display much the same pattern. However, there is no guarantee of a steady process of 'greening' of public opinion with corresponding supply of policies to meet this revealed 'demand'. Political processes interact in complex ways with shifts in public opinion, sometimes leading them and sometimes reacting to them. The strength and nature of political responses to climate change are constrained to varying degrees by political perceptions of what citizens will accept by way of change and incentives. This applies especially to democracies, where there is a need to gain electoral majorities, a continuous web of feedbacks between media, citizens and decision-makers, intensive lobbying by interests in favour of change or the status quo, and an ever-present risk for politicians of 'getting too far ahead of the public' in advocating major changes. Public opinion is tested continuously by political actors and perceptions based on this measurement exert feedbacks effects on the degree of willingness to exercise leadership on climate change. Politicians are also influenced by representations by interest groups arguing for varying degrees of action (or inaction) on climate change mitigation and adaptation. The politics of climate change are complicated still further by the unfamiliar nature of the risks and evidence, based as they are to a large extent on often contested models, projections and observations, and calling for action in the present which will incur large costs but arguably have few evident benefits for current generations of voters or politicians (see Giddens, 2009).

3.3.3 Public attitudes concerning climate change

The evidence on domestic and international attitudes towards climate change and policy is summarised by Nick Pidgeon and colleagues in their Working Paper for this programme (see also Lorenzoni and Pidgeon, 2006). Climate change is widely perceived to be real, serious and in need of action from governments and business. There is a tendency for personal commitment to action to be seen as less feasible and urgent, a result that points to the 'value-action gap' outlined below. Many individuals take the view that their personal action is likely to be of limited impact and that the onus is on the state and business to take the lead. This is a 'rational choice' if it is assumed that others will not join in taking action and thus that personal sacrifices would not be matched and would be outweighed by free-riders. Climate change attitudes are also increasingly politicised: views on the reality and seriousness of climate change are closely correlated with political affiliation, notably in the USA, where party identification is a good predictor for attitudes on climate science and policy (see for example Dunlap and McCright, 2008). This suggests the importance of worldview and 'core values' in shaping and influencing views on climate change, as in the schematic cultural theory elaborated by Thompson (2008).

Views on climate change have shifted somewhat in the past few years and especially in the past year in the USA and UK. Volatility in opinion surveys is notable, and seems to be related to factors such as 'climate fatigue' (apathy and alienation in the face of grim climate scenarios), onset of recession, contingent weather events (a cold winter in the Northern hemisphere in 2009-10, with excessive heat elsewhere in the world not reported nearly as much), the well-publicised controversies over the UEA emails and IPCC errors in reporting some claims about climate impacts), and a well-organised and vocal constituency of climate 'sceptics' or 'contrarians' active in print, broadcast and narrowcast media. IPSOS-Mori reported a sharp fall in UK respondents' belief in the 'definite' reality of climate change in early 2010, following the COP and the 'climate-gate' furore, for example (Jowit, 2010), but more recent work by IPSOS-Mori with Cardiff University indicates that a majority of the public are convinced the climate is changing and that they are ready to take action in the light of this (Spence et al, 2010). Overall, reported concern about climate change is expressed by a majority in opinion surveys in the UK, and rejection of climate science is a minority view.

One can tentatively conclude that, as with environmental attitudes more generally, views on climate change are likely to become 'greener' over time as evidence mounts, incentives for action increase and the issues become more salient in everyday life. However, as with environmental attitudes overall, there are likely to be periods of plateauing of concern when economic pressures become 'front of mind' anxieties for a majority; and there are likely to be short-term swings in attitudes (as in 2009 and 2010) in response to widely reported controversies which seem to favour contrarian views and in response to contingent episodes of exceptionally cold weather. More research is needed to understand better the range of responses and the ways in which opinions are formed and change (Spence et al, 2010).

3.3.4 Evidence and issues concerning motivation of behavioural change and barriers to action

Below we summarise key findings, concepts and issues concerning the generation of public attitudes and values on environmental matters and climate change, and in particular highlight some of the major barriers to understanding and action. While there are numerous theories in psychology and sociology to account for shifts in values and behaviour, and for gaps between them (see APA, 2009; Spence, Pidgeon and Uzzell, 2008; Jackson, 2009 and 2005), there is as yet no convincing general theory of behavioural change nor any overarching theory connecting climate change, behaviour and values. Relevant theoretical perspectives and significant conclusions from recent research are summarised below.

3.3.5 Influences on individual awareness and behaviour

A major study by the American Psychological Association's taskforce on psychology and global climate change (APA, 2009) highlighted these issues that recur in the literature. While drawing mainly on US evidence this overview highlights issues that are echoed in UK studies (see for example the overview by Spence, Pidgeon and Uzzell, 2008):

- there is considerable variation in attitudes concerning the risks posed by climate change, and risk perception is mediated by cultural values and beliefs;
- norms and worldviews and everyday social contexts are major influences on consumption behaviour: choices about energy consumption and use of products are shaped by motivations relating to convenience, comfort, cleanliness (Shove, 2003), economy, health, image and existing habits of household / work routines;
- changes related to climate have potential to inspire collective efforts to deal with shared problems and also to increase stress and anxiety across society, and in particular to exacerbate tensions stemming from existing inequalities within and between societies and from uneven impacts of climate disruption;
- understanding is shaped significantly by media representations of the issues and by social discourse;

- barriers to understanding and action include a low sense of personal agency; low trust in relevant authorities (including scientists perceived to be supported by particular interests); faith in externally developed and imposed solutions that obviate the need for personal change.

3.3.6 The processes of behavioural change

Studies in consumption behaviour, environmental sociology and psychology emphasise the social nature of consumer choices and attitudes, and the embedding of norms in 'practices' of consumption that connect individuals to social networks, wider infrastructures and technologies that gradually normalise expectations and aspirations that would have previously been marginal or unrealisable (Shove, 2003; Jackson, 2005; Jackson, 2008.) New practices emerge in 'niches' within or outside established 'regimes' of what counts as the social norm (Geels, 2002) and can themselves become normalised as technologies and incentives interact and lead to changes in behaviour and perceptions.

The embedding of our consumption choices in practices that are themselves embedded in the prevailing social and technical infrastructure goes a long way to explaining the difficulty for individuals in making radical changes in consumption on their own, and indicates the limitations of behaviour messages from government that are predicated on an individualist model of change in which information is received by a citizen and then stimulates a change in attitude and then in action. Research consistently indicates a relatively low sense of personal agency that is linked to reluctance or perceived inability to change behaviours that are embedded in everyday norms and infrastructures. Citizens feel able to make incremental changes but not radical ones, seeing these as imposing an economic and social burden (see for example Barr et al, 2006; Gatersleben et al, 2009) and thus demanding greater incentives for change and also policies that address change at a collective rather than individual level.

Evidence on the diffusion of pro-environmental behaviours is reviewed by Fell et al (2009), who reinforce these observations and identify numerous factors involved in the evolution of new behaviour and supporting social 'practices':

- compatibility of new behaviour with existing norms;
- relative advantages conferred by new behaviour;
- the 'trialability' of new behaviour (for example, via low-risk experimentation with new products and services);
- observability (is the new behaviour visible among peers and everyday routines and practices?);
- the discussion of new behaviours via everyday channels of communication;
- availability of supportive infrastructure;
- encouragement via changes in action by groups of 'like-minded' people;
- encouragement via trusted sources of authority and leadership, role models and opinion leaders ('influential individuals');

- norms, rules and social networks.

3.3.7 Barriers to change

This all points to significant barriers to take-up of new behaviour and attitudes, and to the existence of lags between expression of attitudes and translation of these into changes in everyday practice. Retallack et al (2007) notes that the great majority of people in the UK have not made any significant changes in behaviour in response to messages about climate change and evidence of the problems. The prevalence of risk-aversion and 'status quo bias' reinforces the 'lock-in' generated by the prevailing pattern of norms and infrastructure. Moreover, behavioural change induced by new patterns of incentive and infrastructure may need to precede and lead changes in attitudes and values. Evidence from environmental psychology and sociology shows the persistence of 'gaps' between values, attitudes and behaviour. For example:

- Research indicates a widespread 'Value / action gap': expressed values are not consistently translated into compatible action. This may reflect a sense that the 'approved' answer to give to questions about environment and climate is the 'green' one, regardless of whether one feels able or willing to act on the expressed attitude. However, it also reflects in many cases a genuine wish to put a value into action or to make a substantial change, and yet a feeling that this is not possible because of constraining circumstances (economic, technical, infrastructural) in one's life (see for example Barr et al, 2006; Jackson, 2005) or other competing priorities.
- A variation on this is an 'Urgency / agency gap': many people feel that the issues of climate change are too large and complex, and so they feel unable to make any difference through personal action, even while recognising the urgency of collective measures. There can also be resistance to action on the grounds that others (government, business, other people with what are perceived to be more environmentally damaging lifestyles) are not seen to be taking steps (see Platt and Retallack, 2009) or to be worthy of trust. These views can be a rationalisation of personal unwillingness to take action, but also reflect what is felt to be a 'realistic' sense of the scale of the issues and the impact of one's own and others' actions and the costs associated with making changes.
- Studies such as these also highlight public perceptions of inconsistency between governmental and other discourse emphasising urgency and scale of risk on the one hand, and the lack of evidence, incentives and signals in everyday life matching up to the official rhetoric of urgency (see for example Rowley, 2010).

- Related to the evidence of ‘gaps’ is the identification by numerous studies of considerable inconsistency in attitudes and behaviour. Gatersleben et al (2009) note that environmental concerns can be linked to rejection of ‘materialist’ attitudes (giving primacy to material consumption and related values), and are associated with greater reported willingness to change, but that the identification of pro-environmental attitudes with ‘post-materialist’ positions (giving priority to ‘self-actualisation’ projects and values) does not necessarily hold. Around one quarter of their respondents expressed environmentalist concerns and also at the same time held pro-materialist views.

3.3.8 Worldviews and identity

Other studies suggest that there is an important connection between worldviews, sense of personal identity and core values, and sense of willingness and capacity to change behaviour and accept evidence that challenges cherished values and views. Personal action on climate may be closely linked to a sense of ‘pro-environmental’ self-identity (Whitmarsh and O’Neill, 2010). Resistance to change behaviour for the sake of environmental concern or avoidance of climate change may reflect not only the view that change is simply not a priority or feasible for a person, but also a sense that core values and identity are threatened by changes in consumption and lifestyle or by a particular body of evidence and discourse (Kahan, 2010). Crompton (2008) and Jackson (2005) emphasise the role of consumption choices and practices in expressing and sustaining social identities and core values. Crompton (2008) and Crompton and Kasser (2009) argue that initiatives aiming to change behaviour need to go beyond information campaigns and incentives and to focus on deeper values relating to personal and group identities. Thompson (2008) proposes, on the basis of the Group-Grid theory of Douglas and Wildavsky (1982) and extensive fieldwork studies, that attitudes and behaviour in relation to climate change and environmental issues reflect five basic orientations or worldviews (also termed ‘solidarities’) that encapsulate distinct modes of social organisation and approaches to risk and the natural world. These worldviews (fatalist, individualist, hierarchist, egalitarian and ‘hermit’) are, it is argued, always present in varying degrees in groups, organisations and whole societies, and need to be acknowledged and lived with, as they represent basic clusters of attitudes and values that are not likely to be dropped or modified significantly except in the face of overwhelming information and evidence (and not necessarily even then). These worldviews underpin particular strongly-held attitudes; for example: for and against the operation of free markets, hierarchical authority structures, emphasis on individual rights versus communitarian responsibilities, and so on.

3.3.9 The importance of group influences in change

The fact that values and norms are developed through social networks and collective practices, and are strongly held much of the time, points to the problematic nature of policies that appeal to citizens to make changes on an *individualised* basis (Retallack et al, 2007; Middlemiss, 2010; Butler, 2010). Middlemiss (2010) argues that this ignores the fact that individuals are constrained in their capacities to make such changes by various contextual factors.

Work by WWF-UK has attempted to devise programmes for behavioural and attitudinal influencing that take account of the social nature of consumption practices and values, and of the problems for individuals in acting in isolation. WWF's Community Learning and Action for Sustainable Living (CLASL) project with DEFRA (see Warburton and Carey, 2008) worked with citizens in local groups over three years to explore ways in which social networks and regular supported exploration of lifestyle change and environmental issues could help shift behaviour, values and identities. The project highlighted the need for facilitation and social contexts and networks that supported individuals in making change. The supportive framework required went up to the national and international level: citizens needed to feel part of a like-minded network locally but also to be reassured by the statements and actions of political leaders that they were not acting alone. Many individuals feel an ethical responsibility - based on guilt, core values (religious or not) and empathy - to act, but sense of agency and commitment are liable to be weakened if others in authority and with capacity to act are not felt also to be 'doing their bit'.

3.3.10 Behaviour, ethics and social structures

Ethical discourses and behaviours are embedded in and influenced by large collective institutions and networks, which have been instrumental in generating what have been termed 'commitment devices' (Offer, 2006) to offset tendencies to self-interest and short-termism - these have included religious commitments, deferred gratification, family commitments, etc. Offer (2006) argues that in industrialised consumer societies such 'devices' for self-sacrifice and long-termism become weakened as individual choice and affluence are more celebrated by mass media and social role models, and Shove makes the point that technological changes and the path-dependency in households established by previous consumption choices produce a ratchet effect of consumption, influencing individuals and households to become further committed to particular standards of comfort, convenience etc that make changes in lifestyle difficult to consider and accomplish. An open question is whether climate change could bring about changes in the prevailing models of individualism and consumerism, for example by generating new kinds of scarcity and demanding greater frugality in everyday life, and by promoting overarching norms and values that make a virtue of this.

3.3.11 Implications for public communications

These considerations, and many other studies to date, indicate a wide range of factors to take into account in devising policies and communications for action on climate change (for an overview, see Spence, Pidgeon and Uzzell, 2008):

- a) the influence of descriptive norms (what people believe the typical behaviour of others to be);
- b) the influence of cultural and group norms and imitation of role models and peers;
- c) the important role of identity and cultural values in perceptions of environmental issues and personal responses;
- d) the role of political identity and framing of issues;
- e) positive incentives to change behaviour are felt to be much more productive and influential than negative ones (focus on threat and risk);
- f) the role of environmental connections in early life - particularly through play in the natural environment - as a potential generator of 'pro-environmental' values and behaviours later on, and the possible weakening of such linkages as societies become more urbanised and suburbanised (see for example Louw, 2005; Hinds and Sparks, 2008);
- g) the pervasive sense of 'lock-in' to lifestyles through dependency on existing infrastructures, work patterns, social norms - the 'practices' of everyday life; this means that many people need a convincing and readily available set of options for consumption that do not disrupt unacceptably the home and work structures in which they are embedded;
- h) changes can come about rapidly as new technologies, incentives, social imitation and infrastructures enlarge 'niche' practices and change the prevailing norms. For this to happen in relation to climate change, *positive incentives, group-based engagement, consistent messages from trusted sources, evidence of need for action, evidence of others in authority taking action, and reinforcement of norms via association with positive identities and values* all seem from the literature to date to be required. So far policy has been much less diverse and consistent than this list demands.

The next section summarises key issues arising from the literature on behavioural, ethical and social aspects of climate change and indicates ways in which these could be integrated into development of scenarios.

3.4 Issues for scenarios: factors in understanding interaction of ethical, social and behavioural aspects with each other and with economic, technological, ecological and political changes

3.4.1 Overview of key points arising from the literatures

We summarise below key points from conceptual and empirical research to date and identify ways in which these need to be taken into account in scenario development:

- environmental issues in general and climate change in particular re marked by a *value-action gap* among citizens and organisations: stated beliefs, attitudes and values are imperfectly (or even not at all) translated into practical action commensurate with the views held, or with willingness to pay and make perceived sacrifices;
- priority attached to environmental issues and action is reduced (though not removed) by experience of economic downturns'
- priority increases when high-profile events occur (for example, Mrs Thatcher's climate speech of 1989), but sustaining this depends on supportive social and infrastructural frameworks;
- some attitude surveys post-Copenhagen indicate a decrease in 'belief' in climate change and less acceptance of the full expert analysis, ie it is happening and is largely or wholly driven by human action; these trends seem to reflect a) economic pressures, b) 'culture war' disagreements in mass media, c) scandals and errors affecting IPCC and UEA, and d) some forms of 'fatigue' in hearing about climate threats; however, majorities still consider climate change to be real and serious, reflecting a long period of developing expert and wider social and political consensus and growing salience of climate issues in mass media;
- public sense of agency in relation to climate change is low, reflecting the scale of the issue, mixed messages from policymakers, and lack of economic and social incentives for change in outlook and action; government and business are expected to take the lead;
- a minority of citizens has internalised an ethical 'green' outlook and takes action accordingly (though still subject to a value/action gap), but is not yet politically, culturally or socially influential and 'aspirational' enough to exert much influence among the rest of the public. However, this outlook has had considerable 'osmotic' effect over the past 40 years and can be expected to gain ground unevenly;
- citizens form their attitudes and values from a complex and shifting mix of mediated 'testimonial knowledge' that is a blend of information from many sources, attitudes and outlooks shaped by local context, wider culture and peer cues, incentives and pressures, mass media, advertising, the arts, official information and so on. While increasing coverage of scientific consensus on climate in media and politics has contributed to majority acceptance of the case that climate change is real and man-made, provision of factual information *on its own* may make little difference to attitudes, values and knowledge: these will shift as a result of many other factors, above all changes in social pressures, cues and incentives that integrate new behaviour with a socially acceptable set of activities, identity and stories; and it seems likely that those with worldviews disposed against the perceived implications of climate policy will remain resistant to the weight of evidence from the IPCC;
- segmentation analysis, public opinion surveys and social science research and models underline these points and highlight the persistence of clusters of attitudes and values hostile or indifferent to climate change messages, alongside a substantial body of opinion that has accepted the diagnosis of change to differing degrees;

- there is considerable questioning by citizens and ‘contrarian’ campaigners, and by many scientists and activists on the ‘other side’ too, of the frequent use of ‘apocalyptic’ language and imagery in relation to climate change, with criticism of such discourse from NGOs and governments ranging from the argument that it induces fatalism to the view that it goes beyond what is warranted by the established body of climate science and modelling evidence (see for example Retallack, 2007; Hulme, 2009);
- changes in these clusters of opinion and values will take place as a result not only of increasing evidence and political consensus but also of changes in social incentives, infrastructure, authoritative agenda-setting bodies and networks (employers, religious communities, educational bodies, mass media, celebrities, local neighbourhoods, communities of interest, etc);
- in the absence in some scenarios of significant change in climate in the UK in coming decades, much will depend on the methods and metaphors used to communicate the probable and possible changes that need to be averted through costly and controversial action now. This means that ‘culture war’ conflicts over the validity of the science and risk assessments deployed by government and other authorities are likely to continue and indeed could intensify;
- ethical aspects of the climate change debates have been highlighted consistently only by NGOs (environment, anti-poverty, human development and rights) and faith communities, and by vulnerable developing countries; the extent to which ethical arguments make a difference to public opinion and action will vary depending on the trust inspired by those making the case, the relevance felt by sections of the public to their own outlook, and the exposure of people to convincing evidence and empathy-inducing experience and information. There is new evidence (Hogg and Shah, 2010) that attitudes can change significantly depending on exposure to ‘global education’ material about issues affecting developing countries and the international community, and we will draw on this in scenarios and in discussion of how the UK’s stance and international image on MDGs, development and human rights could change;
- human rights and other ethical issues will continue to be highlighted by NGOs and churches/other faith communities, and could also be magnified by diaspora communities of immigrants (and not only first generation) in the West, an issue of particular relevance to the UK and especially to London and other big multicultural cities.

3.4.2 Issues for scenario development

In the light of this, we outline here a set of factors for consideration of existing scenarios and for informing the development of new ones. These are key factors to bring to bear on critique of scenarios and construction of new and refined narratives in scenario sets.

Factors for scenario development incorporating ethical, behavioural and social dimensions:

- Ethical, social and behavioural dimensions are not distinct or independent but are embedded and embodied in the following:
 - worldviews: for example, the schema identified by Thompson (2008);
 - identities ;
 - social logic of consumption (the peer pressures, status and identities supported by different qualities and quantities of consumption)
 - everyday practices of consumption, work, leisure
 - everyday structures shaping and constraining choices: infrastructure, work, finances, incentives
 - everyday discourses (media, politics, dominant norms and representations)
- Ethical and behavioural shifts depend to a large extent on social change and shifts in *group norms and incentives*, and on changes in *capacities available to citizens* - the extent to which persons are able to take on responsibilities for behavioural change (Middlemiss, 2010: see diagram below). These include: **cultural capacity** (norms and values); **personal capacity** (mobility, finance etc); **infrastructural capacity** (public and private facilities enabling behaviour change to be initiated and expanded); and **organisational capacity** (resources from workplace and other settings)

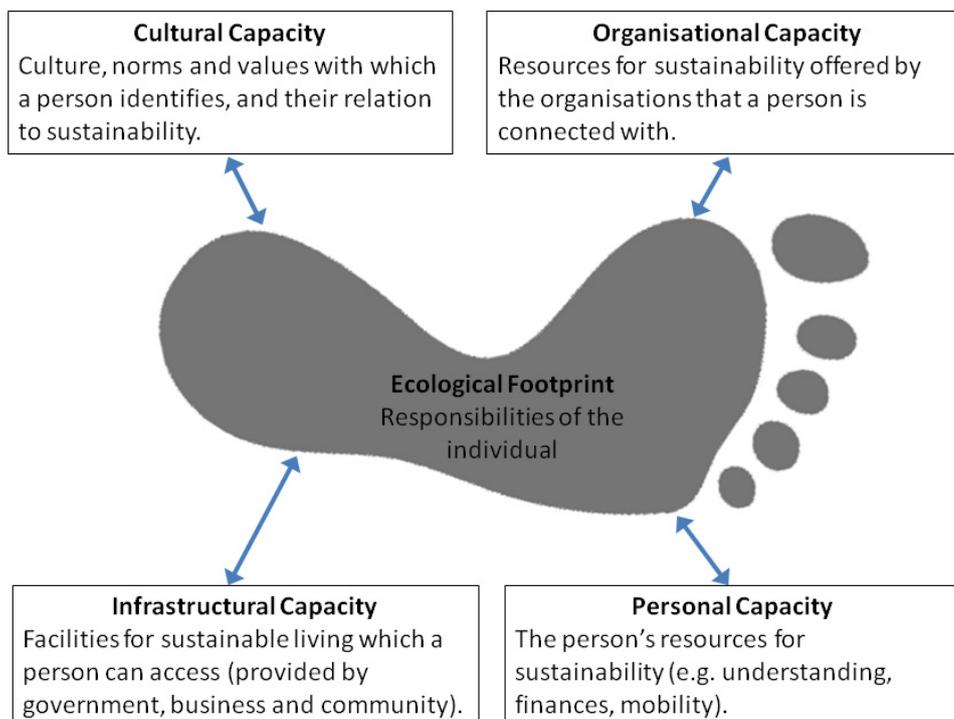


Fig. 1 Capacities for action on environment by individuals
Source: Middlemiss (2010)

- Scenarios need to include narratives that indicate the forces at work in enabling and inhibiting particular shifts in ethical norms and behaviour by citizens.
- Ethical discourses and behaviours are embedded in and influenced by large collective institutions and networks, which have been instrumental in generating ‘commitment devices’ (Offer, 2006) to offset tendencies to self-interest and short-termism. Such devices include religious and other norms, family norms, cultural constraints on consumption. Scenarios need to include consideration of how commitment devices potentially increase in influence, decrease in power and become modified in the face of climate change (for example, will the interaction of climate change with resource scarcities lead to revivals in religion and communal forms of non-materialist consumption?)
- These devices have been undermined by mass affluence and individualism (Offer, 2006); by value placed on ‘choice’ by major actors in society; and by ratchet effects of consumption and expectations (Shove, 2003). Scenarios need to include consideration of how far these trends can continue under different assumptions about technological change, environmental conditions, and so on.
- Changes in ethical frameworks, norms, behaviour and values depend to a large extent on combined influence of experience, legal and financial incentives, education, media discussion, political discussion, and expansion of exemplar ‘niches’ of new values and behaviour within ‘regimes’ of conventional prevailing norms and activities (Shove, 2003; Geels, 2002). Scenarios need to consider which niches will be enlarged under particular assumptions, how, and with what consequences.

The next section discusses in more detail the key themes and questions highlighted for this part of the IDCC study.

3.5. Discussion of major issues in behavioural, social and ethical dimensions of climate change

This section offers commentary in the light of the above analysis and discussion on these themes of central concern to the IDCC study:

- human rights
- implications for development policy, aid and trade and perceptions of the UK’s role and standing in the international community
- weight given to social and non-material impacts of climate change
- public awareness, community cohesion
- approaches of state and non-state actors

3.5.1 Human rights and climate change

There is a growing literature on the implications of climate change for human rights (see for example Caney, 2008 and 2009; International Council on Human Rights Policy, 2008; Office of the HCHR, 2009). The Australian Human Rights and Equal Opportunity Commission (HREOC, 2008) summarises the areas of concern relating to the UN Declaration on Human Rights (UNDHR), the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, and other frameworks. The rights principally at issue are:

- Right to Life;
- Right to Adequate Food;
- Right to Water;
- Right to Health;
- Rights of Indigenous Peoples

Complex issues also arise in relation to the status and rights of climate refugees: again, the questions at stake include issues of attribution of displacement to climate effects as opposed to other factors. HREOC (2008), suggesting recommended policies for Australian policymakers concerning climate and human rights, argues that climate change policy needs to be 'human rights-compliant', reflecting the impact of climate disruption on the capabilities of people and states to secure their rights; and that in particular there is a need to base climate adaptation policies on concern for human rights and the loss of capacity to uphold them. It can be expected that these considerations will play an increasing role in UK development aid, climate and international relations policies in coming decades. There is considerable work going on among NGOs to build human rights into campaigning and policy work on environmental conservation (see Roe et al, 2010), and this could become more closely linked to climate change as the interactions between climate and biodiversity / ecosystems services become more salient.

The key issues in the relationship of human rights and climate change include the impact of climate disruption on the capacities of individuals to have rights recognised and realised. These include the right to life and rights of access to essential goods (food, water and so on). Rights of indigenous peoples are among the group rights that could also be affected by climate disruption. The issue of the rights of displaced persons will also be raised as climate change leads to migrations within and across borders. The problems associated with policy in this respect are significant, since it will remain difficult to demonstrate conclusively that climate change attributable to human action has been the decisive factor in any breach of rights. The issue is made more complex by the fact that in most if not all cases of instability and breach of rights there will be many other factors at work, possibly with climate change acting as a catalyst but not sole contributor to a situation in which human rights are undermined and ignored.

Despite these complications, there will be numerous actors making connections between human rights and climate change, and the discourse of

rights could have rising influence in coming decades. Campaign organisations in the West and in developing countries are likely to invoke human rights in the context of worsening conditions for vulnerable populations, and so are developing country governments seeing themselves as victims of climate change and of unfavourable terms arrived at in international negotiations. Rights-talk is likely to become more prevalent, if not influential in global deal-making. Accordingly it seems likely that the linkage of climate change and human rights arguments and law will become more salient for diplomacy, international aid policy and strategies to support climate change mitigation and adaptation strategies. Against this, Posner and Weisbach (2010) argue that the most realistic scenarios for a global deal in climate are precisely those in which arguments about ethics, historic responsibilities and rights are *excluded*. The case for this position is that a fair global deal is more likely on the basis of foreign policy *Realpolitik* that enables as many states as possible to feel as if they have gained something from the negotiation, and that ethical arguments that make sense at the level of individual rights and justice do not necessarily make sense, still less have political 'traction', for states. In their view, attempts to construct a global deal on the basis of compensatory justice, redistributive justice and human rights are politically impossible, and thus the attempt to pursue them makes a tolerably effective and fair global deal less likely.

Nonetheless, the rise of rights discourse in climate change arguments could be accompanied by legal challenges concerning climate responsibilities, related liabilities and breaches of human rights. Given the points noted above, it will be extremely difficult to mount a case that could demonstrate a chain of connections and liability from (say) a Western corporation's emissions to a particular state of disruption and breach of human rights in a Southern country. The legal problems of ascribing responsibility for impacts remote in space and time from originating actions are very great, as Meltz (2008) notes. However, the attempt to do so could be part of a campaigning strategy to dramatise the ethical and political issues at stake if specific disasters with major human consequences begin to be attributed to climate disruption with greater confidence than can be the case at present.

3.5.2 Rights and future generations

The question of human rights in relation to future generations is, as noted earlier, a vexed and complex one, highly contested. The unborn are not assigned human rights. But could this change? Could the catalyst for this be a linkage of human rights to impacts of climate change on future generations? As with climate change and its impacts on present people, it would be hard to demonstrate with any precision the claim that development x in the past attributable to a government or corporation will have impact y to the detriment of the human rights of people yet unborn. However, there is a precedent in the form of the Hungarian Parliamentary Commissioner for the Environment, who is empowered to initiate investigations and even litigation on behalf of future generations if it is suspected that a given development has been granted permission to go ahead with inadequate consideration by planning authorities and others of the potential harm to be caused in future.

There is also a large literature on the potential construction of legal and rights-based arguments concerning the impact of present decisions on future generations, and drawing on this the Canadian law professor Laura Westra has argued that legal and rights-based arguments can be developed to connect the rights of *children* in the present (for example under the Convention of the Rights of the Child) to the interests of and our responsibilities towards people in the future (Westra, 2006; see also Weiss Brown, 1989; Elliott, 1989). Scenarios could be constructed in which attempts to use legal remedies concerning climate change impacts and to promote representation and redress for unborn people become significant in societies.

3.5.3 UK policy and image in relation to development aid, human rights, conflict

The impact of climate disruption on developing countries is already a significant factor in development and aid policy in the UK. Given the issues discussed above, it is likely to become ever more prominent as a criterion for the targeting of development support, with emphasis on mitigation, adaptation and (with schemes such as the UN programme for reducing emissions from deforestation and forest degradation REDD+ in mind) streams of funding intended to sustain vital ecosystem services. Given the volatility of the economic system in the West in the 2000s and the prospect of more economic turbulence as we approach 'peak oil' and resource scarcities become serious, scenarios need to take into account political and economic pressures on development budgets.

There are likely to be substantial demands from campaigners and from developing countries for sustained flows of finance and technology for mitigation, adaptation and maintenance of ecosystem services (with consequent support for incomes in protected areas) as climate change proceeds. At the same time there could be major pressures on UK Governments to direct more funding to domestic needs and demands, especially in the light of economic crises and energy supply constraints that call for massive investment in new infrastructure. Already we see controversies over the additionality of REDD+ funding (is support for mitigation and adaptation in the global South additional to the aid budget or a relabelling of particular funds?) and this is probably a sign of similar disputes to come.

How might this affect the image and reputation of the UK? The UK's position needs to be considered in relation to a) domestic priorities and policies for foreign policy, aid and trade; b) the UK's position in the EU, and the image and effectiveness of the EU in relation to climate, aid and trade; and c) the UK's place in the West as a whole, and especially in relation to US positions on climate change and responsibilities to developing countries. To the extent that EU and US positions, performance and image are the object of criticism, controversy and attack (verbal and otherwise) from overseas, the UK can be expected to share in the problems, and vice versa in scenarios in which EU and US positions are welcomed in the global South. Scenarios can also be

constructed in which the UK is positioned distinctively as a leader in the EU and the wider West (eg in the G20) in relation to climate diplomacy, generous aid and trade positions, and sustained support for mitigation and adaptation measures and related funding for ecosystem services on REDD+ lines. Evans and Steven (2010) also make the point that UK influence will also depend not only on its own funding and other policies but on the deployment of 'soft power' in persuading other actors to 'devote more energy, resources and political will to global challenges'. In this case, UK image is also dependent to some degree on the success its Governments have in persuading others to change, and also on the extent to which other UK actors (such as businesses) are seen to live up to UK positions and ambitions.

An illustration of an approach informed by understanding of the social, behavioral and ethical complexities at work is the programme of the British Council in developing a '**Cultural relations**' model for policy on climate change - this is based on 'soft power' approaches to cultural diplomacy, community-level initiatives and relationship-building. The programme has a particular focus on faith traditions and interpretive role of faiths in communities, reflecting the considerable potential role of religion in climate initiatives as noted earlier. The 'cultural relations' approach recognizes numerous barriers, as summarized in earlier sections, to consensus and cooperation on climate:

- Cognitive
- Normative
- Political
- Economic

The cultural relations approach is intended to facilitate mutual understanding of climate science, break down lack of trust, and identify cross-cultural normative and cognitive solutions. (For an illustration, see www.africatalksclimate.com). Approaches of this kind could be needed on a large scale in coming decades.

The UK's position in climate change politics and international relations will also be affected by its status as a focus for migration and networks via diasporas with countries vulnerable to climate change and climate-related unrest and resentments. Migration to the UK could increase - *demand* for it certainly will from many parts of the global South - on the basis not only of economic motives but also of flight from the effects of climate disruption and resource scarcities and related unrest (and as noted before, disentangling these factors would be very hard to do). This could be argued to open up scenarios for positive and negative impacts of the UK's role as a centre for diasporas and multi-cultural development in cities. On the negative side, the density and global reach of networks of family and other connections to countries at risk from climate disruption on top of other stresses could make for rapid transmission of resentments and militancy to the UK, as in the case of Islamist terrorism and agitation. However, it needs to be recognised that (so far) such transmission in the case of Islamist militancy based on economic, cultural and political resentments has been on a very small scale, for all its seriousness. As noted earlier, distinguishing 'climate change disasters' from

'normal' disruptive events in vulnerable places would not be easy, and it is hard to see how the addition of claimed climate injustice to existing grievances would lead to more militancy.

The links between environmental degradation and violence are often noted - the risk of 'water wars' for example - and influential security policy thinkers have investigated the potential of climate change to be a 'multiplier' for insecurity and conflict (see for example CNA Corporation, 2007, which concludes that climate change is a 'threat multipliers' in volatile regions and a serious security risk for the USA). So far, however, there seems to be no clear-cut connection between ecological problems and violence, whether *in situ* or exported via terrorism. Ecological factors seem to play a role in conflicts already set in motion by more salient stresses in society, economy, culture and politics, with environmental scarcity and competition of various kinds accentuating violence that is underway for other reasons (see Homer-Dixon, 1999 and 2000; Gleditsch, 1998). Moreover, regardless of the strength or otherwise of the environment-climate-violence connection, would any violent grievances inspired by ecological crisis be directed against the UK? It is hard to see why this would be so, especially if the UK continued to aspire to and play a leadership role in international negotiations and flows of funding to the global South in relation to mitigation and adaptation. On the positive side, the UK can position itself for climate-related diplomacy and influencing via 'soft power' drawing on its strengths in integration of migrant communities and historic ties with many developing countries in the Commonwealth. Scenarios should draw on both these points.

The campaign strategies of NGOs and advocacy coalitions concerning climate, development, global poverty and human rights can be expected to draw on arguments and cases that link human rights to climate impacts. Scenarios can be constructed in which these approaches have different levels of influence on 'niches' of public support and opinion concerning climate, lifestyle and global justice.

3.5.4 Valuation of social and non-material aspects of climate change

Considerable effort has already gone into the quantification of economic impacts that could stem from climate change under different scenarios, notably in Stern (2006). The assessment of less readily quantified impacts is less advanced. These are issues concerning health and psychological wellbeing: climate change and societal stress (flood risk and impacts; the personal impacts of loss of homes and livelihoods as a result of climate change; the individual and societal grief and other impacts likely to be associated with loss, or simply with the *expectation* of loss, of familiar and much-loved landscapes etc; the impacts on local and national identity of changes to important aspects of natural and built heritage. Work is in hand in bodies such as DEFRA and Natural England on the assessment of the value of 'cultural ecosystem services', that is the range of social, psychological and cultural benefits derived from contact with the natural world. Potentially such work will enable development of richer assessments of the qualitative value of social and non-material aspects of the environment, and hence of the

qualitative costs of loss and damage resulting from climate change; it would also enable more quantitative estimates to be developed. This work will be aided by the establishment of the new Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (www.ipbes.net).

The valuation of climate change and climate impacts is likely to be closely connected to assessments of the value of biodiversity and ecosystems worldwide, given the extent and complexity of the interaction of climate change with other ecological crises, in particular loss of biodiversity. As climate change coincides with and exacerbates biodiversity loss driven by changes in habitat from human demands, the question of valuation of social, cultural and non-material dimensions of climate change is bound up with the tangible impacts on wildlife and landscapes of human development. It is likely that attitudes to climate change impacts will be affected by loss of major species in the wild in coming decades (for example, the near-certain disappearance of tigers in the wild), given the widespread public support for and interest in wildlife in the UK and abroad, and the emotional force of bonds with wildlife of a significant proportion of the population. It is possible that the experience of major extinctions, mounting losses of habitat and visible changes in landscape and wildlife in the UK could have a catalytic effect, promoting political and cultural changes of heart and mind and raising support for more radical measures on climate and environmental protection more generally. In terms of the concepts discussed in earlier sections, 'niches' of opinion and values could be expanded in different sections of society and given more political voice.

This raises the question of the potential cultural dimensions of climate change. The nature of climate change, its economic implications, and its connections with matters of life, death and non-material values at home and globally, makes it an issue likely to grow beyond its current position as a policy issue that is not central to political choices and values. As and when climate impacts become more obvious and serious at home and overseas, three domains seem likely to become more important for discussion of values and priorities, which could promote shifts in the valuation of the social and non-material aspects of climate change. The first concerns generational conflict and value shifts: climate change could become a factor contributing to growing resentments from younger generations to baby-boomers and post-boomers concerning the state of the world they are inheriting. The second is the role of faith traditions domestically and globally: as noted above, major faith communities are becoming more aware of and vocal about climate change and environmental degradation, and developing numerous projects worldwide on the issues. The faiths are a major – though by no means the only – 'transmission belt' for debates on values and for challenging market-based and material valuation of goods and services. As social and economic impacts of climate change grow, faiths and other ethically engaged actors in civil society seem likely to become a more prominent source of ethical critique and 'counter-cultural' practice that could have wider influence, including in the largely secularised West as and when scarcities, conflicts and the experience or expectation of major cultural and environmental losses increases. The third, related to this, is the potential for a much greater role of arts and cultural

movements in raising questions of value and priorities concerning climate change and related crises, and acting via the mass and narrowcast media (social networks and so on) as 'transmission belts' for discourses and practices that could expand beyond particular niches.

3.5.5 Public awareness, agency and community cohesion

As noted earlier, public opinion on climate change has been stable over the longer run, with volatile episodes related to particular political events and controversies. Overall, there is majority concern, acceptance of the scientific diagnosis, and agreement that public and private sector agencies should take action. At the same time, there is little political salience for the issues: they are not 'front of mind' except for a small 'niche' segment of the population in the UK and elsewhere. This could change with more direct experience (if it comes) of climate impacts at home; with more indirect experience via the media and social connections (such as via diaspora links) of other countries' climate-related troubles; more experience of related problems such as food and energy price rises. On the other hand, scenarios could also be constructed in which public awareness remains as it is, or even decreases, if climate changes are not apparent, if there are continued public disputes over climate evidence and uncertainties, and if contingent weather events lend credence to populist 'denial' arguments (for example, a long run of cold winters in the northern hemisphere). Moreover, it may not prove to be the case that exposure to particular impacts will lead to any increase in concern for and action about climate change (see Whitmarsh, 2008). It is uncertain how far mass media in the UK and beyond would contribute to greater public awareness and sense of agency: the record and motivations of the mass media on environmental issues (see Smith, 2000) are very mixed, and the media are better equipped to focus on climate change in response to *events* and dramatic simplification (the Copenhagen conference, alleged climate disasters, arguments about the science, etc) than to *process* and complexity (long-run changes, UNFCCC processes, interactions with energy, biodiversity, food etc). There also seems to be little capacity in mass media and proliferating narrowcast media (social network sites etc) for coherent discussion of values and environmental issues and for consistent articulation of authoritative ethical positions from social actors (Morrison et al, 2007).

Impacts on community cohesion in the UK are difficult to assess and would be hard to distinguish from the effects of other developments, such as increased economic migration from across the EU. The possibilities range from increased tension and conflict at domestic as well as global level, to heightened empathy and cooperation at domestic and potentially global level. Greater migration from the global South and the EU could - especially if it occurs in pulses that bring many people at once - lead to political and cultural tensions. More gradual change brings fewer risks of unrest and could enable a rise in empathy and understanding, and consequent pressure for more radical policies on climate from UK Government, business and other actors. The risks to social cohesion include terrorism focusing on perceived climate change injustices; and domestic implications of 'resource wars' and climate-related conflicts (despite the problems mentioned already of attribution of

causality). Community cohesion in the UK in response to domestic climate-related problems - such as major flooding or extreme storms - might even be enhanced, as seems to be the case in responses in communities to the major floods of the past decade. But long-term effects are not clear yet, and how communities would respond to larger, more damaging events on a wider scale is unknown. More such events could stimulate greater efforts at community self-help and creation of expanded 'niches' of climate and energy-related concerns, such as the Transition Towns movement (Hopkins, 2008) and potentially also more empathy with vulnerable communities overseas.

3.5.6 Approaches from state and non-state actors to influencing public attitudes and action

Government approaches to behaviour change and influence have been dominated by the model of information provision, with the assumption of a chain of influence from information to awareness to changes in behaviour. It is now recognised that a much more complex and sophisticated approach is needed, drawing on understanding from social science of the sources of behaviour change and motivation (see Jackson, 2005; Dolan et al, 2010). In particular there is likely to be increased understanding of, and attempts to design policy in the light of, the extent to which changes in behaviour and ethical stances are *socially* driven and sustained via networks, peer groups and communal norms, and *structurally* influenced, by the availability and nature of incentives in the economy, by the presence of physical infrastructure enabling changes in consumption, etc. In this respect, the UNDP devised its programme of collaboration on environmental issues with major faiths, recognising their influence in many countries and communities via social networks, communal norms and ethical messages rooted in traditions and cultural structures. It seems likely that approaches to public attitudes and action will be increasingly informed by social science and by opportunities for influencing via social network media, community groups and trusted peer networks (for example, parents' associations, the WI, churches, etc). In scenarios in which public trust in government messages and authority remains relatively low, we might expect to see more effort put into indirect influencing via trusted third parties in civil society, through new forms of public engagement and policy dialogues.

This points to a probably enhanced role for civil society actors (community associations, social networks, NGOs, faith communities, and so on) as convenors of debate and experimentation about lifestyles, consumption and responsibilities in the light of climate change and related issues. This is arguably a role already taken on by numerous civil society actors such as the emergent Transition Towns network, whose influence and potential have yet to be evaluated (though academic work is underway - see for example the University of Surrey RESOLVE programme: Peters, 2010 forthcoming).

3.6 Commentary on scenario frameworks

3.6.1 Scenarios and social, ethical and behavioural aspects of climate change

This section provides outline commentary on some significant scenario frameworks in the light of the preceding discussion, and outlines a scenario narrative and framework that takes the preceding discussions into account. Construction of long-range scenarios for climate change impacts from the point of view of ecological change, technologies and economic modelling is complex enough (Strachan et al 2008; Alcamo, 2008). The integration of social, cultural, political and descriptive ethical factors is yet more complex, and it is not attempted to any significant degree in the major climate scenarios developed so far, such as the IPCC SRES series (IPCC, 2000) and the Low Carbon Society series (Strachan et al, 2008). These and other systems (such as the Foresight framework) include a range of assumptions about large-scale social and political orientations (localism versus international integration, for example) but have so far not incorporated *finer-grained narratives* about how social, ethical and behavioural dimensions interact with one another and with technological and economic 'drivers' of change. Critics such as Baer (2007) argue that SRES is lacking in constraints on economic development (indefinite growth is assumed to be possible in the A1 family of scenarios, for example) and in integration of divergent political and policy goals and diverse social and cultural approaches to equity and to politically 'acceptable inequality' in climate frameworks and outcomes.

It is suggested that in the light of the social and ethical dimensions of climate change, more needs to be done to develop such finer-grained narratives and models of social change. Based on the discussion in previous sections,, it is proposed that richer scenarios for international dimensions of climate change would need to include consideration of the following:

- the impact of potential changes in 'capacities' as in Middlemiss's (2010) model, summarised in 6.2 above;
- changes in cultural norms: these would include consideration of the role of faith traditions globally, and of civil society in UK and beyond;
- reflection of the extent to which changes in values and behaviour are drive by *group-based shifts and changes in enabling infrastructure* allowing changes in practices of consumption and related values;
- the operation of worldviews and implicit value orientations (as proposed for example by Thompson, 2008) in climate change negotiations and development of policies and priorities in the UK and beyond;
- the consequences of the mismatch between probable UK and Western climate impacts and those forecast for many regions in the global South: this increases the potential for conflict and tensions based on perceived impacts and responsibilities;
- the development of political and social 'niches' and processes for debate about climate justice, distributional issues and procedural justice in mitigation and adaptation;
- the connection of climate change politics to wider shifts in attitudes, values and the strengths and weaknesses of solidarity (cooperative attitudes and values) within society by contrast with 'zero-sum' attitudes and values.

Scenario frameworks have been developed that have begun to reflect some of these factors in more detail than has been done for the SRES series and other major scenario sets such as the Millennium Ecosystems Assessment (MEA, 2005). Examples are outlined below, and we recommend that IDCC scenarios take account of these.

3.6.2 The Stockholm Network: Carbon Scenarios (Dormjan and Isyanova, 2008)

- Scenarios : Kyoto-Plus; Agree and Ignore; Step Change;
- These reflect possibilities for post-Kyoto international negotiating frameworks and tensions between developed and developing worlds;
- The scenarios also reflect tensions and mismatches within countries between climate change as a 'political project' and a 'popular sentiment';
- Factors integrated in the scenarios include public attitudes and responses to contingent weather events.

3.6.3 Forum for the Future: Climate Futures scenarios (Goodman et al, 2008)

- Scenarios: Efficiency First ; Service Transformation; Redefining Progress; Environmental War Economy ; Protectionist World;
- These scenarios have been developed in a framework that integrates these factors: direct impacts of climate change; public attitudes; response of business; nature of the global economy; availability of natural resources; political responses; technologies available for use;
- The Public Attitudes component includes consideration of these factors: direct and indirect experience of climate change; perception of climate science; mass media; role of faith communities; social values and priorities; tolerance of injustice.

3.6.4 Henley Centre / Headlight Vision (London): scenarios for civil society, for the Carnegie Trust Inquiry into the Future of Civil Society in the UK and Ireland (Carnegie, 2007)

- Scenarios: Local Life ; Athenian Voices; Diversity Wars; Global Compact;
- These all focus on the variations in the organisation, role, values and priorities of civil society actors in future in relation to economic, environmental, political and technical changes;
- Factors integrated into the development of the narratives include key social, ethical and behavioural uncertainties: the 'limits of economies' (the reach of market forces and valuations, limits to growth in consumption); shifting activism (the nature of campaigning and its priorities); personal values (formation and priorities); the relationship between state and individual.

3.6.5 A possible basis for scenarios

These scenario sets do not match the depth and complexity of SRES and similar models in terms of coverage of climate projections, economic modelling, technological factors and quantification. However, SRES and similar models do not yet integrate social, cultural, ethical and psychological factors to any significant extent. It is suggested that attempts be made to integrate learning from the more socially attuned efforts into variations on the Foresight and SRES scenario sets.

Drawing on the discussion in previous sections, what overall 'narrative' and framework could be developed as a basis for scenarios? Below we outline a possible approach.

The progress of climate change politics and policymaking depends on the complex interaction of governance systems, economies, science, technology and societal, ethical and behavioural factors. We have outlined some of the complexities of the elements involved in social and behavioural changes. To summarise:

- Individuals' awareness of and attitudes towards climate change are influenced not only by representations of the issues in the media (scientists' and politicians' views) and by personal experience but also by the web of social relationships and understandings in which they operate. Existing values, worldviews, assumptions about other people's behaviour and attitudes, and response to existing norms, all constrain and shape attitudes and understanding. Some worldviews and values will lead to resistance to change in behaviour and attitudes despite the strength of evidence claimed about climate change;
- Individuals' and communities' attitudes and behaviour are also affected by the wider societal and political discourses about climate change. These are highly contested and we can expect disagreement about fundamentals of climate change and policy to *persist* (Hulme, 2009). Scientific evidence does not readily translate into clear-cut policy choices, still less into straightforward politics. Because climate policy can imply major changes in production and consumption patterns, because these would challenge many established interests and preferences in many societies at all levels, and because climate change raises complex and perhaps intractable ethical issues - climate change and policy will remain highly contested within and between societies;
- the strength and nature of political responses to climate change are constrained to varying degrees by political perceptions of what citizens will accept by way of change and incentives. This applies especially to democracies, where there is a need to gain electoral majorities and an ever-present risk for politicians of 'getting too far ahead of the public' in advocating major changes (see for example Ward, 2010);
- public opinion seems largely convinced in the West of the reality of climate change and the need for action to be taken, but there have been and will be swings in attitudes depending on events (for example,

- a run of cold winters and cool summers in the West; alternately, a run of extreme events widely associated with climate change);
- there is a persistent *value-action gap* between reported attitudes and values on the one hand, and actual changes in behaviour to meet climate change challenges on the other. This is related to prevailing norms, the difficulty of breaking away from habitual patterns of consumption and use of technology, the lack of incentives and infrastructure to enable such change, and the perception that personal agency is low by comparison with the need and capacity for action by governments and businesses;
 - while citizens committed to 'pro-environmental behaviour' are in a minority, there is also a minority who are unconcerned about the environment and climate as a matter of conviction and worldview. The mass of citizens in the UK are open in varying degrees to appeals to environmental responsibility. Hogg and Shah (2010) suggest that empathy, willingness to consider significant change and interest in issues such as climate change could be increased through programmes of public education and information on global development;
 - appeals to citizens have been based on a mix of discourses and values - from self-interest to altruistic concern for the poor of the developing world and future generations (Rowley, 2010). Arguments based on ethical claims, appeals to personal and collective responsibility, and legal challenges based on human rights and damage done by climate change could become more salient and radical from campaigning organisations, faith communities and concerned politicians if and when climate change events become more prominent, unambiguous and damaging. Whether such arguments will be a decisive factor in changing values and behaviour is unclear; it is more probable that they will take their part alongside other developments such as changes in incentives and infrastructure in shifting attitudes and behaviour;
 - Whether there will be a greater sense of social justice, empathy and generosity towards developing countries in the face of climate disruption in the UK or elsewhere in the West is unclear. It could be that climate disruption close to home would not generate greater empathy and could lead to more concentration of resources on domestic concerns. It could also be the case that climate disruption overseas would generate spikes in charitable giving but no wider sense of empathy or connection between conditions in developing countries and those in the developed world;
 - the UK's international role as a leader in mitigation and adaptation could safeguard the UK from negative perceptions in the global South in relation to climate change, although perceived failures by the developed world to meet its responsibilities could lead to tension and resentments against the West that would include the UK. At the level of international relations, a 'value-action gap' exists as it does at the level of communities and households: the discourse of urgency in climate policy is not yet matched by commensurate policy, whether in domestic policies (in the developing world as well as in the industrialised world), and this gap opens up space for profound contestation about climate

change ethics, responsibilities and priorities. Given the scale of the costs of mitigation and adaptation, and the interaction of climate politics with developments in the global economy and the prospect of mounting resource scarcities, it is likely that climate policy and ethics will remain deeply controversial and capable of generating serious resentments and policy deals that leave many actors dissatisfied;

- taking all these factors into account, we can envisage developments within societies such as the UK that generate demand from electoral majorities for more radical action on climate (linked perhaps to concerns over energy security - see Spence et al, 2010) and that create a set of feedbacks (via incentives and new infrastructure and domestic energy systems) affecting behaviour and values such that there is wide support for changes in consumption and for global deals reflecting ethical claims for fair treatment for the world's poor and for future generations. Values and attitudes would hold sway that favour empathy and cooperation. This would be the basis for a 'positive-sum' family of scenarios;
- however, we can also envisage developments that limit such demand or restrict appetite for change to domestic conditions (for instance, support for decarbonisation in the UK but not for generous aid to the global South) and that do not provide political backing for global deals. Values and attitudes would hold sway that favour self-interest, 'charity begins at home', and minimal change to existing habits of consumption. This would be the basis for a 'zero-sum' family of scenarios;
- these are clearly possibilities that coexist in the international system (Steven, 2010) and in the segments of opinion identified at national level (as in DEFRA, 2008). The Copenhagen conference resulted in an uneasy blend of zero-sum *Realpolitik* in the process that created the final Accord and of positive-sum aspiration in some of the Accord's provisions and the general commitment to the UNFCCC process. At national and local levels policies are proposed, blocked and refined in a complex process of interaction between actors operating to variations on a zero-sum or positive-sum view of climate change, with widely divergent assumptions about the ethics, economics and politics of climate policy, and with a prevailing dominance of 'realist' utilitarian, economics-led perspectives on the assessment of costs and benefits.

3.6.6 Outline scenario framework integrating behavioural, social and ethical factors

As an illustration of what could be developed, a scenario model for international implications of climate change that incorporated factors relating to values, political responses and pressures from civil society could be generated as follows:

- An axis opposing Zero-Sum approaches to justice, ethics and dilemmas with Rules-based Cooperative approaches to mitigation and adaptation;

- An axis opposing global negotiation and frameworks for action to fragmented patterns of bi- and multi-lateral and multi-level cooperation;
- This would generate a four-fold set of scenarios to the 2030s on these lines:
 1. Ethically informed global deal in a rules-based system developed coherently by state and private/NGO actors
 2. A Realpolitik-based global deal imposed by major powers in a zero-sum system
 3. A fragmented Realpolitik approach to bi- and multi-lateral deals in a zero-sum system
 4. An ethically informed mosaic of bi- and multilateral / multi-level deals in rules-based systems developed by a fragmented set of partners across sectors and levels

3.6.7 Scenario 1 narrative: Ethically informed global deal in a rules-based system developed coherently by state and private actors

Social and behavioural elements: direct and indirect experience of climate change; growing consensus over the scientific evidence and high costs of inaction; influence of role models and peer groups enlarge the segments of the population engaging in pro-environmental behaviour; this trend is reinforced by incentives and infrastructure changes. In major states in developed and developing worlds alike, a critical mass of citizens puts pressure on and gives political encouragement to decision-makers concerned to secure international agreement and urgent action.

Ethical elements: influence from respected organisations and individuals via media and campaigns on citizens and on political and business decision-makers; rising concern for future generations and prospects of children and grand-children in the present; impact on opinion of major disasters plausibly attributed to climate disruption; campaigns and appeals are based increasingly on arguments about universal rights and programmes of public education and information on global change.

Developments: Coordinated campaigning and convergence of political and public opinion in major states and corporations lead to global deals based on universalist models of justice and shared development goals.

Variants and risks: this scenario would not ensure a 'solution' to climate change - variants could include more or less focus on mitigation or adaptation, and more or less focus on sustainability of non-human life and richness of habitats.

3.6.8 Scenario 2 narrative: A Realpolitik-based global deal imposed by major powers in a zero-sum system

Social and behavioural elements: limited direct experience of climate change in developed world and much of the developing world; expert consensus over the scientific evidence and high costs of inaction, but

persistent controversy over policies and costs, and periodic spikes in 'contrarian' arguments and influence ; limited political pressure from public in most major states as segments committed to pro-environmental behaviour remain a minority; this trend is reinforced by limited nature of changes in economic incentives and supporting infrastructure.

Ethical elements: arguments from respected organisations and individuals via media and campaigns rooted in appeals to ethical responsibilities have limited influence as a result of preoccupations with economic crises and resource security; counter-arguments that problems will be met through new technologies and economic growth have more political influence and public support.

Developments: Major states and other actors act on the basis of resource security and self-interest; limited support for most vulnerable and poorest states and groups, with emphasis on technological solutions to climate problems; international deals brokered by small groups of powerful actors as at Copenhagen.

Variants and risks: this scenario would not ensure a 'solution' to climate change - variants could include more or less focus on mitigation or adaptation; risks could include greater militancy from campaigning organisations and inter- and intra-state tensions rooted in instability partly attributable to climate disruption and in perceived injustices.

3.6.9 Scenario 3 narrative: A fragmented Realpolitik approach to bi- and multi-lateral deals in a zero-sum system

Social and behavioural elements: as for Scenario 2 - limited direct experience of climate change in developed world and much of the developing world; expert consensus over the scientific evidence and potential high costs of inaction, but persistent controversy over policies and costs, and periodic spikes in 'contrarian' arguments and influence ; limited political pressure from public in most major states as segments committed to pro-environmental behaviour remain a minority and as the salience and experience of climate changes remain limited for majorities; this trend is reinforced by limited nature of changes in economic incentives and supporting infrastructure.

Ethical elements: arguments from respected organisations and individuals via media and campaigns rooted in appeals to ethical responsibilities have limited influence as a result of preoccupations with economic crises and resource security; counter-arguments that problems will be met through new technologies and economic growth have more political influence and public support.

Developments: As a result of preoccupation with economic pressures and other shorter-term priorities, there is a chronic lack of domestic support in major powers for universal global deal, and we see a gradual break-up of UNFCCC process in favour of bi- and multi-lateral regional deals, and amid considerable protectionism. Major states and other actors act on the basis of

resource security and self-interest; limited support for most vulnerable and poorest states and groups, with emphasis on technological solutions to climate problems; there are attempts at universal ethics-based 'deals' via connections between 'coalitions of the willing' in business and civil society and local governance, but these lack resources and political power.

Variants and risks: variants could include more or less focus on mitigation or adaptation; as in scenario 2, risks could include greater militancy from campaigning organisations and inter- and intra-state tensions rooted in instability partly attributable to climate disruption and in perceived injustices. Risks of instability and conflict would be highest in this scenario.

3.6.10 Scenario 4 narrative: An ethically informed mosaic of bi- and multilateral / multi-level deals in rules-based systems developed by a fragmented set of partners across sectors and levels

Social and behavioural elements: direct and indirect experience of climate change; growing consensus over the scientific evidence and high costs of inaction; influence of role models and peer groups enlarge the segments of the population engaging in pro-environmental behaviour; this trend is reinforced by incentives and infrastructure changes. However, strong resistance exists to policies for radical change in consumption and production, and lobbies against ambitious global deals are influential, rooted in anxieties over economic security and resource scarcity. There is less of a constituency for a strong global deal in major states than in Scenario 1, but a larger one than in Scenarios 2 and 3.

Ethical elements: as in Scenario 1, there is significant influence from respected organisations and individuals via media and campaigns on citizens and on political and business decision-makers; rising concern for future generations and prospects of children and grand-children in the present; impact on opinion of major disasters plausibly attributed to climate disruption; campaigns and appeals are based increasingly on arguments about universal rights. However, businesses and civil society organisations campaigning for change are less coordinated and able to reach domestic and transnational consensus than they are in Scenario 1, and less capable of exerting political influence as a result.

Developments: Gradual break-up of the attempt under UNFCCC to achieve a single global framework, following failures to secure post-Kyoto deals as a result of clash between consensus on the urgency of action and divergence of views on priorities, finance and mechanisms. Acceptance of loosely coordinated processes of multi-level, multi-lateral and bilateral deals, including overlapping arrangements such as multiple regional emissions trading systems. NGOs, faith communities and local actors such as city authorities form their own versions of global deals at sub-national levels. 'Soft power' influencing via networks and overlapping regimes for cooperation plays more of a role than formal international negotiation.

Variants and risks: as for Scenario 1, this scenario would not ensure a 'solution' to climate change - variants could include more or less focus on mitigation or adaptation, and more or less focus on sustainability of non-human life and richness of habitats. Risks include instability and insecurity in a minority of states and areas unable to find a place within the plural frameworks of cooperation and mutual aid developed in this scenario.

Further variations on this model can be envisaged. The scenarios would be accompanied by narratives on social, ethical and behavioural factors and their interaction with other drivers of change, generating the global patterns outlined above.

4 Conclusion

Analysis and understanding of the social, behavioral and ethical dimensions of climate change are at an early stage still. Work on the social and behavioral aspects of environmental action indicates that changes in individual attitudes, values and behavior are constrained by wider social and economic norms, structures, incentives and perceptions (such as worldviews); and that influencing change in the direction of 'pro-environmental behavior' is complex and needs to take into account group pressures and norms and the ways in which new behavior and attitudes tend to be mediated via peer groups and other community structures. Policies to influence behavior are complex and as yet not well understood. Approaches that take full account of the importance of peers and social networks are likely to become more widely used.

Behavioral and social aspects of climate change are entwined in complex ways with ethical considerations. Norms and values are embedded in everyday habits and consumption practices and in the worldviews of citizens and organizations. The complexity and range of ethical issues raised by climate change and discussed increasingly by ethicists and campaigners have yet to be integrated comprehensively in the politics and policymaking processes for climate change mitigation and adaptation. It seems likely that these issues will become more salient if and when climate pressures become more visible widely experienced and reflected in policies that affect everyday life to a greater extent than they do at present in the West and beyond. It is likely that ethical issues will be reflected increasingly in campaigning by NGOs and faith communities and other actors, but whether such advocacy - including perhaps a wider range of legal challenges based on human rights and intergenerational equity - will be influential on policymakers and international decision-making on climate is open to question.

Table 4-1: Summary Table: Scenarios, risks and implications

RISK /SCENARIO	GLOBAL/REGIONAL IMPLICATIONS	IMPLICATIONS FOR UK: DIRECT	IMPLICATIONS FOR UK: INDIRECT
Scenario 1 Global deal Positive sum	Global and regional capacity high for cooperation and resource transfers	Positive image as leader in global deal	Lower risk of exposure to climate protest and conflicts
Scenario 2 Global deal Zero sum	Global and regional governance dominated by major powers and commercial interests	Risk of marginal influence and weak outcomes for global deal	Increased risk of damage to image and influence; risk of more exposure to protest and spillover of CC-related conflicts
Scenario 3 Fragmented deals Zero sum	Global cooperation weak; bilateral and multilateral/regional deals brokered by major powers and commercial interests	Risk of marginal influence and likely end of prospects for global deal on mitigation	Increased risk of damage to image and influence; high risk of exposure to protest and spillover of CC-related conflicts

5 Gaps and Recommendations

As noted above, while there is a great deal of social scientific research now underway in relation to behavior change, social aspects of environmental action, and climate issues, there is a lack of widely accepted theoretical models and of extensive bases of evidence so far. We would recommend that more work be done in these areas in particular:

- tracking of public opinion and reported/observed behavior in relation to climate change in the UK, in order to build up better understanding of changes and influences;
- comparative studies of opinion and reported/observed behaviors across countries, in order to gain better understanding of cultural, social, political and economic variations and to inform programmes such as the British Council's 'cultural relations' approach to climate change information and education;
- more work on the role of NGOs and other civil society actors such as faith organizations and communities, which have a potentially significant and constructive role in many contexts;
- more work on public perceptions of the ethical dimensions of climate change and on the ways in which existing values and attitudes might be changed (more or less empathy for developing countries, for example).

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The understanding of social dimensions of climate change has both an analytical and a normative thrust. It identifies the essentially social aspects of climate processes and, at the same time, builds on the principles of equity and social justice, especially for the most vulnerable people. This paper addresses the social dimensions of climate change from a sustainable, equitable development perspective, understood as "an irreducible holistic concept where economic, social and environmental issues are interdependent dimensions that must be approached within a unified framework", and where the o Climate change is a major challenge to international cooperation, as emphasized for instance, by the Stern Review and various IPCC reports (Stern 2006;IPCC 2007) but also many others. One of the main problems of achieving cooperation under international climate agreements, is free-riding. Countries have an incentive to adopt a non-cooperative behaviour.Â national dimension of climate policy. The i-rst i-ve papers are theoretical papers, the last two. papers employ a climate simulation model combined with a game theoretic module to derive. IFPRI climate-change researcher Gerald Nelson has come up with what the Scientific American calls "a graphical accounting of the limits to what one planet can provide." Nelson's work features cutting-edge global climate models and new three-dimensional animations. It is highlighted in "How Much Is Left?", an article in the magazine's September 2010 issue and an accompanying video, which cover five resource categories. The topic of food is based, in part, on Climate Change: Impact on Agriculture and Costs of Adaptation, a food policy report produced by IFPRI. Nelson discusses his work in the vi