

CHAPTER 1

INTRODUCTION

“All organisations should anticipate climate change – those that are most well-informed and innovative will be best placed to respond to the risks and opportunities.”

The Rt. Hon Margaret Beckett MP; Secretary of State for Environment, Food and Rural Affairs, April 2002

Background

The phenomenon of climate change is as old as planet Earth. Its significance for the United Kingdom in the 21st Century is the rate at which that climate is now changing, the underlying reasons for such rapid change, and the effects this will have on our lifestyle. This study is based upon the assumption that:

- The UK climate will continue to change.
- The scenarios offered by the UK Climate Impacts Programme (UKCIP) are increasingly reliable as indications of the UK climate over the 21st Century.
- It is worthwhile exploring the potential impacts of such scenarios, and to suggest appropriate responses.

The evidence for a rapid increase in the rate of climate change in the United Kingdom is compelling. Continuing research and monitoring at international and UK scales confirm the prospect of increased global temperatures and consequent changes in the UK climate over the 21st Century. Over 180 nations have ratified the United Nations Framework Convention on Climate Change and almost 100 parties have ratified or acceded to the Kyoto Protocol, which sets legally binding constraints on greenhouse gas emissions. Despite this, it is still predicted that significant climate change will occur over the coming century due to greenhouse gases which are already in the climatic system.

These changes in climate will create significant impacts that will present both problems and opportunities, for which well-informed adaptation strategies must be developed. Despite the improvement in the prediction techniques used by climate scientists, there are continuing realms of uncertainty. These uncertainties are particularly associated with the reliability of theoretical models, the control of greenhouse gas emissions, and the underlying contribution of natural processes to climate change.

Nevertheless, such uncertainties are not excuses for not taking appropriate or precautionary action. Uncertainty and risk form part of all strategic and commercial decision making. The lack of absolute certainty in climate scenarios should not be seen as a reason for inactivity.

Definitions

Before introducing the aims and objectives and scope of the study, it is worth stating some definitions of some of the principal concepts associated with climate change. For example, there is even some confusion over what is meant by the term ‘*climate change*’ itself, and also some important distinctions to be made between “*mitigation*” and “*adaptation*” (see also *Glossary of Terms in Annex 1*)

“*Climate*” refers to the average weather experienced in a region over a long period, (30 years is the normal period taken by climate scientists). This includes not just temperature, but also wind and rainfall patterns, and other climate variables., such as humidity.

The climate of the Earth is not static, so “*climate change*” refers simply to the continuous pattern of changes occurring in the past, in response to a variety of natural causes. Unfortunately, the term “*climate change*” is now more casually used with reference to the recent changes in climate that have been observed since the early 1900’s. The implication here is that ‘climate change’ arises (only) as a result of human activity. This study is based on the wider understanding that ‘climate change’ is a longstanding and continuous phenomenon, which is now subject to the influences of human activity, and is therefore changing more rapidly.

The “*greenhouse effect*” is also naturally occurring and makes life on earth possible. Certain gases in the atmosphere (so-called greenhouse gases) absorb energy that is radiated from the Earth’s surface, and so warm the atmosphere. Without the greenhouse effect, life on Earth as we know it would not be possible, as the Earth would be cooler by about 30 degrees Centigrade.

However, the relatively recent increase in the burning of fossil fuels has resulted in the release of large amounts of greenhouse gases into the atmosphere, thereby enhancing the greenhouse effect.

It should be recognised that these ideas are not universally shared. The proposition that human activities are altering climate significantly is not accepted by some industrialists and some scientists. That there are dissenting voices indicates that what is being discussed are opinions, estimates and projections, backed by theory and deriving from hypotheses, and so are not necessarily “facts”, however defined.

Nevertheless, the dominant view, and certainly that which is articulated by the Intergovernmental Panel on Climate Change (IPCC), is that the increase in greenhouse gases, caused by human activity, is the principal reason for increases in global temperatures, and consequent climate change. This is known as the “*anthropogenic*”

component of climate change. There is a variety of alternative views some of which seek to play down the human impact and provide explanations based upon “*natural variability*” in cycles of climate.

Most work on climate change both in terms of academic research and practical activity, seeks to reduce the human effects on global warming by reducing the quantity of greenhouse gases released to the atmosphere. This is known as “*mitigation*”, and forms a key part of the ‘*sustainability*’ agendas adopted by central and local government, businesses and Non-Governmental Organisations (NGOs).

However, for the purposes of this study on the impacts of climate change, the causes of climate change are not so critical. The focus is on what actions society might take in responding to those changes in climate that are now ‘in the system’ and appear to be most likely. Such responses are known as “*adaptation*” and lie at the heart of this study.

Aims and Objectives

This Scoping Study sets out to understand the potential impacts of climate change upon the South West region of the United Kingdom, to explore the current understanding of adaptation to climate change across the region, and to consider possible responses. The principal aims of the Scoping Study are to:

- Provide an overview of the best current information on the predicted climate scenarios at global and UK scales.
- Provide a summary of historic and contemporary climate change data for the South West Region, revealing observed trends.
- Provide an overview of the latest UKCIP climate scenarios for the South West region for thirty year periods centred around the 2020’s, the 2050’s, and the 2080’s.
- Identify the key stakeholders in the South West Region who will be most affected by climate and assess stakeholders’ views on the likely impact on their interests.
- Report on how stakeholders expect to respond to ‘opportunities’ and ‘problems’ associated with adaptation to climate change.
- Assess the key climate change issues for the South West Region to provide integrated, cross-sector information on which to base future strategy for climate change adaptation.
- Identify priorities for further research and information collection in developing a better understanding of the type and extent of potential impacts and appropriate adaptation responses.
- Overall, to provide a single authoritative document on climate change impacts in the South West, for the use of stakeholders in the region, as well as for decision makers at national level.

Context

In the South West Region, work on the impacts of climate change is being co-ordinated through a partnership between key stakeholders, known as the South West Climate Change Impacts Partnership (SWCCIP). Its mission is: “*to investigate, inform and advise on the impacts of climate change in South West England*”.

In 1996 the Climate Change Impacts Review Group (CCIRG) reported on the potential effects of climate change in the United Kingdom. The national response to this review is now led by the DEFRA funded UK Climate Impacts Programme (UKCIP), which seeks to facilitate stakeholder-led, integrated regional studies to assess the impacts of climate change on the UK and to encourage appropriate adaptation responses. UKCIP provides a national framework within which regional initiatives can be undertaken.

At a national level, this Scoping Study provides UKCIP with a study similar to those that have already been produced for other UK regions. So far eight regional Scoping Studies have been completed as well as a series of thematic studies. (See Chapter 2 for further details)

At a regional level this study will inform the ongoing regional partnership in addressing its approach to climate change adaptation in the region. The role of regional stakeholders has been of crucial importance in developing this work. A Steering Group was created for this study, co-ordinated by the SW Regional Office of the Environment Agency, and including representatives of all levels of government, the business community and NGOs. This provided a route to funding (from the South West Regional Development Agency [SWRDA] and other regional organisations) which has made the study possible.

In this way the Scoping Study responds to the Regional Sustainable Development Framework for the South West of England which states that ‘*The basis for addressing climate change and promoting sustainable development has to be a good understanding and a sound information base*’.

Scope of Study

The geographic boundaries are limited to the South West Region, as operated by the South West Regional Development Agency (SWRDA) and the Government Office for the South west (GOSW). The study area therefore contains the counties and unitary authority areas of: Cornwall and the Isles of Scilly, Devon, Plymouth and Torbay, Bournemouth, Dorset and Poole, Somerset, Swindon and Wiltshire, South Gloucestershire, Bristol, Bath and North East Somerset, North Somerset and Gloucestershire. (see Figure 1.1)

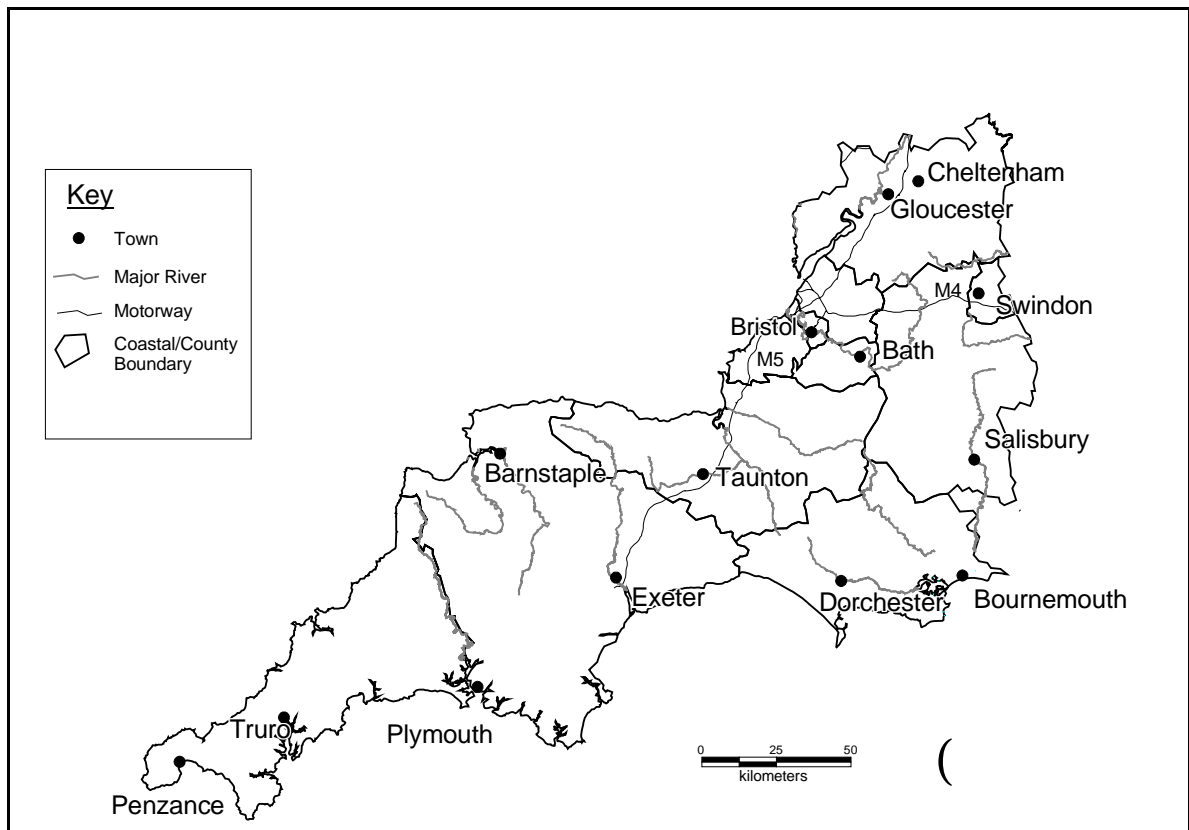


Figure 1.1
Map of South West Region which defines the area of study

Despite the tight regional focus, the study recognises a wider geographic context.

Firstly, the potential impacts of climate change are even more serious in other parts of the world. Sea level rises in places such as Bangladesh could increase global migration to levels that have not yet been contemplated. Increases in temperatures in Mediterranean tourist centres (such as Greece) could make such places less attractive as resorts. These and similar impacts may have significant consequences for the South West itself.

Secondly, the optimal level at which adaptation responses should be made will also vary spatially. For example, responses identified as necessary for the South West Region and requiring changes in Building Regulations will need addressing at a national level. Other responses may be best managed at regional or sub-regional levels.

It is acknowledged that issues of adaptation to climate change form part of a much wider 'sustainability' agenda, especially with regard to the mitigation of potential climate change effects through strategies for (eg.) reducing greenhouse gas emissions. Nevertheless, it is not possible within the scope of this study to give explicit consideration to aspects of mitigation. The focus is on impacts and adaptation. This being said, mitigation issues will be taken into account when

considering adaptation strategies, so that any emerging proposals for responding to predicted changes in climate do not themselves make climate conditions worse by ignoring mitigation implications. In addition it is most likely that adaptation responses (for example by Local Authorities) will form part of a wider climate change or sustainability strategy.

Structure of Report

The study has been divided into main sections as indicated below:

- Other studies on Climate Change Impacts
- Global Climate Change Context.
- South West Regional Context.
- South West Regional Climate Change
- Impact Domain Reports
- Conclusions and Recommendations

Other studies that have been undertaken in the UK are briefly reported in a section on UK research activity. (Chapter 2)

Global Climate Change Context: This part of the study is based upon existing data recently published on climate change at a global scale. It highlights the observable trends in climate change, particularly over the last century; reports on the natural cycles in climate, the calculated

anthropogenic contributions to climate change, and predictions for changes in the climate over the coming century. It reviews the potential impacts of climate change at a global scale, and distinguishes between adaptation and mitigation responses to these impacts. UK initiatives on climate change are tracked mainly through the work of UKCIP. (Chapter 3)

South West Regional Context: This part of the study briefly describes the region in terms of its overall physical attributes, and its social, economic and cultural activity. Further information on specific sectors is provided at the beginning of each domain report. (Chapter 4)

South West Regional Climate Change: This chapter provides an analysis of climate change in the region, including an account of historic trends, a picture of current climatic conditions and future climate scenarios for the region. The historic and contemporary data is drawn from Met Office and similar records held within the region. The scenarios make use of the data recently published by UKCIP for the thirty year periods around the 2020's, the 2050's, and the 2080's. (Chapter 5)

Impact Domain Reports: This section reports on the perspectives of a wide range of stakeholders within the region. Various 'impact domains' have been selected based upon an analysis of other similar studies. These have been classified into three main groups:

- Natural Environment Domains (Chap 6)
- Society and Infrastructure Domains (Chap 7)
- Business Domains (Chap 8)

Each domain has been the subject of a focussed study providing information on context, key issues, opportunities and challenges presented by different climate variables, and suggestions for the way forward. Some domain reports are able to include information on: data availability, perceived significance of stakeholders, and potential adaptation responses. (*Further detail on the methodology, sources of information etc for these sections is available in Annex 2 and Annex 3*)

In addition, the implications for cross-sectoral issues are explored by considering a variety of spatial zones including: coastal environments; urban environments; and rural environments. These are assessed through case studies of single areas chosen as representative of each of the three environments. (Chapter 9)

Local authorities have been identified as important agencies in responding to climate change. A further chapter briefly identifies the range of issues that fall within the responsibility of local authorities and indicates a variety of responses. (Chapter 10)

A simple Summary of the findings of the study is to be found in Chapter 11.

The section on Recommendations is mainly a review of management issues, and again was reliant on contact with stakeholders; principally those public, private and voluntary agencies operating at a regional level, and with local government at county, unitary and district levels. The main purpose here is to draw together recommendations for action for those stakeholders with a regional remit, and others, especially local authorities, with a significant role to play, at sub-regional levels. (Chapter 12)

Priorities for research are identified in Chapter 13.

A brief set of conclusions is provided in Chapter 14.

Annexes: Annexes include bibliographies, lists of those contributing to the report through the completion of questionnaires, participation in interviews and workshops, a glossary of terms, and an explanation of the methodology used for the impact domain reports.

Outputs of the Study

The outcomes of the Scoping Study are available in both paper and electronic format. The full Technical Report (this document) is available as a paper copy and can be accessed on the web at the following address: www.ourSouthWest. A shorter version (24 pages) is also available as a Summary Report.