

ESRC NEW OPPORTUNITIES PROGRAMME
ENVIRONMENT AND HUMAN BEHAVIOUR

Intra-programme workshop report

**THEORETICAL APPROACHES TO POLICY CHANGE
AND HUMAN BEHAVIOUR**

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1. AN INTRODUCTION TO THE PROGRAMME

If society is to adapt to a changing environment it is critical that environmental policy is based on a sound understanding of the relationships between human behaviour and environmental change. Seeking insights into this relationship is the purpose of the ESRC's Environment and Human Behaviour New Opportunities Programme which is comprised of 15 individual research projects each considering all, or parts of, the following research 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?

Individual research projects are approaching their subject matter in their own ways. However, it is the intention of the programme to draw some generic conclusions from individual projects in order to address the overall research programme questions. As part of this process, a workshop was held at the Policy Studies Institute in order to provide a general understanding of the theoretical approaches applied by the individual projects to the relationship between policy change, human behaviour and

environmental change. This, it is hoped, will provide an important first step in the process of synthesising experience and understanding across the projects.

2. WORKSHOP RATIONALE

Understanding human behaviour towards the environment and how this might change/can be changed is a complex task indeed. As with most complex realities, seeking an explanation requires this complexity to be simplified through the use of frameworks, models and theories. Nowhere is this more evident than in the multi-causal domains of human behaviour and public policy.

The researchers from the projects had been requested to address the following questions in their presentations:

- ❑ What was their theoretical approach to their project and why had they adopted it?
- ❑ How important did they think theory was for their project and for the programme as a whole?
- ❑ What key variables were they focusing and why were these variables considered ‘key’?
- ❑ How might the variables be related and influence each other?
- ❑ Could they identify a commonly useful theory for the programme, or did they think that such a theory might emerge?

The rationale for this workshop was to highlight the frameworks, models and theories being employed by the various projects in their attempts to gain insight into the links between human behaviour and environmental change. A range of assumptions about the nature of human behaviour and the dominant forces influencing individual and collective decision-making underpins each of these approaches. The intention of the workshop was then to explore these assumptions in order to provide an overview of our collective understanding of human behaviour and policy change in the context of environmental change, particularly rapid environmental change.

To do so, researchers were requested to evaluate the dominant, and secondary, causal processes for changes in human behaviour being explored in their research sub-themes. For example, are values, beliefs, ideas and interests the dominant explanations for behavioural change or is it a function of institutions, organisations, technology or socio-economic processes? Alternatively, is it the networks of actors that influence human behaviour or the preferences of individuals? (Figure 1)

This framework, although far too simplistic for the programme as a whole, provided a useful platform from which to begin discussion of the differential approaches to the study of environment-human behaviour relations. It also provided a useful initial debate about the significance, or otherwise, of theories, models and paradigms. In particular, it was stressed at the outset that rather than seeking to find synergies across theories, perhaps the programme should instead be seeking to elaborate a conceptual framework within which the diversity of projects could be located. This diversity was considered important, particularly as a clear dichotomy between those projects that are theory driven and those offering a more grounded approach to theory development was recognised. It also became clear that the scale of the decision-making process was important in this process with projects focused on individual decision-making offering a differential set of critical human behaviour-environment variables than those focused on collective decision-making whether through institutions, organisations or in more general policy-making terms.

Here, for example, individual decision-making in the *environmental issues in low-income area* project recognised the central importance of environmental values, psychological and contextual variables on the environmental behaviour of individuals at the local level.

At the level of the community, the *Tilting at windmills* project recognised the importance of variables such as community involvement, communication, participation, local ownership and control, trust in experts, perceptions of landscape, knowledge, context, attitudes and the institutional framework as important concepts influencing the attitudes and behaviours of individuals to renewable energy.

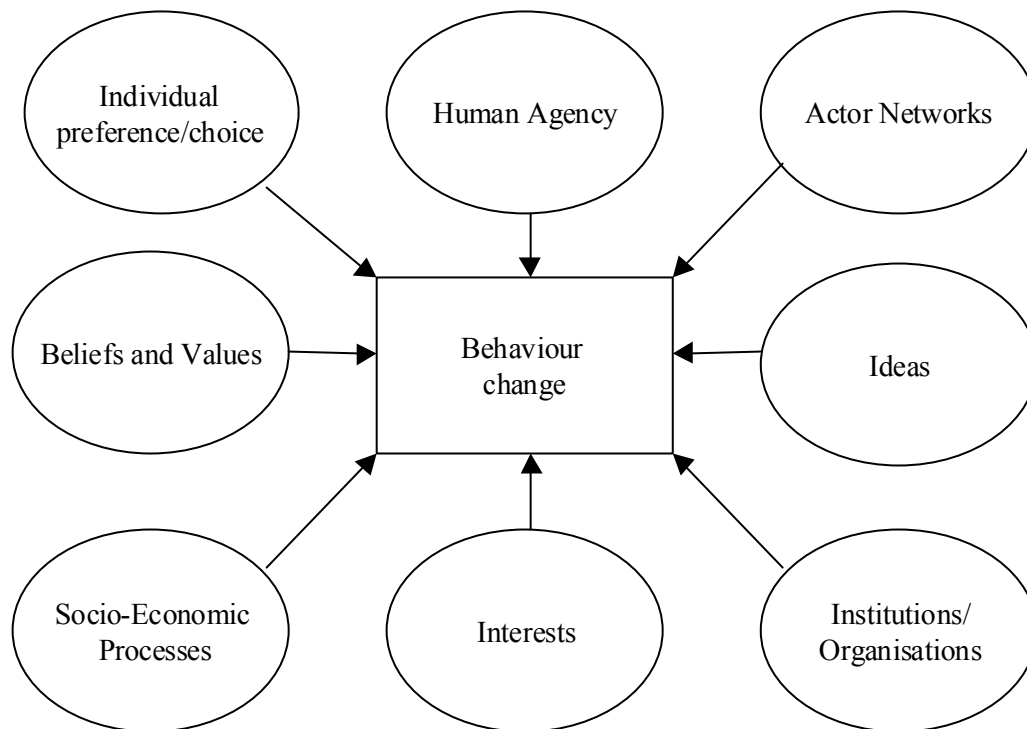


Figure 1: Illustration of some of the causal variables influencing changes to human behaviour

By contrast, those seeking an explanation of behaviour at the level of institutions, organisations and public policy offered a more diverse range of key variables with the *crisis as catalysts* project focusing on the importance of ideas, values, beliefs, norms, attitudes, interests, knowledge and context. Meanwhile, the *institutional theory and societal adaptation* project recognises the critical role of formal and informal social institutions, social capital and organisational learning. This latter issue is also the focus of the *rapid climate change vulnerability* project which recognises the centrality of organisational learning in the vulnerability and sensitivity of organisations to rapid climate change. Here, beliefs, decision-making structures, access to information, and the role of champions are all regarded as important organisational characteristics for such a learning process.

Because of the diversity in approaches, it is clear that no single theoretical approach would satisfy the needs of the programme as a whole. Rather, the need is to recognise how the different variables inter-link to provide a framework for understanding environment-human behaviour relations. This workshop report offers a first step in this process. To begin with, an overview of the theoretical/conceptual approaches adopted by each of the projects is provided.

3. SUMMARY OF APPROACHES

3.1 Hazards, human behaviour and policy change

Clare Johnson, Sylvia Tunstall and Edmund Penning-Rowsell

The *crises as catalyst* project focuses on the relationship between environmental crises and the human behaviour response, with a particular focus on public policy. This is being explored with respect to the flood hazard with the researchers conducting a theoretical study of flood policy transition over the past 50 years and an in-depth study of the influence of four national scale flood events on this process. In this sense, the flood is being used as an example of rapid environmental change, albeit in a particular context and over a particular timescale. Thus, the crisis and its aftermath are being used to magnify our insight into the process of social and human adaptation in response to rapid environmental change. Changing human behaviour is, therefore, being explored in the context of a hazard-response model.

Drawing on a range of theoretical insights of policy change, the researchers argue that whilst institutions and socio-economic conditions are important contextual factors they do not determine policy change. Rather, they argue that values, beliefs and norms influence the attitudes of actors to the policy problem which in turn conditions the ideas which are generated and the interests that they express. These ideas then influence the issues that are negotiated between competing coalitions of actors at all levels of decision-making. Through the negotiation of these issues, powerful coalitions and policy entrepreneurs are then capable of ensuring that certain issues dominate the agenda setting process. Having set this agenda, at times of no flooding or only localised events, the policy change process is assumed to be one of incremental change. By contrast, at times of a national flood crises - such as occurred in 1947 and 2000 - the process is assumed to be one of catalytic change provided by a 'window of opportunity' for increasing the rate of change, the number of actors involved and the issues negotiated. In this sense, the authors hypothesise that the factors driving policy changes are a combination of contextual factors, behaviour factors and the occurrence, or otherwise, of a national flood. Here the role of ideas is centrally important.

This concept of incremental and catalytic change has been developed from three theoretical approaches in the policy change literature. The first, John Kingdon's policy streams approach (Kingdon, 1984, 2003), is fundamentally concerned with understanding how issues materialise, how they come to the attention of policy makers, how they are framed as ideas in the setting of policy agendas and why ideas 'have their time' (Parsons, 1995: 192). Here, the national flood event offers the 'window of opportunity' for the ideas of actors to get onto, and remain on, the policy agenda. In this sense, the flood provides the vehicle for catalysing the policy-making process by accelerating the negotiation of ideas such that they may, if the 'window' is seized, result in changing policy. Or put another way, the flood acts as an environmental catalyst for changing the behaviour of policy makers in response to environmental change.

This does not, however, occur in an ideological and contextual vacuum. Rather, the ideas which result in policy change are those which are deemed to already be under negotiation between, and within, policy advocacy coalitions (PAC, Sabatier, 1991, 1993, 1999). From this theoretical position, actors from a range of organisations and institutions who share core normative beliefs and values combine to form coalitions through which they negotiate policy positions with other competing coalitions. As a dynamic model, the PAC framework argues that, over a period of a decade or more, actors in coalitions, with particular policy entrepreneurs, seek to alter the behaviour of government institutions such that their core beliefs are translated into policy objectives (Sabatier and Jenkins-Smith, 1993). The result is incremental change in the beliefs, values and ideas towards

the flood hazard as illustrated by the changing approach to the flood hazard in England and Wales over the past fifty years; from land drainage to flood defence to flood risk management. Thus, from this theoretical position, the ideas, values and beliefs of the dominant coalition are clearly significant in determining which ideas are likely to be catalysed into policy as a result of national floods.

Finally, the work of Baumgartner and Jones (1993) on 'punctuated equilibria' has provided a useful theoretical basis due in no small part to its explicit recognition of the importance of time. This model sees policy as a continuous process of change characterised by long periods of stability which are occasionally 'punctuated' by periods of public interest, media scrutiny and action (John, 1998). By focusing on shifts in the rate of policy change, the model explores how certain ideas become institutionalised in the decision-making process, arguing that key decision-makers in institutions seek to ensure that certain issues dominate the agenda setting process by enlisting the support of elite beliefs in the political process, ensuring favourable media coverage and public opinion. The outcome is incremental policy change. Whilst this is the norm, they argue that because institutions and organisations tend to focus on one issue at a time, there are certain conditions whereby these established ideas and agendas can be significantly altered, or to use their phrase 'punctuated'. This, we argue, occurs when the national flood offers a 'window of opportunity' which punctuates the stability by providing the opportunity for increasing the rate at which policy changes.

In summary, therefore, the project sees behavioural change, in response to environmental change, as a process of both continuous incremental change brought about by the dominance of certain beliefs, values, norms and ideas in the policy-making process which are then 'punctuated' by periods of catalytic change, which offer a 'window of opportunity' through which many of the ideas of the dominant coalition can be moved up the policy agenda by particular policy entrepreneurs. The conclusion is that if environmental change is likely to lead to more frequent extreme flood events in the future then we must understand what ideas are being negotiated today which are likely to lead to policy changes in the future. Understanding this process provides an important first step if we are to adapt our behaviour in response to rapid environmental change.

- Baumgartner F R and Jones B D 1993 *Agendas and instability in American politics* Chicago Press, Chicago
John P 1998 *Analysing public policy* Continuum, London and New York
Kingdon J 1984 *Agendas, alternatives and public policies* Little Brown, Boston
Kingdon J 2003 *Agendas, alternative and public policies (second edition)* Longman, New York
Parsons W 1995 *Public policy: an introduction to the theory and practice of policy analysis* Edwar Elgar, Cheltenham UK and Massachusetts USA
Sabatier P A and Jenkins-Smith H eds 1993 *Policy change and learning: an advocacy coalition approach* Westview Press, Boulder Colorado
Sabatier P A 1991 Toward better theories of the policy process *Political Science and Politics* 24 147-156
Sabatier P A 1993 Policy change over a decade or more in Sabatier P A and Jenkins-Smith H eds *Policy change and learning: an advocacy coalition approach* Westview Press, Boulder Colorado 13-39
Sabatier P A ed 1999 *Theories of the policy process* Westview Press, Boulder Colorado

3.2 The role of ideas in individual and institutional learning *John Foster*

The *natural capital: metaphor, learning and human behaviour* project is investigating the role of the 'natural capital' metaphor in framing mainstream sustainability discourse. That is, it has a conceptual rather than an empirical focus – it is investigating the conceptual structure of the sustainable development-natural resources-natural capital nexus of ideas – without being theory-driven, in the sense of following out any explicit theoretical account of how that nexus is or ought to be

configured. (To the comment that this sounds like a philosophical rather than a social-scientific endeavour, the protagonists would respond that at this level no such distinction can be firmly made.)

However, the project is underpinned by a tacit picture of why such conceptual exploration matters in the context of environment and human behaviour. Simply put, this picture is of social action as organised meaningful behaviour, meaningful behaviour as part of the making of a shared sense, and a shared sense as a dynamic structure of ideas. From this it follows that social action occurs in the space of ideas, that is, of discourse (collaborative human sense-making). But ideas are themselves structures of *learning* – they are created forms of sense in which the uniquely different particular experiences of individuals meet in a mode of generality with an inevitably open future reference. Social action therefore has a radically heuristic or learning dynamic.

There are (again, simply put) two principal modes in which this can occur:

Mode A: where our ideas guide us into the future - shaping the emergent to the sense we make;

Mode B: where the sense that is made by the emergent configures the evolving shape of our ideas.

The specific research issue for the project is then how alternative models of natural capital (natural resource value) engage differentially with these two dominant modes of heuristic social action. The argument being developed is that for the purposes of genuinely constraining present human behaviour to change in sustainable directions, we are going to need models of natural capital and its preservation which configure the relevant collective action as more exploratory and open-ended (Mode B) than those standardly available in the economic literature and the forms of present policy-making.

3.3 Institutional theory and societal adaptation

Chris High and Mark Pelling

This project is essentially theory led - consisting of the development of a theoretical framework, followed by empirical testing. In exploring societal adaptation to climate change the project is building a theoretical framework from three main bodies of literature namely, New Institutional theory, social capital and organisational learning.

Social Adaptation and Rapid Climate Change

The authors define adaptive capacity as the potential of a social system to adapt to external stressors. Adaptation refers to material changes in the activity or configuration of a system under which key variables are conserved or enhanced (which distinguishes adaptation from degradation). Adaptation to a particular stressor or collection of stressors (such as rapid climate change) will take place in the context of a social system's wider and ongoing adaptation or degradation in the face of multiple environmental, human and technological changes. Rapid climate change is defined from a social perspective, as an unexpected, counter-intuitive and dynamic stressor unfolding over 10-30 years. Adaptive capacity is contingent upon the purpose of a system. If a farmer's ability to sustain a farming livelihood fails because of rapid climate change, and he/she switches to a more diversified livelihood strategy (opening a B&B, for example), then this represents a degradation of his/her livelihood system if judged in terms of farming. However, when judged as a rural livelihood system, the new strategy could be seen as an improvement, and hence a successful adaptation.

Institutions

The literature on natural disasters emphasises the importance of social institutions for shaping the way that environmental stress affects communities and individuals. In exploring social institutions the project follows New Institutional theory in casting institutions as the formal and informal rules that shape human behaviour. A distinction is usually made between institutions and organisations. Organisations are considered agents (players of the game rather than rules), they comprise of constellations of individuals and groups organised in pursuit of particular purposes. Institutions are the ‘rules of the game’ and can be formal (legislative) or informal (cultural). They shape, and are shaped by, individuals and organisations. Institutions have no agency or indeed membership of their own. They are sometimes treated simply as constraints (felt as corruption or inertia for example), but the researchers are sympathetic to the view that they enable as well as constrain, providing a framework through which co-operation between individuals is possible. Institutions can provide spaces and structures for innovation, flexibility, reflection or resistance.

Although this discussion of institutions treats them in isolation, in practice they are systemically interrelated. That is, they have different relevancy to given decisions by given actors, and act to modify one another in particular situations. In particular, the researchers note that while formal aspects of institutional regimes are often more visible than the informal, the former often depend on the latter for their interpretation and reproduction in any context. In spite of this, informal institutions are seen as either too abstruse to tackle or worse, a source of corruption, resistance and anti-social behaviour in top-down oriented institutional analyses. Attention is inevitably directed towards formal institutions, because this is where it is thought there is opportunity for conscious design and improvement. The suggestion being that analysing informal institutions and their relationship to adaptation and change is a key aspect of understanding adaptive capacity, and the project is seeking to develop a framework which helps this analysis, drawing on theory from the literature on social capital and organisational learning.

Social capital

Social capital provides a language to examine the association between the quality of interpersonal relationships within a social system, the operation and evolution of institutions and subsequent shaping of adaptive capacity to rapid climate change. This project is particularly interested in the adaptive capacity of individuals and communities that arises from different forms of social capital, through the development, maintenance and evolution of institutions.

Much of the work on social capital has been criticised for neglecting the issue of power. Here, social capital refers to networked interpersonal relationships. Power is relational, existing within every social interaction. The diversity of theoretical approaches to social capital reflects the context-dependent nature of researching the subject, which means that individual projects have to be careful in the definition, operationalisation and measurement of the concept.

It is supposed that institutional capacity-building and the formation of networks to enhance adaptive capacity depends on a critical thickness of social capital, motivating pressure(s) and a supportive enabling environment that inhibits the emergence of ‘negative’ social capital (such as that found in networks of corruption). However, where formal institutions hold sway, with participants playing roles with more clearly bounded responsibilities and social interaction and exchange of information or resources, the milieu is quite different from the informality and flexibility that characterises social capital exchanges. Hence, the project is interested in the extent to which social capital allows one to

understand informal institutions and the lessons for policy and practice that a balanced appreciation of informal institutions suggests.

Organisational Learning

Organisational learning is an important concept in the management literature. Learning is seen as a core strategic capacity of an organisation in terms of both competitive advantage and survival in a rapidly changing business environment. In the sense that organisational learning is concerned with the social conditioning of capacity to respond to events, it is directly relevant to institutions and adaptation to rapid climate change.

Theories of organisational learning focus on two types of social learning: (i) individual learning as it is socially conditioned, and (ii) collective learning which emerges at the organisational level. Another distinction made about learning in organisations is between single and double loop learning. The former is about efficiency, learning to undertake activities and achieve goals with increased skill. The latter is concerned with changes in the governing values of an organisation, in strategies and assumptions. Double loop learning is seen as harder, frustrated by inhibition and defensive routines and requiring cultural and personal discipline to achieve. This project is interested in such distinctions, not only because they reveal qualitatively different kinds of adaptation and say something about the attendant institutional factors, but also because the relationships between them reveal the links between different forms of adaptation. Can some forms of learning result in fostering adaptations that close or advance adaptive capacity elsewhere in the system, or in the future?

As well as the mainstream views of organisational learning, the researchers are investigating two other recent lineages of organisational theory. The first, 'communities of practice' is a development of situated learning theory and focuses on the formation of individual and group identity through mutual engagement in practice. The second draws on complexity theory for insight into processes of learning and change in organisations. Both lineages focus on the informal reality of organisational life – how things get done, and question the extent to which learning and adaptation can be usefully designed or managed. They focus on engagement with the shadow network, the non-canonical set of institutions and interpersonal relationships that enable an organisation to persist. This perspective opens a space for bottom-up/adaptiveness-in-action, in addition, or as an alternative to, top-down/anticipatory adaptation. The question is the extent to which these can co-exist in practice and be empirically traced.

3.4 Attitudes and societal adaptation to extreme changes: eliciting expert views on the likelihood of rapid climate changes.

Nigel Arnell, Emma Tompkins

The aim of this project is to assess the sensitivity and vulnerability of different parts of society and the economy in Europe to rapid climate change. As such it focuses on organisational behaviour as opposed to individual behaviour or the behaviour of key policy makers. In particular it is seeking to assess what makes organisations and societies vulnerable to change? What is rapid climate change? And, how are organisations likely to be vulnerable to such rapid changes in climate? In this sense the project is testing conceptual frameworks of adaptation to extreme, but rare, events such as the collapse of the thermohaline circulation in the North Atlantic, rapid deglaciation and massive melting of permafrost.

This is achieved through seeking an understanding of the causes and impacts of rapid climate change, linking the physical science complexity with social science approaches for dealing with

uncertainty and developing an innovative tool for enhancing our understanding of rapid climate change.

More specifically, the project is seeking to understand:

1. Organisational awareness of the threat of climate change;
2. The adaptation space - what are the options available? - and what is the organisational awareness of this? and,
3. Organisational strategies to cope with such changes in climate.

To do so variables which seek to explain the characteristics of the organisation, its sensitivity to change and the role of external characteristics such as markets, institutions and regulatory environments need to be evaluated. Here, the characteristics of the organisation that influence learning are deemed significant including its core beliefs, decision-making structures, access to information and the role of champions.

3.5 Local environmental context and human behaviour response

Jake Elster

This project is concerned with trying to document and better understand the links between human behaviour, global environmental problems, and the local neighbourhood environment where people live their everyday lives. Theory is important to this understanding and the authors are using previous work, and existing theories to develop a framework to try and help describe the interactions between neighbourhood, human behaviour and global environmental problems.

The existing theories and approaches cover a wide range of different links at different levels and in different directions:

- links between neighbourhood appearance and behaviour towards the local environment;
- links between national and international policy driven by global environmental problems, and people's behaviour; and
- links between local concerns and action and wider environmental impacts.

It is the intention of this project to make sense of these links and their interactions through the development of a framework. To do so, the researchers have utilised a model of human behaviour developed by environmental psychologists in relation to individual behaviour, recycling and other environmental actions (Barr et al, 2001). Human behaviour in this model is then determined by environmental values, psychological variables (e.g. altruism, citizenship, subjective norms and response efficacy) and situational variables (e.g. context, socio-demographics, knowledge and experience) (Figure A).

The researchers use this basic human behaviour model and attempt to put it into the neighbourhood and wider environmental context. In this process, the model is expanded to illustrate the linkages between, global, national and local contexts on individual behaviour (Figure B). In testing this model in relation to litter dropping by individuals at the local level, the authors argue that behavioural intention is influenced by personal psychological variables, including self-efficacy, altruism and norms as well as situational variables such as cultural and social norms. Actual behaviour could then be influenced by this behavioural intention, plus other more immediate psychological and situational variables such as mood, availability of a litter bin, and the amount of litter already on the streets.

In addition to this individual response, the authors argue that the model is capable of accommodating the issue of collective action by placing it in, for example, the local areas context and then allowing this to interact with individual behaviour. Thus, collective action to tidy up an estate could be placed in the local context and would then have an effect on individual behaviour through both situational and psychological routes, such as its effect on cultural norms, the appearance of the estate, and the likelihood of being challenged if you dropped litter. In the other direction, individual behaviour, such as continuing to drop litter, can have an effect on collective action. For example, by making an estate clean-up group feel powerless to deal with the problem, or by making them more determined, and adopt tougher measures such as naming and shaming.

Figure A
Conceptual Framework of the Research

(Barr, S, Gilg, A W and Ford, N J (2001) 'A conceptual framework for understanding and analysing attitudes towards household waste management', in *Environment and Planning A*, Vol.33, No.11 (November), pp.2025-2048

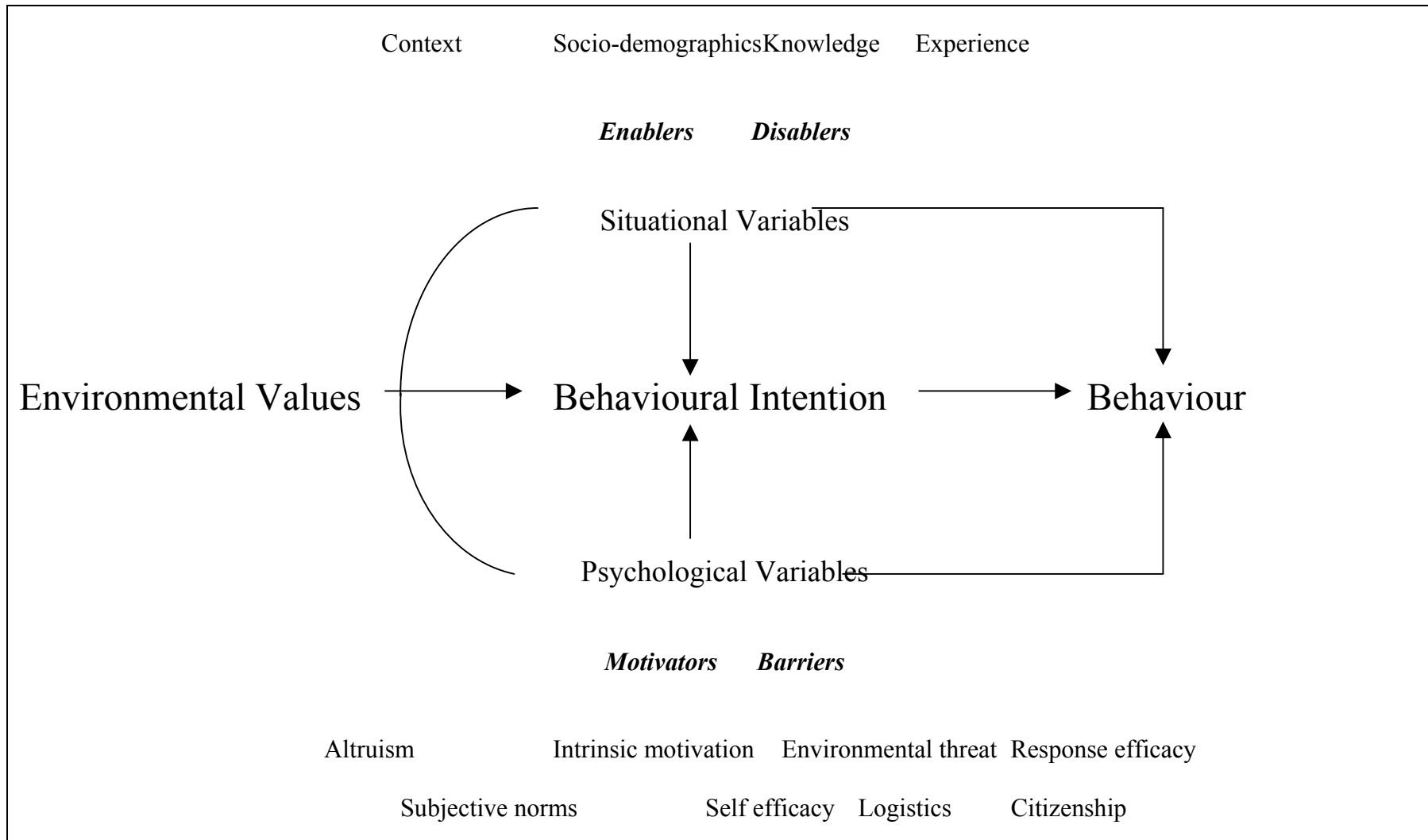
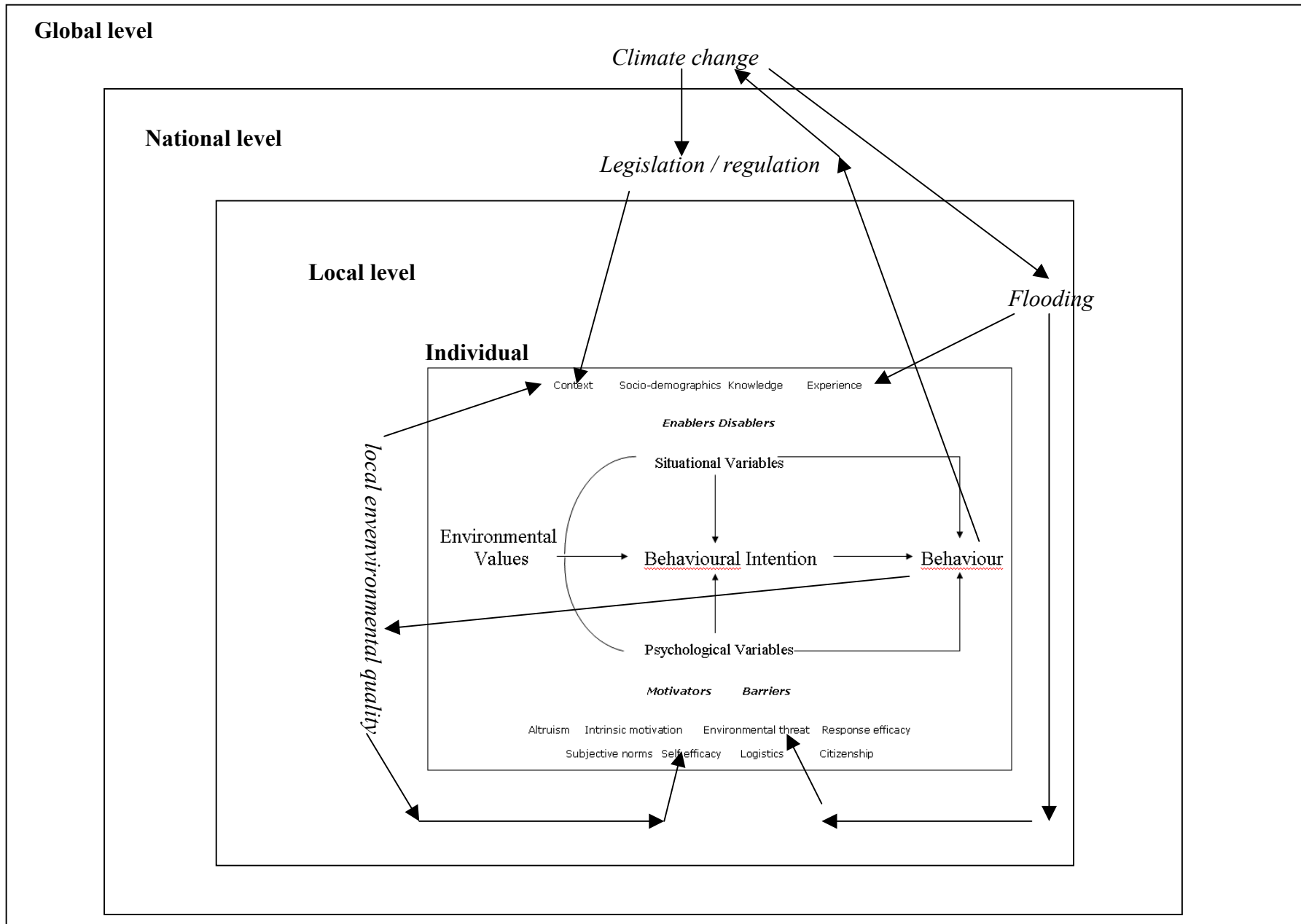


Figure B: Modified Conceptual Framework of the Research



The wider context could also be accommodated. For example, legislation at the local level such as fines for litter dropping could affect individual behaviour and perhaps give a community action group an additional angle to try and tackle the problem of litter. National awareness campaigns could equally have some effect on individual behaviour, and physical initiatives, such as Britain in Bloom initiatives could have an effect on the neighbourhood environment, which in turn could interact with peoples' behaviour. In the other direction, individual behaviour might influence these wider levels. For example, a significant litter problem might lead to a local authority installing a bin.

The framework presented here is work in progress but it seems it can help us understand, organise and communicate the complex interactions between individual behaviour, the local neighbourhood and wider environmental problems. It also seems to stand up when confronted with real life examples.

Barr, S, Gilg, A W and Ford, N J (2001) 'A conceptual framework for understanding and analysing attitudes towards household waste management', in *Environment and Planning A*, Vol.33, No.11 (November), pp.2025-2048

3.6 Socio-technical constructions of human behaviour *Heather Chappells and Elizabeth Shove*

Rather than thinking about how mechanisms of individual choice, belief or value influence human behaviour, this project is primarily interested in the ways in which institutional cultures and attachments to social networks configure the choices available to individuals and their service expectations. This means looking at how social and collective conventions of comfort evolve, at how thermal standards and norms become institutionalised and at the role of a variety of supply chain actors in configuring these arrangements. In this respect, we have taken our inspiration from sociological theories that examine the relationships between systems of production and consumption (Otnes 1986, Fine and Leopold 1993). However, human behaviour might also be viewed as something that is socio-technically constructed. So, another of the project concerns has been to understand how the technologies implicated in the provision of thermal comfort structure patterns of energy consumption. More specifically, how do the assumptions embodied in buildings standards and technologies of heating, ventilation and air-conditioning influence the choices available to individual users and building occupants? To address these issues, the researchers have enrolled ideas from the sociology of science and technology.

On the one hand, they have explored ideas about the social and historical construction of specific devices, how these embody the objectives and priorities of designers and developers, and, how this can lock users into inefficient patterns of resource use (Bijker 1995). Focusing on the interface between those who design and use these technologies, the researchers have also considered how objects are designed in ways that provide a framework for action or set of "prescriptions" that help to define what users can do (Akrich 1992). Together, these ideas about the social construction and scripting of technologies show how technologies associated with the provision of thermal comfort provide a context for certain types of human behaviour, and prompt examination of how they might be re-scripted to embody more sustainable user prescriptions.

The provision of human thermal comfort also depends on the configuration of wider building and energy systems or regimes. Hughes (1983) argues that the institutional and technological components of such systems co-evolve over many decades, with operating rules and associated technical features, becoming consolidated into, what he terms, seamless socio-technical webs. Once established, these network configurations and the institutional cultures they support can prove

extremely resistant to change. So, another feature of this project has been to examine the relationship between the obduracy of certain institutional rules or routines that are embodied and integrated into existing infrastructures and how these limit capacities for environmental modernisation. For example, current building systems incorporate a relatively fixed interpretation of comfort, which supports a standardised model that stipulates that buildings should be kept at a year-round constant temperature of around 21°C. By thinking about how different meanings of comfort evolve and how these become built into current knowledge and building systems, the project aims to examine alternative socio-technical trajectories of provision that might prove more sustainable. For example, if comfort is viewed as a process of human adaptation or adjustment, we might envisage a more open set of prescriptions for service systems, that offers people ample opportunity to modify their own working or living conditions without compromising environmental objectives.

Another important point that Hughes makes is that styles of systems do not develop in any uniform way, but are products of the unique cultural, political and geographical environments in which they evolve. In line with this way of thinking, the study takes account of how national, regional or local contexts influence the configuration of systems of comfort provision and the relative scope for individual or collective action. This is also relevant in terms of understanding whether providing sustainable and comfortable environments is more a matter for self, market or social regulation. For example, in some contexts, systems might be constructed to provide privatised comforts - such as developing markets for personal air-conditioning. In other situations different social and political priorities might hold sway, with the provision of comfort seen as a public responsibility.

In sum, the socio-technical theories reviewed in the project add a number of important elements to conceptual and policy debates about Environment and Human Behaviour. First, they emphasise that the actions and practices of humans are embedded in wider systems of social organisation and are related to the historical pre-conditions embodied in technologies and infrastructures. As such, they show how the challenge for environment policy makers is not just one of changing behaviour, but of the long-term transformation of institutional cultures, infrastructural scripts and social conventions. Second, such frameworks offer insights into how individual practices are linked to wider socio-political regimes and socio-technical landscapes that evolve in particular cultural and geographical contexts. In terms of policy implications, this emphasises the importance of looking at the interweaving scales of socio-technical organisation implicated in defining human behaviour rather than at isolated spheres of markets, households or even communities.

Akrich M (1992) The de-scription of technical objects, in Bijker W and Law J, *Shaping Technology/Building Society*. MIT Press, London.

Bijker WE (1995) *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change*. MIT Press, London.

Fine B and Leopold E (1993) *The World of Consumption*. Routledge, London.

Hughes TP (1983) *Networks of Power: Electrification in Western Society, 1880-1930*. The John Hopkins University Press, London.

Otnes P (1988) (Ed) *The Sociology of Consumption: an anthology*. Solum Forag A/S, Oslo

3.7 The attitude behaviour gap - preferences, beliefs, values and social norms *John Benson, Claire Haggett*

In many ways, this project differs from those presented at the workshop, and indeed in the programme as a whole. The project might also be seen as a microcosm of the programme, as what the researchers are attempting to do is to bring together different disciplinary, and therefore different theoretical and methodological, ideas and perspectives as a mechanism for drawing out and developing commonalities and differences between them. This they are undertaking in relation to the

differential attitudes and behaviours of individuals, communities and institutions in relation to renewable energy.

Through this process, important common themes and concepts have emerged:

- the importance of community involvement, communication, negotiation and participation;
- local ownership and control (and perceptions of control);
- trust in experts and decision-makers;
- perceptions of landscape, and variations in these;
- the importance of knowledge; and where it comes from, how it is used and why;
- the impact of the institutional framework;
- the importance of factors in a particular location and context (local political context, social history, geography, landscape, social climate); and,
- interest in the presentation and justification of attitudes against 'popular' wind development.

It is important to note, however, that this project has not started from, or been informed by, any one particular theory or framework. Rather, it is the intention of the researchers to draw out and develop links between various disciplines and perspectives as the project develops.

3.8 Integrating social vulnerability into research on food systems and global change

John Ingram

There is a need to integrate human behaviour more effectively into environmental paradigms. There are a range of social science methodologies which can help in this, ranging from qualitative (such as discourse analysis and citizen juries) to more quantitative techniques. Among the more quantitative approaches, this project proposes four 'families' which assist in providing the theoretical framework for the study under investigation.

1. **Ecosystems dynamics** underlies the concept of ecosystem resilience – the capacity of an ecosystem to tolerate disturbance without collapsing into a qualitatively different state that is controlled by a different set of processes. Resilience is seen as an essential attribute of linked social-ecological systems (see the Resilience Alliance (www.resalliance.org); Gunderson and Pritchard, 2002; and Holling, 2001).
2. **Ecological economics** spans a range of approaches from coupling human and environmental models, game theoretic analyses of environmental behaviour and more qualitative approaches (Costanza, 1989). One promising framework is the mixture of systems dynamics and qualitative differential equations used in the Syndromes approach developed by the Potsdam Institute for Climate Impacts (e.g., Cassel-Gintz and Petschel-Held, 2000).
3. **Vulnerability assessment and mapping**, well developed in famine early warning systems, uses indicators to overlay relative risks to regions and populations (see Downing *et al.* 2001). Related approaches focus on sustainable livelihoods (for instance based on five 'capitals'), human security (as in the GECHS project) or broad indicators of sustainable development (e.g., the Environmental Sustainability Index).
4. **Multi-agent modelling** seeks to characterise the behaviour of representative stakeholders, in particular the relationships between each other (as in thematic networks or institutions) and with the environment (see Downing *et al.*, 2000 for a review of issues related to integrated assessment).

The main purpose of this project is to contribute to an international review of the experience in each of these families, as applied to integrating natural and social processes of GEC, with the specific emphasis on linking present vulnerability and sustainability concerns with longer-term and global processes of environmental change.

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4. TOWARDS A CONCEPTUAL FRAMEWORK

The diversity of project presentations 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.

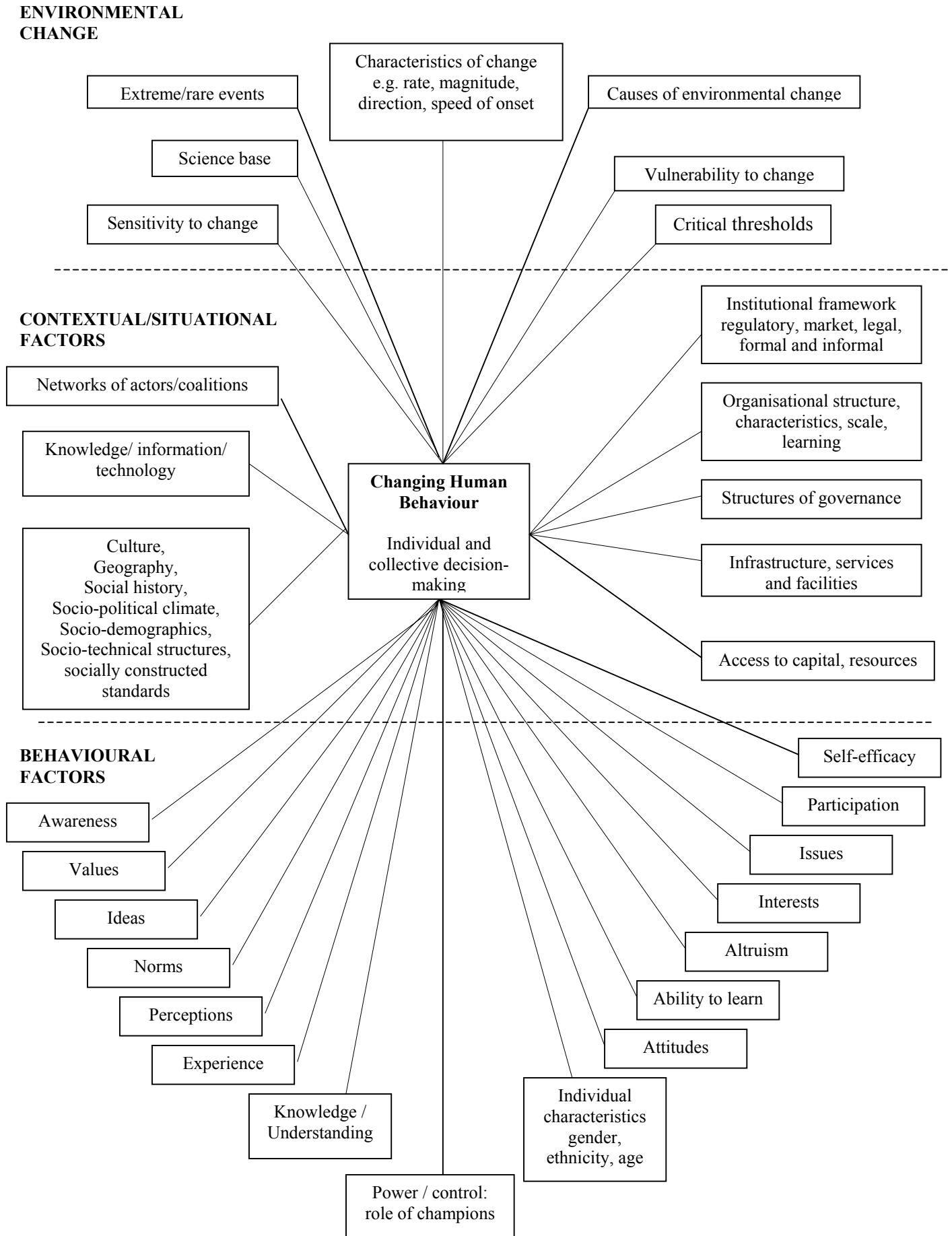
As a first step in this process, this section draws together some of the concluding comments of the workshop participants, recognising that the diversity is such that no single theory would serve as a useful explanation of the range of complex causal relationships explored. Rather, a framework is suggested 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 2). The three realms obviously interact, and co-evolve, continuously. The underlying hypothesis of the framework 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 which influence human behaviour and, 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 2 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. The project summaries above show that each of the projects is highlighting different variables in the framework presented in Figure 2, identifying those that are regarded as dominant/critical in the topics being explored. As the findings from the projects emerge, the challenge for the programme will be to create a map for the programme as a whole, which shows which factors and combinations of factors have been important in which contexts, and have contributed to what kinds of changes. The hope will be that this map will allow conclusions, however tentative, to be drawn about the kinds of interventions that may be required for particular kinds of changes to take place. This should in turn contribute insights into the core issues to which the programme is addressed, namely understanding why people behave as they do towards the environment, how this behaviour may change as environmental change occurs, and what influence public policy might have on this process.

Figure 2: Environment and human behaviour framework



PROJECTS AND PARTICIPANTS

Exploring vulnerability to rapid climate change in Europe

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Future comforts: re-conditioning urban environments

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Natural capital: metaphor, learning and human behaviour

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Tilting at windmills? The attitude behaviour gap in renewable energy conflicts

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Environmental issues and human behaviour in low-income areas in the UK

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