

**Global climate change and sustainable development : third report of
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International Development Committee

**GLOBAL CLIMATE CHANGE
AND SUSTAINABLE
DEVELOPMENT**

Third Report of Session 2001–02

Volume I

HC 519-I

INTERNATIONAL DEVELOPMENT SELECT COMMITTEE
REPORTS IN THE CURRENT PARLIAMENT

Session 2001–2002

FIRST REPORT

The Humanitarian Crisis in Afghanistan and the Surrounding Region HC 300-I and II

FIRST SPECIAL REPORT

Government Response to the Committee's First Report of Session 2001–02 HC 633

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The Effectiveness of the Reforms of European Development Assistance HC 417-I and II

SECOND SPECIAL REPORT

Government Response to the Committee's Second Report of Session 2001–02 HC 1027



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International Development Committee
GLOBAL CLIMATE CHANGE
AND SUSTAINABLE
DEVELOPMENT

Third Report of Session 2001–02

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Footnotes

In the footnotes of this Report, references to oral evidence are indicated by 'Q' followed by the question number. References to written evidence are indicated by the page number as in 'Ev 12'. The oral and written evidence is published separately in Volume II (HC 519-II)

TABLE OF CONTENTS

	<i>Page</i>
REPORT	
Background and acknowledgements	5
SUMMARY	6
I INTRODUCTION	7
II THE SCIENCE, IMPACTS AND VULNERABILITY	8
The science and politics of climate change	8
The greenhouse effect	8
The changing climate	8
A difference of perception	16
The politics of climate change	17
The Impacts of climate change	19
Impact on the poor	19
Regional impacts, adaptive capacity and vulnerability	20
Impact on food	21
Impact on water resources	22
Impact on coasts	23
Impact on health	24
Impact on extreme events	25
The need for further research	29
Vulnerability	29
Factors affecting vulnerability	29
Vulnerability in developing countries	30
Myths of climate change	31
III DEALING WITH CLIMATE CHANGE	32
Adaptation and mitigation	32
Adaptation	32
Types of adaptation	32
Factors affecting adaptation	34
Approaches to adaptation	34
Targeting Assistance	35
Migration	35
Building adaptive capacity	36
Maladaptation	37
Managing climate risk	38
Mitigation	40
Access to energy	41
International negotiations on climate change	43
The UNFCCC and the Kyoto Protocol	43
The Clean Development Mechanism	44
The Global Environment Facility	45
Equity in international negotiations	47
A northern focus	47
Negotiating capacity	47
Setting emissions targets fairly	48
World Summit on Sustainable Development	50
Coping with climate disasters	50
Managing climate extremes	50
Disaster relief	51
Disaster mitigation and preparedness	51

IV CLIMATE CHANGE AND THE INTERNATIONAL	53
DEVELOPMENT AGENDA	53
Linking to the international development agenda	53
Climate change, poverty and the environment	53
Climate change and sustainable development	53
Climate change and the Millennium Development Goals	55
Policy coherence and integration in developed countries	57
Policy integration	57
Donor action and coordination	59
Building scientific and institutional capacity	61
DFID's policy	62
The role of insurance	63
Climate change in the policies of developing countries	64
Synergy in national policies and strategies	64
Multilateral Environmental Agreements	64
Linking NSSDs, PRSPs and NAPAs	65
Energy and transport policies	66
Stimulating action	66
Impact on investment	67
V CONCLUSION	68
Priorities	69
ACRONYMS AND SELECTED GLOSSARY	71
LIST OF CONCLUSIONS AND RECOMMENDATIONS	73
PROCEEDINGS OF THE COMMITTEE RELATING TO THE REPORT	79
LIST OF WITNESSES	80
LIST OF MEMORANDA INCLUDED IN THE MINUTES OF EVIDENCE	81
LIST OF APPENDICES TO THE MINUTES OF EVIDENCE	82

THIRD REPORT

The International Development Committee has agreed to the following Report:

GLOBAL CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

Background and acknowledgements

On 30 October 2001, the International Development Committee announced an inquiry into Global Climate Change and Sustainable Development. The inquiry focused on the potential impact of global climate change on development and developing countries, and especially on poor people in those countries. It considered the Department for International Development's (DFID) policies, strategies and programmes relating to global climate change and how these linked to work on poverty, the environment and sustainable development.

The Committee received thirty-three written memoranda and held four evidence sessions at Westminster. We are grateful to everyone who submitted evidence or who provided background information. A list of all those who gave evidence is included on page 83 of this report. The Committee is grateful to Tom Downing who was a specialist advisor to the Committee during this inquiry and to Sir Crispin Tickell, Dr David Griggs, Dr Peter Newell and Professor Tom Spencer for their invaluable advice at the start of the inquiry.

- We conclude that there is a need to:
- ensure that climate change is on the agenda of developing countries and donor agencies;
 - promote flexible options that make good environmental and economic sense in their own right;
 - build human and institutional capacity, particularly scientific capacity, in developing countries;
 - reduce vulnerability to climate extremes;
 - promote low carbon use and energy efficiency; and
 - ensure that donors and developing countries address climate risk in the priority areas of food, access to water, health and management of coastal zones.

SUMMARY

Irreversible changes are occurring in our climate as concentrations of greenhouse gases in the atmosphere rise. Tackling this problem will require action on an unprecedented scale. Measures to reduce emissions of greenhouse gases must go hand in hand with efforts to adapt to the impact of climate change. Despite a broad agreement on the direction of climate change, most scientists acknowledge that significant uncertainties remain. The precautionary principle should underpin action.

Adaptation will be necessary to moderate adverse impacts and maximise benefits. Developing countries are particularly vulnerable and lack the capacity and resources to adapt. Poor people are particularly vulnerable to climate change. The Department for International Development (DFID), along with other donors, needs to help build adaptive capacity in developing countries, targeting the most vulnerable.

A well-established international process for dealing with climate change exists but is dominated by the interests of developed countries. It focuses mainly on mitigation and largely ignores adaptation. Political differences have hampered progress. Inequality between developed and developing countries has become ingrained into the international process.

Environmental issues and poverty are closely linked. They have to be tackled together. Meeting the Millennium Development Goals requires policies that address climate change and ensure sustainable development. Donor activities should be subject to a climate impact assessment that assesses both the impact of climate change on their programmes, and the impact of their programmes on future climate risk.

A lack of policy integration has undermined action. Policies in developing countries, including Poverty Reduction Strategy Papers and National Strategies for Sustainable Development, contain little that addresses climate risk. Unless developing countries establish policies to deal with this risk, climate change could undermine development. DFID does not have a policy on climate change *per se* but sets it alongside several other environmental issues. Its policies to reduce poverty, encourage growth and build capacity will help to reduce vulnerability to climate change. However, DFID needs to mainstream the issue through all its development policies and ensure that the longer-term risks posed by climate change do not lose out to short-term environmental priorities.

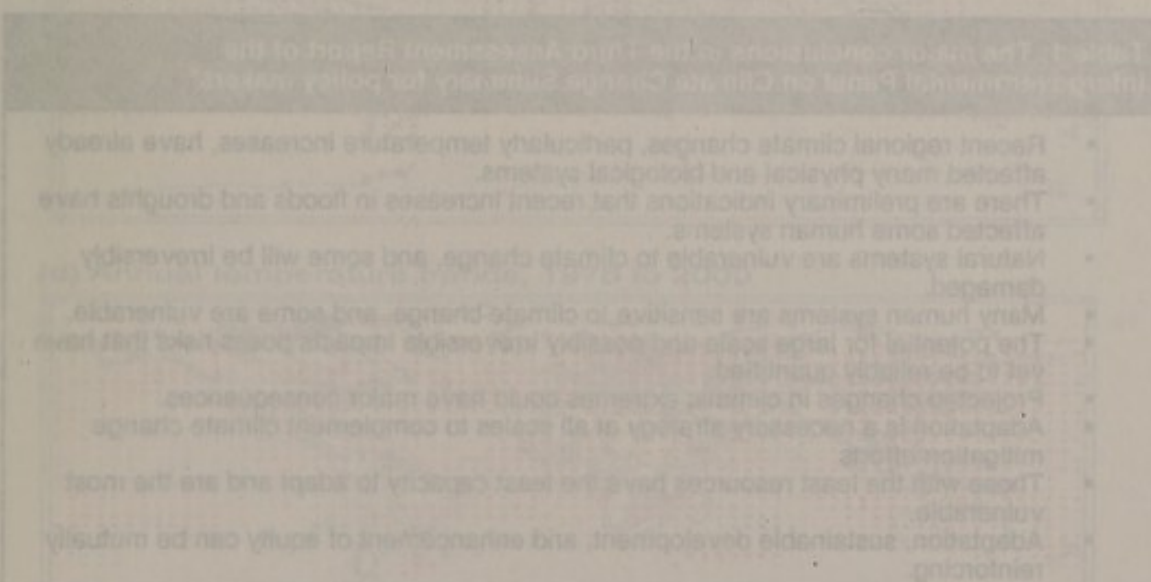
We conclude that there is a need to:

- ensure that climate change is on the agenda of developing countries and donor agencies;
- promote flexible options that make good environmental and economic sense in their own right;
- build human and institutional capacity, particularly scientific capacity, in developing countries;
- reduce vulnerability to climate extremes;
- promote low carbon use and energy efficiency; and,
- ensure that donors and developing countries address climate risk in the priority areas of food, access to water, health and management of coastal zones.

I INTRODUCTION

1. Climate change is a natural process that has been going on for hundreds of millions of years. But **human activity is accelerating climate change and the scale of the action needed to tackle it is unprecedented.**¹ The adverse effects of climate change could completely undermine development investment. Climate change has its origins in the everyday patterns of production and consumption. It affects everyone and (to varying degrees) is caused by everyone. The impacts of climate change will be felt across political and geographical boundaries.² Their significance will depend on location, vulnerability and the ability of human and natural systems to adapt.³

2. Our inquiry sought to examine the potential impact of climate change on developing countries and to look at development-focused efforts to tackle global environmental problems. We set out to examine the likely impacts, the extent of current knowledge (especially within DFID) and the extent to which DFID was prepared to respond to the challenge climate change presents. Chapter 2 of this report reviews the science and impacts of climate change in developing countries. It looks specifically at the nature of climate change, factors affecting vulnerability and possible impacts. Chapter 3 looks at actions to deal with climate change including the international negotiations, adaptation and mitigation, disaster mitigation and preparedness, access to energy, the management of climate risk and looks forward to the World Summit on Sustainable Development. In Chapter 4, the report examines the links between poverty and environmental issues and between climate change and sustainable development. It looks at the impact of climate change on the Millennium Development Goals before going on to look at the policy responses in developed and developing countries. We have identified several priorities; these are included in our conclusions in chapter 5.



¹Financing Climate Change: Providing Public Goods, preventing public bads, Dr Peter Newell, Institute of Development Studies. An abridged version of this paper appears in Financing and Providing Global Public Goods: Expectations and Prospects prepared for the Ministry of Foreign Affairs, Sweden by IDS.

²Food in the 21st Century: Global Climate Disparities, Mahendra Shah, International Institute for Applied Systems Analysis.

³Ev 59

II THE SCIENCE, IMPACTS AND VULNERABILITY

The science and politics of climate change

The greenhouse effect

3. The world's climate is governed by a long-term balance between the energy absorbed by the Earth and the energy that it radiates back into space. Radiation from the sun is either absorbed by the Earth or reflected back into space. Energy absorbed by the earth is re-radiated as heat. Some of this heat is trapped by greenhouse gases in the lower part of the atmosphere where winds, ocean currents, evaporation and precipitation help to distribute it. Without the greenhouse gases to trap some heat the Earth would be more than 30°C cooler. Greenhouse gases include carbon dioxide, methane, water vapour and nitrous oxide. As emissions of greenhouse gases increase, more radiation is absorbed by them, affecting the long-term energy balance and consequently raising the global temperature.

The changing climate

4. The World Meteorological Organization (WMO) and the UN Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC) in 1988, to:

- assess available scientific information on climate change;
- assess the environmental and socioeconomic impacts of climate change; and
- formulate response strategies.

5. The IPCC's three working groups⁴ conduct surveys of technical and scientific literature. The IPCC's assessment reports are widely regarded as the most credible sources of information available on climate change.⁵ Assessments in 1990, 1995 and 2001 all stressed the need for immediate action on climate change. The latest report is the most definitive yet and table 1 summarises its key conclusions.

Table 1: The major conclusions in the Third Assessment Report of the Intergovernmental Panel on Climate Change Summary for policy makers⁶

- Recent regional climate changes, particularly temperature increases, have already affected many physical and biological systems.
- There are preliminary indications that recent increases in floods and droughts have affected some human systems.
- Natural systems are vulnerable to climate change, and some will be irreversibly damaged.
- Many human systems are sensitive to climate change, and some are vulnerable.
- The potential for large scale and possibly irreversible impacts poses risks that have yet to be reliably quantified.
- Projected changes in climatic extremes could have major consequences.
- Adaptation is a necessary strategy at all scales to complement climate change mitigation efforts.
- Those with the least resources have the least capacity to adapt and are the most vulnerable.
- Adaptation, sustainable development, and enhancement of equity can be mutually reinforcing.

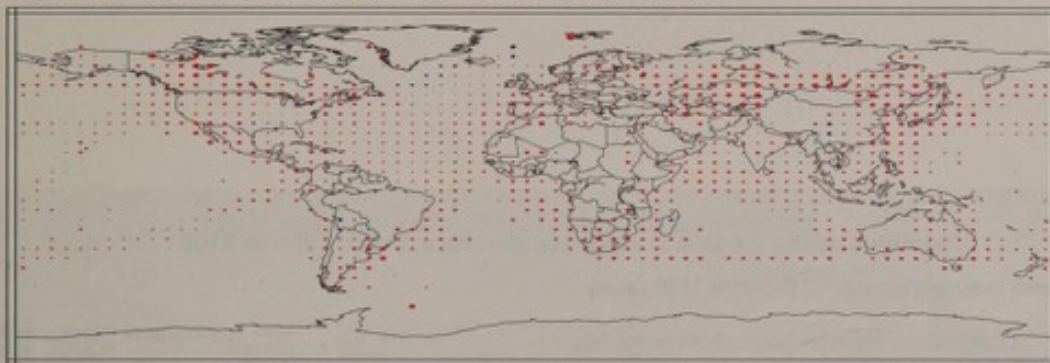
⁴Working Groups of the IPCC are: (i) Science, (ii) Impacts, Adaptation and Vulnerability; and (iii) Mitigation

⁵Third Report from the Science and Technology Select Committee, Session 2000–2001, Scientific Advisory System: Scientific Advice on Climate Change, HC14

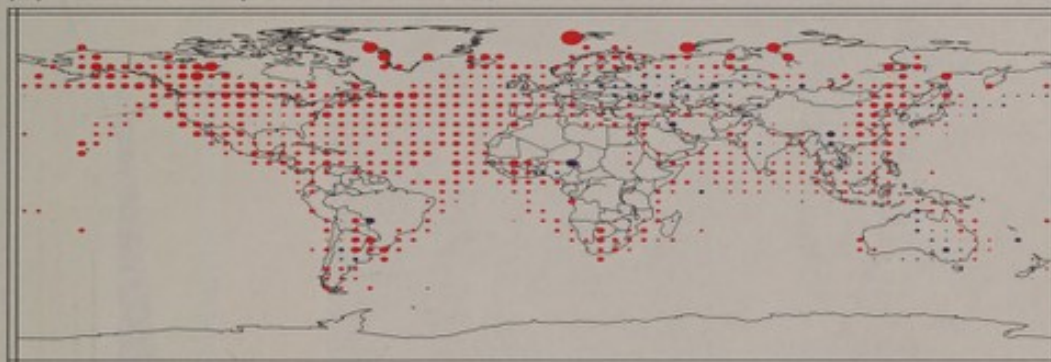
⁶Downing, 2002, Protecting the vulnerable from climate change: Lessons from food security. Based on Intergovernmental Panel on Climate Change, in Managing the earth Pub Oxford University Press.

Figure 1: Annual temperature trends for the periods 1901 to 2000, 1910 to 1945, 1946 to 1975 and 1976 to 2000 respectively. Trends are represented by the area of a circle with red representing increases, blue representing decreases and green little or no change⁷ (See paragraph 6)

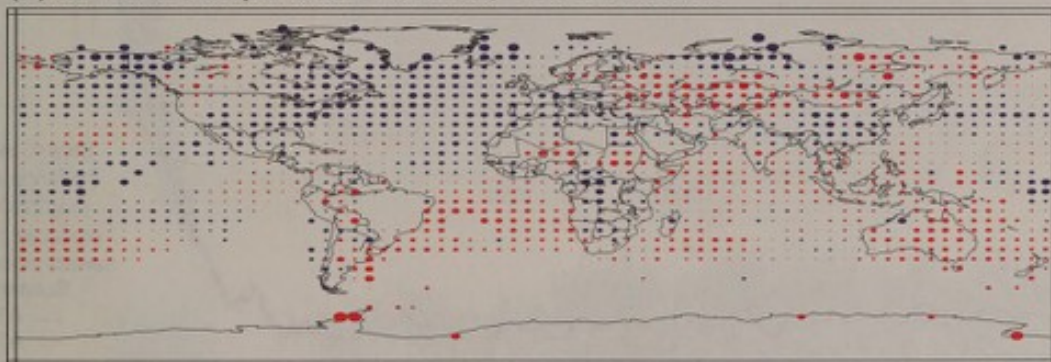
(a) Annual temperature trends, 1901 to 2000



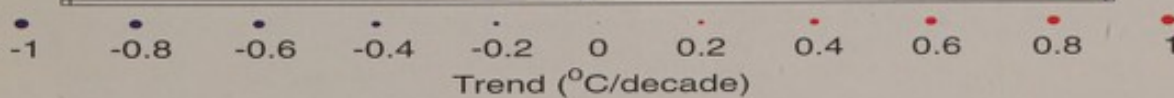
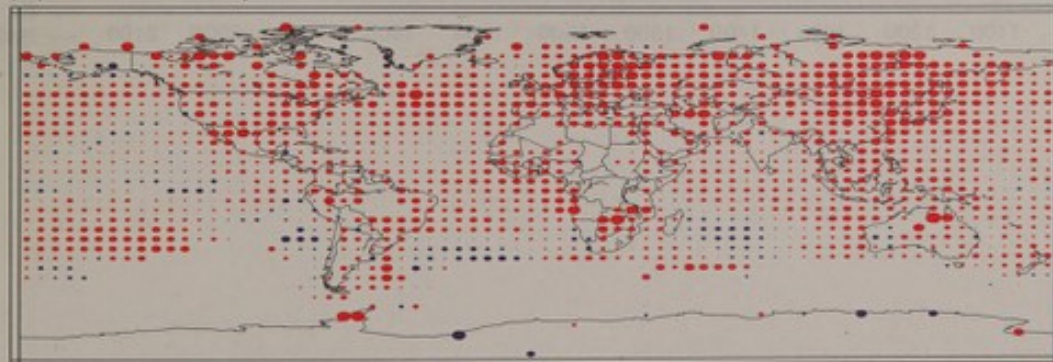
(b) Annual temperature trends, 1910 to 1945



(c) Annual temperature trends, 1946 to 1975

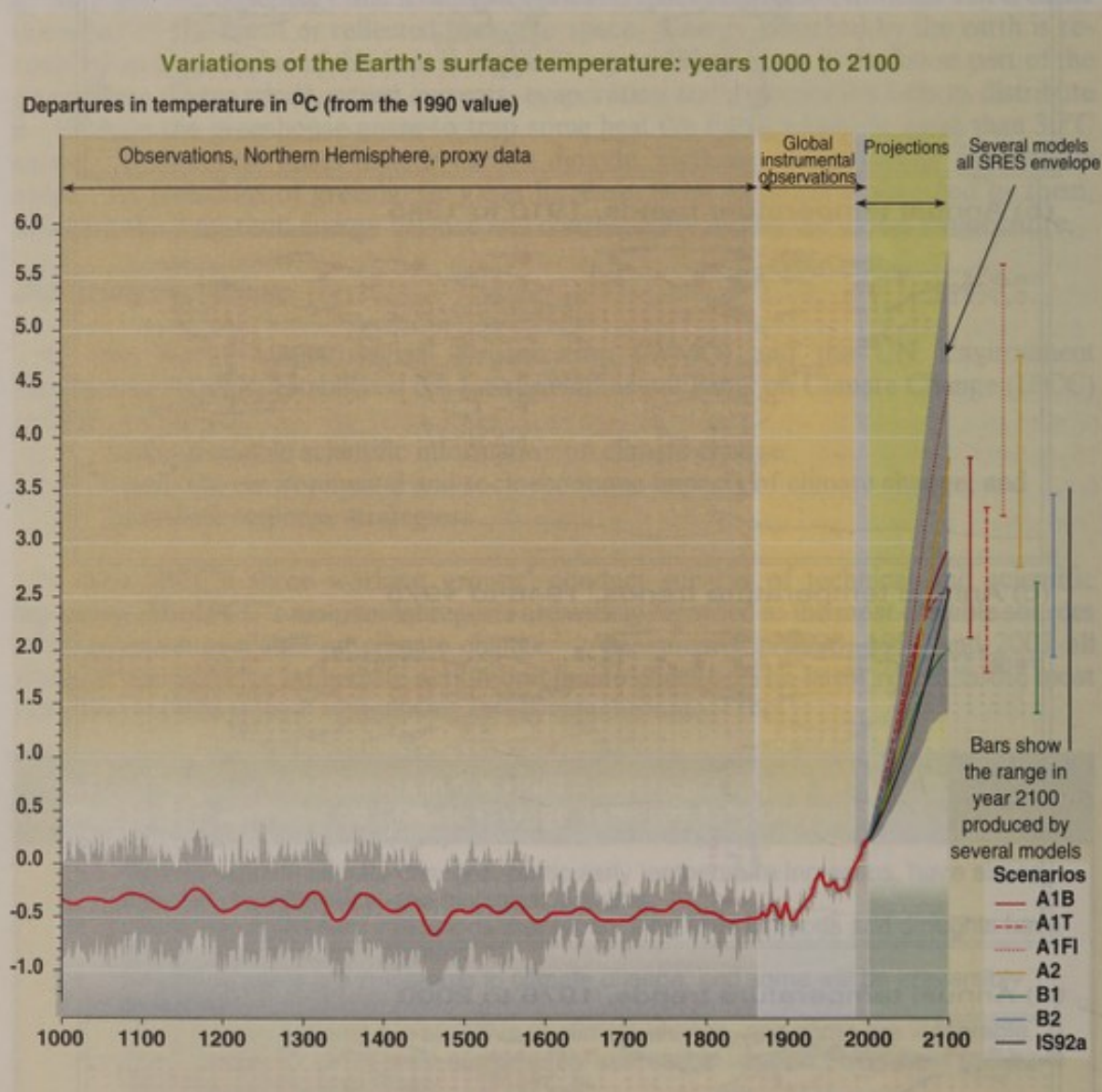


(d) Annual temperature trends, 1976 to 2000



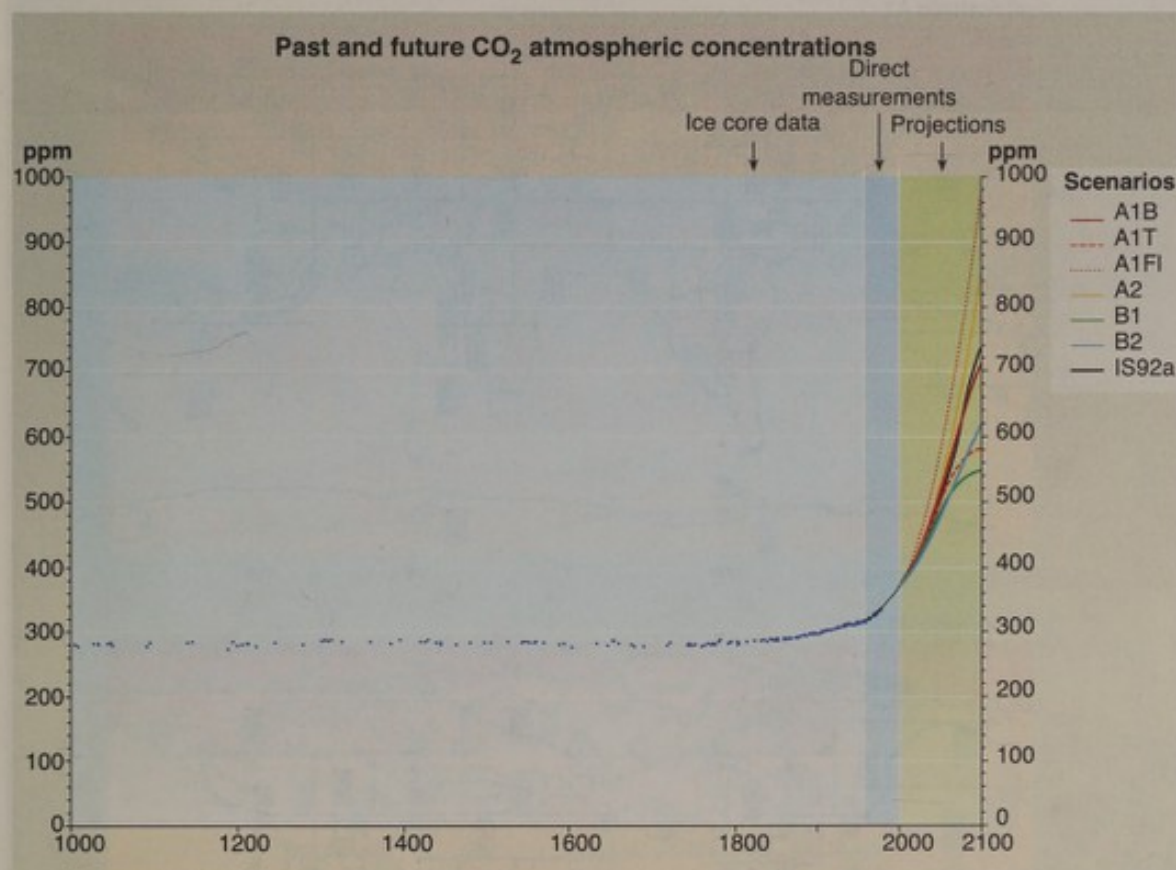
⁷Report of IPCC Working Group I: Technical Summary, 2001

Figure 2: Variations of the Earth's surface temperature: years 1000 to 2100. From years 2000 to 2100 projections of globally averaged surface temperature are shown for six SRES scenarios and IS92a using a climate model with average climate sensitivity. The shaded region marked 'several models all SRES envelope' shows results for the full range of scenarios and models with different sensitivities. Temperature scale is departure from 1990 value.⁸ (See paragraph 6)



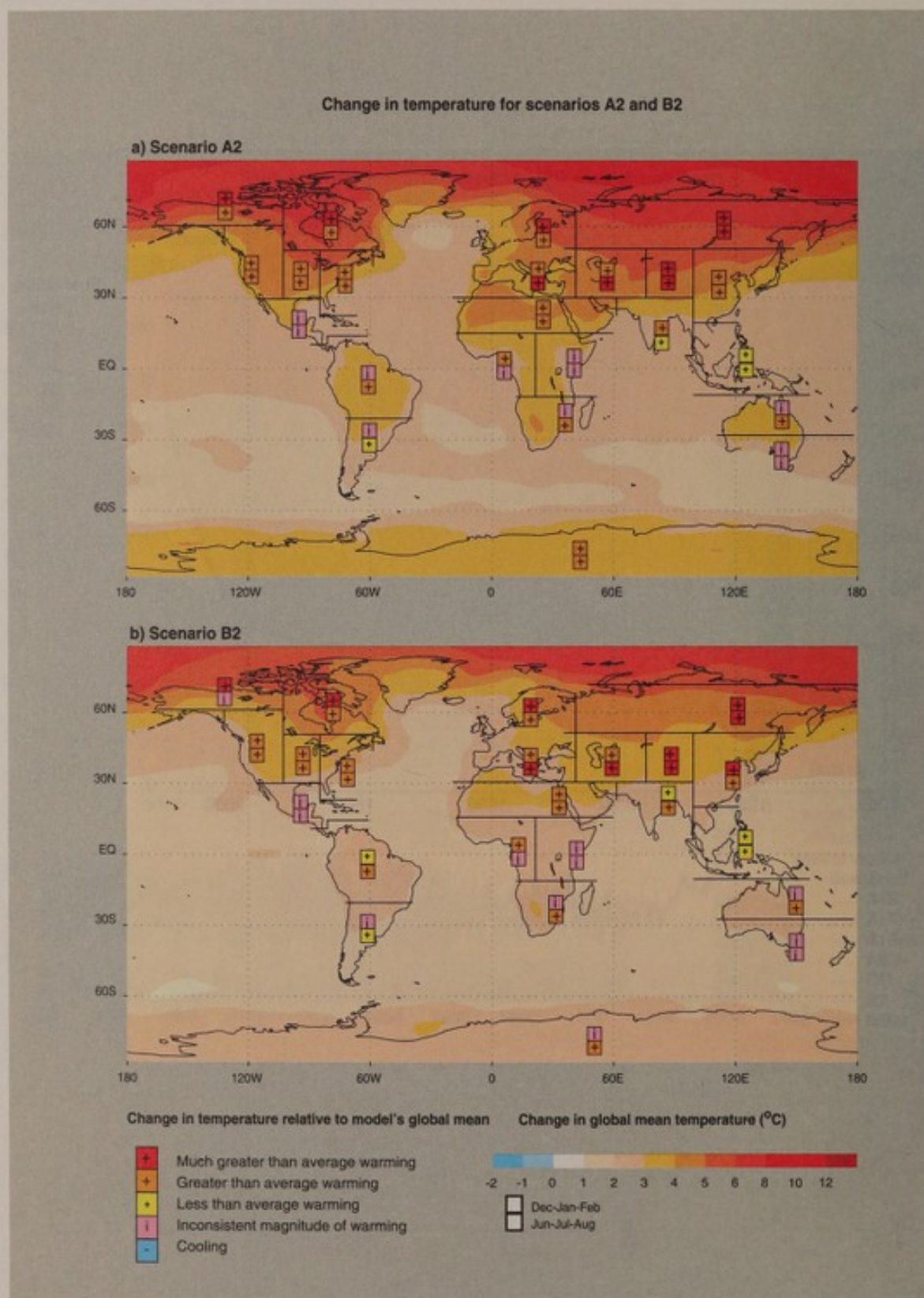
⁸IPCC 2001, Third Assessment Report, Synthesis Report—Summary for Policy Makers

Figure 3: Atmospheric CO₂ concentration from year 1000 to year 2000 from ice core data and from direct atmospheric measurements over the past decades. Projections of CO₂ concentrations for the period 2000 to 2100 are based on six SRES scenarios and IS92a.⁹ (See paragraph 6)



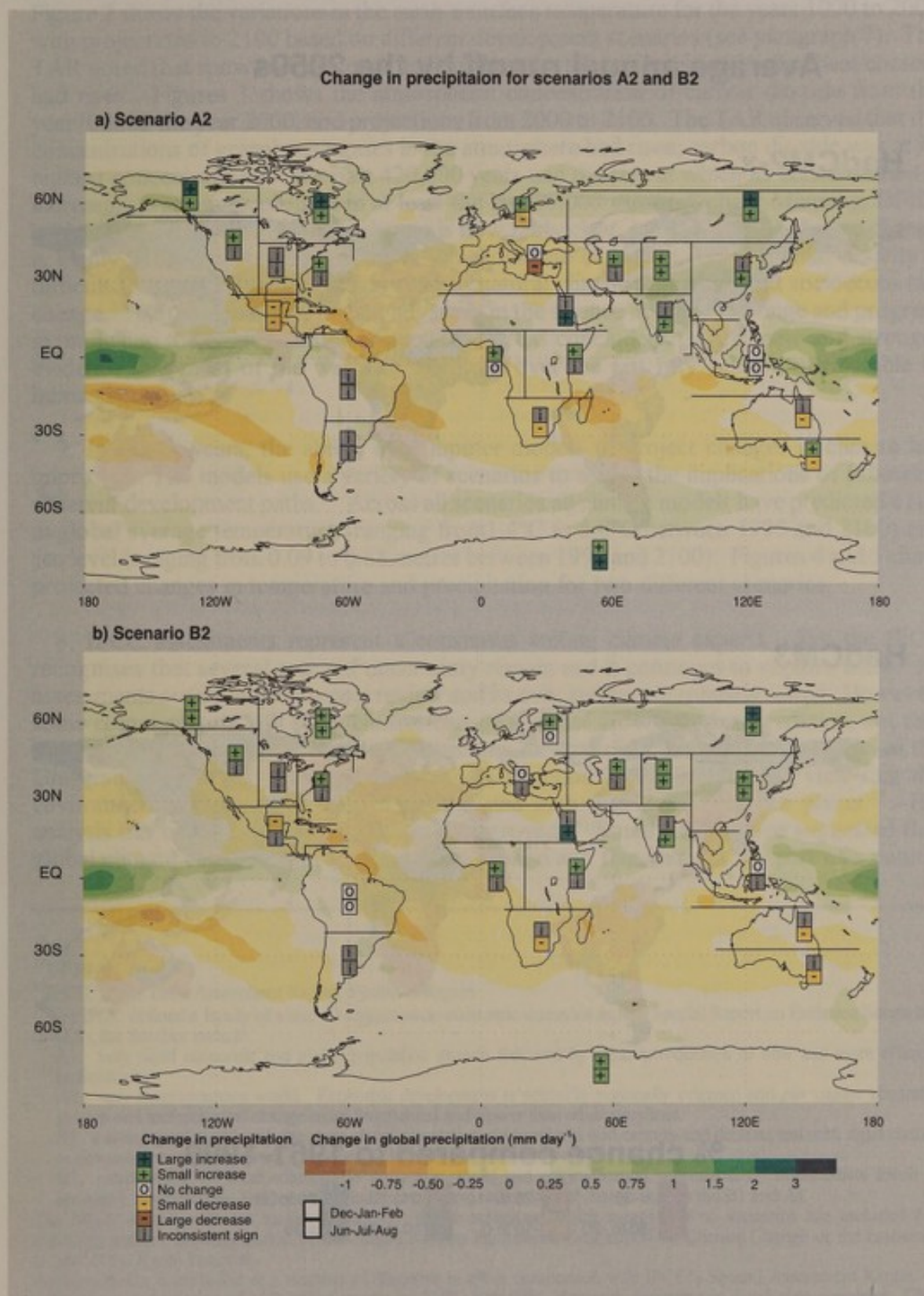
⁹IPCC 2001, Third Assessment Report, Synthesis Report—Summary for Policy Makers

Figure 4: Annual mean change in temperature for scenarios A2 and B2 showing 2071 to 2100 relative to 1961 to 1990. Regions are classified to show level of agreement on magnitude of warming with a consistent result from at least nine models being necessary for agreement.¹⁰ (See paragraph 7)



¹⁰ IPCC 2001, Third Assessment Report, Synthesis Report—Technical Summary

Figure 5: Annual mean change in precipitation for scenarios A2 and B2 showing 2071 to 2100 relative to 1961 to 1990. Regions are classified to show level of agreement on magnitude of warming with a consistent result from at least nine models being necessary for agreement.¹¹ (See paragraph 7)

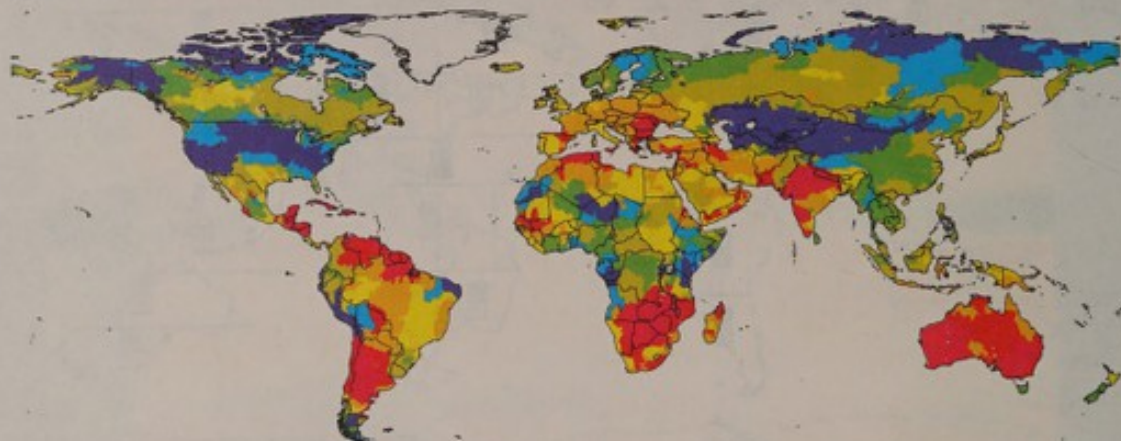


¹¹ IPCC 2001, Third Assessment Report, Synthesis Report—Technical Summary

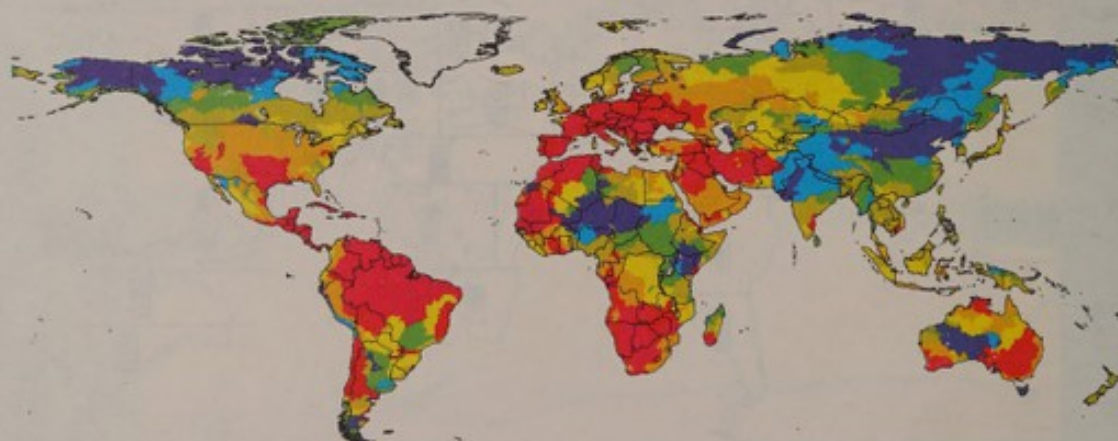
Figure 6: Projected changes in average annual runoff by the year 2050, relative to average runoff from 1961 to 1990. These largely follow projected changes in precipitation. Changes are shown for two versions of the Hadley Centre Model HadCM2 and HadCM3¹² (see paragraph 25).

Average annual runoff by the 2050s

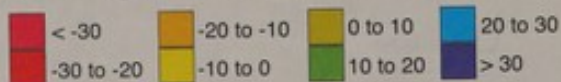
HadCM2-x



HadCM3



% change compared to 1961-1990



6. Climate change isn't something that is going to happen—it has begun already. The IPCC Third Assessment Report (TAR), published in 2001, identified several changes that had already taken place. During the 20th century the global average surface temperature had increased by about 0.6°C. Figure 1 shows annual temperature trends from 1901 to 1999. Figure 2 shows the variations in the earth's surface temperature for the years 1000 to 2000 with projections to 2100 based on different development scenarios (see paragraph 7). The TAR noted that snow and ice cover had decreased while sea levels and ocean heat content had risen. Figure 3 shows the atmospheric concentration of carbon dioxide from the year 1000 to the year 2000, and projections from 2000 to 2100. The TAR observed that the concentrations of greenhouse gases in the atmosphere had risen; carbon dioxide was at its highest concentration for the past 420,000 years and the rate at which its concentration is increasing was unprecedented in at least the last 20,000 years. Richard Manning, DFID, said "...the direction of climate change is now fairly clear, but the pace of climate change is highly uncertain."¹³ The extent to which climate change is due to human activity is difficult to assess against a background of natural climate variability and socioeconomic change.¹⁴ But, based on significant advances in the science of climate change and progress in modelling the earth's natural systems, the IPCC concluded "there is new and stronger evidence that most of the warming observed over the last fifty years is attributable to human activities".¹⁵

7. In recent years, the ability of computer models to project changes in climate has improved. The models use a variety of scenarios to assess the implications of following different development paths.¹⁶ Across all scenarios all climate models have predicted a rise in global average temperature (ranging from 1.4°C to 5.8°C between 1990 and 2100) and sea level (ranging from 0.09 to 0.88 metres between 1990 and 2100). Figures 4 and 5 show projected changes in temperature and precipitation for two different scenarios.

8. IPCC assessments represent a consensus among climate experts. Yet the IPCC recognises that several areas of uncertainty remain and it continues to explore these. Its assessments are all subject to peer review and its conclusions are robustly tested. However, some commentators still claim climate change is either far worse than predicted, not that serious, or possibly beneficial. Bjørn Lomborg, an Associate Professor of Statistics at the University of Aarhus, attracted some media attention by challenging the view that the environment was spiralling out of control and man was destroying the planet.¹⁷ His analysis has been resolutely and robustly destroyed.¹⁸ Some people have suggested that global climate change is not a recent phenomenon and that changes are part of a natural

¹³Q2

¹⁴Ev 59

¹⁵IPCC, 2001, Third Assessment Report, Synthesis Report

¹⁶The IPCC defined a family of some 40 unique socio-economic scenarios in the 'Special Report on Emission Scenarios' (SRES), the families include:

A1. very rapid economic and global population growth followed by rapid introduction of new and more efficient technologies

A2. very heterogeneous world. Economic development is primarily regionally oriented and *per capita* economic growth and technological change more fragmented and slower than other storylines.

B1. a convergent world with the same global population, that peaks in mid-century and declines but with rapid change in economic structures toward a service and information economy

B2. emphasis is on local solutions to economic, social and environmental sustainability. Intermediate levels of economic development, and less rapid and more diverse technological change than in the B1 and A1

The SRES scenarios do not include additional climate initiatives, which means that no scenarios are included that explicitly assume implementation of the United Nations Framework Convention on Climate Change or the emissions targets of the Kyoto Protocol.

Scenario IS92a is included in a number of diagrams to allow comparison with IPCC's Second Assessment Report. It is based on a population of 11.3 billion people by 2100, with 94% of growth occurring in developing countries. GNP growth slows due to an expected slowing of population growth. Income *per capita* rises most rapidly in the developing world but in 2100 it remains well below levels in the developed economies. Assumes only those emissions control policies aimed at mitigating climate change that were agreed as of December 1991 are in place.

¹⁷Bjørn Lomborg set out his views in 'The Skeptical Environmentalist', which was published in August 2001

¹⁸Answering the Skeptical Environmentalist, Scientific American, January 2002, pp59–69 and Grubb, 2001, Relying on Manna from Heaven?, Science, Vol 294, pp 1285–1287

cycle of ice ages and warm periods. Others dispute the significance of current and past measurements claiming that data for the period before the 1960s is unreliable. Some scientists argue that the global climate cannot be modelled accurately and that predictions using current models are flawed. More recently some have suggested that the sun, sun spots, solar flares and solar winds could play a larger part in global warming than industrial greenhouse gas emissions. The IPCC has examined these different views and still concluded that human activity had been the main cause of climate change over the last fifty years. Research cannot completely eliminate uncertainty and it is not possible to quantify all the environmental, social and economic impacts before taking action.¹⁹ Although the IPCC's view represents the best knowledge to date and many of the sceptics' claims have been resolutely rejected, significant uncertainties remain in the science of climate change and the impacts it is likely to have. Therefore, **we believe that the precautionary principle must underpin any approach to climate change and the consensus provided by the IPCC should provide the basis for action.**

A difference of perception

9. Climate change has tended to be the preserve of climate scientists and environmental groups.²⁰ There has been little inter-disciplinary work. Few linkages exist between environmental and poverty issues, and between climate change and sustainable development. Differences between environmental NGOs and development NGOs do not help. The evidence given to the Environmental Audit Committee highlighted the differences between Clare Short and environmental NGOs.²¹ Clare Short told us that the 'northern greens' often adopted an anti-development perspective. Although borne of a genuine concern for the planet, this perspective failed to recognise the needs of the poorest people. She argued that their needs had to be met through economic growth and material well-being.²² She recognised that "...to have a real environmental sustainability we have got to get the greens to join up with the development people, to see what we have got to have is a guarantee to development for the poor countries and the poor people within a sustainable planet."²³ For their part, environmental NGOs claim they have become more conscious of the need to bring together environmental, social and economic concerns together in an integrated approach to development. **We believe that progress has to be made in bringing environmental and developmental view points together. Taking only an environmental approach will not achieve real sustainability. Economic and sustainable use of natural resources that seeks to maximise social welfare and recognises the need to make trade-offs, will do more to eradicate poverty and ensure long-term sustainability than environmental conservation alone.**

10. Developed and developing countries also have different views on climate change.²⁴ The North predominantly sees climate change as an environmental issue. Usually it is the environment ministries and those responsible for environmental protection that lead on national policy and take part in international negotiations.²⁵ Discussion has moved from social and political concerns to more narrowly focused scientific debate—a process known as scientisation. As a result, the humanitarian and development perspective of climate change has often been overlooked.²⁶ Development and humanitarian agencies have been

¹⁹ UNEP, 2001, UNEP Finance Initiatives Climate Change Working Group Position Paper. (See <http://unepfi.net/cc/cop7/ccpp2001.pdf>)

²⁰ Bruce, Burton and Egener, 1999, Disaster Mitigation and Preparedness in a changing climate; A synthesis paper produced for emergency Preparedness Canada, Environment Canada and the Insurance Bureau of Canada. (www.epc-pcc.gc.ca/research/scie_tech/disas_miti.html)

²¹ Third Report from the Environmental Audit Committee, Session 2001–2002, UK Preparations for the World Summit on Sustainable Development, HC616

²² Q150

²³ *Ibid.*

²⁴ Ev 68

²⁵ Ev 93

²⁶ *Ibid.*

largely absent from the fora where climate change has been discussed, and more narrowly-focused conservation and scientific agendas have dominated debate. The two international conventions agreed at the 'Earth Summit' in Rio, in 1992, both arose from an agenda shaped by northern environmental interests. In Rio, concerns about industrial pollution, smog and acid rain dominated the discussions. But these issues did not necessarily apply to developing countries. In particular, the UNFCCC was closely associated with an environmental agenda that sought to conserve resources and promote environmental sustainability. **Developing countries have a different view of climate change to developed countries. They see it not as a problem of pollution or of how to sustain economic growth but as a problem of human welfare that threatens survival itself.**²⁷

The politics of climate change

11. Burning fossil fuels, for electricity, heat and transport, is the main source of anthropogenic greenhouse gas emissions, making climate change primarily a consequence of the activities of industrialised countries. Tables 2 and 3 show the huge difference between the ten countries with the highest emissions and the ten with the lowest emissions. The US alone accounts for twenty-four per cent of all current emissions.²⁸ According to the Corner House just over 120 corporations account for eighty per cent of all carbon dioxide emissions.²⁹ The world's poor have contributed less than one third of anthropogenic emissions of carbon dioxide and methane and less than twenty per cent of industrial emissions.³⁰ Saleemul Huq, International Institute for Environment and Development (IIED), told us that *per capita* emissions in China and India were many times smaller than those of developed countries; many, like Bangladesh, had *per capita* emissions that were negligible compared with the rest of the world.³¹ Senegal, for example, emitted about thirty kilograms, 160 times less than the US where emissions were nearly five tonnes per head.³² However, emissions from developing countries have increased and could increase further as they meet the growing demand for energy and as land use changes. By 2015 emissions from developing countries are likely to exceed those from the developed world.³³ China, India, and Brazil in particular have seen their emissions grow.³⁴ Clare Short recognised that as the economies of developing countries grew they would need to come within the framework for mitigating greenhouse gases.³⁵ In fact, this is required under the UNFCCC.

12. While past and present generations, mainly in the North, bear responsibility for creating climate change, it is future generations throughout the world who will be most severely affected. The present generation has to begin to bear the costs of finding a solution even though it will see little direct benefit itself. **Given their relative contribution, the burden of finding a solution to the problems posed by climate change should fall mainly on developed countries.** As the scientific understanding of climate change grows and evidence for the link between anthropogenic emissions and climate change becomes stronger, the issue of liability will come to the fore. We have already suggested that there is a moral liability but at some point the issue of legal liability will have to be considered.

²⁷ Ev 69

²⁸ Ev 129 [para 4.1]

²⁹ Ev 135

³⁰ Ev 143 [paras 2 and 3]

³¹ Q78

³² Q85

³³ Ev 6 [para 27]

³⁴ Financing Climate Change: Providing Public Goods, preventing public bads, Dr Peter Newell, Institute of Development Studies (IDS). An abridged version of this paper appears in Financing and Providing Global Public Goods: Expectations and Prospects, prepared for the Ministry of Foreign Affairs, Sweden by IDS.

³⁵ Q157

Table 2: Ten countries with highest emissions³⁶

Industrial CO ₂ Emissions (kt)	
United States	5,467,091
Japan	1,204,240
India	1,065,414
Germany	851,499
United Kingdom	527,066
Canada	496,560
Italy	424,691
Ukraine	370,507
France	349,773
Australia	319,574

Table 3: Ten countries with lowest emissions³⁷

Industrial CO ₂ Emissions (kt)	
Somalia	30
The Comoros	66
San Tome and Principe	77
Chad	110
Solomon Islands	161
The Gambia	216
Burundi	224
Guinea-Bissau	231
Central African Republic	242
Congo, Rep.	274

13. Carbon dioxide concentrations are a global phenomenon and it does not matter geographically where reductions in emissions are made but they should be made as cost effectively as possible. There are political reasons why countries may feel reductions should occur in a particular country and many of the barriers to progress on climate change are political.³⁸ The obstacles to progress lie not in a lack of ideas or technical know-how, but in the vested interests of governments, businesses, consumer groups, energy utilities and people's everyday practices.³⁹ The international community has developed a wide range of tools and mechanisms to deal with climate change but lacks the political will to drive them forward.⁴⁰ The G8 countries could tackle greenhouse gas emissions by reforming their patterns of consumption and production without the need for complex global mechanisms. But the massive changes that would be needed are seen as politically unpalatable; a Europe-wide carbon tax was vetoed following an organised and influential lobby on the behalf of industry.⁴¹ Some progress, albeit small, is being made with progress on the Kyoto Protocol, the EU Emissions Trading Directive and the UK Emissions Trading Scheme.

14. Political barriers also limit progress in the South, where climate change often loses out to shorter-term competing priorities. Saleemul Huq stressed how difficult it was to get high-level politicians and policy makers to accept climate change as a pressing problem that needed action to be taken immediately. According to him, there were people in governments who were aware of the threat posed by climate change but their voices were not being heard at the higher levels of policy making.⁴² **The timescale is urgent and the UK and other donors have to take a lead in building capacity so that policy makers and politicians in developing countries can understand climate change in the context of the local issues facing their country, and translate that understanding into effective policies and mechanisms.**

³⁶ World Bank, Development Indicators, 2001

³⁷ *Ibid.*

³⁸ Financing Climate Change: Providing Public Goods, preventing public bads, Dr Peter Newell, Institute of Development Studies (IDS). An abridged version of this paper appears in Financing and Providing Global Public Goods: Expectations and Prospects, prepared for the Ministry of Foreign Affairs, Sweden by IDS.

³⁹ *Ibid.*

⁴⁰ *Ibid.*

⁴¹ *Ibid.*

⁴² Q91

The Impacts of climate change

15. Climate change affects food security, water, biodiversity and infrastructure and therefore will have a dramatic impact on livelihoods. Computer models suggest that climate change will have both adverse and beneficial effects (see table 4).

Table 4: Some potential adverse and beneficial impacts of climate⁴³

Adverse impacts	Beneficial impacts
<ul style="list-style-type: none"> • Reduced crop yields • Decreased water availability • Increased risk of flooding • Risk from sea level rise • Increased exposure to vector-borne diseases such as malaria • Increased exposure to water borne diseases such as cholera • Increase in heat stress mortality 	<ul style="list-style-type: none"> • Increased crop yield in some areas • Increased timber supply • Increased water availability in some previously water scarce areas • Reduced winter mortality • Reduced winter energy demand in some areas

16. Increases in temperature have already begun to affect several physical and biological systems and changes have been observed in aquatic, terrestrial and marine environments.⁴⁴ More frequent floods and droughts are already having an impact on natural, social and economic systems. Some of these initial impacts will cause secondary effects;⁴⁵ impacts that occur only in developed countries could have a knock-on effect on developing countries⁴⁶ and impacts in developing countries could cause population displacement or increased humanitarian need with implications for developed countries.

17. DEFRA's memorandum recognised that the potentially huge economic, human and environmental costs of climate change could create political tensions between countries, increasing regional instability.⁴⁷ Coupled with population growth, this could lead to conflict over diminishing fresh water resources and fertile land.⁴⁸ The World Meteorological Organization's submission pointed out that such conflict could adversely affect sustainable development.⁴⁹

Impact on the poor

18. **The impacts of climate change will not be evenly spread across the globe⁵⁰ and are likely to fall disproportionately on the poor.⁵¹** Richard Manning, DFID, said "...on the whole the most vulnerable people are likely to be the poor people."⁵² The Tyndall Centre's research in Vietnam showed that those already marginalised in an economy were likely to suffer the greatest impact as they had the fewest resources for coping with adverse change.⁵³ Climate change will make social and economic development harder.⁵⁴ In developing countries, it could set back development efforts by several decades unless

⁴³ Report of IPCC Working Group II: Summary for Policy Makers, 2001

⁴⁴ *Ibid.*

⁴⁵ Ev 59

⁴⁶ Q44

⁴⁷ Ev 9 [para 1.3]

⁴⁸ Ev 155

⁴⁹ Ev 164

⁵⁰ Report of IPCC Working Group II: Summary for Policy Makers, 2001

⁵¹ Ev 59

⁵² Q2

⁵³ Ev 60

⁵⁴ Ev 59

development plans and strategies recognise climate risk.⁵⁵ **Climate change has the potential to increase further the inequality between developed and developing countries.** As with corruption and HIV/AIDS, climate change could undermine development investment. However, unlike corruption or HIV/AIDS, climate change is not widely recognised as a problem because many of its impacts are gradual and long-term.

Regional impacts, adaptive capacity and vulnerability

19. Rising temperatures and changes in precipitation will place hundreds of millions of people additionally at risk from either hunger, water shortage, coastal flooding or malaria.⁵⁶ Those people additionally at risk live mainly in Africa, the Middle East and Southern Asia. The IPCC regards Africa, Asia, Latin America and small island states as highly vulnerable to the impacts of climate change while having little capacity to adapt.⁵⁷

20. The impacts of climate change on Africa are particularly worrying (see figure 7). Coastal settlements, which are often important engines of economic growth, will be adversely affected by rising sea levels.⁵⁸ Most African rivers are highly sensitive to climate change and will be adversely affected by an increase in both the frequency and magnitude of droughts, floods and storms. Food security, already a problem in many parts of Africa, could worsen as climate change is likely to exacerbate desertification and cause grain yields across much of Africa to decline. As the climate changes, infectious diseases are likely to spread to areas previously unaffected.⁵⁹

21. In Asia and Latin America, extreme events are likely to be more severe and to occur more frequently, with an associated reduction in water quality.⁶⁰ Increased exposure to infectious diseases will affect health in both Asia and Latin America. In some parts of Asia, heat stress will increase. Rising sea levels and increased flooding will cause population displacement in much of Asia.⁶¹ In Asia agricultural productivity will decline and water will become more scarce in some areas.

22. Small island states are likely to suffer many of the impacts that will affect coastal areas (see paragraph 27) and are particularly at risk from rising sea levels.⁶² Most their critical infrastructure tends to be located on the coastline, where much of socioeconomic activity on islands tends to take place. Rising sea levels will accelerate coastal erosion, loss of land and dislocation of people. An eighty centimetre sea-level rise could inundate two-thirds of the Marshall Islands and Kiribati. A ninety centimetre rise could see eight-five per cent of Male, the capital of the Maldives inundated.⁶³ With limited agricultural land available for food production, any loss of land through coastal erosion or increased salinity could adversely affect food security. Small island states are particularly vulnerable to any increased ferocity and frequency of storms. The already limited access to fresh water is likely to be made worse as flooding and rising sea levels cause saltwater intrusion into freshwater sources. Tourism is important for many small island states and any increase in storm frequency, coral bleaching, beach erosion, or loss of fisheries (for angling) could deter tourists.⁶⁴ Andrew Bennett, DFID, said that some small island states were so fragile that they were likely to become uninhabitable.⁶⁵

⁵⁵Ev 70 [para 4]

⁵⁶Q40

⁵⁷Report of IPCC Working Group II: Summary for Policy Makers, 2001, Table SPM-2

⁵⁸*Ibid.*

⁵⁹*Ibid.*

⁶⁰*Ibid.*

⁶¹*Ibid.*

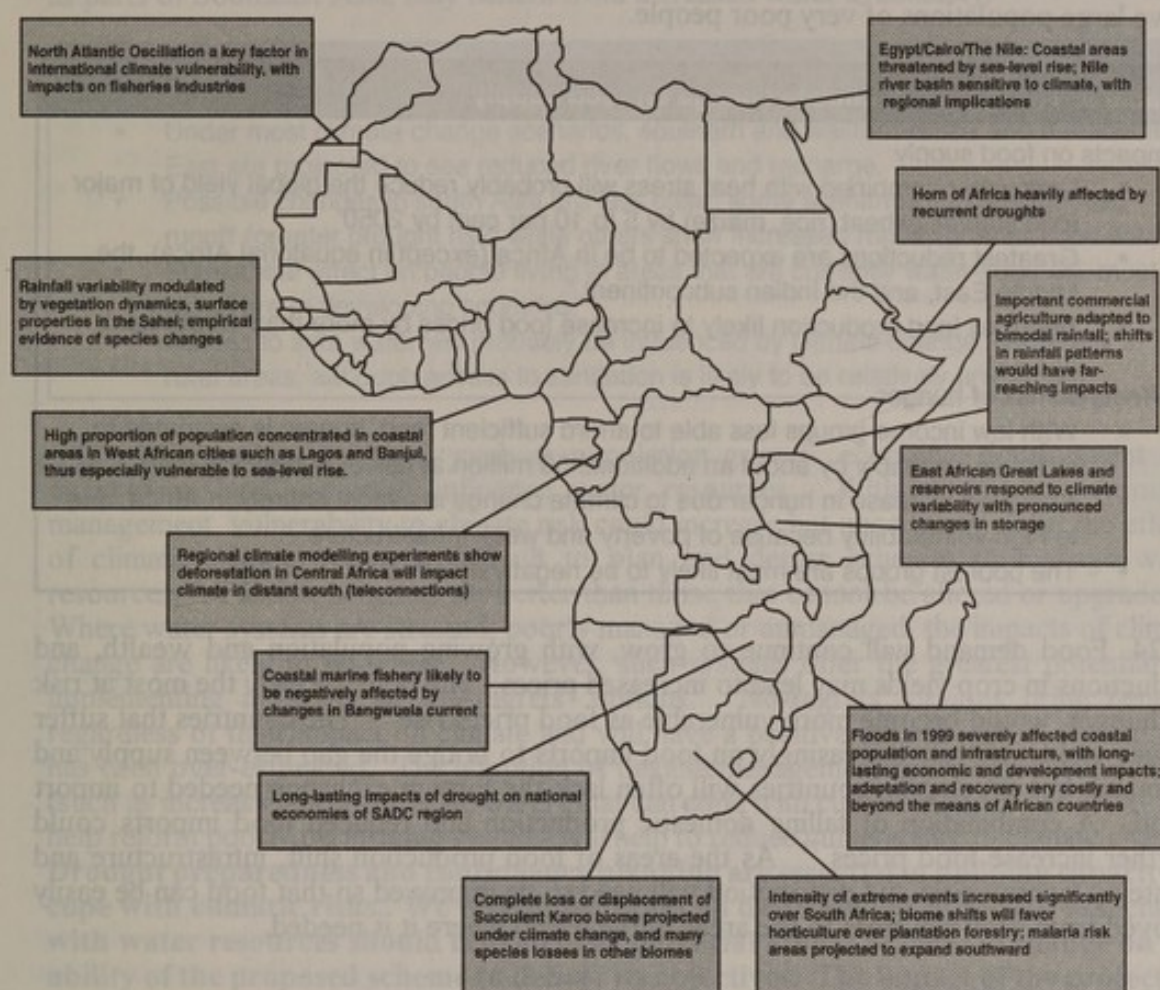
⁶²Ev 59

⁶³IPCC, 2001, Third Assessment Report, Impacts, Adaptation and Vulnerability

⁶⁴Report of IPCC Working Group II: Summary for Policy Makers, 2001, Table SPM-2

⁶⁵Q25

Figure 7: Selected key impacts for Africa.⁶⁶



Impact on food

23. The natural variability of rainfall and temperature are the main climatic factors behind variability in agriculture.⁶⁷ Any change in climate variability will therefore have an impact on food production, with both positive and negative impacts on food security.⁶⁸ Dryland and rain-fed agriculture are the mainstays in tropical regions. In these regions crops already grow at the limit of their temperature tolerance and yields are likely to decrease with even a small increase in temperature.⁶⁹ More frequent droughts will also reduce crop yields in many parts of the world. But in developed countries, where multi-cropping and irrigation are used, climate change could increase yields. In Bangladesh, the delta's high fertility has attracted many farmers; more than eighty per cent of the population in the delta depend on the land for a living. But, as flooding becomes more frequent, soil salinity is increasing. Ultimately, people will be displaced not only by rising sea levels and more frequent floods but by a loss of their livelihood.⁷⁰ The distribution of pests and vector-borne diseases could be extended into previously unaffected areas.⁷¹ Identifying winners and losers from climate change is difficult because of a number of variables, most important of which is the capacity to adapt. Projections are climate model and scenario

⁶⁶ Report of IPCC Working Group II: Technical Summary, 2001

⁶⁷ FAO, 1997, Agriculture and climate change: FAO's role See www.fao.org

⁶⁸ Food in the 21st Century: Global Climate Disparities, Mahendra Shah, International Institute for Applied Systems Analysis.

⁶⁹ Report of IPCC Working Group II: Summary for Policy Makers, 2001

⁷⁰ Ev 128 [para 2.2]

⁷¹ FAO, 1997, Agriculture and climate change: FAO's role See www.fao.org

dependent. India, Thailand, Colombia and many sub-Saharan countries are likely to be losers while China, Mexico and Kenya could see gains.⁷² Many of the losers will already have large populations of very poor people.

Table 5: The impact of climate change on food supply⁷³

Impacts on food supply

- Less water combined with heat stress will probably reduce the global yield of major food staples (wheat, rice, maize) by 5 to 10 per cent by 2050
- Greatest reductions are expected to be in Africa (except in equatorial Africa), the Middle East, and the Indian subcontinent.
- Reduced food production likely to increase food prices by more than 15 per cent.

Effects on risk of hunger

- With low income groups less able to afford sufficient food, hunger is estimated to increase, probably by about an additional 50 million at risk of hunger by 2050.
- Projected increase in hunger due to climate change is almost entirely in Africa, due to high vulnerability because of poverty and weak infrastructure.
- The poorest groups are most likely to be negatively affected.

24. Food demand will continue to grow, with growing population and wealth, and reductions in crop yields may lead to increased prices. The poor, already the most at risk of hunger, would become more vulnerable as food prices rise.⁷⁴ The countries that suffer lower yields will rely increasingly on food imports to bridge the gap between supply and demand, but developing countries will often lack the foreign exchange needed to import food. A combination of falling domestic production and reduced food imports could further increase food prices.⁷⁵ As the areas of food production shift, infrastructure and systems for transport and distribution will need to be improved so that food can be easily moved from growing areas to the areas of the world where it is needed.

Impact on water resources

25. Water is a finite resource unevenly distributed across the globe and often only seasonally available.⁷⁶ Demand for water has increased as populations have grown and economic development has taken place. About one third of the world's population now lives in countries that are water stressed and twenty per cent of the world's population does not have ready access to drinking water, while forty per cent lack sanitation facilities.⁷⁷ Climate change imposes yet another pressure.⁷⁸ It will affect the quantity and timing of rainfall which will in turn affect the volume, timing and quality of river flows and groundwater recharge.⁷⁹ As a result, the size and frequency of floods could increase in many areas.⁸⁰ Figure 6 (see page 14) shows projected changes in annual runoff by 2050 for two different climate models. Higher temperatures will increase evaporation rates making water stress more acute. Given that around seventy per cent of the world's available fresh water is used in agriculture, any impact on water resources could have a knock-on effect

⁷²Food in the 21st Century: Global Climate Disparities, Mahendra Shah, International Institute for Applied Systems Analysis.

⁷³Ev 40

⁷⁴Report of IPCC Working Group II: Summary for Policy Makers, 2001

⁷⁵Food in the 21st Century: Global Climate Disparities, Mahendra Shah, International Institute for Applied Systems Analysis.

⁷⁶Food in the 21st Century: Global Climate Disparities, Mahendra Shah, International Institute for Applied Systems Analysis.

⁷⁷Parliamentary Office of Science and Technology, 2002, Postnote number 178, Access to water in developing countries

⁷⁸Ev 43 [para 4.1]

⁷⁹Ev 42 [para 2.1]

⁸⁰Report of IPCC Working Group II: Summary for Policy Makers, 2001

on food security.⁸¹ However, there will be some positive impacts and a few arid areas, such as parts of Southeast Asia, may benefit from increased water availability.⁸²

Table 6: The Potential impacts of climate change on water resources⁸³

- Under most climate change scenarios, southern and western Africa and the Middle East are projected to see reduced river flows and recharge.
- Possible changes in south Asia are less clear: some scenarios suggest reduced runoff (greater drought risk) while others show increased runoff (greater flood risk).
- Substantial effect on people living in areas that are currently water-stressed, most of which are in developing countries.
- Access to safe water will probably be influenced by climate change, especially in rural areas, although access to sanitation is likely to be relatively unaffected.

26. Many other pressures, such as population growth, economic development and changes in land use, also influence water resources. Without effective resource management, vulnerability to climate risk could increase but uncertainty about the effects of climate change makes it difficult to plan and design schemes to manage water resources.⁸⁴ Flexible schemes are better than those that cannot be altered or upgraded.⁸⁵ Where water systems are stressed, poorly managed or unmanaged, the impacts of climate change are likely to be worse. However, such systems offer the greatest potential for implementing a variety of 'no-regrets' options. 'No-regrets' options bring benefits regardless of their impact on climate and will have a positive impact even if climate risk has been over-estimated. The adoption of flexible management approaches and policies (such as increasing access to safe water) that can cope with current climatic variability and help reform poorly performing systems will help to reduce vulnerability to climate change. **Drought preparedness and contingency planning are essential in building capacity to cope with climatic risks. We recommend that all development proposals associated with water resources should consider the potential effects of climate change on the ability of the proposed scheme to deliver its objectives. The impact of the project on the vulnerability of all stakeholders, including those who could be indirectly affected, should be examined. Taking a precautionary approach would mean that projects should represent no-regrets solutions that seek to optimise current systems while building in flexibility to cope with the uncertainties posed by climate change.**

Impact on coasts

27. Coastal areas are already threatened by erosion, saline intrusion, flooding, tsunamis and indirect effects from man's activities.⁸⁶ Climate change will cause sea surface temperatures to rise and sea-ice cover to decrease. Salinity, wave conditions and ocean circulation may change.⁸⁷ Most coastal areas will be affected by more frequent and increasingly severe storms.⁸⁸ Sea-levels will rise due thermal expansion and through the melting of land-based glaciers, such as those in the Alps.⁸⁹ As sea levels rise, most coastal areas will experience increased flooding, loss of wetlands, contamination of freshwater. Africa, South and Southeast Asia, will be particularly affected by flooding, with lesser

⁸¹ Food in the 21st Century: Global Climate Disparities, Mahendra Shah, International Institute for Applied Systems Analysis.

⁸² Report of IPCC Working Group II: Summary for Policy Makers, 2001

⁸³ Ev 41

⁸⁴ Report of IPCC Working Group II: Summary for Policy Makers, 2001

⁸⁵ Ev 41 [para 4.1]

⁸⁶ Ev 46 [para 1]

⁸⁷ Report of IPCC Working Group II: Summary for Policy Makers, 2001

⁸⁸ *Ibid.*

⁸⁹ Ev 46

impacts in East Asia.⁹⁰ A sea-level rise of thirty centimetres would displace one to two million of the six million people living in the Niger Delta. A sea-level rise of one metre would see two to three million people displaced in the same area.⁹¹ Saleemul Huq said a one metre sea level rise would inundate a fifth of Bangladesh and displace far more than a fifth of the population.⁹² Rising temperatures are likely to have a negative impact on coastal ecosystems, particularly mangroves, which will have knock-on impacts for fish and fisheries. Coral reefs are likely to suffer bleaching and reduced calcification rates. We agree with Robert Nicholls, one of our expert witnesses, that DFID could help to promote sustainable development of coastal areas by:

- encouraging efforts to improve understanding of vulnerability;
- promoting more evaluation of the implications of climate change in coastal areas, particularly in vulnerable regions; and,
- enhancing coastal management capacity so that it can deal with the full range of issues, including climate change.⁹³

Table 7: The Impacts of climate change on coasts⁹⁴

- Increased levels of inundation and storm flooding
- Accelerated coastal erosion
- Seawater intrusion into fresh groundwater
- Encroachment of tidal waters into estuaries and river systems
- Elevated sea-surface and ground temperatures
- Impact on biodiversity and fisheries from a loss of mangroves and coral bleaching

28. Coastal populations are growing rapidly.⁹⁵ The urbanisation and increasing population density of low-lying coastal areas are common features of many developing countries: both increase vulnerability.⁹⁶ Coastal megacities are at risk from rising sea levels, severe storms and flooding.⁹⁷ The number of coastal megacities grew from two in the 1950s to thirteen by 1990. By 2010 more than 320 million people could be living in as many as twenty coastal megacities, with much of the growth in cities in developing countries. There were no megacities in developing countries in the 1950s but by the 1990s there were nine, and there could be as many as sixteen by 2010.⁹⁸ These figures probably underestimate the numbers affected as many people live in large conurbations rather than tightly defined cities. Areas of squatter and informal urban settlement are highly vulnerable and lack the capacity to adapt to climate change.⁹⁹

Impact on health

29. Climate change will have a number of direct and indirect impacts on human health. Mortality and morbidity associated with heat waves will increase, particularly for urban populations, the elderly and those already weakened by illness. With more flooding, the risk of drowning will increase as will the incidence of diarrhoeal diseases.¹⁰⁰ Reduced crop yields could result in hunger and malnutrition, with consequential increases in developmental diseases and reduced adult activity.¹⁰¹ Vector-borne diseases, such as malaria and dengue fever (which already affect nearly half the world's population), are

⁹⁰ *Ibid.*

⁹¹ Ev 156

⁹² Q88

⁹³ Ev 48

⁹⁴ Ev 47

⁹⁵ Ev 46 [para 1]

⁹⁶ Report of IPCC Working Group II: Summary for Policy Makers, 2001

⁹⁷ Defined as cities with a population exceeding 8 million.

⁹⁸ Nicholls, 1995, Coastal Megacities and Climate Change, *GeoJournal* 37.3, 369–379

⁹⁹ Report of IPCC Working Group II: Summary for Policy Makers, 2001

¹⁰⁰ *Ibid.*

¹⁰¹ *Ibid.*

likely to spread to areas previously unaffected. The population displacement and economic disruption associated with climate change could have secondary impacts on health.

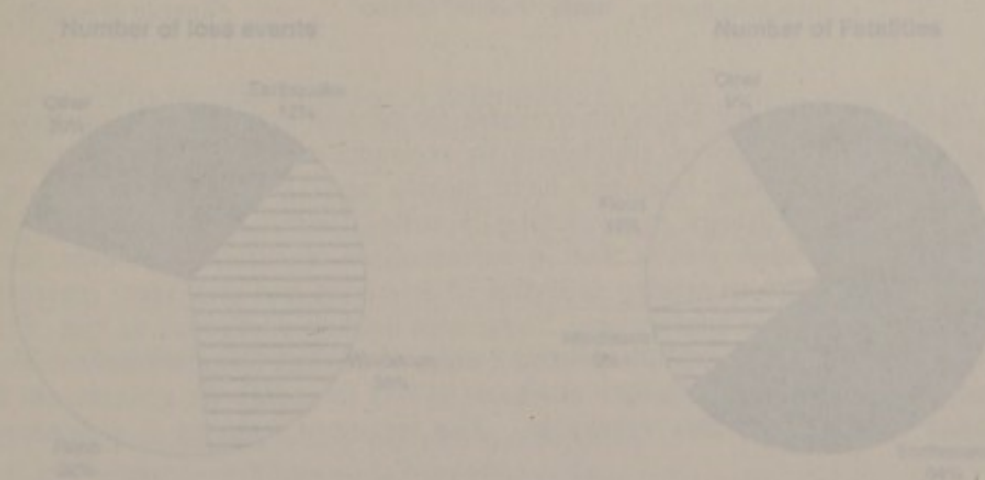
Table 8: The impacts of climate change on human health¹⁰²

- Changes in distribution and seasonal transmission of malaria and other diseases transmitted by insects and ticks (e.g. dengue, mosquito-borne viruses, leishmaniasis).
- Increase in food and/or water borne diseases, particularly diarrhoeal diseases, as higher temperatures encourage the growth of microorganisms and more erratic rainfall increases the frequency of contamination of surface water.
- Increased cardiorespiratory mortality in relation to heatwaves.
- Decreased cold-related deaths
- Increased malnutrition and nutritional diseases with reduced crop yields
- Increased risk of drowning with changes in frequency and/or intensity of weather disasters

Impact on extreme events

30. The IPCC's TAR predicts an increase in the frequency and intensity of extreme weather events. The rapid urbanization in coastal areas is increasing the numbers of people who will be exposed to climatic extremes.¹⁰³ In the last decade the frequency of disasters has increased rapidly; the worst flooding in the Mekong Delta in 2000 followed record levels of flooding in 1998 and 1999. By contrast, the number of non-climate natural disasters has remained largely unchanged. Increases in rainfall intensity and rising sea-levels are expected to drive an increase in flooding and landslides. This will have a direct impact on human settlements, especially informal squatter settlements.

31. Disasters pose a serious threat to development and particularly the development of the world's poorest and most marginalised people. Vulnerable populations do not always have time to recover from one disaster before the next one strikes.¹⁰⁴ Many are affected year after year with a crippling impact on their ability to rebuild sustainable livelihoods. People may be forced into a situation where they have to exploit the environment in an unsustainable way, further increasing their vulnerability. For example, people displaced by flooding might turn to illegal logging to provide firewood, which in turn causes more rapid runoff and increased flash flooding.



¹⁰² Ev 48 and Ev 49

¹⁰³ Report of IPCC Working Group II: Summary for Policy Makers, 2001

¹⁰⁴ Ev 93

Table 9: Key points from the 2001 World Disasters Report¹⁰⁵

- The year 2000 saw the highest number of disasters in the last decade, while 2001 saw the second highest
- The number of geophysical disasters has remained fairly constant, but the past two years have seen the highest number of weather-related disasters reported over the decade.
- A total of 39,073 people were reported killed by disasters in 2001, nearly double the figure for the previous year. However it was lower than the decade's annual average of around 62,000.
- Over the decade hydro-meteorological hazards have claimed 71 per cent of all lives lost to disasters.
- From 1992–2001, countries of low human development (LHD) have accounted for just one-fifth of the total number of disasters, but over half of all disaster fatalities. On average 13 times more people die per reported disaster in LHD countries than in countries of high human development (HHD).
- In the Americas, floods accounted for 45 per cent of all deaths from disasters. In Asia, drought/famine claimed 58 per cent. In Europe, earthquakes claimed 58 per cent, while in Oceania, tidal waves claimed 66 per cent.
- Last year, a total of 170 million people were reported affected by disasters—below the decade's average of 200 million.
- Drought/famine affected over 86 million people last year, many of those living in central and south Asia.
- In the past ten years, drought/famine accounted for 82 per cent of all those affected in Africa, 48 per cent in Oceania and 35 per cent in the Americas. Meanwhile, floods accounted for 69 per cent of all those affected in Asia. And windstorms accounted for 36 per cent of those affected in the Americas, and 33 per cent in Europe.
- The total estimated damage due to disasters during 2001 was US\$ 24 billion—the decade's lowest and well below the annual average of US\$ 69 billion.
- Deaths from natural disasters fell from nearly 2 million in the 1970s to just under 800,000 in the 1990s.
- Numbers reported affected by natural disasters rocketed from just over 700 million in the 1970s to nearly 2 billion in the 1990s.
- Global figures hide some significant variations between the continents. Apart from Africa and Europe, the rest of the world reported substantial increases in the numbers of disaster fatalities in the past two decades. For Oceania, deaths tripled from one decade to the next, while for Asia deaths were up 41 per cent and for the Americas up 32 per cent. Meanwhile, the figures for those affected have more than tripled in Europe and increased 12-fold in Oceania.

¹⁰⁵ International Federation of Red Cross and Red Crescent Societies, 2002, World Disasters Report: Focus on reducing risk (see www.ifrc.org/publicat/wdr2002/chapter8.asp)

Figure 8: A breakdown of natural disasters in 2001 by geographical region.¹⁰⁶

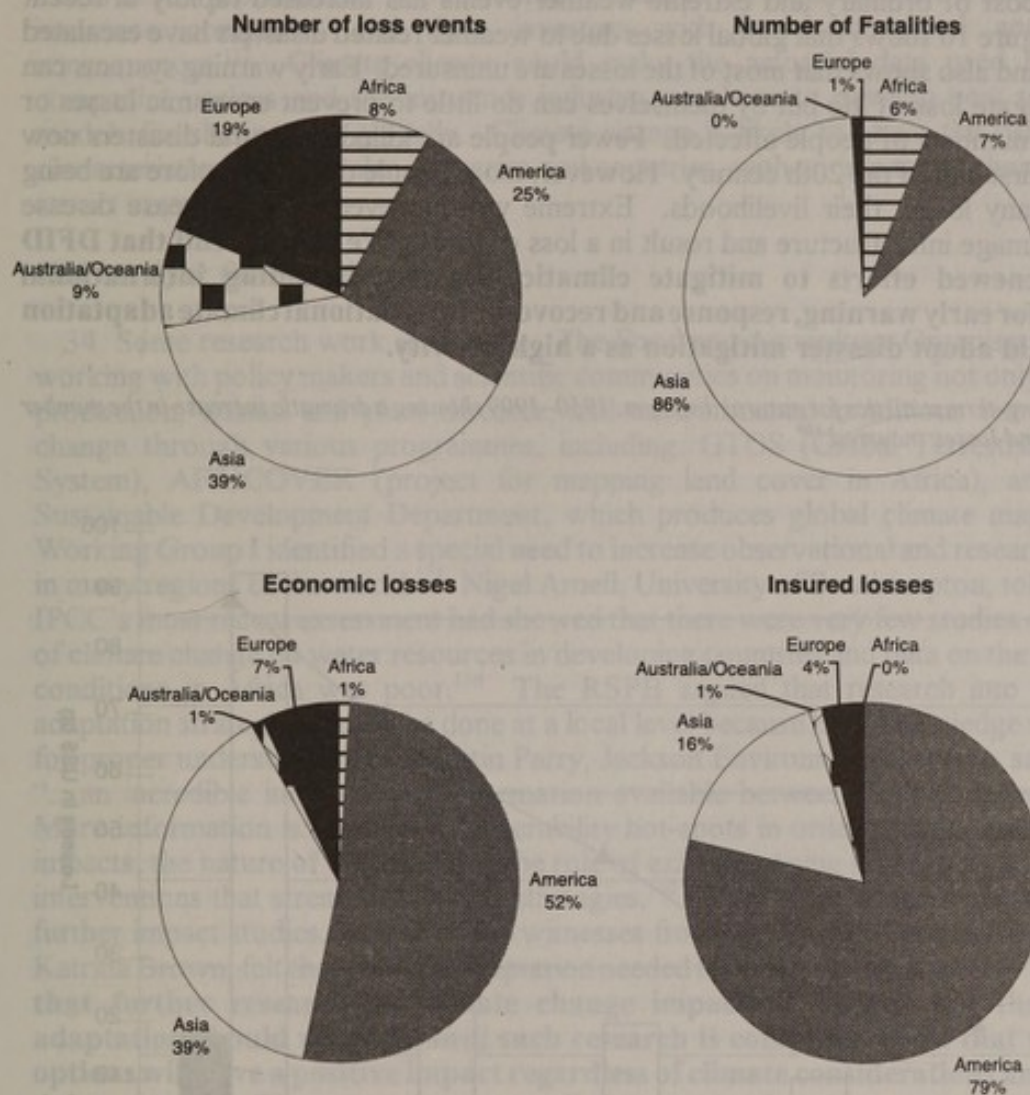
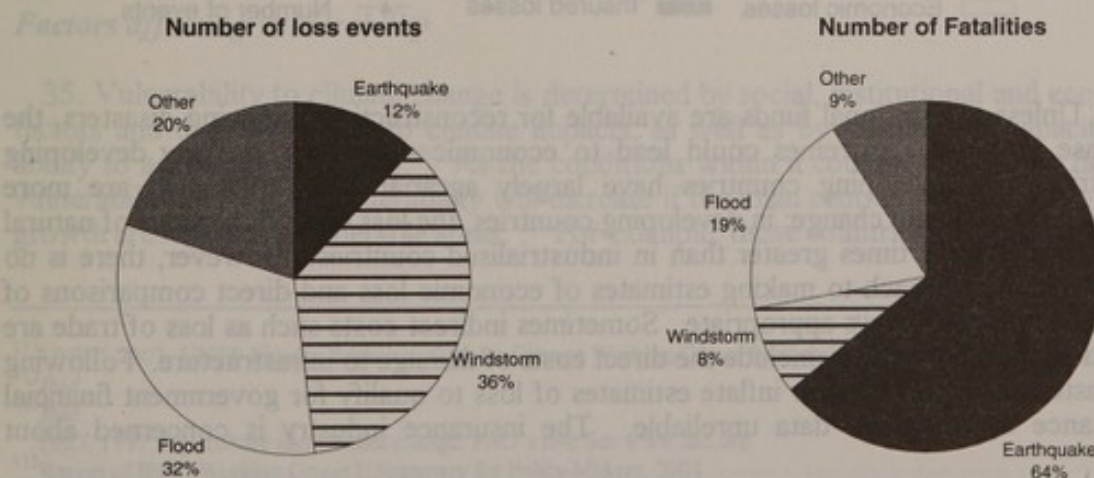


Figure 9: A breakdown of natural disasters in 2001 by type of disaster.¹⁰⁷

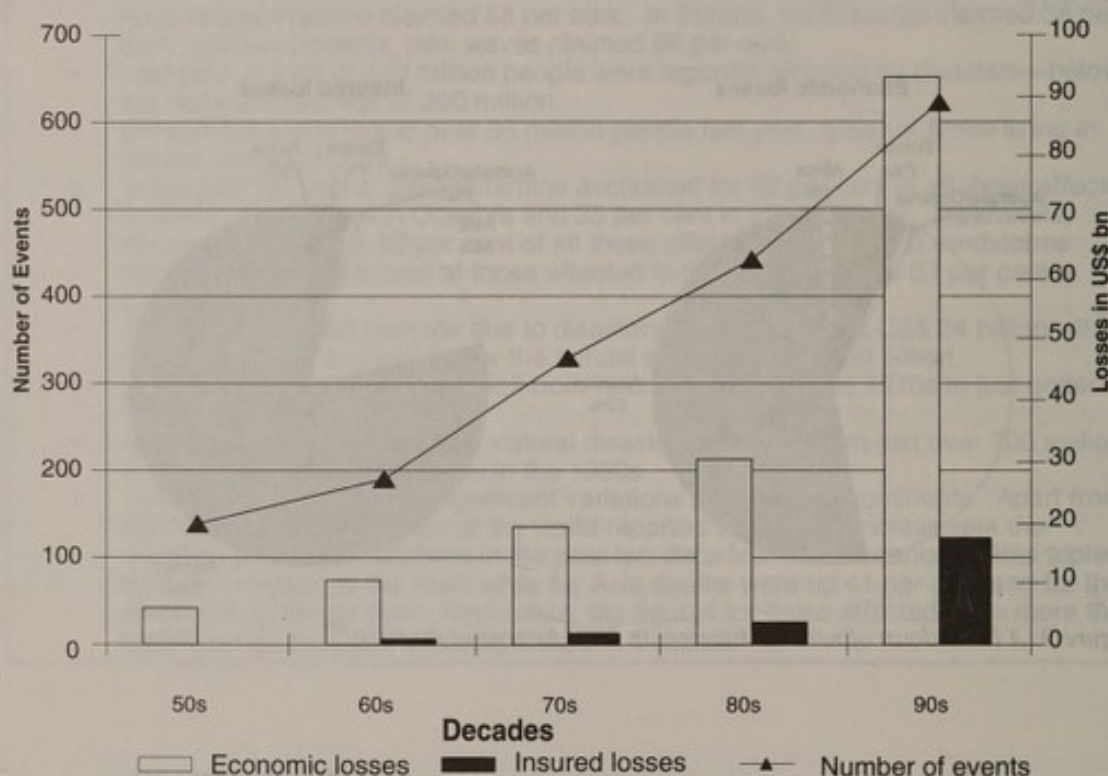


¹⁰⁶Source: Munich Re, Topics: Annual Review of Natural Catastrophes 2001

¹⁰⁷*Ibid.*

32. The cost of ordinary and extreme weather events has increased rapidly in recent years.¹⁰⁸ Figure 10 shows that global losses due to weather related disasters have escalated drastically and also shows that most of the losses are uninsured. Early warning systems can help to mitigate loss of life but by themselves can do little to prevent economic losses or reduce the numbers of people affected. Fewer people are killed in natural disasters now than in the first half of the 20th century. However, more people than ever before are being affected, many losing their livelihoods. Extreme weather events also increase disease burdens, damage infrastructure and result in a loss of trade. **We recommend that DFID support renewed efforts to mitigate climatic disasters, including international standards for early warning, response and recovery. International climate adaptation funds should adopt disaster mitigation as a high priority.**

Figure 10: Long-term statistics for natural disasters, 1950–1999 showing a dramatic increase in the number of disasters and losses incurred.¹⁰⁹



33. Unless international funds are available for reconstruction following disasters, the increase in climatic extremes could lead to economic stagnation in many developing countries.¹¹⁰ Developing countries have largely agrarian economies that are more vulnerable to climate change; in developing countries, the loss of GNP because of natural disasters is twenty times greater than in industrialised countries. However, there is no standardised approach to making estimates of economic loss and direct comparisons of estimates are not always appropriate. Sometimes indirect costs such as loss of trade are included while others only include the direct costs of damage to infrastructure. Following a disaster, the temptation to inflate estimates of loss to qualify for government financial assistance makes some data unreliable. The insurance industry is concerned about

¹⁰⁸ Report of IPCC Working Group II: Summary for Policy Makers, 2001

¹⁰⁹ Source: Munich Re, Topics: Annual review of natural catastrophes, 2001

¹¹⁰ Freeman, P.K., Martin, L.A., Mechler, R., Warner, K. and Hausman, P. (2001). *Catastrophes and Development: Integrating Natural Catastrophes into Development Planning*. Washington: World Bank. See www.worldbank.org/dmf/files/catastrophes_complete.pdf

mounting property losses especially as current socioeconomic trends are concentrating assets in risk prone areas.¹¹¹ Unanticipated changes in risk could have a major impact on insurance companies and their investors with knock-on social and economic consequences.¹¹² Climate change could make the actuarial data used by insurance companies useless and the insurance industry may have to develop new scenarios and models for sharing risk globally. Climate change is likely to affect the risk and return characteristics of particular industries and countries, with an impact on their potential to attract investment.¹¹³

The need for further research

34. Some research work is ongoing. The Food and Agriculture Organisation (FAO) is working with policy makers and scientific communities on monitoring not only agricultural production, animal and plant diseases, and environmental conditions but also climate change through various programmes, including: GTOS (Global Terrestrial Observing System), AFRICOVER (project for mapping land cover in Africa), and the FAO Sustainable Development Department, which produces global climate maps.¹¹⁴ IPCC Working Group I identified a special need to increase observational and research capacities in many regions of the world.¹¹⁵ Nigel Arnell, University of Southampton, told us that the IPCC's most recent assessment had showed that there were very few studies of the impact of climate change on water resources in developing countries and data on the hydrological conditions in Africa was poor.¹¹⁶ The RSPB argued that research into impacts and adaptation strategies should be done at a local level because local knowledge was essential for proper understanding.¹¹⁷ Martin Parry, Jackson Environment Institute, said there was "...an incredible imbalance of information available between the North and South...". More information is needed on vulnerability hot-spots in order to help understand likely impacts, the nature of vulnerability, the role of existing coping strategies and the need for interventions that strengthen coping strategies.¹¹⁸ While most of the witnesses called for further impact studies, neither of the witnesses from the Tyndall Centre, Neil Adger and Katrina Brown, felt that work on adaptation needed to wait for more studies.¹¹⁹ **We believe that further research on climate change impacts is needed but that work on adaptation should not wait until such research is complete, given that many of the options will have a positive impact regardless of climate considerations and are worth doing anyway.** These are sometimes called 'no-regrets' options.

Vulnerability

Factors affecting vulnerability

35. Vulnerability to climate change is determined by social, institutional and economic factors and their sensitivity to climate impacts, as well as by institutional capacity, the ability to adapt, and location.¹²⁰ As the conditions within a country change, so does its vulnerability. National vulnerability will increase if the main centres providing economic growth are located in vulnerable areas.¹²¹ For example, those countries whose populations

¹¹¹ UNEP, 2001, UNEP Finance Initiatives Climate Change Working Group Position Paper.

¹¹² *Ibid.*

¹¹³ *Ibid.*

¹¹⁴ FAO, 1997, Agriculture and climate change: FAO's role See www.fao.org

¹¹⁵ Report of IPCC Working Group I: Summary for Policy Makers, 2001

¹¹⁶ Q43

¹¹⁷ Ev 148 [para 3.1 and 3.2]

¹¹⁸ Q73 and Q75

¹¹⁹ Qq 74-75

¹²⁰ Ev 59 and Report of IPCC Working Group II: Summary for Policy Makers, 2001

¹²¹ Ev 60

and economically productive enterprises are in coastal zones will face a higher risk. IPCC Working Group II noted that the communities that are the most vulnerable to climate change were also subject to pressures from population growth, resource depletion and poverty. Rapid urbanisation, land degradation, water pollution, water scarcity, and the destruction of ecosystems are also added pressures. All these factors affect vulnerability to variations in the current climate, as well as to future climate change.

Vulnerability in developing countries

36. Developing countries have limited financial, human, technological, institutional and natural resources,¹²² making them less able to respond to the effects of climate change.¹²³ Their economies often rely heavily on agriculture and other sectors that are particularly vulnerable to climate change.¹²⁴ The greater vulnerability of their ecosystems and settlement patterns means developing countries are more exposed to the adverse effects of climate change and less able to capitalise on any benefits than developed countries. In 1998, Hurricane Mitch devastated Honduras, with the loss of thousands of lives, the destruction of seventy per cent of the country's roads and bridges, and the main pillar of the economy—the agricultural sector—almost wiped out.¹²⁵ Countries are particularly vulnerable where people are dependent on resources that are vulnerable to climate change. Agricultural activity, vitally important in so many developing countries, often takes place in low-lying areas that are susceptible to sea level rises, Bangladesh being the obvious example.

37. Increased vulnerability is a product of failed social and economic development. But it is not only the poor who are vulnerable. Many people with reasonable livelihoods are vulnerable if extreme weather events could destroy or significantly disrupt their livelihoods. Katrina Brown, Tyndall Centre, said that there was a special need "...for DFID to remember that poverty does not necessarily equal vulnerability..." in targeting its interventions.¹²⁶ **DFID should sponsor vulnerability assessments in developing countries and use the information to help target work on adaption where vulnerability is greatest, rather than focusing work on adaptation only on the poorest. In most cases it will be the poorest who are the most vulnerable.**

¹²² Report of IPCC Working Group II: Summary for Policy Makers, 2001

¹²³ Ev 16 [para 6.1]

¹²⁴ Report of IPCC Working Group II: Summary for Policy Makers, 2001

¹²⁵ Ev 84

¹²⁶ Q62

Myths of climate change

38. Several myths associated with climate change are examined in table 10.

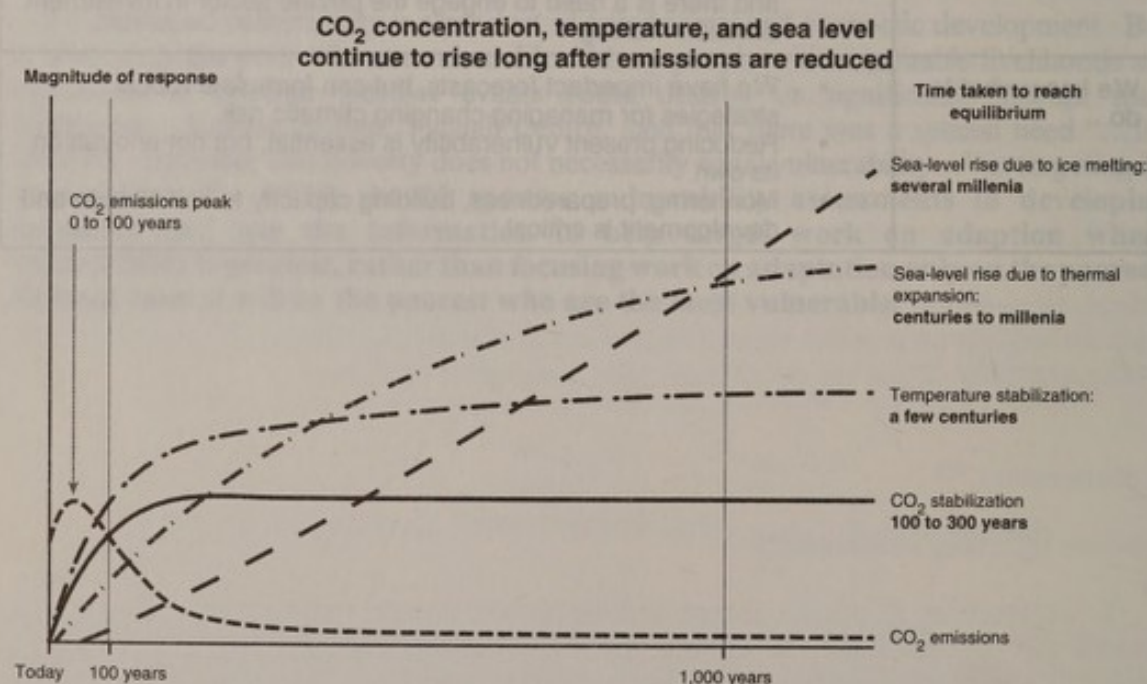
Table 10: Myths of climate change	
Climate change is an issue of deep uncertainty.	<ul style="list-style-type: none"> • Uncertainty has characterised climate change, especially regarding the large scale effects such as the impact on the El Niño/Southern Oscillation (ENSO) switch, the collapse of the West Antarctic Ice Sheet (WAIS), or the role of methane hydrates. • However, for many impacts there is much greater confidence. • IPCC WGII presented impacts with scales of confidence that can be used to support different kinds of action now.
We can adapt to climate change.	<ul style="list-style-type: none"> • Adaptive capacity is unevenly spread across the globe. Those most vulnerable are often the least able to adapt. • There is a limit to what adaptation can achieve. Not all small islands states will be able to adapt to sea level rise, some countries in Africa may find it difficult to adapt to further water stress.
Climate change is a green issue.	<ul style="list-style-type: none"> • Climate change has economic and social impacts that will last for decades. • It will threaten economic development in some countries. • Environmental policies alone cannot tackle climate change and there is a need to engage the private sector in investment decision-making.
We know what to do.	<ul style="list-style-type: none"> • We have imperfect forecasts, but can formulate robust strategies for managing changing climatic risk. • Reducing present vulnerability is essential, but not enough on its own • Monitoring, preparedness, building capacity to link climate and development is critical.

III DEALING WITH CLIMATE CHANGE

Adaptation and mitigation

39. Policy tends to be unequally divided between mitigation and adaptation. Mitigation is centred on near-term energy and industrial policy while adaptation has grown out of natural resource management and concern for impacts. Mitigation is a global problem with a global solution that is regarded as achievable. Impacts are a predicament requiring adaptation. Adaptation is local solutions for local problems, often complicated by politics and is a much harder issue to deal with on a global basis. Even if greenhouse gas emissions were reduced and concentrations of greenhouse gases stabilised, the impacts of climate change would still be felt for hundreds of years (see figure 11).¹²⁷ Martin Parry, Jackson Environment Institute, told us that there was a growing realisation that adaptation was going to be essential and that mitigation on its own was insufficient. He said that it would not be feasible to reach the levels of emissions needed to avoid significant impacts; to do so would require levels ten or twenty times below those specified in Kyoto.¹²⁸ In this section of the report we consider adaptation in detail before going on to consider mitigation.

Figure 11: Even if CO_2 emissions levels peak in the next few years and were then reduced, the concentration of greenhouse gases in the atmosphere, particularly carbon dioxide, would still cause significant changes in climate for a century or more.¹²⁹



Adaptation

Types of adaptation

40. Adaptation determines the residual impacts of climate change as shown in figure 12 and governments have a role to play in anticipating changes and planning for the future.¹³⁰ The world's population and ecosystems have adapted to a constantly changing climate for

¹²⁷ Huq et al, 2002, IIED Opinion: Climate Change and Sustainable Development Beyond Kyoto

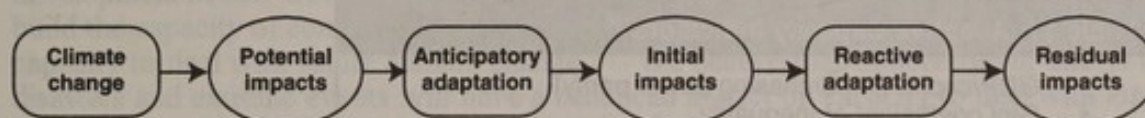
¹²⁸ Q49

¹²⁹ IPCC 2001, Third Assessment Report, Synthesis Report—Summary for Policy Makers

¹³⁰ Q61

hundreds of millions of years.¹³¹ Spontaneous adaptation will continue but is unlikely to be able to occur at a rate sufficient to cope with the changes in climate brought about by human activity, and so greater attention must be paid to planned adaptation. For example, the health impacts described in chapter 2, might be moderated by various social, institutional, technological and behavioural adaptations. Such adaptations will involve strengthening public infrastructure, improving management of resources such as water, action on food safety, urban and housing design, provision of appropriate medical services and facilities.¹³²

Figure 12: The role of adaptation in determining the residual impacts of climate change.¹³³



41. Climate change has the potential to undermine development unless development investment includes measures to address climate risk. Adaptation can reduce adverse impacts and enhance any benefits of climate change,¹³⁴ bringing gains beyond simply providing a basis for coping in the future. Short-term planning and neglect of climate variability (such as promoting development in risk prone locations) can leave communities unable to cope and poorly adapted to deal with future climate risk.

Figure 13: Climate change adaptation matrix.

		Adaptive Capacity	
		Low	High
Impacts	High	Target Vulnerable Communities	Development Opportunities
	Low	Residual Vulnerability and Surprise	Sustainable Livelihoods?

¹³¹Ev 61

¹³²Report of IPCC Working Group II: Summary for Policy Makers, 2001

¹³³Klein, R, 2001: Adaptation to Climate Change in German Official Development Assistance—An inventory of activities and opportunities, with a special focus on Africa, Deutsche Gesellschaft für Zusammenarbeit, Eschborn, Germany.

¹³⁴Report of IPCC Working Group II: Summary for Policy Makers, 2001

Factors affecting adaptation

42. Many of the areas vulnerable to climate change are also under pressure from other factors, such as population growth and resource depletion: most are poor. Efforts to tackle poverty, improve environmental management, and advance sustainable development will enhance adaptive capacity and reduce vulnerability. The need for adaptation will be greatest in developing countries but developing countries typically have a lower capacity to adapt than developed countries.¹³⁵ In situations where wealthier countries could build sea defences, poor countries will suffer a loss of land, livelihood and displacement of population. Table 11 shows some indicators that can be used to measure adaptive capacity and clearly illustrates the kind of factors that affect adaptation.

Table 11: Adaptive Capacity Indicators¹³⁶

- GDP/capita (in purchasing power parity)
- Gini coefficient of inequality
- Literacy
- Incidence of poverty
- Life expectancy at birth
- Insurance mechanisms and access to insurance
- Degree of urbanisation
- Access to public health facilities and services
- Access to education
- Community organisations (social capital)
- Existing planning regulations at national and local levels
- Existing warning and protection from natural hazards
- Institutional and decision-making frameworks
- Political stability

Approaches to adaptation

43. Studies on adaptation are increasingly being taken seriously and have been included in two large GEF projects. There are several methodological approaches to adaptation: it is possible to take a climate scenario, develop an impacts model and from this derive specific adaptation measures; alternatively, it is possible to define several plausible impacts that can be used to develop strategies to build adaptive capacity that enhances autonomous adaptation and produces greater resilience. Most of those who gave evidence to the Committee argued that there was mileage in the second approach as a policy strategy (although there was some disagreement about what further studies were required). The Tyndall Centre told us that building capacity in a flexible manner was a more realistic way forward than trying to prepare for specific events.¹³⁷

44. We agree that a flexible but straight forward approach is needed. There is little justification for imposing an international template using common scenarios and methods at a national and local level. To do so might raise awareness but will not provide much insight into what specific local and national actions were needed. Different solutions will be appropriate in different countries. For example, in a country with a large number of rural poor, vulnerability to drought and famine are less likely to be overcome by urban industrialisation than by an investment in sustainable agricultural development.¹³⁸ **Official Development Assistance (ODA) needs to be targeted to deliver sustainable**

¹³⁵Klein, R, 2001: Adaptation to Climate Change in German Official Development Assistance—An inventory of activities and opportunities, with a special focus on Africa, Deutsche Gesellschaft für Zusammenarbeit, Eschborn, Germany.

¹³⁶Klein, R, 2001: Adaptation to Climate Change in German Official Development Assistance—An inventory of activities and opportunities, with a special focus on Africa, Deutsche Gesellschaft für Zusammenarbeit, Eschborn, Germany.

¹³⁷Ev 67 [para 1]

¹³⁸Ev 60–61

development that enhances adaptive capacity; this might include agricultural research, early warning systems for food security, and technology transfer. Planned adaptation at a national level is easier than at community or individual level, where spontaneous and reactive changes in livelihoods and resource use will occur. The severity of impacts and local circumstances will dictate the adaptive response. **For some countries spontaneous adaptation will not be an option. The people of the Maldives and other small island states may have no alternative but to migrate.**

45. People already cope with a variety of climatic risks and other threats to sustainable livelihoods. While current variability is not a perfect analogue for future climate change, it is important to identify what can we learn from it about risk management and development needs. Both IPCC Working Group II and Saleemul Huq said that helping to build the capacity of communities to deal with extreme events should strengthen adaptive capacity to deal with future climate change.¹³⁹ We believe that concentrating efforts on disasters and extreme events will have a beneficial impact on capacity to deal with long-term climate variability, and greater emphasis needs to be placed on disaster mitigation and preparedness (DMP). **We are concerned that too much focus on the short-term responses to extreme events could undermine progress towards longer-term development goals. We believe a longer-term view of relief and DMP must be taken by donors and recipient countries alike.**

Targeting Assistance

46. New funds for adaptation must supplement current development investment and not divert existing funds.¹⁴⁰ Countries that have been badly hit in the past and those with particularly vulnerable populations stand to gain the most from carefully targeted adaptation measures.¹⁴¹ Targeted adaptation and focusing work on reducing vulnerability will help to reduce climate risk.¹⁴² Given the uncertainties about climate change, the precautionary principle requires a flexible package of measure and inevitably some adaptation strategies may turn out to be redundant. This means there is a risk associated with funding work on adaptation. The scientific uncertainties make it difficult to apply a cost benefit analysis to actions to address climate change; outcomes could turn out to be less serious than currently predicted.¹⁴³ Yet many 'no-regrets' options could still be developed, especially as many of the current systems relating to water, food, urbanisation, energy and transport are far from ideal. With several 'win-win' scenarios and 'no-regrets' options, we believe there are many cases where funding adaption will not only be a risk worth taking but a requirement of the precautionary principle. Least developed countries, small island states and the most vulnerable should be priorities for adaptation. Solutions could build on existing coping mechanisms where appropriate and should be compatible with national sustainability goals and strategies.¹⁴⁴

Migration

47. Migration is an important traditional coping mechanism and as such is an adaptation strategy.¹⁴⁵ Increased climate variability might lead to increased migration,¹⁴⁶ particularly

¹³⁹ Report of IPCC Working Group II: Summary for Policy Makers, 2001 and Ev 71 [para 13]

¹⁴⁰ Ev 62

¹⁴¹ Ev 60

¹⁴² Ev 61

¹⁴³ Financing Climate Change: Providing Public Goods, preventing public bads, Dr Peter Newell, Institute of Development Studies (IDS). An abridged version of this paper appears in Financing and Providing Global Public Goods: Expectations and Prospects, prepared for the Ministry of Foreign Affairs, Sweden by IDS.

¹⁴⁴ Ev 71 [para 10]

¹⁴⁵ Ev 61 and Ev 71 [para 14]

¹⁴⁶ Ev 70 [para 6] and Ev 71 [para 14]

as people leave rural areas to seek off-farm incomes in towns and cities.¹⁴⁷ The number of environmental refugees now exceeds the number displaced by war and conflict.¹⁴⁸ In 1999, the World Disasters Report noted that out of 43 million refugees worldwide, 25 million (nearly 60%) were environmental refugees.¹⁴⁹ Migration can be a sustainable strategy where it builds and reinforces local knowledge and promotes the sustainable use of resources. The Tyndall Centre saw evidence of this in Brazil, Vietnam and a number of small island states.¹⁵⁰ During our visit to Ghana earlier this year, we saw for ourselves how displaced people from Burkina Faso and northern Ghana were introducing more efficient and sustainable ways of producing charcoal as they moved south. If other adaptations, including planned migration, are not possible and coping mechanisms are exhausted, there is a greater chance of displacement migration taking place as a last resort.¹⁵¹ But the right to migrate is increasingly being contested and is a source of conflict in many societies.¹⁵² Many of those displaced in Bangladesh by rising sea levels will migrate to India, exacerbating already high levels of illegal migration.¹⁵³ Andrew Bennett, DFID, told us that migration out of the Sahel into the Ivory Coast was on such a scale that the Ivory Coast had introduced legislation preventing foreign nationals from owning land.¹⁵⁴ There is no international recognition of environmental refugees; they are not entitled to the same rights as refugees from conflict and persecution.¹⁵⁵ The UK Government has no specific policy to deal with them. The British Bangladeshi Professional Association called for a new convention to protect the rights of environmental refugees in the same way that refugees fleeing conflict or persecution are protected under international law.¹⁵⁶ **The need for national and international policies to deal with 'environmental' refugees will become greater as more people are temporarily or permanently displaced from their homes by more frequent and more intense climate disasters or by progressive climate change, such as rising sea levels or desertification. DFID should be pushing for a policy on 'environmental' refugees. Any policy response must recognise that this issue cuts across several Whitehall Departments. DFID must ensure that this issue is raised with and understood by the Home Office and the Foreign Office.**

48. Rural to urban migration is on the increase but some urban livelihoods can be particularly vulnerable, especially for those eking out a living in urban slums. Ian Davis stressed the importance of tackling rural development to slow the flow of people to cities.¹⁵⁷ Support for rural development could help to keep people in an area where there was some hope of adapting livelihoods to cope with climate change rather than seeing them move to areas where they may be even more vulnerable.

Building adaptive capacity

49. When provided with education, access to credit and the freedom to adapt, people can create sustainable systems for themselves. Such systems are often based on indigenous knowledge and traditional coping mechanisms. Saleemul Huq, IIED, argued for strengthening the capacity of institutions and civil society to adapt to climate change. He stressed the importance of institutions for measuring and monitoring impacts, and for

¹⁴⁷ Q5

¹⁴⁸ Ev 129

¹⁴⁹ World Disasters Report 1999

¹⁵⁰ Ev 61

¹⁵¹ *Ibid.*

¹⁵² Ev 61

¹⁵³ Q88

¹⁵⁴ Q25

¹⁵⁵ Jackie Jones, 2000, A study of UK Government Policy and responsibility towards environmental refugees from developed countries displaced by the adverse impacts of climate change. This paper was a dissertation submitted as part of a MSc in Rural Resources and Environment Policy. A copy has been placed in the House of Commons Library.

¹⁵⁶ Ev 131

¹⁵⁷ Q127

analysis and planning.¹⁵⁸ The institutions must be supported by scientific and technical capacity.

50. With ninety percent of suitable land cultivated in Asia and Europe and seventy-five percent cultivated in North America, climate change will have major implications for farming practice. Africa and South America both have more suitable land left uncultivated than is currently under cultivation. Most of this land is concentrated in just a few countries: Angola, Congo, Sudan, Argentina, Bolivia, Brazil and Colombia.¹⁵⁹ In many parts of Africa, despite a drop in rainfall and increasing populations, agricultural productivity has been maintained, largely through improved management.¹⁶⁰ The FAO is working to help build farmers' ability to cope with climate change by encouraging 'no-regrets' agricultural development and by increasing efficiency and flexibility under current climate conditions so that farmers are better placed to deal with future changes. Their 'no-regrets' approach includes reducing the use of nitrogenous fertilisers (which are costly, inefficient and harmful) and making use of breeds of livestock that are efficient converters of feed into milk and meat to reduce methane emissions. They also work with planners to reduce rates of deforestation¹⁶¹ as the erosion of forest cover will have implications for watershed management, biodiversity and the use of forest as carbon sinks.

Maladaptation

51. Achieving a balance between the tensions inherent in the environment agenda and the development agenda, and between economic liberalisation and sustainable development, presents a difficult challenge. It raises the danger of development actions that do not reduce but increase vulnerability, a process known as maladaptation.¹⁶² Preserving existing resilience and adaptive capacity can help avoid maladaptation. Some adaptation strategies and coping mechanisms are latent and communities may be less vulnerable than models might suggest.¹⁶³ Donors must take care to ensure that development activity enhances and does not destroy autonomous and latent coping strategies. Maladaptation arises from development that:

- occurs in risk prone locations;
- is based on short-term considerations;
- neglects known climate variability;
- suffers from a lack of information; or
- is over-reliant on insurance mechanisms.

52. Jonathan Walter, editor of the World Disasters Report, gave us an example of maladaptation in India where an area of mangrove swamp had been cleared for prawn farming; the mangroves had acted as a break to storm surges and subsequent cyclones destroyed not only the prawn farms but threw many small-holders into destitution.¹⁶⁴ **We agree with Neil Adger, Tyndall Centre, that "The first thing that DFID needs to do is make sure that their policies and investments overseas do not actually undermine the capacity to adapt."**¹⁶⁵ Perverse subsidies and large infrastructure projects can undermine adaptive capacity. Without careful assessment and planning, investments in coastal infrastructure, urbanisation, transport and industrialisation could undermine people's ability to adapt spontaneously.¹⁶⁶ Care has to be taken to ensure that disaster risks

¹⁵⁸ Ev 70 [para 4] and Ev 71 [para 9]

¹⁵⁹ Food in the 21st Century: Global Climate Disparities, Mahendra Shah, International Institute for Applied Systems Analysis.

¹⁶⁰ Ev 67 [para 2]

¹⁶¹ FAO, 1997, Agriculture and climate change: FAO's role See www.fao.org

¹⁶² Ev 62

¹⁶³ Ev 61

¹⁶⁴ Q105

¹⁶⁵ Q62

¹⁶⁶ Q63

are not increased by, for example, building on flood plains or changing patterns of land use. **We are convinced that promoting risk management is better than trying to reduce climate hazards through over-reliance on large-scale, inflexible engineering driven structural works, which often turn out to be commercially unviable, technically impractical and impact adversely on the environment.**¹⁶⁷

Managing climate risk

53. Ultimately, adaptation is a risk management strategy.¹⁶⁸ Ian Davis, Cranfield Disaster Management Centre, proposed a risk reduction chain demonstrating the interdependence of the different structural and non-structural measures that could be taken to reduce the risk posed by natural disasters.¹⁶⁹ He told us that very few countries had adequate risk assessment processes in place.¹⁷⁰ Risk assessment, from community levels upwards, is vital if the problems (and solutions) are to be properly identified.¹⁷¹

54. Climate change creates an additional uncertainty about the future. As the climate becomes more variable and extreme events more damaging, relying on historical observations of climatic risks or traditional coping mechanisms may not be sufficient. Societies must adapt to climate change by learning to live with risk. This is achieved by monitoring climate change impacts and adaptive capacity, implementing adaptive responses when appropriate and using climate forecasts to manage near-term risks.

55. Climate change could have a significant impact on health, livelihoods, property, the economy and the environment. But climate change is characterised by uncertainty. Models predict ranges of possible change and impacts are described in terms of likelihoods, vulnerabilities and severity. **Risk management is an ideal tool to help address issues where the probability of consequences has to be balanced against the vulnerability of stakeholders.** Applying the principles of risk management and risk communication may be helpful in analysing climate risk. **But the use of risk management must be underpinned by the precautionary principle and public participation in the process.** Adopting a risk management approach could help to strengthen local disaster preparedness, reduce the vulnerability of the poor, develop formal and informal coping mechanisms and expand access to insurance. The risk of climate change can only be managed through a mix of social and political processes including:

- land use planning and management;
- building codes and standards;
- insurance;
- prediction forecasting;
- warning;
- engineering; and
- new technologies.¹⁷²

¹⁶⁷ Q77

¹⁶⁸ Q61

¹⁶⁹ See figure 1, Ev 80

¹⁷⁰ Q111

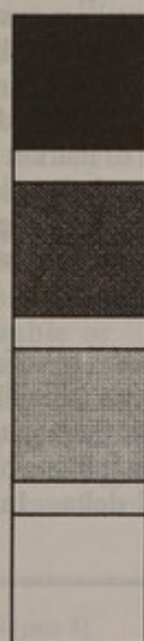
¹⁷¹ *Ibid.*

¹⁷² Bruce, Burton and Egner, 1999, Disaster Mitigation and Preparedness in a changing climate; A synthesis paper produced for emergency Preparedness Canada, Environment Canada and the Insurance Bureau of Canada. (www.epc-pcc.gc.ca/research/scie_tech/disas_miti.html)

Figure 14: Risk diagram for assessing climate risk to development projects and programmes.¹⁷³

Likelihood/Uncertainty/Probability	Almost certain					
	Likely					
	Possible					
	Unlikely					
	Rare					
		Negligible	Minor	Moderate	Major	Severe
Consequence/Severity/Harm						

Risk Scale



Extreme risk: maximum disruption to project, greatest threat to project success, new plan or process required

High risk: significant disruption to project, large threat to success of project. Risk requires higher level of attention. Risk reduction actions needed. Special control/monitoring required.

Medium risk: some disruption to project, some threat to success of the project. Some changes to plan/process may be needed including improved control and monitoring arrangements

Low risk: little disruption, no threat to success, acceptable risk within existing control and monitoring arrangements

56. The application of risk management techniques to climate risk must recognise that there are wider issues beyond simply looking at the magnitude or frequency of impacts. Risk management seeks to base decisions on an analysis of probability

¹⁷³Based on diagram in C. Preyssl, R. Atkins and T. Deak, 1999, Risk Management at ESA (European Space Agency) <http://esapub.esrin.esa.it/bulletin/bullet97/preyssl.pdf>

(likelihood/chance/uncertainty) and magnitude (impact/consequences/severity/hazard) but also considers issues of equity, justice and freedom. In a risk management approach, where there is a lack of full scientific certainty, decisions may have to be guided by the precautionary principle using judgement, values and priorities. For each project or specific case there may be different levels at which action is triggered but the overall framework shown in figure 14 can still be helpful in determining possible courses of action. The process needs to be a participatory one, taking account of the views of as many different stakeholders as possible.

57. People often have different perceptions of risk.¹⁷⁴ Policy makers, the public and scientists may all have different views about what constitutes serious harm and what level of risk is acceptable. Scientists tend to focus on probabilities ('a severe drought is unlikely'). Policy makers and the public focus more on the magnitude of the impact ('a severe drought would be devastating'). Scientists can often be ill-informed about the concerns of the public while policy makers and other stakeholders might have poor information about the probability and magnitude of impacts.¹⁷⁵ Communication and exchange of information are vital if decision making is to reflect the needs of stakeholders and be based on the best scientific information available.

Mitigation

58. Mitigation seeks to reduce the emissions of greenhouse gases and enhance carbon sinks.¹⁷⁶ It could bring several benefits not related to climate including:

- reductions in health problems
- reduction in environmental impacts
- protection and preservation of natural resources (forests, soils, water)
- reductions in subsidies to fossil fuels; and,
- induced technological change.

59. Alternative development paths, with different levels and patterns of production and consumption, will result in different levels of greenhouse gas emissions;¹⁷⁷ a sustainable development path should reduce greenhouse gas emissions.¹⁷⁸ Successful policies on mitigation are likely to be compatible with economic development, for example by reducing the carbon-intensity of the economy. In 1996, China was the second largest emitter behind the US but managed to reverse the trend through a series of market reforms and liberalisations. Its emissions are now eight per cent below the 1996 emissions levels.¹⁷⁹ At the same time its economy grew by a third.¹⁸⁰ Developing countries are willing to take action on mitigation but only once developed countries have made and stuck to commitments to reduce emissions.¹⁸¹

60. Efforts to reduce greenhouse gases will have both an impact on and be affected by socioeconomic policies, especially those relating to development, sustainability and equity.¹⁸² For the vulnerable populations, the closely related issues of mitigation and adaptation are of concern. A failure to mitigate could make adaptation impossible, such as, coping with a metre sea level rise in a densely populated coastal delta. In others,

¹⁷⁴OECD 2001, Identify risk, PUMA/MPM (2001)2

¹⁷⁵Seminar on Health Policy—The Precautionary Principle: Meaning and Utility, 30 January 2002, www.carleton.ca/epic/back3.pdf

¹⁷⁶A sink is a reservoir that can take up and store a chemical element or compound from some part of its natural cycle. For example, soil and trees tend to act as natural sinks for carbon.

¹⁷⁷Report of IPCC Working Group III: Summary for Policy Makers, 2001

¹⁷⁸*Ibid.*

¹⁷⁹Q80 and Q81

¹⁸⁰Q155 and www.news.bbc.co.uk/hi/english/static/in_depth/sci_tech/2001/climate_change/china.stm

¹⁸¹Q87

¹⁸²Report of IPCC Working Group III: Summary for Policy Makers, 2001

mitigation policy could exacerbate impacts on vulnerable livelihoods, for example, by increasing the cost of fertilisers or energy.

Access to energy

61. Energy is essential for social and economic development¹⁸³ and any development strategy must address the need for suitable, sustainable and affordable energy.¹⁸⁴ Many developing countries face an enormous challenge in bridging the energy gap; Andy Haines, London School of Hygiene and Tropical Medicine, told us that two billion people did not have access to adequate energy.¹⁸⁵ Tackling poverty, meeting the Millennium Development Goals (MDGs) and ensuring sustainable development will require an increase in energy consumption. Energy consumption in developing countries is predicted to double over the next twenty years.¹⁸⁶ In the short-term, it is unlikely that an economic case can be made for switching from dirty fuels like coal and oil. Phasing out fossil fuels entirely may not be possible or desirable for many decades.¹⁸⁷ Most developing countries will remain dependent on fossil fuels as a major source of energy for decades to come because they are cheap and readily available.¹⁸⁸ But there can be some synergy between the goals of energy efficiency, greenhouse gas mitigation and energy security. The Intermediate Technology Development Group argued that because developing countries start from relatively low levels of energy consumption there was an opportunity for them to follow a cleaner energy technology path.¹⁸⁹ Substituting gas for coal and other high carbon sources will help to reduce greenhouse gas emissions while still meeting the demand for energy.¹⁹⁰ Gas can provide an environmentally and economically acceptable short-term solution as the renewable sources that will ultimately play a major part in providing energy for power and heat are developed.¹⁹¹ We were encouraged to see in Nigeria that efforts were being made to reduce gas flaring by developing a domestic market for natural gas, tackling flaring and providing an alternative energy source. However, it was clear that more could be done to accelerate the process. Solutions for tackling climate change and bridging the energy gap should combine existing and new energy solutions to ensure the future is both economically and environmentally sustainable.¹⁹²

62. Renewable energy, especially small-scale off-grid solutions, could reduce local, regional, and global environmental impacts as well as energy security risks (in some cases at a lower cost for consumers). For example, renewable energy technologies could be the lowest cost option for providing off-grid household and village-scale power in rural areas of developing countries.¹⁹³ **We accept that fossil fuel use will continue to rise in developing countries as efforts are made to bridge the energy gap. However, each time the use of fossil fuels is considered as a source of energy, developing countries and donors should assess if a viable renewable alternative would ultimately be more sustainable or if there is a low-emission alternative. We believe that the Clean Development Mechanism has a crucial role to play in helping to make this transition and DFID should be promoting it within developing countries. We are conscious that dealing with individual projects is unlikely to bring about the large scale transformation needed in energy systems and some form of mechanism may be necessary to speed up the market transformation to cleaner energy sources.**

¹⁸³ Ev 144 [para 5]

¹⁸⁴ Ev 145 [para 18]

¹⁸⁵ Q44

¹⁸⁶ G8 Renewable Energy Taskforce, Final Report, July 2001. See www.renewabletaskforce.org/report.asp

¹⁸⁷ Ev 146 [para 2.7]

¹⁸⁸ Ev 139

¹⁸⁹ Ev 144 [para 5]

¹⁹⁰ Ev 145 [para 1.2]

¹⁹¹ Ev 147 [para 2.8]

¹⁹² UNEP, 2001, UNEP Finance Initiatives Climate Change Working Group Position Paper.

¹⁹³ G8 Renewable Energy Taskforce, Final Report, July 2001. See www.renewabletaskforce.org/report.asp

63. Significant investment related to energy and power generation, mainly based on fossil fuels, is taking place in developing countries (see table 12). Little is focused on renewable energy or energy efficiency because they are thought to be associated with high costs and long payback periods.¹⁹⁴ Investing in more sustainable technologies could contribute towards sustainable development and reduced greenhouse gas emissions.¹⁹⁵ The Clean Development Mechanism, the Global Environment Facility and multilateral development banks have a significant role to play in helping to shift the focus of investment. The policies of developing countries must ensure that investments help to provide long-term sustainability, deliver emission reductions and encourage technology transfer. However, any policies to mitigate greenhouse gases in developing countries should not result in inequitable restrictions on access to fossil fuels as a source of energy.¹⁹⁶

Table 12: Fossil fuel and renewable energy financing as at Sept 2001¹⁹⁷

Fossil fuel financing, World Bank Group, since 1992	US\$20.8 bn
Estimated lifetime CO ₂ emissions from these projects	40.6 bn tons
Worldwide CO ₂ emissions from consumption/flaring of fossil fuels, 1999:	22.3 bn tons
No. of World Bank Group fossil fuel projects, since 1992	212
Renewable energy/energy efficiency financing, World Bank Group, since 1992	US\$900 million
No. of World Bank Group renewable energy/energy efficiency projects, since 1992	30
Top three recipient countries of World Bank fossil fuel aid since 1992	India (US\$3.196 bn) China (US\$2.914 bn) Russia (US\$2.89 bn)
Total megawatts, fossil fuel power plant generation capacity financed by World Bank since 1992	39,423MW
Total megawatts, existing solar power plant generation capacity worldwide, 2000:	300MW

64. Switching from high carbon fossil fuels to gas or even to renewable energy is only part of the answer in providing energy to the rural poor. The provision of alternative forms of energy needs to be done in parallel with policies to improve the sustainability of biomass (such as firewood, agricultural crops, energy crops, and other organic matter) as an energy source. Half the world depends on biomass fuels for domestic energy and more than two billion people use biomass for cooking. Making the use of biomass more sustainable will have a price. The International Energy Agency has estimated that it would cost about US\$ 12 billion to encourage sixty per cent of biomass users to use energy more sustainably.¹⁹⁸ Set against this, however, policies to reduce greenhouse gases would bring substantial health benefits by tackling the high levels of indoor pollution associated with biomass, or reducing by vehicle emissions.¹⁹⁹ **Donors should promote sustainable use of biomass**

¹⁹⁴Linkages between climate change and sustainable development, Beg et al, 2001 (submitted to Climate Policy in October 2001 revised December 2001)

¹⁹⁵Ev 146 [para 2.2]

¹⁹⁶Ev 139

¹⁹⁷The Sustainable Energy and Economy Network, see www.seen.org/pages/vital.shtml

¹⁹⁸Ev 144 [paras 11–14]

¹⁹⁹Ev 50 [para 4]

energy (firewood and other organic matter used to produce energy) to ensure that access to energy is possible in as environmentally friendly and affordable a way as possible.²⁰⁰ There should be a focus on local production in developing solutions especially in the development of simple measures such as improved stoves, briquetting of sawdust and other indigenous solutions.²⁰¹

International negotiations on climate change

The UNFCCC and the Kyoto Protocol

65. The United Nations Framework Convention on Climate Change (UNFCCC) was signed by more than 150 countries at the 1992 Earth Summit in Rio de Janeiro. Its ultimate aim is the "...stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."²⁰² It established that:

- climate change was a serious problem;
- action could not wait upon the resolution of remaining scientific uncertainties;
- developed countries should take the lead; and,
- developed countries should compensate developing countries for additional costs incurred in taking measures under the Convention.

66. The UNFCCC requires that developed countries help vulnerable developing countries to meet the costs of adaptation, assist with technology transfer and support capacity building.²⁰³ Developing countries are seeking an equitable framework for achieving the stabilisation of atmospheric concentrations of greenhouse gases. They need a clear indication of their current and future obligations based on their current and future emissions. They want to enhance their ability to combat and respond to climate change, particularly by developing adaptive capacity.²⁰⁴

67. The Kyoto Protocol to the UNFCCC was adopted in 1997 and contained additional legally-binding commitments; countries agreed to reduce their greenhouse gas emissions to at least five per cent below 1990 levels between 2008 and 2012. Although the Protocol has yet to come into force, it represents a small but important first step towards tackling climate change.²⁰⁵ Developing countries have not taken on any specific emissions targets, but they do have other obligations under the UNFCCC and Kyoto.²⁰⁶ While the EU and Japan have made progress in ratifying the Protocol, the US, Canada and Australia are reluctant to do so.²⁰⁷ Although it is likely that enough countries will ratify the Protocol to see it enter into force, many believe that without the participation of the US the Protocol would be severely undermined. We hope that our colleagues in Congress will reconsider this issue. However, others feel that without the US the Protocol could actually be more effective as the 'price' of carbon would remain high (there would be more value in trading carbon emissions if the market was not flooded with all of the US emissions) making the various Kyoto mechanisms more attractive. While the US has now accepted that climate change is caused by human activity, they still show no sign of softening their position on

²⁰⁰ Ev 130 [para 5.4]

²⁰¹ Ev 144 [para 15]

²⁰² United Nations Framework Convention on Climate Change, Article 2 (See <http://unfccc.int/resource/docs/convkp/conveng.pdf>)

²⁰³ Ev 13 [para 4.2]

²⁰⁴ Huq et al, 2002, IIED Opinion: Climate Change and Sustainable Development Beyond Kyoto

²⁰⁵ UNEP, 2001, UNEP Finance Initiatives Climate Change Working Group Position Paper.

²⁰⁶ Ev 13 [para 4.5]

²⁰⁷ The Parliamentary Office of Science and Technology has produced two papers on implementing and ratifying the Kyoto Protocol that will provide greater detail on the mechanisms in the Protocol and the ratification process. Post Note Number 147 October 2000 and Post Note Number 176, April 2002.

the Kyoto Protocol. Australia takes a similar position to the US, believing that the Protocol would be damaging to its economy.

68. The Protocol made provision for some market-based mechanisms intended to lessen the potential economic impacts of emission-reduction requirements. These include Joint Implementation, the Clean Development Mechanism, and Emissions Trading. The International Institute for Environment and Development emphasised that the various market mechanisms must deliver sustainable development and address knowledge, technology and resource transfer.²⁰⁸ Over the last two decades the focus has shifted from setting broad global targets, through a range of market-based approaches, like taxation and standards-based approaches, to stand-alone economic instruments. The success of any instrument will depend on:

- the degree to which it addresses environmental and cost effectiveness;
- its flexibility and scope for encouraging innovation;
- its equity;
- its openness; and,
- its public and political acceptability.²⁰⁹

The Clean Development Mechanism

69. The Clean Development Mechanism (CDM), defined in article twelve of the Kyoto Protocol, allows developing countries either to start their own mitigation projects or develop such projects jointly with industrialised countries.²¹⁰ CDM is still new and the detailed provisions governing how it will work are still being worked out. The only CDM projects so far have been pilot projects. However, of the three mechanisms listed in paragraph 68 it is the one most likely to benefit developing countries; the ground rules for the other mechanisms are still to be established. CDM is intended to help developing countries achieve sustainable development while helping developed countries to reach emissions reduction targets.²¹¹ It is a vehicle for the transfer of clean technology and a stimulus for private investment.²¹²

70. Some of the detailed provisions for CDM that are still being worked out relate to funding for adaptation. One proposal is that two per cent of the project be set aside for funding adaptation, although it is unclear if these funds would fully fund projects or supplement other funding. It is unlikely that CDM is going to generate much funding for adaptation in the near future. IIED told us that the absence of the US from the Kyoto Protocol diminished the scope for CDM projects.²¹³ CDM projects are not likely to be evenly distributed; it is estimated that eighty per cent of projects will go to just a few countries (mainly India, China and Brazil).²¹⁴ With low emissions, the countries of sub-Saharan Africa have limited scope for reducing emissions, making it difficult to attract CDM projects. The same barriers that deter foreign direct investment (FDI) are also likely to deter CDM projects from developing countries.²¹⁵ Poorer countries are more likely to attract small scale projects rather than large scale investment. The transaction costs associated with CDM could be as high as tens of thousands of pounds and do not vary significantly with the size of projects. This may make small projects economically unviable within the CDM.²¹⁶ Conscious of this, the CDM Executive Board set up a panel

²⁰⁸ Ev 73 [para 22]

²⁰⁹ Financing Climate Change: Providing Public Goods, preventing public bads, Dr Peter Newell, Institute of Development Studies (IDS). An abridged version of this paper appears in Financing and Providing Global Public Goods: Expectations and Prospects, prepared for the Ministry of Foreign Affairs, Sweden by IDS.

²¹⁰ Ev 139

²¹¹ Ev 14 [para 4.7]

²¹² Ev 73 [para 22]

²¹³ Ev 73 [para 22]

²¹⁴ Ev 14 [para 4.9]

²¹⁵ *Ibid.*

²¹⁶ Ev 15 [para 4.10]

in April 2002 to make recommendations on simplifying procedures for small-scale CDM. We welcome the fact that DFID has commissioned research looking at how CDM projects can contribute to poverty alleviation and examining the scope for simplified procedures for small-scale CDM projects.²¹⁷ **We believe that fixed transaction costs will continue to make small scale CDM projects in developing countries economically unviable. Unless these costs can be reduced or some other provision made for small scale projects the majority of developing countries will see little benefit from CDM. The UK Government should be pressing for these matters to be addressed by the CDM as quickly as possible.**

71. While the distribution of CDM projects might not matter from a global carbon perspective, as it does not matter where emissions reductions take place, it does matter from a sustainable development perspective. The CDM has an explicit objective to promote sustainable development and CDM investments should be supporting this objective. However, the UNFCCC gave the responsibility for ensuring that CDM investments met the sustainable development objective to host countries. Many developing countries lack the experience and capacity to ensure that this objective is met. Donors clearly have an interest in ensuring that each CDM project meets sustainable development criteria. They should ensure that host countries are able to assess and monitor this criteria.²¹⁸ The UK Government could also investigate the scope for building incentives or rewards into CDM so that the CDM can properly recognise the value of additional benefits beyond emissions reductions and climate protection.

The Global Environment Facility

72. Adrian Davis, DFID, explained that the basic *raison d'être* for the Global Environment Facility (GEF) was to provide funds to cover the additional costs of targeting environmental objectives through a development project or programme.²¹⁹ Around US\$1.3bn of the US\$3.4bn GEF has so far allocated has been allocated to climate change but by June 2001 disbursements totalled only US\$386mn. GEF climate change projects are organised into four areas:

- removing barriers to energy efficiency and energy conservation;
- promoting renewable energy by removing barriers and reducing implementation costs;
- reducing the costs of low greenhouse gas emitting energy technologies; and,
- supporting the development of sustainable transport.²²⁰

73. The UNFCCC has often used the GEF as a mechanism to implement new agreements. Three new funds, to be administered by GEF, were established at Bonn (the fifth Conference of Parties, CoP-5) to provide assistance to developing countries. These were:

- the Special Climate Change Fund: to assist developing countries with adaptation and technology transfer;
- the Least Developed Countries Fund: to support the preparation and implementation of national adaptation programmes of action (NAPAs); and,
- the Kyoto Protocol Adaptation Fund: to finance adaptation projects in developing countries that have become parties to the Kyoto Protocol.²²¹

²¹⁷ Ev 37

²¹⁸ Ev 73 [para 24]

²¹⁹ Q37 and Ev 6 [para 31]

²²⁰ Ev 6 [para 31]

²²¹ Ev 13 [para 4.3]

74. Neil Adger, Tyndall Centre, told us that at Marrakech (CoP-7) the GEF was given responsibility for another new fund, the Adaptation Fund.²²² Bilateral donor agencies and national governments are obviously the main players in terms of planning for the future and adaptation. But, with responsibility for so many different funds, GEF is well placed to coordinate much of the international activity and ensure information is shared.²²³ It could ensure that knowledge gained from adaptation work carried out in developing countries was shared efficiently and effectively.²²⁴

75. GEF is the main source of funding for adaptation. Projects are funded in a three-stage process: Stage I for studies and planning only; Stage II for planning and capacity building; and, Stage III for further capacity building as well as actual implementation of adaptation measures. The International Institute for Environment and Development considered that this was a rather cumbersome process. Very few activities have been funded under Stage II and none have been funded under Stage III.²²⁵

76. Bilateral and multilateral donors should ensure guidelines and procedures are simple and straightforward so that the most vulnerable developing countries can access GEF funding easily for work on adaptation to climate change.²²⁶ GEF must address the needs of developing countries including:

- needs for adaptation;
- needs for understanding adaptation processes; and,
- needs to consider migration as a potentially sustainable adaptation strategy both locally and internationally.²²⁷

77. DFID estimated that the UK had provided around £215 million to GEF since its inception. Negotiations are currently under way for the 3rd replenishment of the GEF, to cover the period from 2002 to 2006. The UK has called for a fifty per cent increase in the funds available from US\$2bn to US\$3bn.²²⁸ Adrian Davis, DFID, told us that the increase was to cover work arising from deteriorating global environmental trends and the new responsibilities GEF was being asked to take on.²²⁹ Decisions on the replenishment were being delayed by the US and Japan, who together accounted for about forty per cent of the GEF. The US was two years, or US\$220 million, in arrears on the GEF²³⁰ and was unlikely to settle these arrears in a single payment. **We support DFID's call for an increase in funding available to the GEF provided that first, any additional resources are new resources and other development activities were not jeopardised, and secondly, DFID worked to ensure that a clear allocation was made within GEF for funding work on adaptation beyond capacity building and preparation of NAPAs.** During the replenishment discussions DFID should use its influence to ensure climate change is not lost among the myriad other GEF activities.²³¹

78. The GEF is essentially an environmental fund, with rules appropriate to global environmental concerns; there must be global benefits from work it funds and that the funding it provides must be additional or incremental. However, while these rules are relatively easy to apply to the reduction of greenhouse gas emissions, they are difficult to translate to climate adaptation (or at least to adaptation for human livelihoods). The costs are often not incremental and it is difficult to distinguish at present between the long-term

²²² Q72

²²³ *Ibid.*

²²⁴ Ev 72 [para 21]

²²⁵ Ev 72

²²⁶ Ev 72 [para 21]

²²⁷ Q72

²²⁸ Ev 6 [para 32]

²²⁹ Q36

²³⁰ *Ibid.*

²³¹ Q72

climate change risk and the present exposure to climatic variability. **The GEF should be strongly encouraged to develop means to fund precautionary adaptation projects that reduce the impact of present climatic variations on the most vulnerable populations.**²³²

Equity in international negotiations

A northern focus

79. Developed countries have contributed more to climate change while developing countries suffer the most from its consequences. Equity and social justice lie, therefore, at the heart of the climate change debate. But they have not often featured in what are northern-focused and environmentally-dominated negotiations. For example, negotiations have largely ignored adaptation, a prime concern of developing countries.²³³ Benito Müller, Oxford Institute for Energy Studies, told us that the international climate regime had focused almost exclusively on mitigation.²³⁴ Negotiations had focused on reducing the burden of implementation on polluters²³⁵ and market mechanisms intended to reduce emissions were geared towards northern consumers and were unlikely to deliver technologies that would directly benefit the poor.²³⁶ Future negotiations could be jeopardised, unless notions of fairness and equity are adequately addressed.²³⁷

Negotiating capacity

80. Climate change does not attract the same levels of international attention as other policy issues. There is a marked imbalance between the international institutions dealing with trade and those dealing with the environment or sustainable development.²³⁸ Similarly there is an imbalance in the negotiating capacity that developed and developing countries can bring to international negotiations. Benito Müller told us that at the Bonn Conference of Parties (CoP-5), where the negotiations had continued for three days without interruption, the US had 120 official delegates while India had seven, and some countries only one.²³⁹ Developing countries often lack the capacity or resources to play a full part in international negotiations, even to the extent of having the resources or capacity to field a team able to cope with the demands of successive all-night negotiations. It is of little surprise then that the results emerging from such negotiations do not fully address the needs or concerns of developing countries. Pooling resources in larger groupings, such as the G77 and China bloc, could help but the internal politics of such groupings sometimes undermines their effectiveness. Some funding is available to help developing countries participate in international meetings. A trust fund was established by the UNFCCC to support the participation of representatives from developing countries, especially least developed countries, small island states and economies in transition. Additional funding and programme-specific budgets were made available to support participation in workshops and expert group meetings. This is all welcome but does little to address the huge imbalance in the negotiating and scientific capacity between north and south. **We find the huge imbalance in the negotiation capacity between developed and developing countries alarming. The best way to bring about fairness and equity will be to ensure developing countries can shape and implement agreements effectively. Institutional**

²³² Downing and Klein, Towards an International Funding Strategy for Climate Adaptation: A Contribution from Adaptation Science. A Background Paper to the Scientific and Technical Advisory Panel of the Global Environment Facility. Nairobi: STAP/GEF.

²³³ UNEP, 2001, UNEP Finance Initiatives Climate Change Working Group Position Paper.

²³⁴ Q90

²³⁵ Huq et al, 2002, IIED Opinion: Climate Change and Sustainable Development Beyond Kyoto

²³⁶ Ev 145 [para 18]

²³⁷ Linkages between climate change and sustainable development, Beg et al, 2001 (submitted to Climate Policy in October 2001 revised December 2001)

²³⁸ Huq et al, 2002, IIED Opinion: Climate Change and Sustainable Development Beyond Kyoto

²³⁹ Q91

capacities will have to be strengthened and negotiating capacity developed. DFID could make an important contribution towards helping developing countries play a more significant part in international negotiations, as it does for trade negotiations.²⁴⁰

81. It is not only a matter of capacity but also of priorities. The International Institute for Environment and Development told us that small island states were well organised and had formed the Alliance of Small Island States (AOSIS). AOSIS has obtained legal and technical advice to help it in negotiations.²⁴¹ The least developed countries (LDCs) were less well organised in climate change negotiations than they were in other fora, such as the World Trade Organisation (WTO).²⁴² LDCs need access to scientific and legal advice, either by boosting their own capacity or from independent sources.

Setting emissions targets fairly

82. Both atmospheric stabilisation of greenhouse gases and the entry of developing countries into the climate regime are likely to require a move to *per capita* emission targets.²⁴³ David Crichton and the Corner House both suggested DFID should consider the 'contraction and convergence' model set out by the Global Commons Institute.²⁴⁴ Contraction and convergence is based on *per capita* emissions and offers an opportunity to address issues of equity. With emissions shared on a *per capita* basis, developed and developing countries could trade surplus emissions rights.²⁴⁵ Advocates of contraction and convergence point to its inherent equity and its ability to bring together developed and developing countries in a single framework. However, contraction and convergence recognises that emissions from developing countries will grow and does hold back their development in order to rectify damage caused by developed countries.²⁴⁶

83. Benito Müller proposed a global compromise set of quotas under which each country is given an allocation between their present use and a *per capita* entitlement. This would reduce the cost of lowering global emissions and still permit many developing countries to benefit from selling their surplus rights. Figure 15 clearly shows that *per capita* carbon emissions are many times higher in high income countries than in low income countries. But it also shows that high income countries are more carbon-efficient in producing wealth. While developed countries need to reduce the amount of carbon they produce per person, developing countries must become more efficient in their use of carbon. Developing countries have an opportunity to avoid making the mistakes developed countries made during the industrialisation of the North. They can follow a cleaner development path, becoming more efficient in their use of carbon as their economies grow, investing in energy efficiency and low carbon energy supplies.

84. UK policy on emissions reduction has focused on bringing the Kyoto Protocol into force. DFID recognised that the targets in the Protocol were probably inadequate but argued that the Protocol would provide a starting point from which to make further progress. DFID acknowledged that contraction and convergence models had an intuitive logic, but noted that their success depended on developed countries making significant cuts in emissions. There has been little evidence that developed countries are willing to do this. DFID stated that, without agreement to reduce emissions, contraction and convergence was "...interesting but ...little more than that".²⁴⁷

²⁴⁰ Ev 70 [para 5]

²⁴¹ See www.field.org.uk/fieldmain/climate.htm

²⁴² Ev 71 [para 10]

²⁴³ Huq et al, 2002, IIED Opinion: Climate Change and Sustainable Development Beyond Kyoto

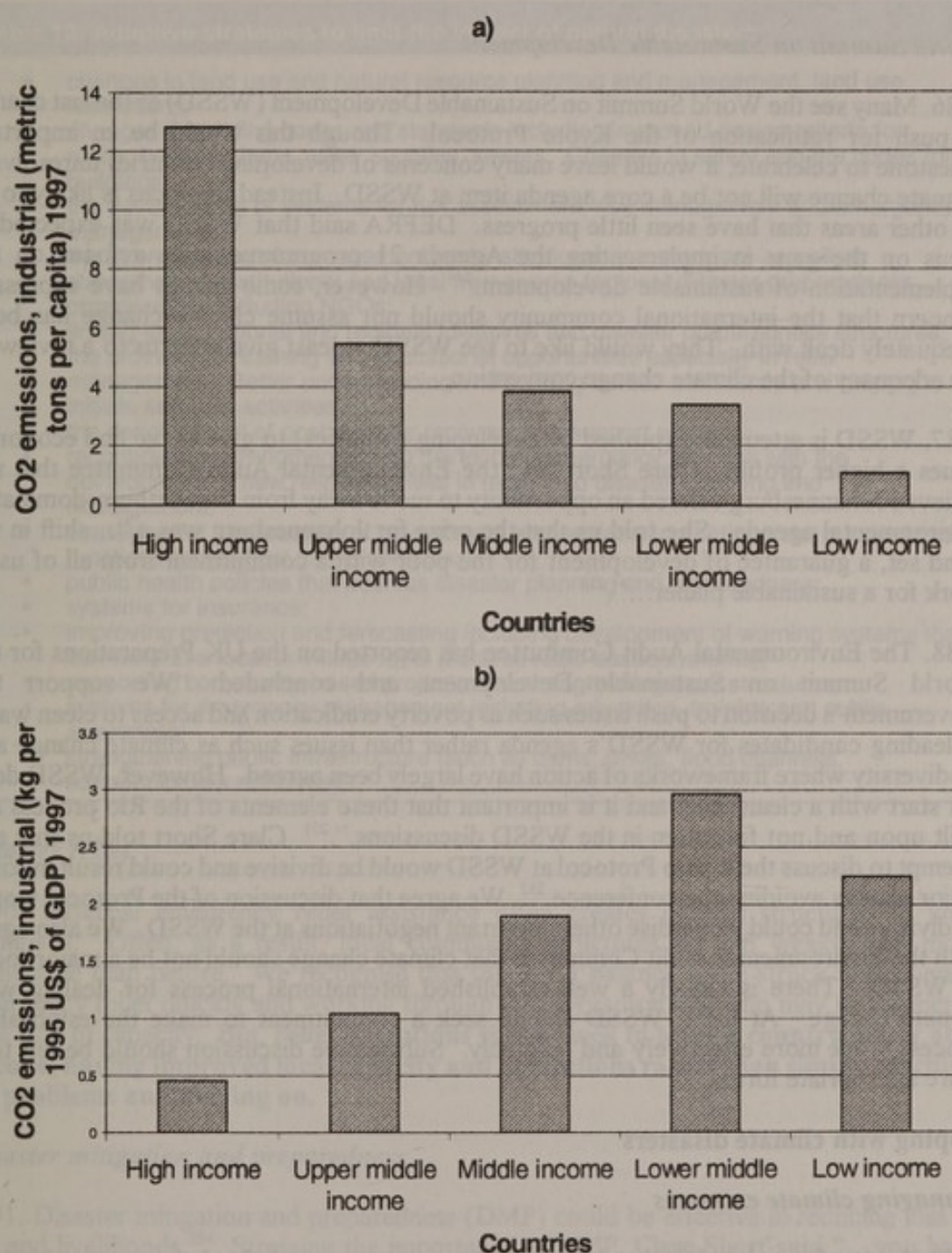
²⁴⁴ Ev 138 and Ev 151

²⁴⁵ The Corner House, 1997, Climate and Equity, After Kyoto

²⁴⁶ Ev 125 [paras 31–32]

²⁴⁷ *Ibid.*

Figure 15: Carbon emissions on a) a per capita basis and b) per US\$ of GDP. High income countries emit ten times the CO₂ of low income countries. However, lower income countries are inefficient producing much more carbon per US\$ GDP than the high income countries.²⁴⁸



85. There would appear to be a clear case for moving to *per capita* emissions levels. But, the main point is to set quotas that can be traded. Some element of the quota should be *per capita*, but this should be set at an existing baseline, like 1990, so that there is a disincentive to continue population growth (energy use can grow but the quota is already fixed). It will be more difficult to make targets based on notions of carbon-intensity or percentage energy efficiency work in practice and they may not deliver the intended

²⁴⁸Source: World Bank Development Indicators

benefits. In designing any scheme to share emissions rights or allocate emissions targets it is important to remember that the international community has a poor track record when it comes to dividing global commons, like oceans or the atmosphere, equitably.

World Summit on Sustainable Development

86. Many see the World Summit on Sustainable Development (WSSD) as the last chance to push for ratification of the Kyoto Protocol. Though this would be an important milestone to celebrate, it would leave many concerns of developing countries unresolved. Climate change will not be a core agenda item at WSSD. Instead the focus is likely to be on other areas that have seen little progress. DEFRA said that WSSD was expected to focus on the gaps in implementing the Agenda 21 programme, with a focus on the implementation of sustainable development.²⁴⁹ However, some groups have expressed concern that the international community should not assume climate change has been adequately dealt with. They would like to see WSSD at least give impetus to a review of the adequacy of the climate change convention.

87. WSSD is attempting (pushed by developing countries) to give social and economic issues a higher profile. Clare Short told the Environmental Audit Committee that she believed Johannesburg offered an opportunity to move away from the northern-dominated environmental agenda. She told us that the prize for Johannesburg was a "...shift in the mind set, a guarantee of development for the poor with a commitment from all of us to work for a sustainable planet..."²⁵⁰

88. The Environmental Audit Committee has reported on the UK Preparations for the World Summit on Sustainable Development and concluded: "We support the Government's decision to push issues such as poverty eradication and access to clean water as leading candidates for WSSD's agenda rather than issues such as climate change and biodiversity where frameworks of action have largely been agreed. However, WSSD does not start with a clean sheet and it is important that these elements of the Rio process are built upon and not forgotten in the WSSD discussions."²⁵¹ Clare Short told us that any attempt to discuss the Kyoto Protocol at WSSD would be divisive and could result in some major players avoiding the conference.²⁵² We agree that discussion of the Protocol would be divisive and could jeopardise other important negotiations at the WSSD. We also agree with the Environmental Audit Committee that climate change should not be a major focus of WSSD. There is already a well established international process for dealing with climate change. At most, WSSD should seek a commitment to make the established process work more effectively and equitably. Substantive discussion should be left to a more appropriate forum.

Coping with climate disasters

Managing climate extremes

89. A mix of social, political and economic measures are needed to help manage the risks posed by extreme climate changes. Post-disaster reconstruction offers an opportunity to rebuild infrastructure and systems in a different way, making them more resilient. There are opportunities to change agricultural practice, land use planning, and building codes. Table 13 lists several adaptive strategies that have been used in the past to moderate the

²⁴⁹ Ev 15 [para 5.4]

²⁵⁰ Q150

²⁵¹ Third Report from the Environmental Audit Committee, Session 2001–2002, UK Preparations for the World Summit on Sustainable Development, HC616

²⁵² Q155

effect of natural disasters (although they are not always adequately or fully applied, and so their effectiveness is limited).

Table 13: Adaptive strategies to limit the impact of natural disasters²⁵³

- changes in land use and natural resource planning and management, land use restrictions;
- changes in building codes and standards including improved design criteria for roads, bridges, dams, water supplies, sewers. Changes in safety and fire codes for buildings;
- the development of systems for risk assessment, risk management and emergency management;
- the strengthening of management and institutional preparedness as well as strengthening institutional and legal frameworks for local disaster-preparedness organisations including NGOs;
- linking local, national and regional initiatives and disaster preparedness structures;
- the provision of training and educational opportunities especially in relief management. Better understanding and training for self sufficiency and helping to initiate self help activities.
- the development of post disaster recovery and support systems;
- reconfiguring, strengthening and developing emergency services with the development of new responsibilities in relation to disaster planning and management;
- strategies for continuation of government and business operations and survival and functioning of critical public services;
- public health policies that address disaster planning and preparedness;
- systems for insurance;
- improving prediction and forecasting including development of warning systems that can work at a local or village level (such as radio based systems);
- supporting community-based projects and strengthening local structures;
- systems for emergency management including education, training and public awareness;
- strengthening public infrastructure (such as dams, dykes, flood channels, communication networks);

Disaster relief

90. External emergency relief assistance often creates parallel structures to local initiatives. Often, as a result, local community structures are left weaker and more vulnerable than before. We recognise that there is a balance to be struck in delivering emergency relief quickly and working through local organisations who may be hampered by a lack of capacity. But, **relief operations should seek to leave a country better able to cope, having improved local capacity and institutions rather than simply patching up problems and moving on.**

Disaster mitigation and preparedness

91. Disaster mitigation and preparedness (DMP) could be effective in reducing loss of life and livelihoods.²⁵⁴ Stressing the importance of DMP, Clare Short said "...you have floods in the southern United States of America and a few people lose their cars; you have them in Mozambique—it used to be Bangladesh but Bangladesh has learned—thousands of people lose their lives. Part of dealing with catastrophes is to be prepared and organised to deal with them."²⁵⁵ A well functioning early-warning system can be one of the most effective measures for saving lives. In 1971, a cyclone in Bangladesh cost 300,000 lives. A similar storm in 1991 killed about 100,000 and in 1998 in another comparable event only

²⁵³Bruce, Burton and Egener, 1999, Disaster Mitigation and Preparedness in a changing climate; A synthesis paper produced for emergency Preparedness Canada, Environment Canada and the Insurance Bureau of Canada. (www.epc-pcc.gc.ca/research/scie_tech/disas_miti.html)

²⁵⁴Ev 83

²⁵⁵Q152

about 100 died.²⁵⁶ But early warning systems can only help to save lives if adequate provision is made for shelter and evacuation. They can do little to prevent economic loss and destruction of livelihoods.

92. Many witnesses stressed the need for DMP work to be properly funded. Ian Davis, Cranfield Disaster Management Centre, noted that while donors often generously funded relief work, longer-term reconstruction and rehabilitation was starved of resources.²⁵⁷ In their memorandum, Tearfund said that the cost of investing in disaster mitigation and preparedness was lower than the cost of post-disaster relief and reconstruction. But despite the case for investment, donors see DMP as a low priority. Tearfund argued that if international development targets were to be met disaster mitigation and preparedness had to be given a higher priority and more funding. It is unclear why DMP is starved of resources while relief work is well funded, but it may be related to the fact that the cost of DMP work is often borne by developing countries while relief and reconstruction is funded by donors and aid agencies.

93. Disaster mitigation needs to be put on a more formal footing within many countries. Developing countries have seen DMP as a low priority²⁵⁸ and often it is not reflected in national plans and strategies.²⁵⁹ It should be integrated within existing structures and become part of the normal political and development process.²⁶⁰ Coordinating activity under the umbrella of the International Strategy for Disaster Reduction (ISDR) could provide a focus for increasing and improving disaster mitigation and preparedness work within a country.²⁶¹ A lack of capacity and resources in developing countries has hampered DMP²⁶² where even low-cost interventions have not been implemented largely because of a lack of knowledge and awareness. Many represent 'no-regrets' options as even in the absence of climate change, improving disaster mitigation and preparedness has the potential to deliver significant economic and social benefits.²⁶³

94. Ian Davis, Cranfield Disaster Management Centre, advocated the involvement of local communities and devolution of control for some DMP activities.²⁶⁴ Much of the detailed planning and policy making on disaster mitigation and preparedness needs to happen at a local or community level. There is a difficulty, however, in that much of the information on climate change impact exists only at a global or national level. Activity at national and local levels needs to be coordinated with the involvement of public and private organisations and other stakeholders. Capacity for addressing DMP is often better at a local government level. At a local level people need to be encouraged to participate in coordinating meetings and committees. It is vital that at a local level there is a focus on the need for families to have some minimum level of self-sufficiency.²⁶⁵

²⁵⁶ Q17

²⁵⁷ Q101

²⁵⁸ Ev 83

²⁵⁹ Q113

²⁶⁰ Q124

²⁶¹ Bruce, Burton and Egener, 1999, *Disaster Mitigation and Preparedness in a changing climate*; A synthesis paper produced for emergency Preparedness Canada, Environment Canada and the Insurance Bureau of Canada. (www.epc-pcc.gc.ca/research/scie_tech/disas_miti.html)

²⁶² Ev 83

²⁶³ Bruce, Burton and Egener, 1999, *Disaster Mitigation and Preparedness in a changing climate*; A synthesis paper produced for emergency Preparedness Canada, Environment Canada and the Insurance Bureau of Canada. (www.epc-pcc.gc.ca/research/scie_tech/disas_miti.html)

²⁶⁴ Q119

²⁶⁵ Bruce, Burton and Egener, 1999, *Disaster Mitigation and Preparedness in a changing climate*; A synthesis paper produced for emergency Preparedness Canada, Environment Canada and the Insurance Bureau of Canada. (www.epc-pcc.gc.ca/research/scie_tech/disas_miti.html)

IV CLIMATE CHANGE AND THE INTERNATIONAL DEVELOPMENT AGENDA

Linking to the international development agenda

Climate change, poverty and the environment

95. Environmental issues and poverty are closely linked and must be tackled together. Many poor people make their living from or depend on natural resources and are concerned about environmental issues. Links between tackling poverty and addressing environmental issues therefore need to be recognised in the strategies and policies of donors and recipient countries alike. We welcome the fact that DFID is encouraging developing countries to make such links.²⁶⁶

96. But DFID, along with most other donors, has paid too little attention to global climate change.²⁶⁷ DFID's evidence made it clear that to them climate change was just one of the many environmental issues threatening development. We disagree. By grouping climate change with environmental degradation or mismanagement of natural resources the long-term nature of climate risks will be overlooked as DFID's policies react to short-term concerns. Climate change must have an identity of its own within DFID's portfolio of work on environmental issues that makes it distinct from short-term environmental concerns. Issues such as desertification, loss of biodiversity, loss of habitat and climate change are all long-term problems requiring global solutions and DFID needs to ensure that they are not lost in a big box just labelled 'the environment'.

Climate change and sustainable development

97. The notion of sustainable development has evolved considerably since the Brundtland Commission's 1987 report and the Rio Summit. It is no longer linked solely with the environmental agenda. DFID's memorandum stated that sustainable development recognised the need to address the social, economic and environmental aspects of development.²⁶⁸ But sustainable development is still sometimes narrowly interpreted as being concerned only with the environment,²⁶⁹ although in practice it is social and economic development that are addressed while environmental concerns are often marginalised. The tools of cost benefit analysis make the economic dimension of sustainable development easier to grasp, but the social and environmental impacts of policies are more difficult to assess. Saleemul Huq argued that consideration of climate change helped to focus attention on sustainability rather than just on the developmental aspects of sustainable development. It enabled a long-term perspective on development to be taken on issues such as energy policy, disaster management, population growth and consumption. In his view, a climate change perspective brought the issue back to "...the sustainable development paradigm rather than the immediate development paradigm which many people are locked into, both national governments and aid agencies."²⁷⁰

²⁶⁶ Q166

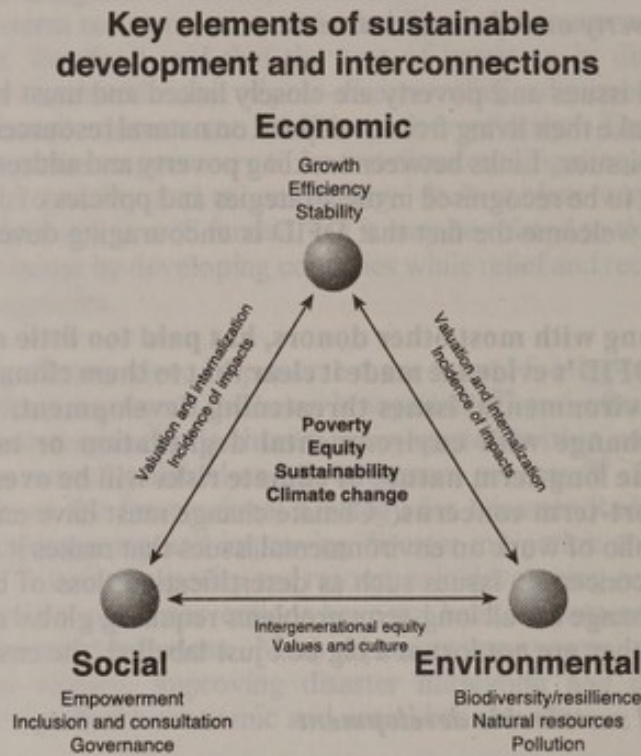
²⁶⁷ Ev 131

²⁶⁸ Ev 1 [para 2]

²⁶⁹ *Ibid.*

²⁷⁰ Q93

Figure 16: The triangle shows the three major dimensions of sustainable development. Examples of linkages between the economic, social and environmental dimensions are shown along the sides of the triangle with important issues that interact with all three dimensions shown inside the triangle.²⁷¹



98. Because climate change is seen as accelerating irreversible changes in habitats and biodiversity, the policy response has tended to focus on durability. We are encouraged that DFID recognises that conservation does not have to exclude economic use of natural resources. As Clare Short told us, forestry and logging can be carried out sustainably.²⁷² However, the Tyndall Centre argued that wealth creation and sustainability do not always go hand in hand. Sometimes a move from cash crops to food crops and a return to traditional farming methods produces a more sustainable livelihood for the rural poor (who are often adversely affected by increasing industrialisation in an economy).²⁷³

99. The development pathway the world chooses to follow will affect future vulnerability. Population growth and future economic development will affect the scale of the impacts of climate change. A world with lower population and where wealth is more equitably distributed will suffer less from the adverse impacts of climate change.²⁷⁴ Climate change and sustainable development are interdependent. If development is to occur in a way that is socially, economically and environmentally sustainable then sustainable development has to be made the central goal of any global climate regime.²⁷⁵ And climate change policies must form a part of any overall sustainable development strategy.²⁷⁶ **DFID's policies should reflect the interdependency between sustainable development and climate change.**

²⁷¹ IPCC, 2001, Third Assessment Report, Synthesis Report—Technical Summary.

²⁷² Q152

²⁷³ Ev 61

²⁷⁴ Ev 39

²⁷⁵ Huq et al, 2002, IIED Opinion: Climate Change and Sustainable Development Beyond Kyoto

²⁷⁶ Q49

100. The IPCC's rejection of a proposal to prepare a technical report on climate change and sustainable development represents a missed opportunity.²⁷⁷ **We believe the UK government should be pushing the IPCC to pay greater attention to adaptation, the linkages between climate change and sustainable development, and the identification of 'no-regrets' and 'win-win' responses. Developing countries should also be encouraged by the UK Government to apply pressure within the IPCC on the same issues.** The IPCC needs to develop its capacity to deal with sustainability and development. Currently, all of its Technical Support Units (TSUs) are based in developed countries. Development agencies often have little direct role in the IPCC's operations. Vulnerability has been defined solely in terms of climate change, rather than integrating climate change exposure and climatic risks or disasters. The IPCC's work is driven more by future climate scenarios than present climatic risks, the need for adaptation, or coping capacity. But the recent appointment of a new chair, Dr Rajendra Pachauri, offers an opportunity to reorient the IPCC process towards a development first agenda. **DFID should support efforts to orient the IPCC toward climate risk management, including present climatic variability and disasters, as part of ongoing development planning. DFID could also examine the scope for jointly funding a Technical Support Unit with a leading developing country to examine development and equity issues, promoting research to develop innovative projects on climate change adaptation in developing countries, and supporting policy dialogues in developing countries.**

Climate change and the Millennium Development Goals

101. Clare Short said that climate change would add to the difficulties of meeting the Millennium Development Goals.²⁷⁸ DEFRA's submission recognised that action to tackle climate change was intimately linked with the achievement of the MDGs²⁷⁹ and that without serious action to tackle climate change and to integrate it into all areas of policy, the achievement of the MDGs could be in jeopardy.²⁸⁰ DFID's Departmental Report for 2002 made clear that progress towards MDGs was slowest in sub-Saharan Africa and, on current trends, Africa was unlikely to meet any of the MDGs.²⁸¹ Climate change will compound the problem as both the IPCC and the evidence we received made clear that Africa would face a significant number of adverse affects from climate change (see paragraph 20 and figure 7). Climate risk can only make achievement of the MDGs even harder. Climate change could prevent the MDGs being achieved or undermine development in the longer-term, unless development investment includes some element to improve capacity for adaptation.²⁸² However, tackling climate change is compatible with both the achievement of the MDGs and sustainable development. But, it needs to be considered at an early stage in policy formulation and needs to be properly integrated. We welcome the work within DFID to examine the impact of climate change on the MDGs.²⁸³

²⁷⁷ Ev 73 [para 23]

²⁷⁸ Q159

²⁷⁹ Ev 10 [para 1.4]

²⁸⁰ Ev 9 [para entitled Executive Summary]

²⁸¹ DFID, 2002, Departmental Report 2002, Cm 5414

²⁸² Ev 60

²⁸³ Q7 and Ev 121 [para 3]

Table 14: Impact of climate change on Millennium Development Goals

Millennium Development Goals with targets	Possible adverse impacts
Goal 1: Eradicate extreme poverty and hunger <ul style="list-style-type: none"> • Halve, between 1990 and 2015, the proportion of people whose income is less than US\$1 a day • Halve, between 1990 and 2015, the proportion of people who suffer from hunger 	<ul style="list-style-type: none"> • Decreased crop yields • Increase pressure on government and private flood insurance systems • Increased economic losses and damage to infrastructure • Loss of livelihoods • Decreased potential for use of hydroelectric power
Goal 2: Achieve universal primary education <ul style="list-style-type: none"> • Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling 	<ul style="list-style-type: none"> • Secondary impacts from weakened economic and human systems • Damage to infrastructure
Goal 3: Promote gender equality and empower women <ul style="list-style-type: none"> • Eliminate gender disparity in primary and secondary education preferably by 2005 and in all levels of education no later than 2015 	<ul style="list-style-type: none"> • No direct impacts • Indirect impacts through reinforcement of traditional gender roles under weakened economic systems e.g. child bearing, collecting firewood and water
Goal 4: Reduce child mortality <ul style="list-style-type: none"> • Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate 	<ul style="list-style-type: none"> • Heat stress increases risk of death and serious illness for urban poor • Malnutrition due to decreased food availability • Extended range and activity of some pest and vector-borne diseases • Increase death and injury associated with extreme events • Increased risk of infectious diseases and epidemics associated with extreme events
Goal 5: Improve maternal health <ul style="list-style-type: none"> • Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio 	<ul style="list-style-type: none"> • Increased risk of death and serious illness for urban poor • Malnutrition due to decreased food availability • Extended range and activity of some pest and vector-borne diseases • Increase death and injury associated with extreme events • Increased risk of infectious diseases and epidemics associated with extreme events
Goal 6: Combat HIV/AIDS, malaria, and other diseases <ul style="list-style-type: none"> • Have halted by 2015 and begun to reverse the spread of HIV/AIDS • Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases 	<ul style="list-style-type: none"> • Extended range and activity of some pest and vector-borne diseases • Increased risk of infectious diseases and epidemics associated with extreme events

<p>Goal 7: Ensure environmental sustainability</p> <ul style="list-style-type: none"> • Integrate the principles of sustainable development into country policies and program and reverse the loss of environmental resources • Halve, by 2015, the proportion of people without sustainable access to safe drinking water • Have achieved, by 2020, a significant improvement in the lives of at least 100 million slum dwellers 	<ul style="list-style-type: none"> • Increased flood, landslide, avalanche and mudslide damage • Increased risk of forest fires • Decreased water resource quality and quantity • Displacement of people in coastal areas especially in megacities and associated peri-urban areas. • Increased damage to coastal ecosystems, coral reefs and mangroves • Increased soil erosion
<p>Goal 8: Develop a global partnership for development</p> <ul style="list-style-type: none"> • Develop further an open, rule-based, predictable, nondiscriminatory trading and financial system (includes a commitment to good governance, development, and poverty reduction—both nationally and internationally) 	<ul style="list-style-type: none"> • Exacerbation of regional resource conflicts makes it more difficult to establish systems for good governance, trade and finance.

Policy coherence and integration in developed countries

Policy integration

102. Having agreed an international framework, many countries are well into the process of formulating specific climate policies. Policy integration and coherence are probably the cheapest and the most effective contributions any government can make towards climate protection. Without proper integration and coherence, policies to protect the climate will be undermined, countered and rendered ineffective by other policies. Climate protection needs to be a fully integrated component of policies on energy, agriculture, transport, trade and industry, as well as international development and cooperation. These policies should always seek to protect or at least ensure a minimal impact on the climate.²⁸⁴ Benito Müller, Oxford Institute for Energy Studies, said "Climate change needs to be mainstreamed in development policy, not the other way round. It is not environmental protection; it is human impacts which count in the developing world."²⁸⁵ Integration and coherence must extend to policies at local or regional level as issues like urban planning can have an important impact.²⁸⁶ Figure 17 shows a schematic representation for an integrated framework.

103. Any policy for action on climate change and climate risk should cover four key areas:

- Raising awareness across all sectors, countries, communities;
- Mitigation to reduce greenhouse gases;
- Adaptation to manage the effects of climate change;
- Research to monitor changes, refine progress and define the effects more precisely and to develop tools to deal with it.²⁸⁷

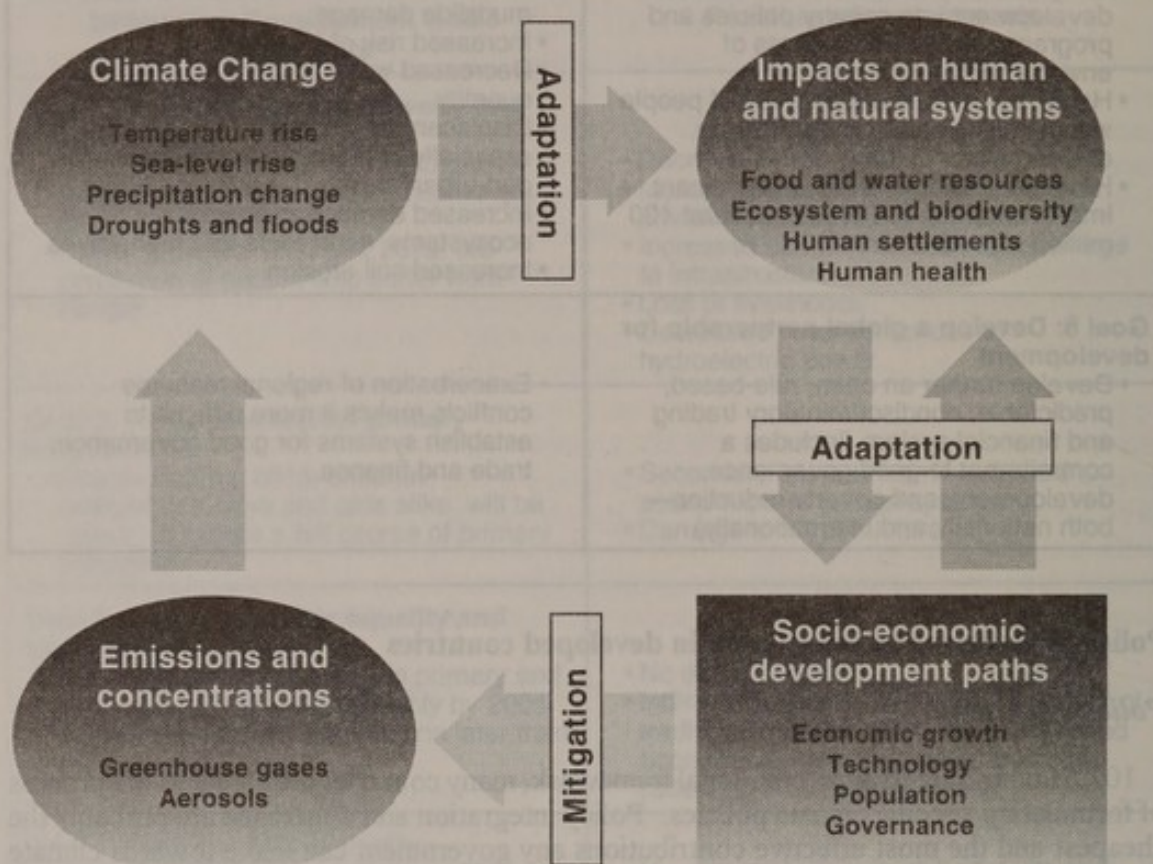
²⁸⁴ Financing Climate Change: Providing Public Goods, preventing public bads, Dr Peter Newell, Institute of Development Studies (IDS). An abridged version of this paper appears in Financing and Providing Global Public Goods: Expectations and Prospects, prepared for the Ministry of Foreign Affairs, Sweden by IDS.

²⁸⁵ Q90

²⁸⁶ Linkages between climate change and sustainable development, Beg et al, 2001 (submitted to Climate Policy in October 2001 revised December 2001)

²⁸⁷ UNEP, 2001, UNEP Finance Initiatives Climate Change Working Group Position Paper.

Figure 17: Climate change—an integrated framework. Schematic representation of an integrated assessment framework for considering climate change.²⁸⁸



104. At present there is a lack of policy coherence and integration nationally as well as internationally.²⁸⁹ All government actions need to support measures taken to address climate change. Cooperation cannot just be across government departments and between international agencies, it must also link environment and development goals. While DEFRA is working to reduce climate impacts and limit emissions, other departments continue to support and subsidise the use of fossil fuels. Greenpeace told us that ECGD had provided support for 140 fossil fuel and nuclear power generation projects in thirty-eight countries between April 1992 and April 2001. To date it had not invested in any renewable energy projects other than some large and medium sized hydroelectric projects.²⁹⁰ DFID said that they had advised ECGD on the approaches it might take to looking at the environmental consequences of export credits but said it was for ECGD to make the decisions and seek further advice where it could find it.²⁹¹ **Work undertaken to mitigate the effects of greenhouse gases should not be undermined by other policies, such as support given to fossil fuel projects where suitable renewable alternatives exist. We urge ECGD to help focus investments in developing countries on sustainable solutions through the application of its sustainable development guidelines.**

²⁸⁸ IPCC, 2001, Third Assessment Report, Synthesis Report—Summary for Policy Makers

²⁸⁹ Linkages between climate change and sustainable development, Beg et al, 2001 (submitted to Climate Policy in October 2001 revised December 2001) and Financing Climate Change: Providing Public Goods, preventing public bads, Dr Peter Newell, Institute of Development Studies (IDS). An abridged version of this paper appears in Financing and Providing Global Public Goods: Expectations and Prospects, prepared for the Ministry of Foreign Affairs, Sweden by IDS.

²⁹⁰ Ev 140 [para 7] and Ev 141 [para 10]

²⁹¹ Q18

Donor action and coordination

105. In general, donors do not recognise climate change as a development problem and overall there has been little funding of work on adaptation.²⁹² Effort among donor agencies and specialist bodies established to deal with climate change and climate protection is often duplicated. In addition, many organisations are now being asked to work on areas that are beyond their core competencies.²⁹³ It has not been possible to quantify the aid flows that directly support the UNFCCC or that relate directly to climate change.²⁹⁴ However, interest in donor activity is growing; the German technical cooperation agency, GTZ, recently commissioned a paper on adaptation to climate change.²⁹⁵ **DFID could influence the focus on adaptation and work to develop a greater understanding of the importance of adaptation among donors.**²⁹⁶

106. Adaptation to climate change must be considered by donors in cases where a development project or programme has long-term goals expected to last for decades.²⁹⁷ Examples might include infrastructure projects, or projects, such as forestation, that cause slow changes in patterns of land-use. Climate change could affect the sustainability or even success of donors' projects and programmes in several ways:

- there may be a risk to a project and its deliverables from climate change impacts;
- the intended beneficiaries may be vulnerable to climate change impacts or to the effects of mitigation policies; or,
- the project could increase a community's or an ecosystem's vulnerability to climatic hazards.²⁹⁸

107. Donors need to establish evaluation criteria and performance indicators relevant to climate change. They should also consider developing a general criterion for development investment that focuses on long-term sustainability, in addition to existing criteria for poverty focus, gender balance and environmental protection.²⁹⁹ Some form of climate impact assessment is needed, just as environmental impact assessments have become the norm for large infrastructure projects.³⁰⁰ At the very least, risk and vulnerability assessments should be conducted alongside environmental impact assessments.³⁰¹ The Tyndall Centre recommended assessing the impact of climate change on existing and planned projects.³⁰² They also recommended identifying vulnerability hot-spots, so that capacity building and adaptation programmes can be properly targeted. DFID told us that it was currently reviewing its environmental screening procedures and would consider how climate impacts should be incorporated into the process.³⁰³ **We recommend that DFID encourage other donors, bilateral and multilateral, to develop evaluation criteria and performance indicators for climate change. Donors, including DFID, should begin carrying out climate impact assessments that review both the potential impact of climate change on a project and the impact of any project on climate. DFID could**

²⁹² Q97

²⁹³ Financing Climate Change: Providing Public Goods, preventing public bads, Dr Peter Newell, Institute of Development Studies (IDS). An abridged version of this paper appears in Financing and Providing Global Public Goods: Expectations and Prospects, prepared for the Ministry of Foreign Affairs, Sweden by IDS.

²⁹⁴ *Ibid.*

²⁹⁵ Klein, R, 2001: Adaptation to Climate Change in German Development Assistance—An inventory of activities and opportunities, with a special focus on Africa, Deutsche Gesellschaft für Zusammenarbeit, Eschborn, Germany.

²⁹⁶ Q75

²⁹⁷ *Ibid.*

²⁹⁸ *Ibid.*

²⁹⁹ *Ibid.*

³⁰⁰ Q96

³⁰¹ Klein, R, 2001: Adaptation to Climate Change in German Official Development Assistance—An inventory of activities and opportunities, with a special focus on Africa, Deutsche Gesellschaft für Zusammenarbeit, Eschborn, Germany.

³⁰² Ev 68 [para 3i]

³⁰³ Ev 124 [para 24]

play a leading role by developing such criteria and then spreading best practice. The outcomes from the research DFID has commissioned should be used to help develop the criteria and indicators.

108. Clare Short was clear about the need for developing countries to integrate climate considerations and risks into their national strategies and planning processes.³⁰⁴ How they do this will depend on the support they are given to help address the lack of information on, and the lack of local capacity for addressing, climate change. While donors are primarily focused on 2015 as the deadline for achieving the Millennium Development Goals, many developing countries need to be taking a longer-term view for policy development. **Given the dependence of many countries on donors and the fact that countries will often respond to what they perceive are donor priorities, it is important that DFID and other donors show that climate change is an issue that deserves serious consideration within the context of their national and local priorities.**³⁰⁵

109. There has been some criticism of the failure by donors, notably the World Bank, to integrate goals on climate protection into their mainstream activities.³⁰⁶ Criticism has centred around energy policy and the reform of energy sectors in developing countries where decisions have been driven more by price than social or environmental considerations. Export credit agencies have attracted similar criticism as they play a vital role in controlling and restricting the investments made by development banks. Through its position on the board of the MDBs and through the advice it provides bodies like ECGD, DFID must ensure that climate change is recognised as an issue and that the policies and actions of these organisation will not increase climate risk.

110. **DFID should assess which actors and institutions are best placed to work on climate change using criteria of equity, efficiency and effectiveness.** Some interventions, like many current proposals for reducing greenhouse gases, may not be the most equitable or efficient but they are effective; others that are more equitable may not be so effective.³⁰⁷ **DFID should assess the comparative advantage of donors and encourage those with particular expertise on climate change issues to take a lead.** DFID also needs to examine the scope for working with UN agencies on climate issues. Andy Haines, London School of Hygiene and Tropical Medicine, told us that UN agencies often did not have sufficient staff to co-ordinate the surveillance and research work on climate change and health; the World Health Organisation (WHO) had one person working part-time on climate and health. Sari Kovats, London School of Hygiene and Tropical Medicine, agreed that WHO lacked the capacity to support individual assessments in particular countries.³⁰⁸ It may be possible for other agencies, such as bilateral donors like DFID, who have a presence on the ground, to work in partnership with WHO on such assessments.

111. DFID should also ensure that support for work on climate change by multilateral agencies links with the poverty reduction agenda. Action on climate change needs to be reflected in Country Assistance Strategies and Country Strategy Papers. These should make the appropriate links to the Poverty Reduction Strategy Papers (PRSPs), National Strategies for Sustainable Development (NSSDs), National Adaptation Programmes for Action (NAPAs) and other national strategies of developing countries. Donors must also take account of the impact their projects and programmes will have on climate and the

³⁰⁴ Q163

³⁰⁵ Ev 72 [para 20]

³⁰⁶ Financing Climate Change: Providing Public Goods, preventing public bads, Dr Peter Newell, Institute of Development Studies (IDS). An abridged version of this paper appears in Financing and Providing Global Public Goods: Expectations and Prospects, prepared for the Ministry of Foreign Affairs, Sweden by IDS.

³⁰⁷ *Ibid.*

³⁰⁸ Q55

impact climate will have on their programmes through some kind of climate impact assessment.

Building scientific and institutional capacity

112. Greater scientific capacity is needed within developing countries to help them develop solutions and inform the policy-making process. Andy Haines, London School of Hygiene and Tropical Medicine, stressed the need to build capacity in developing countries through both south-south and south-north collaboration.³⁰⁹ Africa has suffered a tremendous brain drain, with the result that today most African scientists do not work in Africa.³¹⁰ Benito Müller told us of a scientist friend from Senegal who claimed that he could live on a first-class airline seat the whole of the year as a consequence of the international conferences he was asked to attend but, at the same time, he could not afford a research assistant.³¹¹ The south has many talented and dedicated scientists who can bring new ideas and a different perspective to collective problems like climate change. But they need proper support. Adequate resources and infrastructure are needed to encourage scientists to remain in their own countries and to build a scientific community capable of carrying out research on local priorities and advising policy makers accordingly.

113. Building scientific capacity to monitor issues, such as changes in the prevalence of disease in response to climate change, are essential. During our recent visit to West Africa we visited the Kintampo Health Research Centre in Ghana, which has strong links with the London School of Hygiene and Tropical Medicine, and saw at first hand how institutional links can help in building scientific capacity. There are a number of practical measures that donors and developing countries could support to help build scientific capacity, including:

- Developing research and training centres that can become centres of excellence in the South and at the same time enhancing regional and international co-operation through both south-south and north-south institutional links. Activities in this area should involve both governments and private sector organisations.
- Promoting scientific education and expanding scientific literacy.
- Supporting interdisciplinary approaches that integrate economic, social, and environmental issues and focus on sustainable development.
- Promoting and supporting the development of new technologies.
- Supporting initiatives such as UNESCO's International Fund for Technological Development in Africa and the Commission on Science and Technology for Sustainable Development in the South's (COMSATS) technical assistance fund.
- Investing in infrastructure and training in new information and communications technologies.
- Developing a suitable legal framework in developing countries and internationally to ensure the protection of Intellectual Property Rights.

114. If climate change is to be properly integrated, institutions will need to be strengthened, both in developed and developing countries. Donors should help to promote boundary institutions that can translate climate risks and the need for adaptation and mitigation into viable strategies at national and local levels. **Donors must make the development of scientific and institutional capacity to deal with climate risk one of their top priorities.** DFID has a good understanding of the importance of knowledge and technology transfer, through south-north and south-south linkages. This isn't the case with all bilateral donors: the US blocked a G77 and China group proposal at the WSSD Prepcom in Bali for a developing countries network of scientific centres of excellence in developing countries.³¹² The US argued instead that developing countries should support

³⁰⁹Q49

³¹⁰Q53

³¹¹Q90

³¹²See Earth Negotiations Bulletin for PrepCom VI 28 May www.iisd.ca/linkages/download/asc/enb2231e.txt

existing networks. We hope that scientific and technical cooperation will feature strongly at WSSD. DFID should work with the scientific and technical communities to build, enhance and maintain links between the scientific and technical communities in developed and developing countries on bilateral and multilateral levels. We are aware that the Parliamentary Office of Science and Technology (POST) are looking into this issue and we look forward to seeing the results of their work. We would encourage both DFID and POST to work closely on this as it can only be of mutual benefit.

DFID's policy

115. Any efforts to reduce poverty and empower the vulnerable are likely to increase resilience to climate change.³¹³ Both will contribute to better adaptive capacity and reduced vulnerability as will improvement in the management of natural resources.³¹⁴ Saleemul Huq recommended that DFID took a livelihoods approach to developing policies and made sure that the policies were both pro-environment and pro-poor.³¹⁵ DFID's work on sustainable livelihoods, its work on mainstreaming environmental issues, and its efforts to build international constituencies for development are having some effect. However, the evidence DFID gave to the Committee made clear that DFID did not have a climate change policy *per se*. Their responses to our questions referred to the general principles of development (country-driven, sustainable livelihoods, mainstreaming environment) and offered few specific programmes related to climate change. Richard Manning explained that DFID had selected eleven countries³¹⁶ where it would work to incorporate environmental issues, sustainable development and climate change into country policies.³¹⁷ We look forward to seeing how the work in these countries, to incorporate environmental issues, sustainable development and climate change, develops. Adrian Davis, DFID, thought that adaptation would be main focus of DFID's climate change activities. **We agree that adaptation should be DFID's main priority in terms of action on climate change. DFID should consider developing a specific policy on adaptation. This could promote adaptation, and ensure that adverse effects are moderated and benefits realised while maladaptation is avoided.**

116. In our view, DFID does not need to change its policies radically but a greater emphasis should be placed on mainstreaming climate considerations through other policies. We see the development of indicators and a system for climate impact assessment as crucial in monitoring climate considerations. Richard Manning reassured us when he told us that DFID did not see climate change as irrelevant to the poverty agenda and recognised that over time they were closely linked.³¹⁸ But DFID's own evidence to the Committee said that "climate change, while important, is only one factor in the set of environmental opportunities and risks".³¹⁹ **We remain concerned that DFID sees climate change as a subset of environmental issues rather than the most urgent.**³²⁰ If climate change is taken to be just another environmental problem it will be lost among all the short-term considerations.

117. DFID must build its own capacity on climate change if it is to target the most vulnerable effectively and give the best advice on policy integration.³²¹ We recognise that DFID has been active in international negotiations including the Conference of Parties (CoP) and the Subsidiary Body for Scientific and Technological Advice (SBSTA). Richard

³¹³ Ev 40

³¹⁴ Report of IPCC Working Group II: Summary for Policy Makers, 2001

³¹⁵ Ev 72 [para 19]

³¹⁶ Kenya, India, China, Russia, Uganda, South Africa, Zambia, Mozambique, Malawi, Nepal and Ghana. See Q7

³¹⁷ Q6

³¹⁸ Q167

³¹⁹ Ev 7 [para 34]

³²⁰ Q163

³²¹ Ev 73 [para 26]

Manning described work in progress to raise awareness of climate change across the department and said senior management had been briefed on climate change.³²² We are encouraged at the emphasis that is now being placed on climate change within DFID. Awareness-raising activities, dissemination of new research findings and the production of an internal briefing document following the presentation to senior managers on the science of climate change are all helpful. The work with DEFRA to provide summaries of IPCC findings, especially where these identify regional/sectoral climate impacts, and summaries of the ongoing international process will be invaluable. **We welcome the research work that DFID and other UK government departments have commissioned, particularly on how the prospects for reducing poverty and achieving the Millennium Development Goals are likely to be affected by climate change. We look forward to seeing the results and watching how DFID will use them to inform and influence policy.**

118. Developing countries need help to adapt to climate change.³²³ DFID should identify areas that are particularly vulnerable such as sub-Saharan Africa, which has suffered falling GDP over recent decades and which will suffer adverse impacts from climate change.³²⁴ Looking at the distribution of natural disasters could identify other countries that are priorities for adaptation and help to target measures in those affected worst.³²⁵ The UNFCCC and Kyoto Protocol require that each country must inform others about its national climate change activities. This is done through papers known as National Communications (NC). Many developed countries have submitted their second National Communication and developing countries have started to submit their first. Although there is limited material on climate change in developing countries for DFID to draw upon, National Communications should provide a useful starting point. **All DFID country and regional offices should obtain relevant National Communications as a starting point for discussing actions on climate change.**

The role of insurance

119. Ian Davis, Cranfield Disaster Management Centre, told us that insurance was a powerful tool for dealing with risk.³²⁶ It can spread risk across the global economy and protect investments in infrastructure. The insurance industry had considerable expertise in risk management. Globally it is three times larger than the fossil fuel industry, with control over some thirty per cent of the world's stocks and shares.³²⁷ The insurance industry is interested in developing countries as new markets. However, a lack of political stability in some countries has meant many companies regard investments there as carrying too high a risk. In a stable country and with a cooperative government, the insurance industry could probably offer premium incentives for climate risk reduction measures, could reinstate damaged infrastructure in a more resilient way and could be a source of advice on risk management.³²⁸ Premium incentives may be a useful way of encouraging developing countries to adopt and mainstream sensible policies on climate change and sustainable development. We would see a dialogue between donors, recipient governments and the private sector, particularly insurers, as constructive and beneficial. DFID might find a closer dialogue with the insurance industry worthwhile. Perhaps this could be achieved through the UNEP Finance Initiative or through the UK Advisory Committee for Natural Disaster Reduction.³²⁹

³²² Q6 and Q163

³²³ Ev 131

³²⁴ Ev 140

³²⁵ Ev 59

³²⁶ Q137

³²⁷ Ev 150

³²⁸ Ev 151

³²⁹ Ev 150

120. We agree with David Crichton that there is a certain irony in the World Bank insisting on insurance during construction for infrastructure projects but no continuing requirement for insurance once the bridge or road is handed over.³³⁰ DFID should examine whether there should be a requirement for continuing insurance cover once a project is completed and handed over. This should include an assessment of how developing countries could finance such a requirement.

Climate change in the policies of developing countries

121. The likely impacts described in chapter 2 mean climate change is of direct relevance to development goals such as tackling poverty, ensuring food security, water, access to sanitary living conditions, and access to energy.³³¹ We have already seen that the most adverse impacts will be in developing countries where populations are the most vulnerable and least able to adapt, but climate change does not feature prominently within the policies of these countries.³³² This is probably due to a combination of competing priorities and a lack of knowledge and capacity to address climate risk. While sustainable development will help to reduce vulnerability over time, it is unclear whether it can occur fast enough to make a difference (even despite the uncertainties over the rate of climate change).

Synergy in national policies and strategies

122. The proper integration of climate policies within national policies on social, economic and environmental issues enhances the capacity of countries to deal with climate change. Many of the policies necessary to ensure climate protection or to mitigate climate impacts could have ancillary benefits and national policies should recognise such benefits.³³³ The British Bangladeshi Professional Association stressed the importance of linking strategies on climate change with national sustainable development objectives. It believed climate change was more than a long-term environmental issue and had to be recognised as a short and medium-term development issue.³³⁴ Climate change has largely been ignored in NSSDs.³³⁵ **Developing countries must integrate actions on climate change into their national strategies. Ministries of Finance must be involved in this process, as the costs associated with the longer-term impacts of climate change have to be considered now.**³³⁶

123. Most donors are keen to support initiatives where there is effective policy integration. DEFRA told us the UK would consider providing support for adaptation where it was a credible part of an overall poverty reduction strategy.³³⁷ Policy integration should be a priority for developing countries not least because it might release donor funding for adaptation.

Multilateral Environmental Agreements.

124. Developing countries have been asked to prepare freestanding national studies for various multilateral environmental agreements (MEAs). As every MEA has its own format, separate plans had to be produced for each one. The net effect was the development of plans that lacked coherence and coordination and that contained little of

³³⁰ Ev 151

³³¹ Linkages between climate change and sustainable development, Beg et al, 2001 (submitted to Climate Policy in October 2001 revised December 2001)

³³² Ev 139

³³³ Linkages between climate change and sustainable development, Beg et al, 2001 (submitted to Climate Policy in October 2001 revised December 2001)

³³⁴ Ev 128 [paras 3.1–3.2]

³³⁵ Ev 71 [para 12]

³³⁶ Q163

³³⁷ Ev 15 [para 4.12]

any practical value.³³⁸ Saleemul Huq, IIED, called for better integration of multilateral environmental agreements saying, "It is much more important than just doing another standalone plan which will be left on the shelf or brought to international meetings but not have any relevance for the country."³³⁹ DFID and other donors should be working to ensure that existing strategies are pulled down from the shelves, dusted off and revised. New strategies should take account, from the outset, of the need for an integrated policy framework. Climate change must be a part of such a framework. The MEAs could reduce the burden on countries by adopting similar reporting conventions but the ultimate goal must be to have them properly integrated within national policies.

Linking NSSDs, PRSPs and NAPAs

125. DFID recognised the impacts of climate change were fundamental to the development prospects of many poor countries and called for adaptation measures to be placed in the context of national poverty reduction strategies and other development processes.³⁴⁰ However, there is little evidence that National Strategies for Sustainable Development (NSSDs) and Poverty Reduction Strategy Papers (PRSPs) are addressing poverty in a way that takes account of environmental issues and resources. National plans lack coordination.³⁴¹ DFID suggested that poverty reduction strategies provided the ideal vehicle for ensuring that poverty and environment issues were properly integrated into other policies and programmes, especially macroeconomic policies. If correctly developed, PRSPs could serve a dual purpose by serving as national strategies for sustainable development as well. Sectoral policies needed to recognise poverty and environment linkages. We believe that climate change can be mainstreamed through PRSPs. Climate change strategies should, however, remain distinct from short-term environmental strategies to avoid them becoming lost among short-term competing priorities.

126. Guidelines for the preparation of National Adaptation Programmes for Action (NAPAs) were established at CoP-7 in Marrakech. The development of NAPAs is a vital part of building policy coherence and mainstreaming climate change considerations in developing countries. However, little guidance exists on what could or should be included. A least developed countries expert group was established to help the preparation of NAPAs and promote the exchange of best practice. It acts in an advisory capacity to least developed countries on the preparation of NAPAs and capacity building needs. DFID has a representative on the group.³⁴² Plans for a fund to provide the necessary financial resources for the preparation of the NAPAs were discussed and are to be taken forward by the GEF. We support DFID's aim of ensuring that NAPAs become an effective part of the mainstreamed response to climate change.³⁴³

127. The International Institute for Environment and Development (IIED) recommended that the UK government should help and encourage policy integration by ensuring that NSSDs included climate change issues and actions.³⁴⁴ This policy integration should go further. **The National Communication, NAPA, PRSP, NSSD, and other similar policies and reports should be a consistent, coherent set of documents, committed to the same sustainable development path and recognising the interdependency of issues like poverty reduction, the environment, climate change and sustainable development.** Developing countries may not need help to develop specific policies on climate change if they can be encouraged and helped to design all their policies in a way that minimises the impact on the climate. **DFID and other donors may have to support some capacity and**

³³⁸Ev 71 [para 11]

³³⁹Q89

³⁴⁰Ev 122 [para 13]

³⁴¹Q89

³⁴²Ev 123 [para 18]

³⁴³Ev 123 [para 20]

³⁴⁴Ev 70 [para 7]

institution-building activity to ensure that the machinery of governments in developing countries can deliver coherent and integrated policies. We do not underestimate the challenge this presents; there are many examples of incoherent policies in developed countries. DFID should sponsor some research to determine the need for capacity and institution building in developing countries. Saleemul Huq, IIED, stressed the importance of climate models in helping countries prepare plans for mitigation and adaptation.³⁴⁵ DFID and DEFRA worked with the Hadley Centre on a portable computer model that can be run on a personal computer.³⁴⁶ This is intended for use in developing countries to help develop understanding and inform planning using a model that better reflects local circumstances.³⁴⁷

Energy and transport policies

128. Subsidies that distort water, energy and transport markets need to be reformed. Many are simply inefficient, some create perverse incentives and others are biased against the poor and could be better targeted. Energy policy is crucial; developed and developing countries will have to facilitate a transition from mainly fossil fuel based energy production to low carbon and renewable alternatives. They will have to help industry to use initiatives like emissions trading and CDM. Long-term investments in clean technologies will require clear and stable policy regimes in many countries.³⁴⁸ DFID should press multilateral agencies to consider energy sources and efficiency and where appropriate and possible, donors should foster the use of renewable sources of energy. If a project uses fossil fuels or other sources of energy likely to contribute to greenhouse gases, donors should require they are used as efficiently as possible.

129. Transport and transport infrastructure play a vital part in economic development and sustainable growth. The transport needs of developing countries are immense and developing countries often lack the resources needed to build efficient and modern transport systems. Until recently the transport sector deficit in Zambia absorbed twelve per cent of the government's total revenues. Effective transport systems are essential for access to domestic, regional and international markets and for the creation of jobs. Clearly, greater transport capacity is needed if developing countries, particularly those in Africa, are going to meet the MDGs and wherever possible investment in transport should be focused around sustainable transport policies. The developing world already suffers from both poor mobility and high levels of transport-related pollution.³⁴⁹ DFID and other donors should encourage developing countries to develop sustainable transport policies. This makes sense on economic, social and health grounds as well as from an environmental and climate perspective.

Stimulating action

130. Developing countries must develop their own objectives to tackle their own specific problems. A country's ability to build a sustainable future will be affected by issues of governance.³⁵⁰ A lack of resources and capacity hampers the ability to identify and implement appropriate responses to climate change. Corruption, inefficient public services and weak enforcement mechanisms play a major part in the misuse of natural resources and could undermine efforts to reduce climate risk.

³⁴⁵ Ev 71 [para 8]

³⁴⁶ Ev 5 [para 26], Ev 36 and Q21

³⁴⁷ Q166

³⁴⁸ Ev 146 [para 2.6]

³⁴⁹ Ev 147 [para 2.10]

³⁵⁰ Ev 60

131. Many of the key players and policy makers, financial institutions and the private sector, are not engaged in the debate on climate change with developing countries.³⁵¹ As a result, much of the work on climate change has taken place within specialisms and within specialists' own spheres of competence. There has been little interaction between climate experts and experts in development or disaster studies either at a research or policy level.³⁵² Policies to address climate change could have a positive impact on regional economic development just as environmental issues can be tackled in ways that bring economic and social benefits. Many actions can be taken locally and regionally, without waiting for international agreements, particularly on co-ordination and sharing of best practice. The process of building capacity must be participatory and should ensure local communities are involved in its planning.

Impact on investment

132. Developing countries have an understandable concern that the imposition of environmental conditions and policies could deter foreign direct investment (FDI).³⁵³ The imposition of sensible environmental conditions would be unlikely to deter a serious investor interested in a long-term partnership. Any conditions imposed would be little different to those they faced elsewhere in the world. FDI far outstrips ODA and is vital for development. It is essential that investments are environmentally and socially sound.³⁵⁴ However, increased climate risk (such as extreme weather events or sea level rises) could jeopardise a country's ability to borrow and to attract FDI. Shell told us there were a range of external barriers to successful private sector involvement in developing economies, in particular, weak governance, inappropriate legal and policy frameworks to encourage private sector investment, and limited developmental capacity. They acknowledged that while governments, donors and civil society, had historically tackled these challenges there was a role for businesses in tackling these issues.³⁵⁵ Climate risk adds another potential barrier to FDI unless countries can demonstrate that the risks have been recognised and a policy framework exists or is being developed to address them. Poor disaster preparedness might hamper a country's chance of obtaining insurance cover and could affect its credit rating. Developing countries need to take action on adaptation and mitigation to show that they can manage climate risk.

³⁵¹ Linkages between climate change and sustainable development, Beg et al, 2001 (submitted to Climate Policy in October 2001 revised December 2001)

³⁵² Ev 94

³⁵³ Ev 73 [para 25]

³⁵⁴ Ibid.

³⁵⁵ Ev 147

V CONCLUSION

133. Climate change is here, it will be with us for decades, and the changes already underway are irreversible. Adaptation is a necessity, not an option. And it must certainly not be regarded as an alternative to mitigation.

134. The greatest barrier globally to action on climate change is not funding, a lack of knowledge or a lack of consensus but the lack of political will. Developed countries will need to change patterns of consumption and patterns of wealth generation drastically. But there are a number of 'win-win' and 'no-regrets' scenarios that can be identified without further research and these should be acted upon now. The precautionary principle should guide action.

135. Inequity between the north and the south has overshadowed the entire climate change debate. DFID should champion greater equity in international debate and help move negotiations from discussing how to minimise impacts on polluters to how to build systems that will benefit developing countries. The impetus for action on mitigation should remain with developed countries. However, as their emissions rise, developing countries will eventually have to take steps to mitigate greenhouse gas emissions. There must be a greater focus on adaptation as many developing countries will face dramatic impacts over the next few decades regardless of the success of mitigation policies.

136. Climate change is a development issue that requires a multi-disciplinary approach. Climate scientists, environmental groups and development agencies must all cooperate and work across traditional boundaries. DFID itself can play a part in raising awareness and should encourage other donors, both bilateral and multilateral, to do the same. Better international cooperation and coordination is needed, especially between donors.

137. Both developed and developing countries need to recognise the ways in which climate change will affect development. They must take action now to ensure that their policies to cope with climate change and ensure climate protection are cost effective, properly resourced, fully integrated and mutually reinforcing. Economic growth and poverty reduction must be the top priorities for developing countries. But, to be sustainable beyond the short-term, the policies to deliver them have to take account of climate impacts. Climate protection offers countries a chance to consider development strategies and policies from a different perspective.³⁵⁶

138. It is important that all government actions take account of climate change considerations, otherwise the good done by one policy will be wiped out by another (ECGD credits for fossil fuel projects must balance the need for development against the potential to increase concentrations of greenhouse gases).

139. Reducing vulnerability is really about risk management and risk reduction. Maladaptation through inappropriate development policies must be avoided. This requires a climate risk assessment of current policies, plans, programmes, and projects to identify the likely climate impact of a project and the impact climate might have on longer-term objectives and longer-term sustainability. Proposals for new work should be subjected to a climate risk assessment at an early stage in planning.

140. DFID treats climate change as just another environmental problem. But its global nature, the differentiated liabilities and vulnerabilities, and inter-generational element prevent it from being just another environmental issue. To treat it as such risks losing any focus on the longer-term solutions needed, as attention is diverted to other environmental

³⁵⁶ Linkages between climate change and sustainable development, Beg et al, 2001 (submitted to Climate Policy in October 2001 revised December 2001)

issues that have short-term impacts and solutions. Loss of biodiversity, desertification and loss of habitat have long-term consequences in the same way that climate change does and they too might lose out to competing short-term environmental priorities if they are treated just as a number of environmental issues. Climate change must maintain a distinct identity within DFID's programmes and the Environmental Policy Department should seek to mainstream and integrate it into other policy areas. We do not believe that DFID needs to make any major change in its development policies to address climate change. Actions on governance, institution building and capacity building should continue but DFID needs actively to promote consideration of climate risk and adaptation to climate change. DFID believes that economic growth and strengthening institutions will reduce developing countries' vulnerability to climate change but given the pattern of economic development over recent years we doubt that it can occur fast enough to make a difference.

Priorities

141. The next two decades are critical to establishing an effective mitigation regime and ensuring sustainable development is on track. Priorities in several areas have emerged from this inquiry:

- **Scientific uncertainty**
Significant effects are possible but much uncertainty remains despite good monitoring programmes. Actions need to be guided by the precautionary principle and donors and recipient countries need to adopt flexible approaches to keep options open.
- **Policy agendas**
There is a need to put climate change on the agenda of developing countries and aid agencies.
- **Policy integration**
Developmental, environmental and social goals need to recognise climate change and take account of likely impacts. Recognising climate change offers an opportunity to adapt and reform current sub-optimal systems using a 'no-regrets' approach.
- **Building capacity**
Human and institutional capacity needs strengthening. DFID should focus on helping developing countries to identify their needs and to develop their own capacity to carry out analysis and planning based on their own priorities, rather than responding to donor fashions.³⁵⁷ Linkages between developed and developing countries for training and research will be helpful. Capacity should be built within existing institutions that already have responsibilities for resources likely to be affected by climate change. There is little need to build separate capacity devoted solely to climate change. There is a need for institutional capacity building at local and national levels and the focus for capacity building work will have to be wider than national government level. Research institutes and NGOs can form a bridge between local action and international policy/markets, especially in relation to building resilient communities. But those institutions and NGOs will also have their own capacity building needs.
- **Monitoring progress on climate change**
Indicators on climate change, for measurement of capacity building, and for the evaluation of the effectiveness of DFID programmes and projects will have to be developed.
- **Disasters and extreme events**
The increased frequency and magnitude of extreme events poses risks to life and health, and could lead to significant social and macroeconomic

³⁵⁷ Ev 72 [para 15]

impacts, and massive displacements of population. Reducing vulnerability to natural disasters and extreme events is essential.

- Promoting low carbon use and energy efficiency in production

Policies must be integrated, for example by linking technology transfer, CDM, and export credits. Developing countries lack a viable and affordable alternative energy source to fossil fuels but they should be encouraged and helped to be as energy and carbon efficient as possible. The opportunities to benefit from the Clean Development Mechanism, Activities Implemented Jointly and other mechanisms should be reviewed, enhanced and partner organisations should be encouraged to participate in these mechanisms.

- Priority areas

Donors and developing countries need to take steps to ensure that climate risk is addressed in areas such as coastal management, access to water, sustainable livelihoods, agriculture and health.

ACRONYMS AND SELECTED GLOSSARY

Adaptation	Adjustment in natural or human systems to a new or changing environment. Coping with the residual effects of climate change. (See paragraph 40)
AIJ	Activities Implemented Jointly or Joint Implementation (JI)
AOSIS	Alliance of Small Island States
Biomass	Biomass is any organic matter, available on a renewable basis through natural processes or as a by-product of human activity. Biomass includes: agricultural crops and wastes, wood and wood waste, energy crops, and municipal solid waste. Biomass can be converted into energy through many different means such as combustion (burning), gasification, fermentation, and anaerobic digestion.
CAS	Country Assistance Strategy
CDM	Clean Development Mechanism. (See paragraphs 69–71).
Climate change	Climate change is a long-lasting change in either the climate or its variability. The United Nations Framework Convention on Climate Change (UNFCCC) defined climate change as "...a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability..." ³⁵⁸ This definition makes a distinction between climate change due to human activity (anthropogenic) and climate change due to natural processes.
CoP	Conference of the Parties to the Framework Convention on Climate Change. The supreme body of the United Nations Framework Convention on Climate Change, comprising countries that have ratified or acceded to the Framework Convention on Climate Change. The first session of the Conference of the Parties (CoP-1) was held in Berlin in 1995, followed by CoP-2 in Geneva 1996, CoP-3 in Kyoto 1997, CoP-4 in Buenos Aires, CoP-5 in Bonn, CoP-6 in The Hague and CoP-7 in Marrakech.
CSP	Country Strategy Paper
DEFRA	Department for Environment, Food and Rural Affairs
DFID	Department for International Development
DMP	Disaster mitigation and preparedness (See paragraphs 91–94)
ECA	Export Credit Agency
ECGD	Export Credit Guarantee Department
ENSO	El Niño/ Southern Oscillation
FDI	Foreign Direct Investment
GEF	Global Environment Facility (See paragraphs 72–78)
GHG	Greenhouse Gases
Gini coefficient	An indicator of income inequality reflecting the distribution of income throughout the population. If income is distributed equally across the

³⁵⁸United Nations Framework Convention on Climate Change, Article 1 (See <http://unfccc.int/resource/docs/convkp/conveng.pdf>)

population, the coefficient is equal to 0, and if a few individuals predominantly hold the wealth, the coefficient is closer to 1.

GNP	Gross National Product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit. German government owned corporation for international cooperation
IDNDR	International Decade for Natural Disaster Reduction, now known as ISDR
IPCC	Intergovernmental Panel on Climate Change (See paragraphs 4–5 and 100)
ISDR	International Strategy for Disaster Reduction
LDC	Least Developed Country. An informal term for countries defined using a number of parameters including <i>per capita</i> GDP.
Maladaptation	An adaptation that does not succeed in reducing vulnerability but increases it instead.
MDB	Multilateral Development Bank
MDG	Millennium Development Goal (See paragraph 101)
MEA	Multilateral Environmental Agreement
Mitigation	In terms of climate change reduction and stabilisation of greenhouse gas emissions and enhancing the sinks of greenhouse gases. In terms of disaster relief, action to limit the impact of disasters. (See paragraph 58)
NAPA	National Adaptation Programme of Action (See paragraph 126)
NC	National Communications. A central requirement of the Convention (and the Protocol) is that each Party must inform the others about its national climate change activities.
No regrets	Actions to address climate risk that also make good environmental and economic sense in their own right. They are actions that will lead to a beneficial outcome, even if climate change turns out to be an exaggerated fear. No regrets options are measures worth doing anyway.
NSSD	National Strategy for Sustainable Development
PRSP	Poverty Reduction Strategy Paper
SBSTA	Subsidiary Body for Scientific and Technological Advice
TAR	Third Assessment Report from the IPCC
TSU	Technical Service Unit
UNEP	United Nations Environment Programme (UNEP)
UNFCCC	United Nations Framework Convention on Climate Change (See paragraphs 65–66)
WAIS	West Antarctic Ice Sheet
WHO	World Health Organisation
WSSD	World Summit on Sustainable Development (See paragraphs 86–88)
WMO	World Meteorological Organization
WTO	World Trade Organisation

LIST OF CONCLUSIONS AND RECOMMENDATIONS

1. Irreversible changes are occurring in our climate as concentrations of greenhouse gases in the atmosphere rise (paragraph entitled Summary).
2. Human activity is accelerating climate change and the scale of the action needed to tackle it is unprecedented (paragraph 1).
3. We believe that the precautionary principle must underpin any approach to climate change and the consensus provided by the IPCC should provide the basis for action (paragraph 8).
4. We believe that progress has to be made in bringing environmental and developmental view points together. Taking only an environmental approach will not achieve real sustainability. Economic and sustainable use of natural resources that seeks to maximise social welfare and recognises the need to make trade-offs, will do more to eradicate poverty and ensure long-term sustainability than environmental conservation alone (paragraph 9).
5. Developing countries have a different view of climate change to developed countries. They see it not as a problem of pollution or of how to sustain economic growth but as a problem of human welfare that threatens survival itself (paragraph 10).
6. Given their relative contribution, the burden of finding a solution to the problems posed by climate change should fall mainly on developed countries (paragraph 12).
7. The timescale is urgent and the UK and other donors have to take a lead in building capacity so that policy makers and politicians in developing countries can understand climate change in the context of the local issues facing their country, and translate that understanding into effective policies and mechanisms (paragraph 14).
8. The impacts of climate change will not be evenly spread across the globe and are likely to fall disproportionately on the poor (paragraph 18).
9. Climate change has the potential to increase further the inequality between developed and developing countries (paragraph 18).
10. Rising temperatures and changes in precipitation will place hundreds of millions of people additionally at risk from either hunger, water shortage, coastal flooding or malaria (paragraph 19).
11. Drought preparedness and contingency planning are essential in building capacity to cope with climatic risks. We recommend that all development proposals associated with water resources should consider the potential effects of climate change on the ability of the proposed scheme to deliver its objectives. The impact of the project on the vulnerability of all stakeholders, including those who could be indirectly affected, should be examined. Taking a precautionary approach would mean that projects should represent no-regrets solutions that seek to optimise current systems while building in flexibility to cope with the uncertainties posed by climate change (paragraph 26).

12. We agree with Robert Nicholls, one of our expert witnesses, that DFID could help to promote sustainable development of coastal areas by:
 - encouraging efforts to improve understanding of vulnerability;
 - promoting more evaluation of the implications of climate change in coastal areas, particularly in vulnerable regions; and,
 - enhancing coastal management capacity so that it can deal with the full range of issues, including climate change (paragraph 27).
13. We recommend that DFID support renewed efforts to mitigate climatic disasters, including international standards for early warning, response and recovery. International climate adaptation funds should adopt disaster mitigation as a high priority (paragraph 32).
14. We believe that further research on climate change impacts is needed but that work on adaptation should not wait until such research is complete, given that many of the options will have a positive impact regardless of climate considerations and are worth doing anyway (paragraph 34).
15. Developing countries have limited financial, human, technological, institutional and natural resources, making them less able to respond to the effects of climate change (paragraph 36).
16. DFID should sponsor vulnerability assessments in developing countries and use the information to help target work on adaption where vulnerability is greatest, rather than focusing work on adaptation only on the poorest. In most cases it will be the poorest who are the most vulnerable. (Paragraph 37).
17. Official Development Assistance (ODA) needs to be targeted to deliver sustainable development that enhances adaptive capacity; this might include agricultural research, early warning systems for food security, and technology transfer (paragraph 44).
18. For some countries spontaneous adaptation will not be an option. The people of the Maldives and other small island states may have no alternative but to migrate (paragraph 44).
19. We are concerned that too much focus on the short-term responses to extreme events could undermine progress towards longer-term development goals. We believe a longer-term view of relief and DMP must be taken by donors and recipient countries alike (paragraph 45).
20. The need for national and international policies to deal with 'environmental' refugees will become greater as more people are temporarily or permanently displaced from their homes by more frequent and more intense climate disasters or by progressive climate change, such as rising sea levels or desertification. DFID should be pushing for a policy on 'environmental' refugees. Any policy response must recognise that this issue cuts across several Whitehall Departments. DFID must ensure that this issue is raised with and understood by the Home Office and the Foreign Office (paragraph 47).
21. We agree with Neil Adger, Tyndall Centre, that "The first thing that DFID needs to do is make sure that their policies and investments overseas do not actually undermine the capacity to adapt." (Paragraph 52).

22. We are convinced that promoting risk management is better than trying to reduce climate hazards through over-reliance on large-scale, inflexible engineering driven structural works, which often turn out to be commercially unviable, technically impractical and impact adversely on the environment. (Paragraph 52).
23. Risk management is an ideal tool to help address issues where the probability of consequences has to be balanced against the vulnerability of stakeholders (paragraph 55).
24. But the use of risk management must be underpinned by the precautionary principle and public participation in the process (paragraph 55).
25. We accept that fossil fuel use will continue to rise in developing countries as efforts are made to bridge the energy gap. However, each time the use of fossil fuels is considered as a source of energy, developing countries and donors should assess if a viable renewable alternative would ultimately be more sustainable or if there is a low-emission alternative. We believe that the Clean Development Mechanism has a crucial role to play in helping to make this transition and DFID should be promoting it within developing countries (paragraph 62).
26. Donors should promote sustainable use of biomass energy (firewood and other organic matter used to produce energy) to ensure that access to energy is possible in as environmentally friendly and affordable a way as possible. There should be a focus on local production in developing solutions especially in the development of simple measures such as improved stoves, briquetting of sawdust and other indigenous solutions (paragraph 64).
27. We believe that fixed transaction costs will continue to make small scale CDM projects in developing countries economically unviable. Unless these costs can be reduced or some other provision made for small scale projects the majority of developing countries will see little benefit from CDM. The UK Government should be pressing for these matters to be addressed by the CDM as quickly as possible (paragraph 70).
28. We support DFID's call for an increase in funding available to the GEF provided that first, any additional resources are new resources and other development activities were not jeopardised, and secondly, DFID worked to ensure that a clear allocation was made within GEF for funding work on adaptation beyond capacity building and preparation of NAPAs (paragraph 77).
29. The GEF should be strongly encouraged to develop means to fund precautionary adaptation projects that reduce the impact of present climatic variations on the most vulnerable populations (paragraph 78).
30. Developed countries have contributed more to climate change while developing countries suffer the most from its consequences. Equity and social justice lie, therefore, at the heart of the climate change debate (paragraph 79).
31. Climate change does not attract the same levels of international attention as other policy issues (paragraph 80).
32. We find the huge imbalance in the negotiation capacity between developed and developing countries alarming. The best way to bring about fairness and

equity will be to ensure developing countries can shape and implement agreements effectively. Institutional capacities will have to be strengthened and negotiating capacity developed. DFID could make an important contribution towards helping developing countries play a more significant part in international negotiations, as it does for trade negotiations (paragraph 80).

33. Relief operations should seek to leave a country better able to cope, having improved local capacity and institutions rather than simply patching up problems and moving on (paragraph 90).
34. DFID, along with most other donors, has paid too little attention to global climate change. DFID's evidence made it clear that to them climate change was just one of the many environmental issues threatening development. We disagree. By grouping climate change with environmental degradation or mismanagement of natural resources the long-term nature of climate risks will be overlooked as DFID's policies react to short-term concerns (paragraph 96).
35. DFID's policies should reflect the interdependency between sustainable development and climate change (paragraph 99).
36. We believe the UK government should be pushing the IPCC to pay greater attention to adaptation, the linkages between climate change and sustainable development, and the identification of 'no-regrets' and 'win-win' responses. Developing countries should also be encouraged by the UK Government to apply pressure within the IPCC on the same issues (paragraph 100).
37. DFID should support efforts to orient the IPCC toward climate risk management, including present climatic variability and disasters, as part of ongoing development planning. DFID could also examine the scope for jointly funding a Technical Support Unit with a leading developing country to examine development and equity issues, promoting research to develop innovative projects on climate change adaptation in developing countries, and supporting policy dialogues in developing countries (paragraph 100).
38. At present there is a lack of policy coherence and integration nationally as well as internationally. All government actions need to support measures taken to address climate change. Cooperation cannot just be across government departments and between international agencies, it must also link environment and development goals (paragraph 104).
39. Work undertaken to mitigate the effects of greenhouse gases should not be undermined by other policies, such as support given to fossil fuel projects where suitable renewable alternatives exist. We urge ECGD to help focus investments in developing countries on sustainable solutions through the application of its sustainable development guidelines (paragraph 104).
40. DFID could influence the focus on adaptation and work to develop a greater understanding of the importance of adaptation among donors (paragraph 105).
41. We recommend that DFID encourage other donors, bilateral and multilateral, to develop evaluation criteria and performance indicators for climate change. Donors, including DFID, should begin carrying out climate impact assessments that review both the potential impact of climate change on a project and the impact of any project on climate. DFID could play a leading

role by developing such criteria and then spreading best practice. The outcomes from the research DFID has commissioned should be used to help develop the criteria and indicators (paragraph 107).

42. Given the dependence of many countries on donors and the fact that countries will often respond to what they perceive are donor priorities, it is important that DFID and other donors show that climate change is an issue that deserves serious consideration within the context of their national and local priorities (paragraph 108).
43. DFID should assess which actors and institutions are best placed to work on climate change using criteria of equity, efficiency and effectiveness (paragraph 110).
44. DFID should assess the comparative advantage of donors and encourage those with particular expertise on climate change issues to take a lead (paragraph 110).
45. Donors must make the development of scientific and institutional capacity to deal with climate risk one of their top priorities (paragraph 114).
46. We agree that adaptation should be DFID's main priority in terms of action on climate change. DFID should consider developing a specific policy on adaptation. This could promote adaptation, and ensure that adverse effects are moderated and benefits realised while maladaptation is avoided (paragraph 115).
47. We remain concerned that DFID sees climate change as a subset of environmental issues rather than the most urgent (paragraph 116).
48. We welcome the research work that DFID and other UK government departments have commissioned, particularly on how the prospects for reducing poverty and achieving the Millennium Development Goals are likely to be affected by climate change. We look forward to seeing the results and watching how DFID will use them to inform and influence policy (paragraph 117).
49. Developing countries need help to adapt to climate change (paragraph 118).
50. All DFID country and regional offices should obtain relevant National Communications as a starting point for discussing actions on climate change (paragraph 118).
51. Developing countries must integrate actions on climate change into their national strategies. Ministries of Finance must be involved in this process, as the costs associated with the longer-term impacts of climate change have to be considered now (paragraph 122).
52. The National Communication, NAPA, PRSP, NSSD, and other similar policies and reports should be a consistent, coherent set of documents, committed to the same sustainable development path and recognising the interdependency of issues like poverty reduction, the environment, climate change and sustainable development (paragraph 127).
53. DFID and other donors may have to support some capacity and institution-building activity to ensure that the machinery of governments in developing

countries can deliver coherent and integrated policies. We do not underestimate the challenge this presents; there are many examples of incoherent policies in developed countries. DFID should sponsor some research to determine the need for capacity and institution building in developing countries (paragraph 127).

PROCEEDINGS OF THE COMMITTEE RELATING TO THE REPORT

MONDAY 15 JULY 2002

Members present:

Tony Baldry, in the Chair

Hugh Bayley
Tony Colman

Ann Clwyd
Tony Worthington

The Committee deliberated.

Draft Report [Global Climate Change and Sustainable Development], proposed by the Chairman, brought up and read the first time.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs entitled 'Background and Acknowledgements' read and agreed to.

Paragraph entitled 'Summary' read and postponed

Paragraphs 1 to 141 read and agreed to.

Postponed paragraph entitled 'Summary' read again and agreed to.

Resolved, That the Report be the Third Report of the Committee to the House.

Ordered, That the Chairman do make the Report to the House.

Ordered, That the provisions of Standing Order No. 134 (Select committees (reports)) be applied to the Report.

Several papers were ordered to be appended to the Minutes of Evidence.

Several papers were ordered to be reported to the House

[Adjourned till Tuesday 16 July at Ten o'clock.

LIST OF WITNESSES

Tuesday 15 January 2002

Mr Richard Manning, Director-General, Resources, Mr Andrew Bennett, Chief Natural Resources Adviser, and Mr Adrian Davis, Head, Environment Policy Department, Department for International Development, and Mr David Warrilow, Head of Science Policy, Global Atmosphere Division, Department for Environment, Food and Rural Affairs Ev 21

Tuesday 29 January 2002

Professor Martin Parry, Jackson Environment Institute, School of Environment Sciences, University of East Anglia, Professor Nigel Arnell, Department of Geography and Tyndall Centre for Climate Change Research, University of Southampton, Professor Robert Nicholls, Professor in Coastal Geomorphology and Management, Flood Hazard Research Centre, Middlesex University, Professor Andy Haines, Dean, and Ms Sari Kovats, Research Fellow, London School of Hygiene and Tropical Medicine Ev 51

Dr Neil Adger, School of Environmental Sciences and Tyndall Centre for Climate Change Research, University of East Anglia, and Dr Katrina Brown, School of Development Studies and Tyndall Centre for Climate Change Research, University of East Anglia Ev 63

Dr Benito Müller, Senior Research Fellow, Oxford Institute for Energy Studies, and Dr Saleemul Huq, Director, Climate Change Programme, International Institute for Environment and Development Ev 74

Tuesday 12 February 2002

Professor Ian Davis, Cranfield Disaster Management Centre, Miss Sarah La Trobe, Publicity Policy Officer, and Mr Andy Atkins, Director of Advocacy, Tearfund, Ms Madeleen Helmer, Development Officer, Climate Centre, Netherlands Red Cross, and Mr Jonathan Walter, Editor of the World Disasters Report Ev 94

Thursday 18 April 2002

The Rt. Hon. Clare Short, a Member of the House, Secretary of State for International Development, Mr Richard Manning, Director-General, Resources, and Mr Adrian Davis, Head, Environment Policy Department, Department for International Development Ev 111

LIST OF MEMORANDA INCLUDED IN THE MINUTES OF EVIDENCE

1. Department for International Development Ev 1, 35, 37, 121
2. Department for Environment, Food and Rural Affairs Ev 9, 35
3. Professor Martin Parry Ev 39, 40
4. Professor Nigel Arnell Ev 41
5. Professor Robert Nicholls Ev 46
6. London School of Hygiene and Tropical Medicine Ev 48
7. Tyndall Centre for Climate Change Research Ev 59, 67
8. Dr Benito Müller Ev 68
9. Dr Saleemul Huq Ev 69
10. Professor Ian Davis Ev 80
11. Tearfund Ev 82
12. Netherlands Red Cross Ev 93
13. Jonathan Walter Ev 110

LIST OF APPENDICES TO THE MINUTES OF EVIDENCE

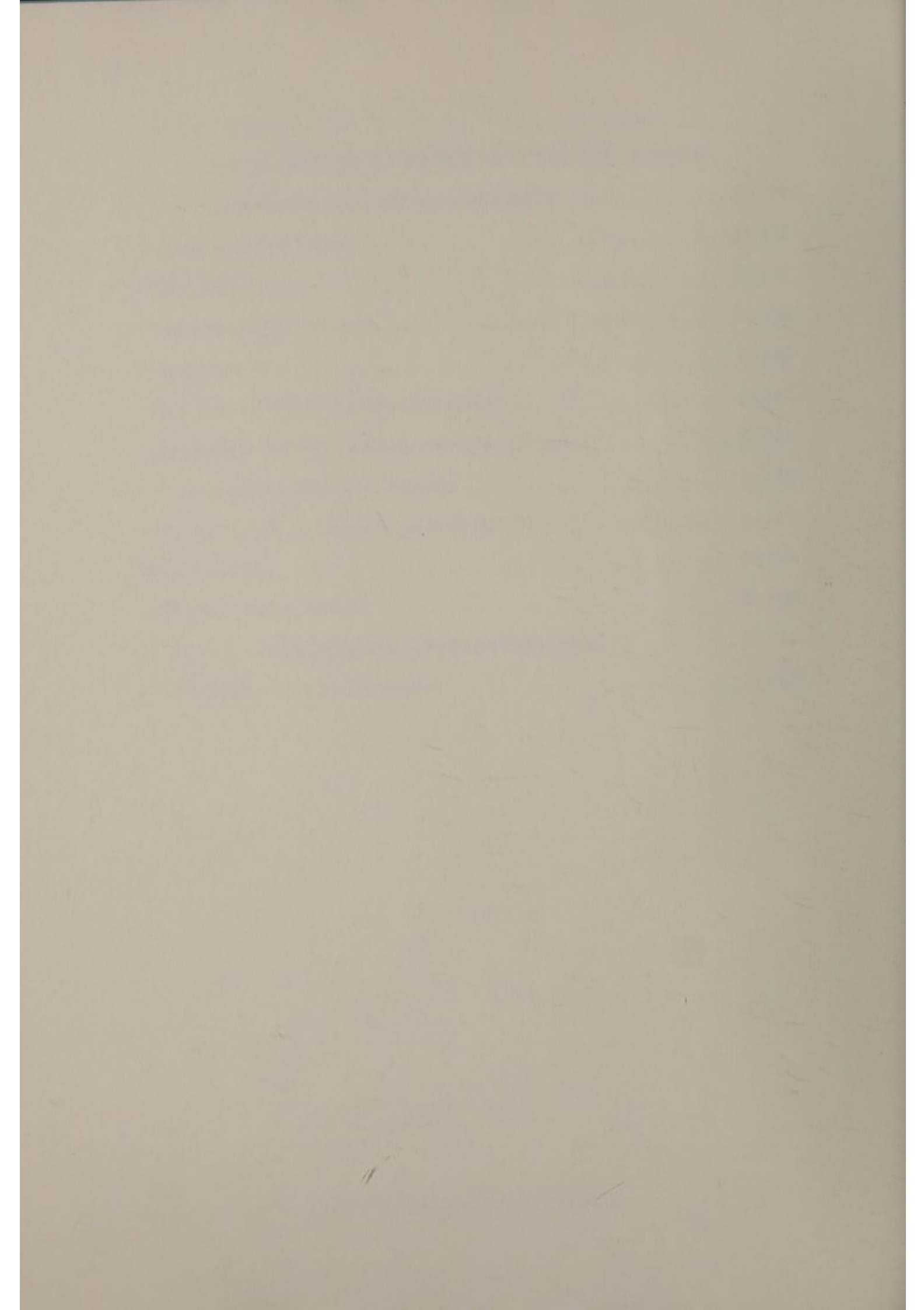
1. British Bangladeshi Professional Association (BBPA)	Ev 127
2. British Geological Survey	Ev 131, 132
3. The Corner House	Ev 135
4. The Green Globe Task Force	Ev 139
5. Greenpeace UK	Ev 140
6. Joint Nature Conservation Committee (JNCC)	Ev 142
7. Intermediate Technology Development Group (ITDG)	Ev 143
8. Royal Dutch/Shell Group of Companies	Ev 145
9. Royal Society for the Protection of Birds (RSPB)	Ev 147
10. Mr Peter Yeo	Ev 149
11. Professor David Crichton	Ev 150
12. Julie Ukeje, Assistant Director (Climate Services), Nigeria	Ev 155
13. World Meteorological Organization	Ev 163

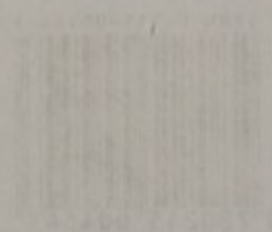


LIST OF APPENDICES TO THE MINUTES OF EVIDENCE

1. British Biographical Professional Association (BBPA)	Ev 127
2. British Geological Survey	Ev 131, 132
3. The Corner House	Ev 135
4. The Green Globe Task Force	Ev 139
5. Greenpeace UK	Ev 140
6. Joint Nature Conservation Committee (JNCC)	Ev 142
7. Technology Development Group (TDG)	Ev 143
8. Royal Society Task Group of Companies	Ev 145
9. Royal Society for the Protection of Birds (RSPB)	Ev 147
10. Sir David Lee	Ev 149
11. Professor David Colclough	Ev 150
12. Alistair G. Aspinall Director (Climate Services), Nippon	Ev 155
13. World Meteorological Organisation	Ev 163







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