

ESRC NEW OPPORTUNITIES PROGRAMME
ENVIRONMENT AND HUMAN BEHAVIOUR (EHB)
PROGRAMME

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WORKSHOP REPORT

by

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1. BACKGROUND

The ESRC's Environment and Human Behaviour New Opportunities Programme is motivated by the perception that it is important that environmental policy is based on a sound understanding of the relationships between the environment, and environmental change, and human behaviour. The Programme consists of 15 research projects (although the start of one has been delayed by an accident to the principal investigator). The common questions to which they are all more or less specifically addressed are questions:

- Why do people behave as they do towards the natural environment?
- How do, or will, people seek to adapt their behaviour in response to environmental change, especially rapid environmental change? and
- What public policy approaches might persuade people to change their behaviour, either to mitigate the extent of negative environmental change, or to adapt to it in ways that do not exacerbate it, and to change their behaviour in ways that are least costly for society as a whole?

The purpose of the Second EHB Programme Workshop (the First Programme Workshop was a Programme start-up in February 2003) was to bring the projects in the Programme together at a time when their research results should be emerging, in order to provide an opportunity for exchange and mutual learning between the programme researchers, and to see whether any generic insights and conclusions were beginning to emerge for the Programme as a whole.

The workshop consisted of researchers from the Programme presenting their developed thoughts and initial results to other researchers and a few external guests. The presentations were grouped according to some broad themes: Rapid Climate Change: Impacts, Vulnerability and Adaptation; Learning and Behaviour Change; and

Values, Culture, Lifestyles and Environmental Impacts. The Programme for the workshop is given at Annex 1, and the Participants List at Annex 2.

Section 2 of this report presents, explains and briefly discusses a conceptual framework for the Environment & Human Behaviour Programme, as it had been developed through the Programme Workshop in September 2003 ‘Theoretical Approaches to Policy Change and Human Behaviour’ (see Johnson & Ekins 2003 for a report). In fact Section 2 is largely taken from the conclusions of this report. In Section 3 the various projects in the Programme are located in relation to this framework. Section 4 concludes by identifying some generic programme themes and issues which seem to be especially important for the relation between human behaviour and the environment.

2. ENVIRONMENT AND HUMAN BEHAVIOUR: TOWARDS A CONCEPTUAL FRAMEWORK

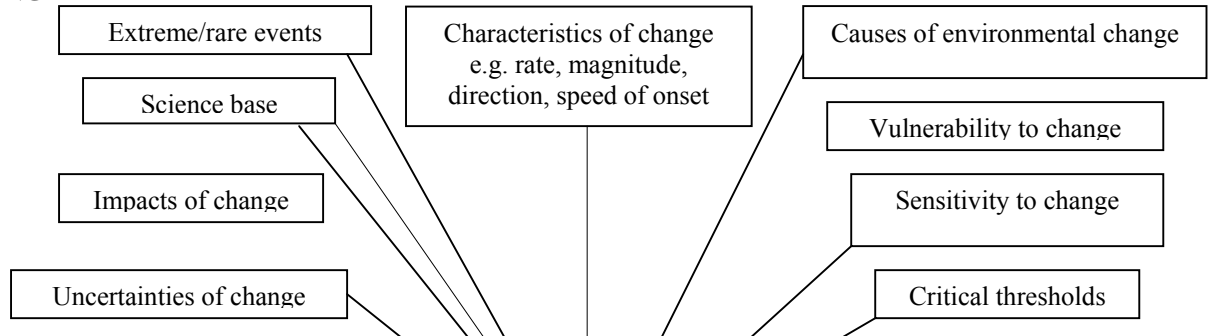
The diversity of projects in the Programme illustrates the range of factors which need to be included if the complex relationship between environmental change and human behaviour are to be understood. To simplify this complexity a conceptual framework is needed, within which an understanding of the relationship between core environmental variables, intervening contextual variables and the influence of these on individual and collective behavioural change can be developed. Only with such a framework will it be possible to derive generalisations from the ways individual projects have addressed the three programme research questions.

The diversity is such that no single theory would serve as a useful explanation of the range of complex causal relationships explored. Rather, a framework, initially developed in the Programme’s ‘Theory’ workshop (Johnson & Ekins 2003) is suggested which sets out what seem to be the main factors in the three realms that seem critical to the environment-human behaviour relationship: the individual realm, the context and situations in which individuals find themselves, and the natural environment, and environmental change, itself (Figure 1). The three realms obviously interact, and co-evolve, continuously. The underlying hypothesis on which the framework is based is that *individual and collective behaviour towards the environment, and changes in that behaviour, occur within specific contexts, are influenced by environmental factors and differ depending on the relative influence of, and interaction between, a range of behavioural factors.*

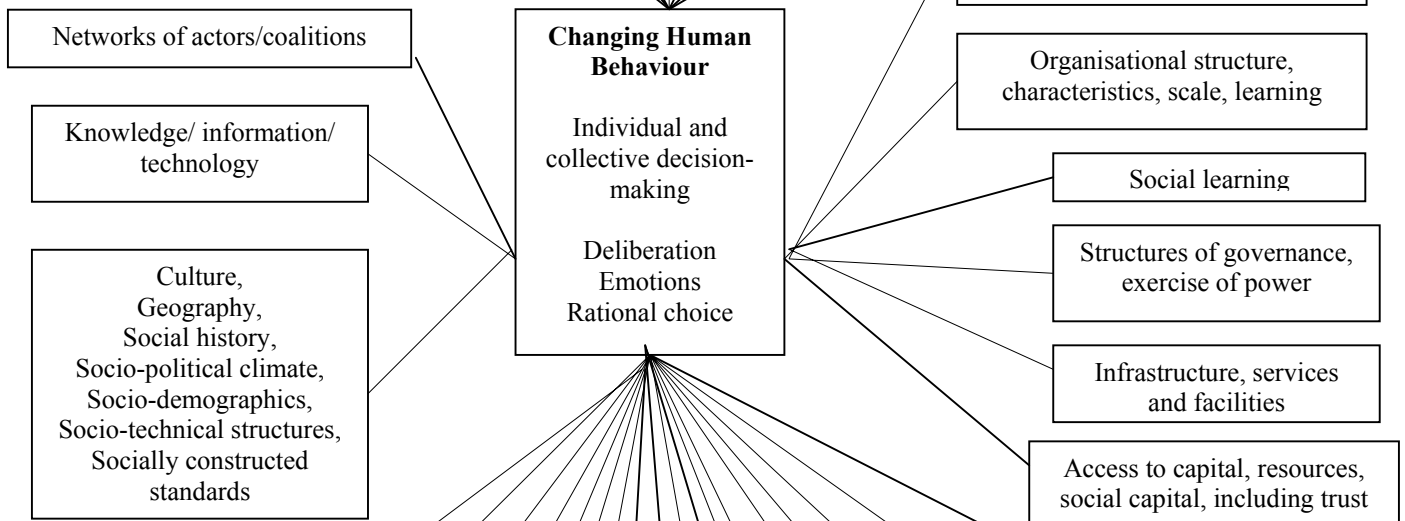
It is therefore a combination of context, individual behavioural factors and environmental factors, acting through deliberation, emotion and rational choice, which influence human behaviour. If human behaviour towards the environment is to change, then changing the variables which influence this behaviour will be necessary. Because the various factors are inter-related, often in complex ways, and because different individuals live in different contexts and situations, a change in any one factor, or in any combination of factors, will not necessarily cause different individuals to change in the same way. On the other hand it may be that changes in particular factors are critical in a wide range of situations, and for many individuals, if behavioural change is to take place.

Figure 1: Environment and human behaviour framework

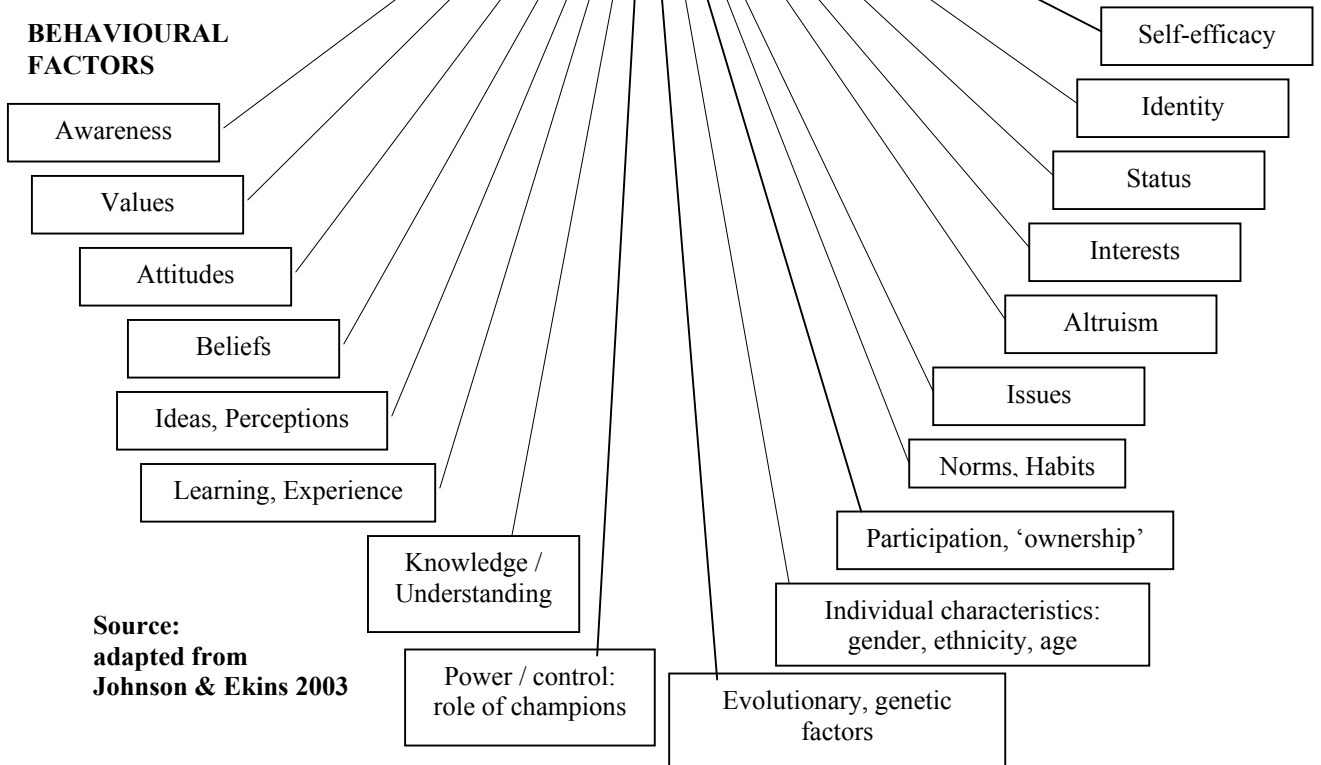
ENVIRONMENTAL CHANGE



CONTEXTUAL/SITUATIONAL FACTORS



BEHAVIOURAL FACTORS



Source:
adapted from
Johnson & Ekins 2003

Figure 1 therefore illustrates a framework which identifies key environmental, contextual or individual drivers of change, which act separately or in combination to influence individual and collective decision-making in response to environmental change. Each of the projects in the Programme is highlighting different variables in the framework presented in Figure 1, identifying those that are regarded as dominant/critical in the topics being explored. Section 3, which is based on the presentations at the Second Programme Workshop and the project summaries submitted by researchers as part of their annual reports for 2003, begins the process of creating a map for the programme as a whole, showing which factors and combinations of factors have been important in which contexts, and have contributed to what kinds of changes. Section 4 will then show the extent to which this map allows conclusions to be drawn about the kinds of interventions that may be required for particular kinds of changes to take place.

3. MAPPING THE CORE CONCERNS OF THE ENVIRONMENT AND HUMAN BEHAVIOUR (EHB) PROGRAMME

As noted above, the EHB Programme consists of 15 (14 operational) projects. These are listed in Annex 3, grouped by the six themes identified in the Programme's Call for Proposals, and other themes, with their principal investigator. This section will consider them briefly one by one, relating them to the framework of Figure 1 and noting any particularly important characteristics. As noted above, the summary sections for each project are based on, or taken directly from, the project's own reports. The commentary is by this report's author.

Rapid Climate Change

1. Exploring Vulnerability to Rapid Climate Change in Europe

Summary

The specific objectives of this project are:

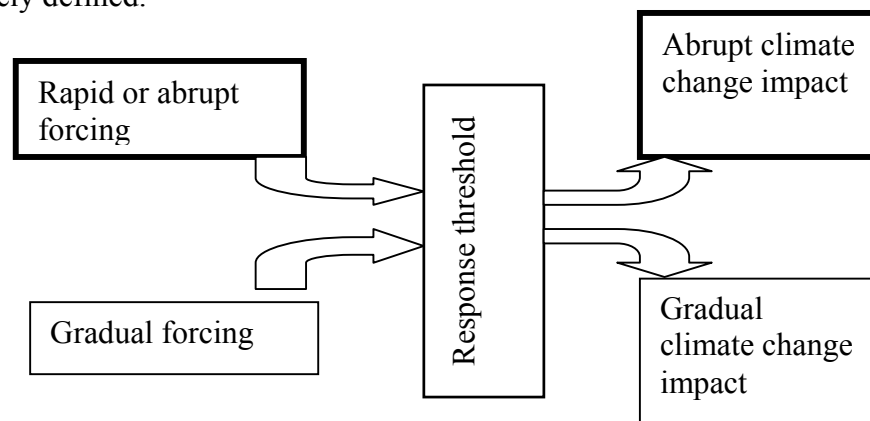
- to characterise and define rapid climate changes which may affect Europe, and collate state-of-the-art assessments of their likelihood and climatic manifestation
- to undertake a qualitative assessment, based on previously published climate change impact assessments and structured interactions with key stakeholders, of the sectors of the economy and society in Europe likely to be affected by the defined rapid climate changes;
- to construct numerical indicators of vulnerability to defined rapid climate changes, across Europe and the UK;
- to assess the attitudes of managers in different sectors to the threat of extreme, but rare, challenges, and begin to construct a conceptual model of adaptation to such challenges;
- to provide the basis for a quantitative assessment of the *risk* of rapid climate change impacts, combining vulnerability and likelihood.

The approach adopted involves a survey of the relevant published and grey literature, a set of Delphi surveys of expert opinion on likelihoods and consequences of rapid

climate change, and a final project workshop to ascertain expert opinion on vulnerabilities across Europe. There are three linked Delphi surveys: the first seeks to determine the likelihood of defined rapid changes as assessed by physical scientists, the second gathers opinions on the impact of such changes from academics and environmental managers, and the third attempts to characterise the ability of organisations to respond to rapid and abrupt changes.

Highlights of the Research and Important Findings

Virtually all of the published work on rapid and abrupt climate change concentrates on mechanisms, not consequences. An early task of the project was to develop a conceptual model of rapid or abrupt climate change. A distinction has been drawn between abrupt and rapid climate changes and abrupt climate change *impacts*. The former represent large changes to the *forcings* applied to a system, whilst the latter arise once a key *response threshold* is crossed (see figure below). A rapid or abrupt climate change need not cause a major impact; an abrupt climate change impact may result from a gradual change in climate forcings. An important difference between rapid and abrupt climate change forcings and abrupt climate change impacts is that the former can in principle be defined objectively, whilst the latter may be subjectively defined.



Central to the study is the definition of a series of scenarios characterising potential rapid or abrupt climate changes, as a guide to the assessment of impacts and responses. Three scenarios have been defined, as summarised below.

Scenario	Outline description
Collapse of thermohaline circulation	Change in climate at three time horizons: <10 years, 20-30 years and 50-60 years, with collapse assumed in (i) 2025 and (ii) 2050
Rapid sea level rise	Increase in sea level of 2m by 2100, relative to 1961-1990, with rate of rise continuing (i.e. approx 20mm per year: West Antarctic Ice Sheet collapse plus maximum IPCC rate)
Accelerated feedback	Increase in temperature of 2°C by 2020s, 4.2°C by 2050s, and 7.2°C by 2080s: twice the highest IPCC scenario rate

Important findings from early discussions with practitioners were (i) that very extreme scenarios – such as a 5m rise in sea level – were too extreme to be taken

seriously in adaptation planning, and (ii) assessments of the likelihood of the changes occurring were extremely important in influencing adaptation strategies and perceived vulnerability. This has informed both the characterisation of the scenarios and the form of the first Delphi survey, which seeks explicitly to gather expert opinion on the likelihoods of rapid change.

Commentary

In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

ENVIRONMENTAL CHANGE	CONTEXTUAL FACTORS	BEHAVIOURAL FACTORS
Causes of env. change		Awareness
Characteristics of change		Perceptions
Extreme/rare events		Knowledge/understanding
Sensitivity to change		Attitudes
Vulnerability to change		
Critical thresholds		
Impacts of change		

Although the project is exploring the attitudes of managers in different sectors, it seems that there is a very limited focus on the social/institutional factors that might make attitudes in one sector very different from those in another, although of course the importance of these factors may emerge in the course of the research. Rather the emphasis of the research is very much on understanding the vulnerability and risks emerging from particular kinds of rapid climate change and contrasting these with the current attitudes of managers, including presumably their perceptions of possible necessary adaptations in response. Clearly, whether these attitudes and perceptions are consistent with the findings of risk and vulnerability to emerge from the research, will be one of the major outcomes of the project.

2. *Crisis as Catalysts for Adaptation: Human Responses to Major Floods*

Summary

The research has examined four events of environmental crisis (the 1947, 1953, 1998 and 2000 floods) with the following objectives:

- to examine the influence of each of the floods on changes to public policy and policy actions;
- to examine what influence the very different socio-economic and political context for each of the floods has had on human behaviour and behavioural changes;
- to evaluate the influence of key actors on the policy change process; and,
- to examine how human behaviour towards the environment has changed over time in order to highlight generic signals of human behaviour, which can influence changes in public policy.

In respect of these four aims, the main findings of the project have been:

- All four of the floods investigated resulted in changes in policy towards the flood hazard. However, in all but one example, these changes did not reflect any 'new' policy ideas or fundamental changes in policy direction. Rather, the major floods explored here (and some minor floods) served to act as a catalyst for increasing the rate at which a policy idea, already under consideration prior to the flood, was given prominence and acted upon.
- Our findings provide further illustration of the importance of *context* in any evaluation of policy responses as a result of crisis events in three important ways. Firstly, we found that the availability of *technology, information, and knowledge* at the time of each of the floods significantly influenced the policy ideas which existed for managing the flood risk. Secondly, the *values, beliefs and attitudes* of the dominant actors influenced which of the available policy ideas were engaged as policy change options in the agenda-setting process, although many other factors affected which were prioritised and implemented. Here, the distinction between incremental and catalytic policy change proved valuable: by understanding the incremental changes in policy, and the underlying values and beliefs that these represent, the historic developments in attitudes towards the flood hazard provided important contextual understanding of policy behaviour at times of crisis. Finally, the socio-economic, institutional and political *context* at the time of each flood was, unsurprisingly, found to be a key contextual factor in determining policy response.
- In each of the floods, two or three actors, not necessarily previously engaged in the flood policy domain, played prominent roles in ensuring that certain policy ideas dominated the agenda setting process. This did not, however, represent a radical shift in policy thinking. Rather, these individuals were able to develop their policy ideas within a receptive environment. Or, put another way, they were able to influence which policies were germinated from the policy seed-bed. In this way, our research has illustrated the importance of key actors for influencing which ideas become policy, but this can only be achieved where there is general consensus to these ideas in the first place.
- Policy towards the flood hazard in England and Wales has evolved both incrementally and catalytically over the past 50 years or so. Our research has highlighted the importance of understanding the incremental if we are to offer any understanding of potential changes in light of rapid climate change events. Key influencing factors in this process appear to be a combination of contextual (information, knowledge, technology, social, political, economic), behavioural (values, attitudes, beliefs) and environmental drivers (scientific knowledge-base, extreme events). Within this complexity, seeking generic signals of change in any of these factors, which might lead to changing policy in the future, is a complex task indeed. However, by monitoring change in the drivers seen as so critical in the past, this can provide a more informed understanding of the ideas which, in the event of a crisis, might lead to changing policy in the future. For example, if changing knowledge about, and attitudes towards, technology resulted in incremental increases in the funding of flood warning technological research and development, this would be a 'signal' of potential changes in policy directed towards flood warnings, and flood warning technology in particular, in the event of a major flood.

Commentary

The starting point for the research is a particular kind of environmental event, possibly associated with rapid climate change. In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

ENVIRONMENTAL CHANGE	CONTEXTUAL FACTORS	BEHAVIOURAL FACTORS
Science base	Knowledge/information/technology	Values
Extreme/rare events	Wide range of social, political, economic conditions	Attitudes
Impacts of change		Ideas
		Beliefs
		Role of champions/key actors

One of the most interesting findings of this project is the relationship between the institutional and political context at the time of crisis events, and the personal values/attitudes/beliefs of individuals who happen to be in key positions at the time. Another key finding is the importance of incremental change in influencing what catalytic changes might be adopted following crisis events. As noted in the project's Summary Report "a rapid environmental change event forces people to address policy needs but any changes to this policy tend to be based on prior knowledge and ideas".

3. Rapid Climate Change in the UK: Towards an Institutional Theory of Adaptation

Summary

Work on this project to date has concentrated on extending the theory of organizational adaptation (by building a synthesis of literatures on the institutional economics of climate change and extreme events, the management theory of organisational adaptation to exogenous risk and the climate change and natural hazards literature on human adaptation to risk) and generating guidelines for the mapping of the institutional constraints on adaptation.

Three literatures, concerned with institutional adaptation to climate change, social capital and social learning, have been reviewed with the aim of moving towards a better integrated understanding of the way institutions operate to constrain adaptive capacity in organisations threatened by environmental risk and of flagging areas for future theoretical development. In this case rapid climate change (a cooling scenario for the UK) is the defined hazard.

Institutions are defined as the rules of the game and include formal institutions enshrined in legislation, job descriptions or codes of practice and informal institutions rooted in cultural norms, attitudes and habits of behaviour. A tension lying within the theory on institutions is the extent to which they operate as structures constraining human action whilst simultaneously being the product of human agency. The balance between structure and agency in any one organisation or social setting is identified as

being critical for determining the extent to which institutions enable space for adaptation and change without allowing disintegration of social units and failure to meet core objectives of the organisation. There is a fine line between stasis and inertia on the one hand brought about by an excess of structural control and chaos on the other caused by too much individual agency. Somewhere in the middle lies a theoretical space of creative interaction between structure and agency where adaptive capacity is likely to be most effectively fostered.

There is a strong orientation in each of the literatures on institutional economics, social capital and social learning towards a relational interpretation of power and it is this that provides a common epistemological ground. Power is seen as being contested or reinforced in every social interaction. A detailed theory of adaptation then must include a concern not only for organisational structure but also the spaces of interaction between actors that provide opportunities for the distortion, misunderstanding or even reinvention of received policy. Further investigation of the implications of a relational reading of power on adaptation theory and subsequent adaptation policy is worthwhile.

Social capital remains a contested concept despite its rapid take up by the policy community. The review of social capital theory undertaken in this project has identified a number of problematic areas for its use in adaptation theory and policy. To move towards a greater understanding of the interaction of crisis on social capital it is necessary to identify the limits of the concept. Some work identifies social capital with collective organisation, others include deeper cultural norms and habits of reciprocity. Ambiguity in meaning confounds methodological challenges that have made elusive the identification of comparative indicators for aggregate measures of social capital. Despite these caveats social capital theory provides a useful entry point for examining social relationships and communities of practice within and between organisations. The distinction between tight bonding relationships where ideas can be reproduced and bridging or linking relationships where new ideas can be transferred between communities of practice is particularly useful, differences between cultural and collective action reading of social capital offer opportunities for building theory to link the cultural and political elements of adaptive capacity.

Social learning includes a focus on both the social contexts in which individuals can learn and the notion that social groups and organisations can learn as entities beyond the learning of constituent individuals. The interplay between individual and organisational learning is valuable for adaptation theory and worth future investigation. The literature on communities of practice has many connections with social capital theory in acknowledging the importance of imagined communities whose members share a common identity beyond formal designations of roles and responsibilities and in the use of a relational understanding of power. Communities of practice are places for learning through experience with boundary objects and actors providing connectivity between discrete communities. Work on the so-called shadow network of informal relationships that cross-cuts formal organisational structures provides another lens on the movement and modification of policy, ideas and information as it passes through an organisation or from one organisation or community of practice to another. The aim here is to make more theoretically visible informal institutions and again opportunities exist for extending theoretical understanding of institutions and adaptation.

Two broad areas where further research is required are:

- The need for a greater understanding of the social properties of systems that enable or constrain adaptation.
- The need for a more refined understanding and more empirical evidence for the operation of informal social networks in influencing the behaviour of organisations and social learning in building adaptive capacity.

Understanding of social adaptation to climate change has been dominated by a focus on directed, material adaptations. These are the use of social systems to effect or influence observable physical changes or changes in behaviour responding directly to climate change. An example would be the mobilisation of family members to support an injured relative following a disaster event. This is important work and is a necessary first step in mapping the contours of adaptation. However this is a limited worldview. A deeper engagement identifies three additional spaces for interaction between social systems and adaptive capacity:

- First where social systems play a role in indirect adaptations that do not in themselves seek to reduce climate change risk but that build resilience to the background risk or life. An example here would be to invest in education as a long-term strategy for enhancing a household's or family's access to human, social and financial capital. The contrast is with those marginalized households where education is not invested in building ways of reducing risk and vulnerability.
- Second, where adaptations are directed at climate change but the aim is not to make material interventions but rather to change the institutional architecture that constrains further opportunities for material change. A strategy to build a more effective set of social contacts or build the width or depth of existing social contacts with a view to increasing potential social capital would count as an adaptive strategy for an individual or organisation.
- Finally, indirect action that responds to background stress would be the most removed space for social systems to influence adaptive capacity. An example would be involvement in collective or representative decision-making, such as voting in local elections or an organisation's discussion groups. The project has opened up these three additional arenas for the social aspects of adaptation and aims to provide initial empirical evidence from the second period of research.

Theory on organisational management points to a lack of understanding surrounding the behaviour and influence of informal social networks in organisational performance. This observation coincides with a gap in the literature on adaptation to environmental risk and climate change. Informal social networks are most often associated with negatives such as corruption, with little theoretical or empirical work seeking to identify or examine their positive potential in adaptation. Given that adaptation to future stress and shock will require unanticipated action, informal networks may prove to be an essential element in rapid and effective local self-organisation for adaptation. The degree to which changes tied to informal networks can be reproduced and transferred through social learning also requires further work. Having identified this research need deductively the second period of research aims at providing initial empirical evidence.

Commentary

Unlike the previous two projects, the precise nature of the environmental change requiring adaptation is not specified in any detail. Rather the focus is on the institutional response to the change. In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

ENVIRONMENTAL CHANGE	CONTEXTUAL FACTORS	BEHAVIOURAL FACTORS
Extreme event (cooling)	Institutional framework	Values
	Organisational structure	Knowledge/understanding
	Power	Ability to learn
	Social capital	Attitudes
	Social learning	Beliefs

The deductive approach means that in contrast to the previous project, the initial focus is on building knowledge from theory. Less attention has been paid to the empirical characteristics of individuals, or their interaction with social and institutional contexts in influencing the nature or scale of adaptation to past events. This is the focus of the final stage of the project where theoretical developments will be ground tested through discussions with stakeholders.

4. Predicting Thresholds of Social Behavioural Responses to Rapid Climate Change

Summary

The primary aim of the project was to contribute (using Q-methodology) to knowledge and understanding of the likely behavioural responses of individuals (as part of communities) to rapid climate change. Through a pilot survey, the ways in which participants perceive impacts associated with a series of rapid climate change scenarios were mapped using a combination of quantitative and qualitative methods and compared with overall perceptions of climate change and potential behavioural responses. Of particular interest was any threshold in responses that may translate into significant social impacts and/or maladaptive behaviour.

A set of physical ‘scenarios’ for rapid climate change was developed. Four scenarios were tested that are geographically specific (i.e. related to West Midlands); pertain specifically to climate, rather than related (e.g. ecological, economic) impacts, and are based on annual average temperature change (status quo, +2.5, +5, -2.5) over a 10-year period: i.e. the independent variable as this is the dimension of climate change that most people can relate to. It is worth noting that one of the hottest summers experienced recently in the UK occurred during the research period.

Q-methodology was used to identify and describe factors that represent four different types of attitudes both to rapid climate change as portrayed through the scenarios and related potential behavioural response: i.e. (i) concern, (ii) scepticism, (iii) action oriented, and (iv) apprehension.

Factor 1 – the strongest – was ‘Concern’ of individuals about climate change and a willingness to take action to either directly address or invoke collective change to address the issue. This represented the majority position, associated with a belief that climate change is happening and an important public issue about which something should be done. But there is no great sense of urgency. Factor 2 is described as ‘Scepticism’, and is associated with a lower propensity to believe that climate change is taking place and a good deal of scepticism with respect to public discourse in relation to climate change, particularly from the media. Individuals who identified with this factor tended to see themselves as ‘natural sceptics’ or ‘objective’ in orientation. Factor 3 is described as ‘Action Oriented’ because of its emphasis primarily on taking steps to do something about climate change, which is seen as a real and occurring phenomenon. These people were least inclined to attribute this change to normal climatic variation, with many believing that climate is already changing. The fourth factor - ‘Apprehension’ - was the smallest but also one of the more important factors. It represents apprehension about the ability to deal with climate change, both in terms of taking action to avoid the potential consequences and mitigating its impacts. What is worrying about this factor is that it represents a marked lack of faith in the ‘system’: i.e. the likely response of both individuals and institutions — a form of cynicism that lends itself to advocating a fairly dramatic, and potentially maladaptive, course of action.

Some evidence was found of a behavioural threshold, to the extent that certain factors manifest more strongly at lower rates of climate change. The lower threshold may reflect the existence of a ‘priming effect’ whereby changes (particularly warming) affirm expectations that have been established by media reporting. Higher threshold changes, particularly around the factor of Apprehension, may more seriously reflect a breakdown in social capital and maladaptation to climate change. There is also a marked difference in response between scenarios that involve warming to one where there is a net cooling. That the observed impacts occurred at such high rates of climate change may reflect difficulties in conveying the full effect where the scenarios are restricted to climate data. A larger response might be expected where scenarios include a range of social and biophysical impacts.

The results of the research will both contribute to an understanding of the way in which society responds to climate change information and inform the dynamics of community interaction with climate change information. This is important because reactions appear in part to be a function of expectations, which are in turn related to the types of information that is being disseminated and levels of trust in the messenger. The research demonstrates that information comes imbued with social and political meaning, where the receiver is constantly evaluating and judging it against their own experience and perceptions.

Commentary

While recognising that individuals are part of one or more communities, the research focused on individual attitudes and potential responses to climate change. The characteristics of change were important to the individual response and there was evidence of critical thresholds. Information (its source as well as its content) was an

important factor in determining the response. In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

ENVIRONMENTAL CHANGE	CONTEXTUAL FACTORS	BEHAVIOURAL FACTORS
Characteristics of change	Information	Awareness
Critical thresholds	Institutional framework	Perceptions
Impacts of change	Exercise of power	Knowledge/understanding
Extreme events	Infrastructure	Attitudes
	Trust	Experience
		Habits
		Ownership

In its analysis of four key attitudes to climate change – concern, scepticism, an action orientation, apprehension – the study stopped short of analysing what factors might cause a shift from one attitude to another, beyond finding that information and its source are likely to play an important role. This could usefully be the subject of further research.

Global Environmental Change and Food Systems

5. *Integrating Social Vulnerability into Research on Food Systems and Global Change*

Summary

The research aim of the project is to enhance understanding of how concepts of vulnerability of social aspects of food systems to global environmental change can be integrated with concepts from natural science to provide a more holistic approach to vulnerability studies. The specific objective is to review methods for investigating the vulnerability of human food systems to global change.

Research developed initially through a literature review of all the issues surrounding vulnerability and environmental change. This moved into further theoretical research on resilience theory, on adaptation theory, on development theory, on Actor Network Theory, on entitlement theory, on the theory of human need, on theories of distributive justice and social perspective, and on theories of spatial scale. Research into food systems vulnerability began with an assessment of the work of Amartya Sen and the politics of hunger. The practice of famine early warning systems, food storage and consumption smoothing were analysed through several case studies, in both an urban and rural context. This led to research into theories of political ecology and thus into theories of food and development.

Important findings from the research fall into the area of vulnerability and food systems theory. The first important finding is that vulnerability, in the context of climate change, entails two simultaneous modes: a *general* mode in the sense that we are all vulnerable, and a *particular* mode in the sense that different groups in society are differentially at risk from different threats to their livelihood. This illustrates the

necessary connections across scale between factors contributing to environmental change. It also brings vulnerability theory in the context of climate change in line with the far more progressive theorization of vulnerability that has been achieved in the field of hazards research.

Building on this theoretical development of a narrative approach to climate change vulnerability the project examined how this affected analysis of food systems vulnerability in the context of environmental change, leading to a recognition that a food system as such is an immensely difficult phenomenon to describe, both conceptually and practically:

- **Conceptually**, the most difficult problem is how to ‘frame’ a system: that is, what elements of the process of food production, distribution and consumption should be included for analysis and what left out. This also brings up issues of spatial and temporal scale. A secondary problem is how to connect a food system, once framed, with a livelihood system, once defined.
- **Practically**, the most difficult problem concerns methods for analysing food systems vulnerability at the regional scale. This is because so many externalities, apart from ‘global environmental change’ determine a food system and vulnerabilities within it. One key determinant of vulnerability concerns the machinations of the market and exchange. Building on Sen’s analysis of hunger and entitlement, the research in this project has concluded that aspects of exchange or market factors apply throughout the entire circular process of food production, distribution and consumption and are determining aspects of access and availability.

Social vulnerability, more often than not, is determined by the capacity of people locally to purchase food on the market. The market is complicated by a number of factors, including fluctuating commodity prices and local currency values. This means that a local ‘food system’ analysis needs to incorporate market constraints and options for local adaptation as part of an integrated approach to climate change vulnerability. Short-term, snap-shot assessments are of little value. What is probably of more value is to assess adaptive capacity and various forms of empowerment at the local scale in order to determine where the greatest degree of vulnerability might exist. This reinforces the importance of the ‘livelihood security’ approach.

The further development of useful typologies of vulnerable food systems should be rooted in nature-society theory that describes the nature of the boundaries and framings of food systems, that develop a language of the nature of systems behaviour rather than its static qualities, and that incorporates the differential vulnerability and adaptive responses of actors within socio-institutional networks.

Commentary

This research focuses on vulnerability to environmental change in general, as it relates to food systems. There is a detailed focus on the social and economic context within which groups face vulnerability, but seemingly no consideration of individual characteristics and behaviours within this.

In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

**ENVIRONMENTAL
CHANGE**

Vulnerability to change

**CONTEXTUAL
FACTORS**

Institutional framework
Structure of governance
Infrastructure etc.
Access to capital, resources
Networks of actors/coalitions

**BEHAVIOURAL
FACTORS**

Sustainable Mobility

6. Taxation Futures for Sustainable Mobility

Summary

This project aimed to provide a framework in which alternative transport taxation and charging regimes could be explored, to identify what conditions, supporting measures and technologies would be needed for the alternative regimes, and to identify an agenda for future research on the issue of appropriate taxation regimes for use with sustainable transport technologies and behaviour patterns.

The research has highlighted the social, policy and economic drivers that have resulted in the rapid ascendancy in terms of policy profile of the concept of national road user charging. It has identified a combination of four key factors, which are:

- The ongoing failure of transport policy to include sufficiently effective behavioural change measures to cut congestion and reduce emissions;
- The rise in the cost of transport policy interventions (including significant cost increases for rail, and expenditure in the motorway widening programme);
- The reduction in Treasury income of reforms to the current tax regime to make it more reflective of environmental performance, and policies to promote cleaner vehicle technologies;
- The difficulties of taxing fuel in a future multi-fuel transport sector, and equity issues of taxing fuels at different rates in different sectors.

This project has shown how these factors combine to explain that there are long-term structural drivers for the replacement of the current car taxation regime. Having identified the nature of these drivers, a second set of key findings relate to the design of the proposed policy measure. The modelling exercise and comparison with other modelling work has generated three key findings:

- There has probably been too much focus on designing an ideal car taxation system that cannot be realised for at least 10-15 years. The transitional path to such a future and the role of transitional reforms are crucial. Of particularly relevance are interim stages that permit learning and adaptation to occur.
- The UK has a current policy focus upon congestion reduction, which has led to the proposal for a complex congestion charge using GPS and in-car technologies. This could have serious negative second order impacts (for example leading to traffic growth shifting to low charge areas and times and major land use effects).

Other countries are exploring a simpler distance charge system, which, although seemingly less effective, may deliver the bulk of benefits with less negative second order impacts. This project has shown that different road user charging scheme designs have very important differences in terms of their transport, social and economic impacts.

- Clarity is needed over the policy goals that a national road user charge would address. It may be that the UK is depending too much on this tax reform, possibly seeing it as a way to avoid the hard political decisions that have dogged transport policy to date. A tax regime change does not lessen this political dilemma.

Commentary

The context for this project is one of assumed policy response to environmental change, involving taxation measures to address the environmental implications of road transport, coupled with an assumed need or desire for the government to maintain revenues from transport taxation. There is little discussion of individual behavioural factors. Rather the proposal for taxation reform is couched in terms of the need for technology development and policy learning.

In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

ENVIRONMENTAL CHANGE	CONTEXTUAL FACTORS Technology Socio-political climate Socio-technical structures Organisational (policy) learning	BEHAVIOURAL FACTORS
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Urban Systems and Long-term Climate Change

7. *Future Comforts: Re-conditioning Urban Environments*

Summary

The aim of this project was to explore social conventions of thermal comfort and implications for the sustainability of the indoor environment in the context of global climate change. The project entailed collating and analysing existing literature on the history, specification and provision of thermal comfort in order to review different interdisciplinary perspectives and lines of enquiry and take stock of the social and technical issues at stake, and recording the views of practitioners involved in the specification and construction of buildings in order to locate, compare, and better understand the ambitions and expectations of those in a position to influence the co-evolution of comfort-related technology and practice.

The project’s analysis of existing thermal comfort research identified a number of different paradigms, each informed by distinctive theories of comfort from the building and social sciences. These contrasting positions have significant implications for definitions of comfort and for how it is achieved in the real world. For example,

‘physiological’ approaches define comfort as a quantifiable condition to be met, supporting the provision of standardised indoor environments and systems of mechanical control. This approach has proved extremely influential, affecting the design and management of indoor environments worldwide and consequently contributing to escalating levels of energy use. In this context, the development of more ‘adaptive’ strategies is especially important. Interpretations of comfort as an active achievement – rather than as a definable state of affairs – are typically more flexible, often supporting and ‘allowing’ building designs that are naturally ventilated. While adaptive strategies permit greater thermal diversity, it is not clear how these approaches will fare in the longer run. The future of comfort seems less certain than at first anticipated.

Interviews with UK comfort-makers identified several key trends with regard to the definition, construction and achievement of comfort in the UK that have important implications for future research and policy. Many respondents recognised that standardising indoor temperatures and the increased uptake of mechanical cooling technologies contribute to escalating levels of energy use and rising CO₂ emissions. Further discussions indicated that these trends are expected to continue. A number of respondents were, for instance, of the view that demand for air-conditioning is ‘driven’ by changing consumer expectations – and by the sense that people need and want air-conditioning in all realms of life – including the home. These people took the specification of thermal conditions for granted, believing this to be simply determined by client demand for tightly controlled mechanical systems.

At the same time, project interviews showed the detailed specification of comfort to be a matter of continual negotiation. For example, there was evidence of a significant amount of innovation and diversity in how engineers and architects conceptualise and measure comfort in different environmental and social contexts. This is significant since different models and methods of comfort-making support more and less sustainable design strategies.

Interviewees described efforts to formalise environmental design criteria and develop regulations and standards in such a way as to support the construction of naturally ventilated buildings. Mechanically controlled indoor environments can be precisely defined, described and specified. Having become accustomed to a certain level of ‘precision’, a number of interviewees concluded that the development of robust and reliable standards for naturally ventilated buildings depended upon thermal comfort researchers’ ability to provide comparably verifiable and repeatable results. While much can be done in this direction, the basic problem remains: methods of natural ventilation are being judged and evaluated against systems of mechanical control. There were few signs of more radical thinking, or of efforts to actively challenge the model of the indoor climate that current methods and standards inadvertently perpetuate. Advocates of the ‘adaptive’ approach were concerned that efforts to develop more sustainable design criteria would be over ridden by seemingly unstoppable consumer demand for air-conditioning.

The three stages of the project contribute to an understanding of how preferences are formed, where needs – even ‘basic’ needs like the ‘need’ for comfort - come from and how these are historically and culturally defined and structured by multiple actors and agendas. The project has contributed to the development of theories of long-term

social and environmental change that go beyond individualistic models of choice, action, belief and behaviour. It has examined how collective conventions of comfort evolve and how thermal standards and norms have become institutionalised and embodied in buildings. As well as documenting the social and technical construction of conventions and practices, including those that have far reaching implications for sustainability, the project has developed and refined understanding of how technologies implicated in the provision of thermal comfort structure, stabilise and maintain service expectations and structure patterns of resource use.

This work on comfort offers insights into how individual practices are linked to wider socio-political regimes and socio-technical landscapes that evolve in specific cultural and geographical contexts. In this respect, the wider policy implications of the work are clear. First, it is vital to examine the processes through which service expectations (and associated patterns of resource use) become normal and to understand interaction between the multiple actors involved. Policy has to comprehend and seek to intervene in the specific systems of provision through which particular behaviours or practices are formed.

This project has opened up novel lines of enquiry concerning the relationship between environment and human behaviour. Challenging conventional wisdom, the project has shown how the actions and practices of humans are embedded in wider systems of socio-technical organisation and how these in turn relate to relations, expectations and ‘paradigms’ of comfort already embodied in technologies and infrastructures. Viewed in these terms the challenge for environment policy makers is not just one of changing end-user behaviour, of persuading end-users to behave differently, but of fostering the long-term transformation of institutional cultures, infrastructural scripts and social conventions.

Commentary

This project is not primarily about environmental change but about the evolution of social conventions and practices that have implications for it. Rather than seeking to understand or change individual attitudes or perceptions the project is more concerned with how institutions and conventions evolve and how they shape what people can do. Indeed, an important part of the message of this work seems to be that attempts to change human behaviour are unlikely to be successful unless they derive from an understanding of relations and interdependencies between individuals and institutions and from a policy context that seeks to foster change in socio-technical systems and regimes.

In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

ENVIRONMENTAL CHANGE

CONTEXTUAL FACTORS

BEHAVIOURAL FACTORS

- Technology
- Socio-political climate
- Socio-technical structures
- Socially constructed standards
- Institutional framework

- Norms
- Perceptions
- Attitudes

Tourism and the Environment

8. *Indigenous Peoples, Environmental Change and Tourism in Extreme Environments*

Summary

This research project stands slightly apart from most other contributions to the Programme in that it focuses on the world's marginal areas, the more peripheral parts of what used to be referred to as the Third World. These areas cover approximately 15% of the world land mass (excluding Antarctica), are fairly extreme environmental regions (hot deserts, mountains rain forests, etc.). The research was concerned to identify new directions, theories and methods in environmental social science research, with specific regard to the behavioural responses of indigenous / threatened peoples in extreme environments to: (1) extreme climatic variability; (2) resource management; (3) conflicting tourism development strategies. The specific context of the research (a case study of the Sahara/Tuareg people) includes issues of sustainability, resource management, tourism development strategies, primary commodity extraction (oil/gas and minerals), population movement and (re)settlement, international development/aid strategies and regional destabilisation and insecurity.

The case study on which most of this research is based highlights a number of important issues. One is that the concept of the environment is seen rather differently by the peoples of these regions than by most external agents. For the indigenous people of this region, as in many other parts of the world, the environment is not perceived solely as a physical entity, but also as a socio-cultural entity. This is rarely understood by most external agencies, including government and many 'aid' and tourism-associated agencies.

Secondly, these regions are mostly politically marginalized or conflict zones in which demands for such things as 'democracy', 'indigenous rights', better governance etc., often focus on environmental issues, so that such demands are often framed within the environment discourse. However, not only are there insufficient meteorological records to suggest that the Sahara-Sahel is experiencing climatic change as distinct from extreme variations within a medium-term norm, such as periods of extreme drought, to which people of the Sahara-Sahel are accustomed. There is also little to suggest that they are exercised by largely hypothetical questions of possible climatic change. This is because the peoples of these areas generally have to contend with more immediate and pressing issues, relating to their survival, so that questions relating to the possibility of climatic change are often of little or no concern to them. Their ranking of 'climatic change' as one of the agents that may turn their world upside down is low.

Thirdly, the parts of the world described in this research tend to be those that have become widely sought after by international tourism agencies, particularly those seeking 'adventure tourism'. Most of these regions welcome tourism, as it is an

important means of livelihood. However, it is also seen as posing major threats to their 'environment' and 'way of life'. Perhaps even more alarming is that tourist development in such regions is invariably closely associated with those same agencies, notably state and commercial elements, which are at the heart of the people's marginalisation and other 'grievances'. In short, sustainable development in such regions, especially in the form of tourism, is not merely an 'environmental' issues, but often of a highly political nature. This is rarely understood by elements of the 'travel-tourism' industry, nor the agencies with which the industry is usually associated.

Thus the context for the research was increasing concern amongst a small but growing number of the indigenous (Tuareg) population of the Central Sahara that tourism is likely to lead to an environmental catastrophe (especially to their cultural heritage). These people have become increasingly organised and vociferous in their demands for controls over '*tourisme sauvage*' and for more environmentally sustainable forms of tourism. This research has examined the actions and strategies of these 'environmentalists' in their increasingly 'political' struggle against the pressure for mass tourism and '*tourisme sauvage*'. However, their major struggle has been against government agencies, which have actively opposed their efforts for what at first appeared to be seemingly quite irrational reasons.

After three months of this research project, the environmentalists appeared to be well on their way to winning their case. Their successes were short-lived, however, being interrupted by the kidnapping of 32 European hostages by 'Islamic militants'. By the time the hostages were liberated six months later, Saharan tourism had diminished, with severe consequences for the livelihoods of many local people.

The hostage crisis put any further moves to develop more sustainable forms of tourism on hold. It also resulted in a growing perception amongst local people that the hostage crisis had been organised by government elements trying to create a 'terrorist situation' in the Sahara and hence secure US and other external military assistance. As this perception became more widespread, government agencies (including security forces) began harassing those 'environmentalists' who had brought the central government's attention to widespread local government corruption and 'bad governance'. The more 'environmentalists' tried to bring their case (now including illegal harassment) to the attention of government ministers and the President, the greater their harassment at the hands of local government agencies. Unable to understand the rationale for this government action, the environmentalists undertook their own research and discovered that a network of individuals in the top echelons of local/regional government were not only related to some of the most notorious Saharan bandits but were actively involved in widespread smuggling (narcotics, arms, etc). This, along with the central government's involvement in orchestrating the hostage crisis, was perceived by the environmentalists as the reason why government agencies have consistently opposed their proposed reforms and demands for good governance. Attempts to draw this state of affairs to the country's President appear to have failed. The entire 'dossier' has now been presented to certain international agencies, including the International Crisis Group, which is likely to declare the Saharan regions of S. Algeria, Niger and Mali as an 'international crisis zone'.

The case study is typical of what is happening in many of the world's more politically marginalized regions where local people become concerned by the degradation of their environment by external agencies. Attempts to introduce better governance, better resource management and more sustainable development policies tend to run counter to these external interests which are usually allied to state and/or other exercisers of power.

This study, building on previous detailed research over many years, well illustrates how the environment, in its wider meaning, is at the core of many conflicts, especially in regions which are at or beyond the margins of the state. It also enhances our empirical and theoretical understanding of key issues in the debates on post-colonialism, sustainable development, tourism, globalisation, marginalisation-exclusion, indigenous rights, weak/failed states and, most especially, the new imperial order. It also highlights how resistance to bad governance, resource exploitation, etc., invariably becomes articulated through environmental discourse.

Commentary

As noted in the Summary above, this research project is unique in the Environment and Human Behaviour Programme in that it is both concerned with a Third World country (as is one other project in the Programme), and focused on a situation of ongoing conflict in which 'environmental' concerns play a major role.

However, despite these differences, the framework of Figure 1 seems able to capture many of the most significant elements with which the project is concerned. Thus the context with which the project is concerned is one of rapid environmental change, but in terms of outside interventions in the area concerned rather than climate-induced changes, to which the indigenous people are both sensitive and vulnerable.

ENVIRONMENTAL CHANGE	CONTEXTUAL FACTORS	BEHAVIOURAL FACTORS
Vulnerability to change	Culture, geography	Awareness
Sensitivity to change	Social history	Perceptions
Causes of change	Socio-political climate	Beliefs
Characteristics of change	Institutional framework	Identity
	Structures of governance	

Their understanding of and responses to these changes derive from a complex interaction between all the contextual factors listed above, which range from their culture and social history, to the international institutional frameworks relating to aid and development, to the local political power-structure and its relations to national-level authorities. These in turn condition their prior beliefs about their situation, and their awareness and perceptions of it. The project has shown how complex behavioural responses to any environmental change are. There are no reasons for thinking that responses to changes in the natural, rather than social, environment, will be any less complex or prone to conflict.

Natural Capital

9. *Natural Capital: Metaphor, Learning and Human Behaviour*

Summary

The aim of the project was to explore ways in which the metaphorical concept of natural capital can be deployed to promote behavioural change in the direction of sustainability. The project has adopted an interdisciplinary model that combines educational, economic, philosophical and sociology of knowledge approaches.

The ‘natural capital’ metaphor models humans’ relation to the natural environment in a way intended to help operationalise the basic sustainable development requirement to take proper account of future as well as present quality of life in economic, social and environmental decision-making. The value of those environmental functions which support continuing human well-being is represented as that of a set of *capital assets*. Environmental sustainability is then a matter of ensuring that present activities preserve a *sufficient* natural capital stock for successive generations. The favoured criterion of sufficiency is that *critical natural capital* – natural resources and services both centrally important to human welfare and incapable of being substituted for by human-made capital – should not diminish.

It is clear from project discussions that the standard approach to valuing capital assets has been carried over with this metaphor to the valuation of natural capital. The net benefits produced by an asset are summed over its lifetime, with future benefits and costs discounted to a net present value for inclusion. In the same spirit, whether or not a natural capital asset is treated operationally as *critical* depends on present assumptions about what will be of central human importance, and what will count as a substitute for what, in the future. An important part of our research has involved identifying some quite general problems with this standard capital valuation model, arising from the inherent uncertainty, and in key respects the indeterminacy, of environmental futures. Under these conditions the model generates difficulties not just for the feasibility of predictions lacking a firm basis for projecting trends, but for the social and political authority of decision-processes which seek to constrain present activities on the basis of contestable future scenarios.

In response to these problems, an alternative model of capital valuation, drawn from the concept of *real option* value, has been explored. Originally developed in financial economics, this concept now underpins a set of sophisticated tools for non-financial capital asset management. The real option value of a capital asset is in effect the ratio between the costs of maintaining it in being and the potentiality for maximising benefits that its continued existence, under creative management, supports. Capital assets which can be used flexibly and adaptably, depending on emerging circumstances, have such value. Crucially, it depends not only on costs and options under incertitude, but also on the robustness of the social intelligence (both the knowledge base, and the systems of individual and institutional learning) available for negotiating this incertitude. Natural capital assets lend themselves to a real-option value model, because while there is an in-built downward pressure on the costs of maintaining them (from their characteristic self-regenerative capacities, offering a potential baseline of *non-depreciation*), they provide a wide range of opportunities for development in response to emergent knowledge, technologies and values.

This perspective on the natural capital metaphor has enabled the project to begin developing an account of maintaining natural asset value which turns on *building relevant social intelligence in the present*, through social learning, rather than on attempting to second-guess an inherently uncertain future. This account may offer considerable practical advantages in supporting the development of indicator- and appraisal-based methods of operationalising sustainable development at both national and local levels.

Commentary

It has been an important theme of the EHB Programme that conceptions of the environment are an important influence in how it will be treated. The ‘capital’ model of the environment, being consistent with economic views of the world generally, is quite widespread in thinking about sustainable development. This project adds a new component to such thinking, not just in terms of the option value inherent in environmental capital (which is a well-established component of total economic value as conceived by environmental economists), but also the importance of social learning about the environment if option value is to be effectively realised. This project therefore stresses the uncertainties involved in environmental change, and the need for social learning, at many different levels, for the uncertainties both to be reduced, where possible, and managed through the appropriate retention of environmental capital.

In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

ENVIRONMENTAL CHANGE	CONTEXTUAL FACTORS	BEHAVIOURAL FACTORS
Uncertainties of change	Social capital Social learning	Knowledge/understanding Ability to learn

Other

Listening to Children: Environmental Perspectives and the School Curriculum
(project not operational at March 2004)

10. *Tilting at Windmills? The Attitude-Behaviour Gap in Renewable Energy Conflicts*

Summary

The aim of the project is to bring together a range of disciplines, and devise new research questions and methodologies, to understand and address the apparent gap between human attitudes and behaviours in renewable energy conflicts; while there is high public support for renewable energy (including wind power), there is often very strong public opposition to individual windfarm developments leading to low success in permitting decisions. The project will unpack this apparent gap using theories, concepts and existing research from a range of disciplines, including economics, environmental management, geography, planning, politics, psychology and sociology.

The project has developed a number of insights and indications for further research.

Firstly, a number of theoretical links between different disciplines have been identified which may form the basis for such work. For example, social constructionist ideas have been identified as common to a number of subject areas, as have other meta theories. As well as the common use of theoretical perspectives, a number of interconnected issues and themes have arisen from across different disciplines. These have included:

- Considering the nature of the planning system, and the importance of understanding how this affects the decisions that are made and the formation of opposition
- Addressing the concept of ‘knowledge’; where it comes from, how it is used, and why.
- The need to unpack and understand what is meant by ‘opposition’.
- Considering the importance of place, landscape value, and local social and historical context

The first way in which common themes and ideas that have arisen from different disciplines might be addressed by new cross-disciplinary research is for theoretical positions from one discipline to be examined by using methods from another. For example, the emphasis in geography on the way that people understand and treat information in different ways in defining ‘problems’ could be examined by a discursive psychology approach.

Secondly, it may also be possible to link different methods together, and develop methodological triangulation. This might take the form of findings from one dataset enhancing understanding of another, such as a range of survey results contextualised by greater depth in interviews and ethnography. It could also for example be through the framework of economic models being developed by data or concepts from other disciplines. Factors and variables could be built into the model, and research from other disciplines, such as sociology or social psychology, could suggest what these variables might be.

A number of theories of attitudes and behaviour have also been considered, most notably that of ‘nimbyism’, a concept which is surprisingly widely used still. However, evidence from several empirical studies has cast doubt on this as an explanation for opposition, and cross national comparisons can be used to highlight the complexity of the issues and the necessary focus on the interaction between people and planning; this may be in terms of such things as communication, involvement, and ownership.

Finally, the work of the project has also included a (re)consideration of the nature and very existence of a ‘gap’ between attitudes and behaviour. Is it useful to think of a gap between public endorsement of wind energy and unsuccessful project implementation? Is the gap in terms of individual beliefs and actions, or in terms of a vocal minority imposing their will on the decision making process? It has been highlighted that any one behavioural act may be governed by a large number of factors, so there may only be a weak relationship between attitude and any particular behaviour. Another way of considering the gap is to take account of the ‘time factor’,

which could explain the differences between attitudes and behaviour. It might be that there is a time lag between the different stages of development and attitudes towards windfarms. Attitudes change over time but changes in behaviour occur later than an expression of attitudes. These issues will be further considered during the remainder of the project.

This project is therefore reviewing the different approaches, theories and research that exist from a range of disciplines; drawing out commonalities between them; and developing informed research directions and designs based on these. In terms of our findings in relation to human behaviour, it is clear from the work so far that the issues are extremely complex, with a number of variables and elements and issues to take into consideration.

Commentary

This project is concerned with the behavioural reaction to a public policy response to climate change, namely the support for wind energy. It is clear that such reaction is no less complex than reactions to climate change itself. The institutional framework, networks of actors (who may or may not be broadly representative), knowledge and information, the role of key individuals and issues of participation and ‘ownership’ (real or metaphorical) are all important factors in how the relation between values (perhaps pro-environment values), attitudes (perhaps in favour of renewable energy) and behaviour (opposition to a particular wind farm) is actually played out.

In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

ENVIRONMENTAL CHANGE	CONTEXTUAL FACTORS	BEHAVIOURAL FACTORS
	Knowledge/information	Knowledge/understanding
	Institutional framework	Participation/ownership
	Networks of actors	Role of key individuals
	Structures of governance	Values, Attitudes
	Culture, geography	Altruism
		Power, control, role of champions

11. UK Small Firms and their Response to Environmental Pressures

Summary

This research sought to gain insights into how organisations influence human behaviour and encourage or discourage environmentally responsible actions by exploring small firm responses to growing environmental pressures from markets and state regulations. The research was also interested in exploring the significance of scale in understanding the environmental behaviour of economic actors (in a context in which SMEs constitute 99% of all private sector enterprises) and in examining the role of both the state and the markets in influencing the environmental decision-making of small firms.

The key research topics and questions were:

- *The increasing importance of market dynamics and economic agents in ecological restructuring.* Are SMEs showing signs of ecological restructuring? Are market dynamics driving this?
- *Changing discourses and emerging ideologies.* Do owner-managers accept the business case for sustainability? Are environmental and economic interests regarded as compatible?
- *Transformations in the role of the state.* Are the environmental policies of the state encouraging the ‘greening’ of SMEs?

The empirical work involved face-to-face interviews with 10 ‘key informants’ drawn from industry and government and 40 SME owner-managers in the construction and restaurant industries in London and Leeds.

This research used ecological modernisation (EM) theory as an analytical framework. Whilst UK politicians espouse EM’s win-win philosophy and exhort business to voluntarily undertake environmental measures on the basis that it will be good for business, in-depth interviews with owner-managers in the construction and restaurant industries suggest that many small firms have yet to accept the ‘business case for sustainability’.

Architects are the drivers of innovation in construction and clearly have a powerful influence on client choice. They are well organised, with very high levels of professional body membership. They are therefore key to driving the sustainability agenda forward within the industry. However, the findings from this study suggest that there is limited ecological restructuring occurring at the top of the building supply chain, as most architects are not pushing the environmental agenda forward for fear of alienating clients. One of the key barriers is that clients tend to be commercially driven and perceive sustainable designs as too costly. Building developers or end-users do not appear interested in eco-efficient measures that reduce running costs if it means raising capital costs in the short-term. It is clear that the primary driver of environmental reform currently within the industry is regulation rather than market forces. Given the knowledge-intensive nature of the architecture industry, it seemed ironic that one of the biggest issues for architects appears to be that of an information deficit on environmental practices. Respondents highlighted the merits of educating both architects and clients (builders and end customers) on the benefits of -and business case for- sustainable design.

The responses of builders suggest that there is also little environmental reform taking place further down the supply chain. Business owners regard many of their environmental impacts as beyond their control. The business case for using ‘green’ materials, and for eco-efficiency measures such as recycling and minimising waste is not apparent to the owner-managers interviewed. The enormous competitive pressures on firms (exacerbated by the many unregulated ‘cowboy’ builders in the industry), has meant that cost and speed are the number one issues whilst environmental management remains a peripheral (even negligible) concern for most firms. Environmental measures are often resisted as an unnecessary cost burden; even statutory regulations are sometimes flouted by less scrupulous builders to reduce costs. It is perhaps not surprising that so few building firms appear to have embraced

voluntary environmental action. Low levels of compliance within the industry and a lack of adequate enforcement has meant that policies which have been recently introduced to curb environmental impacts, such as increases in the landfill tax, have led to few changes in the behaviour of builders. So far, market-based mechanisms have had limited success in effecting environmental reform amongst builders. It is evident that the environmental and economic sustainability of the construction industry is intimately connected. Whilst the business case for environmental best practice is not perceived, and whilst there continues to be such small profit margins for SMEs due to excessive price competition, there continues to be a lack of resources to invest in environmental management.

In the restaurant sector, there appears to be limited ecological restructuring occurring, as the majority of respondents feel there is little scope to minimise waste, energy and water usage. Moreover, market forces appear to be doing little to encourage environmental reform as most restaurateurs do not believe that being environmentally-friendly will be a particular draw for customers. Although many are advocates of organic food, most do not offer organic options on their menu due to high prices and problems of limited supply. Recent food safety fears in the UK have prompted restaurateurs to be more vocal about the sourcing of their produce and the quality of their suppliers. Respondents see legislation as the most appropriate way to improve the environmental practices of the restaurant industry. Yet it appears that there is little in the way of environmental regulation impacting the sector currently. Owner-managers feel that there is a lack of partnership and dialogue between government and the restaurant industry, although responses from key informants indicate that this is beginning to improve.

Commentary

In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

ENVIRONMENTAL CHANGE	CONTEXTUAL FACTORS Institutional framework (esp. markets, regulation) Organisational scale	BEHAVIOURAL FACTORS Interests
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12. Middle Class Environmental Values in India: An Interdisciplinary Dialogue

Summary

The main aim of this project was to bring together for a meeting an array of scholars and activists who have some interest and/or involvement in the subject of the environmental values, beliefs and behaviours of India's middle classes. The academic rationale for this meeting was that this is an issue with which very few people are directly engaged. Despite the fact that, by some reckonings, India's middle classes now number some 300 million people, most analyses of environmental issues and conflicts have tended to concentrate on the rural poor and marginalized (especially women, forest dwellers and tribal peoples) and/or on elites (political, administrative

and scientific). The massive environmental impacts of the higher-consuming middle classes, and, perhaps more importantly, their role in shaping the legal, political, cultural, educational and media structures and norms in relation to the environment, have received far less attention. The meeting was intended to stimulate original ideas and theoretical frameworks, and to create an informal network of scholars and activists who could share information and perspectives, and conduct future collaborative work.

The project has found that there exists a rich and diverse array of writing on 'environmental' struggles and discourses in colonial and postcolonial India, many of which focus on the rural, and on elites and/or subalterns. Recently, however, there has been a growing interest in urban environmental issues, and, to some extent, in India's 'middle classes' (a term that is open to considerable discussion). The key issues are environmental, social-cultural and political, comprised of themes and arguments concerning the relationships between India's middle classes and the complex and multitudinous meanings and materialities of the environment. Subjects for debate include civic indifference and the public sphere; environmental activism; and Hinduism and ecological thinking. An unexpected area of importance that was raised during the project was the relationship between class, the Hindu Right and the environment.

Of major theoretical and methodological importance to work in this area is the treatment of values and beliefs and their connection to behaviours, in relation, for example, to such issues as civic indifference, the varieties of environmental activism, religious and cultural connections with the environment, and the sense of vulnerability to environmental change. A conclusion from reviewing this work is the importance of recognising diversity and dynamism within the middle classes in relation to 'the environment'. It is clear that a very wide variety of values, beliefs and behaviours can be found amongst India's middle classes, reflecting regional, linguistic, gendered, ideological and other pluralities. There is a therefore a need to develop situated understandings of what constitutes 'the environment' amongst different middle class groups; and also of the ways in which environmental issues reflect and are often emblematic of wider social and political debates.

It became very apparent during this project that the three core questions articulated by the EHB Programme (see Section 1) are the *right* questions to ask in relation to India's middle classes and environmental change; and, indeed, that they are extremely *important* questions to ask. The environmental beliefs, concerns, attitudes and behaviours of the middle classes already have a huge regional impact, and with the growth of the Indian economy, widening consumption, and shifting values, these impacts are likely to have a significant global impact (for example, in terms of global warming). However, there has been very little work on this subject, and the project has significantly advanced conceptual understandings of the issues, and of trends and experiences, as well as *how* these issues might be further investigated through the generation of rigorous, empirically-grounded data.

One needed result of such careful, grounded work would be the ability to challenge the clearly problematic assumption that 'western' environmental theories, histories and experiences can provide a straight-forward guide to the future, or a template by which India's present can be understood and analysed. It is surely the case that the

perceptions of the Indian middle classes to environmental issues, and their responses to them, are both highly dynamic and will need to be understood in their own terms.

Commentary

The project has defined a crucial area for further work, and it is to be hoped that the approaches and methodologies which arise out of the insights it has generated will be useful in other than Indian contexts. The key themes are clearly values and beliefs, how they emerge and change in the course of industrialisation and the formation of a ‘middle class’, and their ongoing interaction both with the culture and society of which they are a part, but also with the environmental issues that are at least partly a result of industrialisation.

In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

<p>ENVIRONMENTAL CHANGE Vulnerability to change Sensitivity to change</p>	<p>CONTEXTUAL FACTORS Culture, social history Socio-political climate Institutional framework</p>	<p>BEHAVIOURAL FACTORS Awareness, perceptions Values, beliefs, attitudes Norms, interests Identity, status Individual characteristics</p>
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13. *Appraisal, Institutional Learning and Sustainability: Defining a New Agenda*

Summary

The aims of this research were to develop a new research agenda linking appraisal, policy learning and sustainability, to contribute to analysis and better understanding of the role of appraisal in policy processes with environmental implications, and to contribute to more effective practice in this field, by providing insights on the nature and conduct of appraisal, on ways in which processes are affected by participants, and vice versa, and on the role of appraisal in the wider context of sustainable development.

Some of the key research questions were:

- How are the nature and role of appraisal techniques represented by governments, statutory agencies, EU institutions and international organizations?
- What theories of the policy process are implicit in these representations?
- How, if at all, are they changing?
- How, and with what short- and longer-term effects, has appraisal operated in practice? How does this experience accord with the expectations of theorists, policy makers, key stakeholder groups and practitioners, and how are these expectations in turn affected by it? What are the theoretical implications?

Themes for analysis from the research include:

- Changing conceptions of subjectivity in the process of appraisal;
- The quest for civil legitimacy;

- The spaces that even ‘technical’ approaches may provide for dialogue;
- The ways in which different approaches to appraisal may lead to alternative constructions of what it means for development to be sustainable.

Appraisal – defined in the project to include a variety of *ex ante* techniques and procedures that seek to predict and evaluate the consequences of certain human actions – has been afforded an increasingly important role in environmental policy. The research is showing that both the nature of appraisal and its role in the political process have been inadequately conceptualised. Exploration of a literature that has tended to polarise ‘technical’ and ‘deliberative’ models has identified a need for sensitive selection and combination of approaches, taking account of both the *object* and *objective* of appraisal in particular contexts. An important role for appraisal (by design or by default) may be that of providing spaces for dialogue and learning in the making of policies and decisions. This perspective on appraisal has both theoretical and practical implications, some of which have already been identified and will contribute to the project’s final agenda for further research. One research finding has been that a great deal has been written about the virtues of different approaches to appraisal but rather less has been done to test the various claims through meticulous empirical work. Developments in both theory and practice are likely to flow from such research.

The research so far has indicated, as have a number of other commentators, that both technical and deliberative approaches, as typically represented, have shortcomings, and that the most constructive way forward is likely to involve a careful tailoring of different forms of appraisal to specific problems and situations. In this sense the polarisation that has characterised much recent commentary may be unhelpful. In the policy-making arena, more careful tailoring of appraisal processes and tools is slowly becoming a priority, and it is time for longitudinal research involving retrospective and ‘real time’ studies of such practices, to address a number of important questions. When appraisal practices become more open, deliberative and participatory, allowing for full acknowledgement of uncertainty and different framings, can policies still be formulated and decisions made, and do they differ from those that might have emerged from the ‘old’ approaches? Can subjectivity successfully be reframed as practical reason (or under what circumstances is this possible)? One of the most interesting questions – how, if at all, practices of appraisal provide spaces for dialogue and learning of various kinds – needs to be addressed not only in the context of fora that seek consciously to promote such outcomes (those that might be said to adopt a learning strategy) but also in quasi-technical practices where there is some evidence that learning (amongst regular participants, and ultimately in a wider policy community) can occur over time; studies of the latter might provide useful lessons on how to nurture constructive elements in the design of modified appraisal procedures. The newer, deliberative, and mixed, approaches, also need to be scrutinised, as noted above. In both cases, questions to ask include: what kinds of learning might be looked for in practices of appraisal across various policy domains, and by what means are they to be detected and explored? How enduring are any new positions or values ‘learned’ in processes of appraisal? What makes for lasting changes in perspective that translate into the substance of policy?

To answer such questions, research is needed with retrospective elements where necessary combined with (and sometimes incorporating) ‘real time’ studies of

appraisal processes as they are happening. A generous time frame is essential if subtle and long-term processes of ‘knowledge creep’ and ‘enlightenment’, of a kind that might eventually lead to significant reframing of policy problems, are to be detected. There are questions about depth and breadth of analysis too, and in particular a need to be sensitive to the variety of ways in which knowledge and information are used (for example, the experience of participants, their social identities, the stories they tell, the images and representations they invoke in discussion, and their intuition).

There is growing evidence from empirical observation that controversial techniques can ‘ride out’ criticism for many years, but sometimes become untenable. There is still understanding of the processes through which legitimacy is maintained without difficulty, questioned with little effect or forfeited to such a degree that policies and practices have to be modified. The reasons for change when it does happen in certain sectors, or at particular political moments, are not always clear. The ‘New Approach to Appraisal’ in UK transport policy is a good example, suggesting that the general political climate, and dominant discourses in any given policy sector, can pre-empt or permit certain kinds of analysis at different times. In-depth research, which may of necessity be retrospective, needs to be conducted in a range of different sectors and contexts, to explore how attempts to gain civil legitimacy, by adopting new approaches to appraisal, actually work in practice.

Finally, there is the crucial question of connections between appraisal and the policies and decisions (and, ultimately quality of life and environment) that it is meant to influence – the question of outcomes, rather than outputs. There remains a dearth of empirically strong, theoretically informed analysis in this area, while assumptions (implicit theories of the policy process) abound. Investigations need to be broadened beyond the qualities of the assessment and its direct products, to include the use of assessment results in, and their impacts on, decision making, and to explore the contextual conditions within which the assessment operates. Exploring the interface between appraisal and policy inevitably involves asking questions about rationality and power, and seeking to explain stability and change in both the short and the longer term.

In terms of the three fundamental questions of the EHB Programme (see Section1), this research speaks most directly to the third, which asks what public policy approaches might persuade people to change environmentally damaging behaviour. It is clear in this context that providing information can play an educative and attitude-shaping role, and that indicator systems can allow the implications of alternative courses of action to be evaluated. Appraisal practices are highly relevant here. Through a combination of the information and knowledge that they generate, and the potential they offer for deliberation about the ultimate ends of policy, contemporary appraisal practices can enable individuals and organisations to address the complexity inherent in the pursuit of sustainable development. Such practices may quite conceivably change attitudes in the process. The project improves understanding of how such processes work, how they could be made to work better, and how they could best be researched.

In response to the first of the questions - why people behave as they do towards the environment – this project’s contribution lies in improved understanding of why certain agents, including government bodies or other organizations, may fail to

consider the environmental implications of their practices. This may be because key values embedded within their favoured techniques of policy evaluation and appraisal effectively preclude full consideration of environmental implications.

The second question asks how behaviour is adapted in response to environmental change. The introduction of environmental appraisal procedures in sectors not traditionally considered to have an environmental remit can be regarded as part of a process of adaptation, in which traditional forms of environmental policy, having failed to halt environmental decline, are joined by more systematic efforts to ‘integrate’ environmental considerations horizontally across government policy sectors. This may be regarded as part of a broader project of ecological modernisation, whereby economic growth becomes decoupled from negative environmental effects usually associated with it.

Commentary

Environmental appraisal, and its broadening into both strategic environmental assessment and sustainability appraisal, have been important processes over the last thirty years in the attempt to take environmental factors more into account in decision-making. It is therefore important to understand, as this project seeks to do, what have been the impacts of the appraisal on the decisions that have been taken, whether the appraisal has led to individual or social learning, and whether different approaches to appraisal lead to different outcomes and which might be preferable on which grounds.

In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

ENVIRONMENTAL CHANGE	CONTEXTUAL FACTORS	BEHAVIOURAL FACTORS
Science base	Knowledge/information	Awareness, perceptions
	Institutional framework	Values, beliefs, attitudes
	Structures of governance	Norms, interests
	Socio-political climate	Knowledge/understanding
	Socio-technical structures	Participation
	Socio-technical standards	Ability to learn
	Social learning	

14. *Environmental Issues and Human Behaviour in Low-Income Areas of the UK*

Summary

The aims of this project were to draw together and build on existing work to produce a practical overview of the relationship between environmental issues and human behaviour in the context of low-income areas in the UK, and to explore how public policy could potentially draw on any relationships, or factors, which were found to encourage and support positive changes in environmental behaviour. An overview of existing information would be supplemented by focus group interviews.

The overview of existing information has found a good range of useful existing evidence and data, covering a wide range of relevant issues, including local environmental conditions in low-income neighbourhoods; impacts of local environmental issues on resource use and other global environmental issues, and visa versa; how local, and wider global, environmental issues impact on people and their quality of life, and environmental concerns of people living in low-income areas; and responses to environmental concerns and problems by people living in low-income areas, and factors affecting people's behaviour towards the environment in low-income areas

The new research has sought to elucidate more detail about the knowledge, concerns and awareness of global environmental issues among people living in low-income communities; understanding of, and feelings about, links between local environmental issues and wider global environmental issues; ideas about responsibility for local and global environmental issues, and mechanisms driving local and global environmental problems; people's ideas about practical, and 'ideal world', solutions to local and global environmental problems; and peoples' willingness to change their behaviour, and factors preventing them doing so

Some potentially interesting areas emerging from early analysis include:

- Evidence that people living in low-income areas often have high awareness of, and concern about, global environmental issues, and that they are often actively thinking about their wider environmental behaviour and taking active steps to improve it (by for example, recycling, reducing car use, or carrying out practical conservation work). This contrasts interestingly with the stereotype of the environment as a middle class issue
- A strong focus on individual responsibility for environmental problems, especially at the local level. People talked to often tended to see 'people' or 'individuals' as responsible for environmental problems as much as, or even rather than, local authorities, business or 'the Government'
- People readily identified ways in which global environmental problems impact on our everyday lives, such as through changes in weather, skin cancer, and wildlife changes. Again this contrasts interestingly with the idea that global environmental problems are often seen as remote and hard to relate to

Commentary

Low-income areas often experience worse environmental conditions than elsewhere, and yet by definition they are likely to have fewer local resources with which to address them. Clearly the perceptions and attitudes to environmental issues in such areas are crucial both to changing environmental conditions there through local action and to understanding what kinds of external intervention might be most effective in bringing about such change.

In the terms of Figure 1, this project seems to be concerned with the following elements of the framework presented there:

**ENVIRONMENTAL
CHANGE**

**CONTEXTUAL
FACTORS**

**BEHAVIOURAL
FACTORS**

Impacts of change	Knowledge/information Socio-political climate Infrastructure/services/ facilities Access to capital, resources Socio-technical standards Social learning	Awareness, perceptions Values, attitudes Knowledge/understanding Participation
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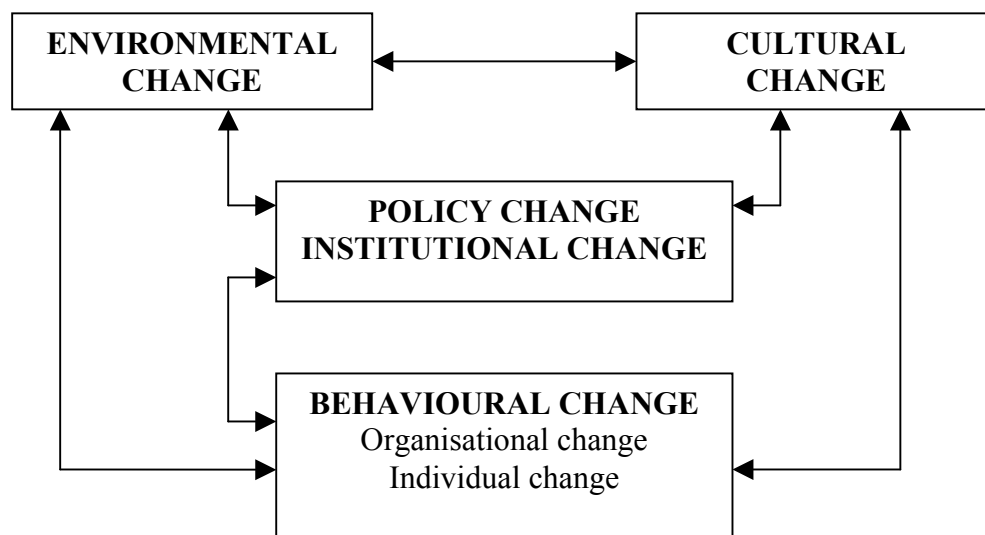
4. GENERIC THEMES AND CONCLUSIONS

Figure 1 provides a broad overview of the range of influences on human behaviour in relation to the environment. Section 3 has shown that the different projects in the EHB Programme have explored different aspects of this overall picture in their own way.

In the workshop on ‘Theoretical Approaches to Policy Change and Human Behaviour’, organised in September 2003 (reported in Johnson & Ekins 2003), it was clear that the projects were not using a common theoretical approach and, indeed, that no general theory existed that could be used across the range of issues being covered.

Figure 2 provides a much simplified schema, similar in conception to Figure 1, which can be used to illustrate how the theoretical approaches of the projects depends to a large extent on their starting point. Figure 2 shows a reciprocal interaction between the three same broad categories as in Figure 1: environmental change, policy and institutional change, and organisational and individual behavioural change.

Figure 2: Simplified Schema of Influences on Behaviour



The starting point for Project 2 (*Crises as Catalysts for Adaptation: Human Responses to Major Floods*) was environmental change, and the focus of analysis was how this led to policy change. The theoretical approaches used included those from

the literature on policy streams and agenda setting, on policy advocacy coalitions and on ‘punctuated equilibria’.

Project 3 (*Rapid Climate Change in the UK: Towards an Institutional Theory of Adaptation*) was also concerned with rapid climate change, but its initial focus was on adaptation and how this was influenced by institutions, which it defined as ‘the formal and informal rules that shape human behaviour’ (which is the sense in which it is also used in Figure 2). It then sought to analyse institutional adaptation through the concept of social capital and in response to individual and organisational adaptation.

Project 4 (*Predicting Thresholds of Social Behavioural Responses to Rapid Climate Change*) focused on possible individual responses to rapid climate change, and the way this was influenced both by prior attitudes towards it, and by perceptions of the rapidity of climate change. There is some evidence of a threshold or response to climate change related to its perceived severity.

Project 1 (*Exploring Vulnerability to Rapid Climate Change in Europe*) in contrast started with the adaptation of organisations to their perceptions of vulnerability to rapid climate change, and analyses this with reference to organisational awareness and organisational ‘adaptation space’ (defined by such constraints as markets, regulations and other institutions) and the organisational strategies they then adopted.

The point of departure for Project 5 (*Integrating Social Vulnerability into Research on Food Systems and Global Change*) was also vulnerability to environmental change, but this time of the food system. The analytical approach here was through comparison of the insights offered by four quite different literatures: ecosystem dynamics, ecological economics, vulnerability assessment and multi-agent modelling.

The core focus of Project 9 (*Natural Capital: Metaphor, Learning and Human Behaviour*), in terms of responses to environmental change, was *learning*, both in relation to the concepts employed (such as natural capital) and the meaning attached to them, where ‘meaning’ denoted a dynamic structure of ideas. The usual social behavioural sequence is that social action (defined as organised, meaningful behaviour based on a shared sense of meaning) tends to shape emerging realities according to this shared meaning, but at times of rapid or unusual change social learning was required to allow the emergent realities to shape, and create a new, shared sense of meaning.

Differences, and changes, in meaning, and therefore in perceptions or expectations, were important in many of the projects. In respect of Project 7 (*Future Comforts: Re-conditioning Urban Environments*) meanings and expectations of ‘comfort’ were shown to be the product of many social and institutional influences and interactions, which could be characterised as a socio-technical system or regime. Conventions of indoor environmental management in different societies and cultures depend on how such systems co-evolve. Attempts through policy to change comfort-related behaviour (such as efforts to reduce indoor temperature settings) need to recognise and take account of physiological, psychological, social, technological and institutional factors, and how they develop and interact in different environments.

Meaning is also an important factor in the so-called ‘attitude-behaviour gap’ between stated public attitudes and particular individual and social responses to wind power projects (Project 10 – *Tilting at Windmills? The Attitude-Behaviour Gap in Renewable Energy Conflicts*). Wind power in the abstract as renewable energy is one thing. When it impinges locally, however, such issues as ownership and participation in decision-making, knowledge about the issues and trust in those purveying it, and specific local factors such as planning history and landscape quality, become an impotent filter through which the meaning of wind power can change from renewable energy to unwanted local development.

For small businesses (Project 11 – *UK Small Firms and their Response to Environmental Pressures*) the word environment is largely associated with extra regulations and additional cost. The idea central to the concept of ecological modernisation – that environmental performance can be improved to economic advantage rather than disadvantage – has clearly failed to penetrate the small-business community, which has therefore remained at best indifferent, and at worst hostile, to environmentally related behavioural change.

The project on the Indian middle classes (Project 12 – *Middle Class Environmental Values in India: An Interdisciplinary Dialogue*) and the Tuareg people of the Sahara (Project 8 – *Indigenous Peoples, Environmental Change and Tourism in Extreme Environments*) shows how important are culture and values in shaping the meaning of the word ‘environment’ itself. This is also the case for low-income communities in the UK (Project 14 – *Environmental Issues and Human Behaviour in Low-Income Areas of the UK*). Here, as elsewhere, it is clear that environment and behaviour have a number of complex interactions. It is also as clear that environmental change can change behaviour, as that behavioural change can change the environment, but, as in all cases of complex interaction, it is far from easy to predict will lead to desired policy results.

Just as environmental change may change environmentally significant behaviour, it is both likely, and to be hoped, that the appraisal of policy-related environmental change (Project 13 – *Appraisal, Institutional Learning and Sustainability: Defining a New Agenda*) may lead to changes in the policy. This again depends on learning, institutional learning in this case, whereby the rules of the game embodied in, for example, the planning system, as flexible enough to be changed.

It is still an open question as to whether any amount of research will generate robust theoretical understandings and representation of all the interactions in Figure 1, or even of the reduced form in Figure 2. Certainly a very great deal of research will be required to achieve this, and it will need to be carried out according to a structured programme that need not constrain the individual projects but will allow their results to be related both to each other and to an underlying framework as portrayed in Figure 1.

Finally, there is an additional issue which has not been addressed at all in the EHB Programme, and which remains the only box in Figure 1 which remains completely untouched by any project in the Programme: the effect on environment-related behaviour of genetic and evolutionary factors. It would be truly extraordinary if the disposition to certain behaviours as a result of natural selection, and environmental

interactions over the long history of human evolution, were not relevant to the human behaviours that have impacts on the environment today, but as a research area this still remains largely unexplored.

PAUL EKINS
May 19th 2004

REFERENCES

Johnson, C. & Ekins, P. 2003 'Theoretical Approaches to Policy Change and Human Behaviour', report of a workshop at Policy Studies Institute, London, www.psi.org.uk/ehb

ANNEX 1

ESRC NEW OPPORTUNITIES PROGRAMME

ENVIRONMENT AND HUMAN BEHAVIOUR

SECOND PROGRAMME WORKSHOP

December 9-10, 2003

Policy Studies Institute (PSI), 100 Park Village East, London NW1 3SR

(Named participants are those involved in the projects, one of whom will make the presentation, though others may attend)

DAY ONE – DECEMBER 9TH

9.30 Welcome and coffee

10.00 Introduction to the Workshop
Professor Paul Ekins, PSI, Programme Academic Co-ordinator

Rapid Climate Change: Impacts, Vulnerability and Adaptation (1)

10.15 Dr Mark Pelling, Dr Chris High
University of Liverpool
Rapid climate change UK: towards an institutional theory of adaptation

11.00 Coffee

11.20 Professor Nigel Arnell, Dr Neil Adger, Emma Tompkins
Tyndall Centre, University of Southampton, University of East Anglia
Exploring Vulnerability to Rapid Climate Change in Europe

12.05 John Ingram, Tom Downing, Stuart Franklin
Natural Environment Research Council, Stockholm Environment Institute
Global Environmental Change and Food Systems: Integrating Social
Vulnerability into Research on Food Systems and Global Change

12.50 Lunch

Learning and Behaviour Change

13.45 Professor Robin Grove-White, John Foster, Stephen Gough
Lancaster University, University of Bath
Natural Capital: Metaphor, Learning and Human Behaviour
Discussant: Chris High

14.30 Professor Robert Blackburn, Andrea Revell
Kingston University
UK Small Firms and their Response to Environmental Pressures

- 15.15 Tea
- 15.30 Dr. Susan Owens
Cambridge University
Appraisal, Institutional Learning and Sustainability: Defining a New
Agenda
Discussant: Judith Petts
- 16.15 Emerging Common Themes and Differences
Professor Paul Ekins, PSI
- 16.30 Discussion
- 17.00 Close

DAY TWO – DECEMBER 10TH

- 9.30 Welcome and coffee
- 10.00 Introduction to Workshop and Report from Day One
Professor Paul Ekins, PSI, Programme Academic Co-ordinator

Rapid Climate Change: Impacts, Vulnerability and Adaptation (2)

- 10.15 Professor Judith Petts, Simon Niemeyer, Glenn McGregor
University of Birmingham
Predicting Thresholds of Social Behavioural Responses to Rapid Climate
Change
- 11.00 Coffee
- 11.15 Dr. Clare Johnson, Professor Edmund Penning-Rowsell, Sylvia Tunstall
Middlesex University
Crises as Catalysts for Adaptation: Human Responses to Major Floods
Discussant: Mark Pelling

Values, Culture, Lifestyles and Environmental Impacts

- 12.00 Dr. Emma. Mawdsley, Dr. Glyn Williams
Birkbeck College London, King's College London
Middle Class Environmental Values in India: An Interdisciplinary
Dialogue
- 12.45 Lunch
- 13.40 Dr. Jeremy Keenan
University of East Anglia

Indigenous Peoples, Environmental Change and Tourism in Extreme Environments

- 14.20 Professor John Benson, Clare Haggett
Newcastle University
Tilting at Windmills? The Attitude-Behaviour Gap in Renewable Energy Conflicts
- 15.00 Tea
- 15.40 Dr. Elizabeth Shove, Heather Chappells
Lancaster University
Future Comforts: Re-conditioning Urban Environments
Discussant: John Foster
- 16.00 Dr. Stephen Potter
Open University
Taxation Futures for Sustainable Mobility
- 16.40 Emerging Common Themes and Differences
Professor Paul Ekins, PSI
- 16.50 Discussion
- 17.15 Close

ANNEX 2

ENVIRONMENT AND HUMAN BEHAVIOUR SECOND PROGRAMME WORKSHOP

INTENDED PARTICIPANTS

(a small number were prevented from attending by illness or other pressing commitments)

DAY 1 – DECEMBER 9TH

Presenters and other programme participants

Olivia Bina	Cambridge University
Robert Blackburn	Kingston University
Heather Chappells	Lancaster University
Marie Cribb	University of Southampton
Paul Ekins	PSI
John Foster	Lancaster University
Stuart Franklin	Stockholm Environment Institute
Stephen Gough	University of Bath
Claire Haggett	Newcastle University
Chris High	University of Liverpool
Clare Johnson	Middlesex University
Jeremy Keenan	University of East Anglia
Ben Lane	Open University
Emma Mawdsley	Birkbeck College
Susan Owens	Cambridge University
Mark Pelling	University of Liverpool
Judith Petts	University of Birmingham
Andrea Revell	Kingston University
Elizabeth Shove	Lancaster University
Emma Tompkins	University of East Anglia

Guests

Derek Brown	ESRC
Simon Dresner	PSI
Roger Levett (pm)	Levett-Therivel
Pam Merritt	ESRC
Michele Pittini (am)	Environment Protection Economics, Defra
Mujtaba Rahman (am)	Environment Protection Economics, Defra
Justin Ram	Transport, Environment & Taxation Economics, DfT
Sarah Wiggins	School of Geography, Southampton University
Ken Wright	Climate Change Impacts & Adaptation Branch, Defra
Lin Yan (pm)	Environmental and Transport Tax Team, HM Treasury

DAY 2 – DECEMBER 10TH

Presenters and other programme participants

John Benson	Newcastle University
Olivia Bina	Cambridge University
Heather Chappells	Lancaster University
Paul Ekins	PSI
John Foster	Lancaster University
Claire Haggett	Newcastle University
Chris High	University of Liverpool
Clare Johnson	Middlesex University
Jeremy Keenan	University of East Anglia
Ben Lane	Open University
Emma Mawdsley	Birkbeck College
Graham Parkhurst	University of the West of England
Edmund Penning-Rowsell	Middlesex University
Judith Petts	University of Birmingham
Elizabeth Shove	Lancaster University
Emma Tompkins	University of East Anglia
Sylvia Tunstall	Middlesex University

Guests

Paolo Agnolucci	PSI
Derek Brown	ESRC
Patrick Devine-Wright	Institute of Energy & Sustainable Development, De Montfort University
Simon Dresner	PSI
Tina Fawcett	Bartlett School of Graduate Studies, UCL
Roger Levett	Levett-Therivel
Pam Merritt	ESRC
Tadj Oreszczyn (pm)	Bartlett School of Graduate Studies, UCL
Michele Pittini (am)	Environmental Protection Economics, Defra
Mujtaba Rahman (am)	Environmental Protection Economics, Defra
Justin Ram	Transport, Environment & Taxation Economics, DfT
Alex Veitch	Energy Saving Trust
Ken Wright	Climate Change Impacts & Adaptation Branch, Defra
Lin Yan (pm)	Environmental and Transport Tax Team, HM Treasury

ANNEX 3

APPROVED PROJECTS IN THE ESRC'S ENVIRONMENT AND HUMAN BEHAVIOUR NEW OPPORTUNITIES PROGRAMME

LISTED BY RESEARCH AREA

Rapid Climate Change

Dr. N. Arnell (University of Southampton)
Exploring Vulnerability to Rapid Climate Change in Europe

Dr. C. Johnson (Middlesex University)
Crises as Catalysts for Adaptation: Human Responses to Major Floods

Dr. M. Pelling (Liverpool University)
Rapid Climate Change in the UK: Towards an Institutional Theory of Adaptation

Professor J. Petts (University of Birmingham)
Predicting Thresholds of Social Behavioural Responses to Rapid Climate Change

Global Environmental Change and Food Systems

Mr. J. Ingram (Natural Environment Research Council)
Integrating Social Vulnerability into Research on Food Systems and Global Change

Sustainable Mobility

Dr. S. Potter (Open University)
Taxation Futures for Sustainable Mobility

Urban Systems and Long-term Climate Change

Dr. E. Shove (Lancaster University)
Future Comforts: Re-conditioning Urban Environments

Tourism and the Environment

Dr. J. Keenan (University of East Anglia)
Indigenous Peoples, Environmental Change and Tourism in Extreme Environments

Natural Capital

Professor R. Grove-White (Lancaster University)

Natural Capital: Metaphor, Learning and Human Behaviour

Other

Dr. R. Barratt (Keele University – *project not operational*)

Listening to Children: Environmental Perspectives and the School Curriculum

Professor J. Benson (Newcastle University)

Tilting at Windmills? The Attitude-Behaviour Gap in Renewable Energy Conflicts

Professor R. Blackburn (Kingston University)

UK Small Firms and their Response to Environmental Pressures

Dr. E. Mawdsley (Birkbeck College London)

Middle Class Environmental Values in India: An Interdisciplinary Dialogue

Dr. S. Owens (Cambridge University)

Appraisal, Institutional Learning and Sustainability: Defining a New Agenda

Professor A. Power (London School of Economics)

Environmental Issues and Human Behaviour in Low-Income Areas of the UK