

The Human Environment,: the scenic (landscape structures) implications in the UK of psychological and societal responses to climate change.

Most studies on the impacts of climate change, are written by climatologists and tend to assume a measured and gradual response without any significant change in political or social structures. The multiple volumes of the UK government sponsored Climate Impacts Programme, for example tell us virtually nothing about social adjustment (UKCIP, 2000)

There are two main reasons for challenging the assumption of social continuity. Firstly, any major shift in the technological and productive base of society, especially on the scale necessary to seriously tackle greenhouse gas emissions, will have major social ramifications. Wealth will shift between social groups. Some parts of the country will gain new advantages relative to others. New occupations and industries will be created.

Secondly, we cannot assume that people will continue to support existing social structures and maintain optimism about the future in the face of a visibly deteriorating environment. Extremes weather events and ecological change will occur within a global context of unprecedented political instability as populations inside fixed national boundaries find themselves unable to keep up with the shifting rainfall, agricultural zones or sea levels (MOD, 2001). In historical circumstances when people have felt threatened and insecure they have demanded rapid social change with long term ramifications that would have been impossible to predict.

The relationship between such social changes and the British landscape will be complex. The landscape has developed through the complex nexus of environmental, ecological, economic and political forces (see Rackham 1986, Hoskins, 1955). The landscape in turn has influenced social attitudes to the environment. Since the first settlement in the British Isles, the goal of successive generations has been to tame and humanise the environment by maximising productivity and removing predators. By the 17th century this tamed landscape would inspire people to see the relationship with the environment as a "friendly and equal partnership" (Jellicoe, 1995 233).

Climate change, though, has the potential to reintroduce the concept of nature as a threatening force. It will bring increasingly erratic and extreme weather events, new human diseases, and pests. It will also disturb the ideal of continuity and permanence which underlies the romantic attitude to landscape. The Climate Impacts Programme talks repeatedly of winter rainfall as so many percent above "normal", or summer temperatures as so many degrees above "normal" (UKCIP, 2000). The concept of normality will become less and less tangible for people born into the greenhouse world. They may well feel that they have made an irrevocable break with previous generations.

SOCIAL RESPONSES TO CLIMATE CHANGE

This paper suggests three scenarios for social responses to climate change and considers the implications of each for the British landscape. One scenario assumes a full response to reduce emissions to a sustainable level. The other two scenarios assume an inadequate response; one in which social structure is strengthened, and one in which social structures degrade. All three responses are plausible in the face of previous experiences for social adaptation. This paper does not seek to argue that any one scenario is more likely than the others (in any case, these are but three scenarios out of many) but gives them equal weight to show that the range of outcomes is far wider than is commonly appreciated.

SCENARIO ONE- BUSINESS AS USUAL (BAU)

'Business as usual' (BAU) assumes that society is unwilling to change its consumption patterns or energy intensive lifestyles. Under BAU, governments concentrate on supporting

economic growth with which they hope to fund adaptation. Their direct response to climate change is the minimum necessary to address voter concern and meet international obligations. BAU assumes that most people maintain their fundamental optimism about the future and support for the existing economic and political institutions.

This is the scenario implicitly assumed in most UK government climate impact studies and advocated by libertarian populists, such as Bjorn Lomborg (Lomborg, 2001). "Business as Usual" is also the nickname given to the A1 and A2 scenarios, the most pessimistic of the six emissions scenarios developed by the Intergovernmental Panel on Climate Change (IPCC, 2001) Advocates of the BAU scenario believe that these climate impacts, which lie at the most extreme end of the IPCC predictions, will not become intolerable and assume that technological breakthroughs can ultimately allow a rapid reduction in emissions without effecting economic growth.

Under the BAU scenario we can assume a continuation of well established economic trends; increased affluence with a concomitant increase in house size; increased personal mobility and consumption; and, increased globalisation of trade leading to continued erosion of local economies. As a result the BAU scenario will continue landscape trends that have already become marked over the past 50 years; increased urbanisation and, in particular, suburbanisation; increased density of roads; the expansion in farm and field size and the further simplification in the range of crops grown.

Even under BAU there are inevitable changes in energy production. Whilst global energy demand continues its exponential rise, oil production will peak in 2005 and slowly decline from then on. Oil companies, in particular BP and Shell , are already positioning themselves to supply the renewable energy technologies needed to supply this shortfall. Wind, wave, and hydro power will all need to expand significantly under BAU. The UK government has already set an initial target of 20% of electrical supply from renewables.

Assuming that BAU is a continuation of the current legislative and social context, renewables would still have to struggle through the local planning process. Their landscape impacts will therefore be tempered by local opposition in areas of valuable property and historic landscapes. In general the transition to new energy sources will have limited landscape impacts because BAU seeks to maintain current lifestyles. Urban sprawl is still urban sprawl even if some of the cars are powered by hydrogen, or the houses are fitted with solar panels.

The greatest impacts are therefore likely to come from adaptation. We can expect most investment in sea defences and measures to lessen the impacts of river flooding, such as river straightening, a ban on development in areas prone to regular flooding, and reforestation of catchment areas.

In order to justify BAU, though, society will need to maintain a studied indifference to the environment. It is possible to imagine that people in urban areas will be as unaffected by the early ecological impacts of climate change they were by the death of two thirds of the nation's elm trees in the 1980's. However, the impacts will become increasingly hard to ignore and people will need to find solace in collective denial (Marshall, 2002). Drawing on the experience of social denial of human rights abuses (Cohen, 2001) we can expect a BAU society to become more inward looking, more overt in its consumption and possibly deliberately destructive of landscape and historical values.

SCENARIO TWO - THE ENVIRONMENTAL WAR ECONOMY (EWE)

The 'Environmental War Economy' (EWE) is a phrase taken from a report by the New Economics Foundation that argues that the austerity measures and command economy of the Second World War provide a model for a society "faced with a crisis in which individuals are asked to subordinate personal goals with a common good" (Simms 2000).

The EWE scenario assumes that social and economic activity is subsumed within the goal of reducing greenhouse gas emissions to a sustainable level. If this level is calculated on the basis of equal per capita emissions - and it hard to imagine Southern governments endorsing any global agreement that was not based on this principle - this will require rich countries such as the UK to reduce their greenhouse gas emissions by up to 90% (Marshall 2001).

A two pronged strategy will be necessary to achieve this transformation: reducing the baseline demand for energy through conservation measures and changes in lifestyle; and exploiting all potential sources of non-fossil fuel energy. In both cases there are considerable implications for the British landscape.

We can assume that transport is one of the first places that any government will start looking for reductions in energy consumption. It currently accounts for one third of UK energy consumption (DTI 2000). Half of this energy is consumed by cars and taxis. Even with billions of dollars currently being invested in alternative car technologies (hydrogen, hybrid, and solar) it is hard to imagine any energy constrained future that can justify this level of energy use for instant personal mobility.

We cannot underestimate the impact of car ownership over the past 50 years on personal lifestyles, residential and employment patterns, and patterns of food retailing and production. Shifting from personal back to public transportation systems would therefore have major landscape impacts. At a policy level it would entail halting urban sprawl and road expansion, and increasing urban densities. At a societal level a reduction in mobility would make people more dependent on local employment. Local economies would be further strengthened by any reduction in freight transport (which currently accounts for 6% of national energy consumption (DTI,2000).

Another 30% of UK energy consumption is in the home, mostly from space and water heating. Any reduction in domestic energy consumption would need to start with the renovation of the UK housing stock, the oldest and worst insulated in Western Europe, to meet stringent retroactive building regulations. The application of low energy design principles would significantly change the appearance of urban areas. All south facing roofs would carry solar hot water and photo-voltaic panels, buildings would be restructured to reduce glazing on north faces and increase shading and glazing on south faces.

The greatest landscape impacts would come from replacing fossil fuel energy sources. Because of its northern latitude and high cloud cover, the UK is at the margin of viability for electricity production from solar power. However, the UK has some of the best locations for wind generation in the world. In the EWE scenario, we could anticipate that public interest legislation would support development of wind generation in all viable locations on land and sea. Even with 2.5 megawatt wind turbines, the largest currently available, it would still take over 30,000 windmills, each standing 100 metres high, to replace the current 75 gigawatt of national electricity generating capacity (DEWI 2000). In many parts of Britain the landscape would be dominated by windmills, just as it is now dominated by electricity pylons.

Reforestation is a theme that appears repeatedly in any EWE scenario. Deciduous tree planting around buildings is necessary in any strategy to minimise air conditioning. Urban wood lots have often been proposed as a source of fuel for winter heating and this principle has recently been applied on a large scale in the Beddington Zero Energy Development in South London (White, 2002). Finally, when reforestation is for a permanent land change, forests can remove and sequester carbon from the atmosphere. The Kyoto Protocol already allows countries to offset their emissions against such carbon sinks and it seems certain that all future agreements will provide incentives for reforestation. Even in a country with a high

pressure on land, reforestation wherever possible would be a logical component of an EWE response and has the potential to radically alter the grazing landscapes of Wales and Scotland.

Although many of the ideas above originate in the green movement, a EWE society might be far from being a "green utopia". EWE strategies are chosen to satisfy just one goal; the reduction of greenhouse gas emissions, and do not necessarily respect wider environmental ideals. Nuclear power could be a major component of energy production. The best trees for carbon sequestration or fuel wood might well not be native species, and might even be trees that have been genetically modified for the purpose. Monsanto has been experimenting with such trees for the past five years.

Finally, although environmentalists have always believed that a low energy society would be more democratic (for example Illich, 1974), there is no reason to assume that the EWE society is a participatory democracy. Many societies facing insecurity have willingly ceded power to a centralised force through a desire for stability. Actual war economies typically cite a greater public good when they repress dissent and debate. It becomes harder to predict landscape impacts when they are based on arbitrary decisions by a very small elite. For example, no one could have fully anticipated the impacts of Pol Pot or Mao on the landscapes of Cambodia and China.

SCENARIO THREE- COLLAPSE AND SOCIAL FRAGMENTATION (DSF)

Although Northern government institutions will acknowledge that climate impacts may provoke social disintegration in Southern countries (for example, MoD, 2001), they will never entertain any such scenario for our own society. However, it is clear that at some point the exponentially increasing costs from climate change will exceed gross national product. Insurance company CGNU, believes this point may come as early as 2065 (Guardian, 2002). There are plentiful historic examples of cultures far less vulnerable than our own that have collapsed in the face of environmental deterioration. The rapid decline of the Maya civilization is a well documented example (Ponting, 1993).

Collapse and Social Fragmentation (CSF) is a scenario for a society which breaks apart under the cumulative impacts of climate change. The initial cause is the direct economic effects of climate impacts to a highly interconnected global economy. Whereas under the EWE scenario society found cohesion in facing a common threat, under the CSF scenario, society is already too fragmented to muster a united response. People express their despair over a rapidly deteriorating environment by withdrawing support for political institutions and the existing economic system. With the loss of centralised control, society breaks down into groups with competing interests and ideologies.

The CSF scenario is a transition to a far less complex and interconnected society. The break down in international relations is the first and most probable stage of DSF. Basic human needs - food, shelter, security - would need to be met locally. Settlements would need to be far smaller, and large urban areas would no longer be sustainable.

We need to look back a long way in British history, at least five hundred years, to find a model for a society capable of surviving without a strong central government and trade. Of the three scenario's, CSF has the greatest implications for landscape. Yet, paradoxically, the CSF landscape is the easiest to predict from historical precedents.

CSF is the scenario which could see the greatest change in social attitudes to the environment because it is the one under which people are most vulnerable to extreme weather events. They would be in an unenviable position; they need to be self sufficient without the infrastructure of an industrialised society, and under the constant shocks of a

deteriorating climate. It would be reasonable to assume that the CSF society would come to regard the natural world with fear and antagonism.

CONCLUSIONS

In this paper I have tried to show that no calculation can be made of the impact of climate change on the landscape without consideration of the likely social response. I have attempted to show that there would be considerable landscape changes under any of the three scenarios above. What is more, the psychological response to climate change, will produce yet deeper changes in the cultural relationship between humans and nature. I have attempted to show that the range of possible social responses to climate change is so wide as to make it impossible to predict with any accuracy the overall landscape impacts.

It is still impossible at this time to predict the actual course that society will take. At the present we are still acting out the 'Business as Usual' scenario. Judging by the evidence being published in the scientific journals over the past three years, climate change is already occurring faster than previously assumed, further increasingly the likely trauma and severity of future social adaptation.

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