

Working Paper

**ZIMBABWE AND UNITED NATIONS FRAMEWORK
CONVENTION ON CLIMATE CHANGE**

**Peter G.H. Frost
Institute of Environmental Studies,
University of Zimbabwe,**

October 2001

**Overseas Development Institute
111 Westminster Bridge Road
London SE1 7JD
UK**

ISBN 0 85003 564 3

© Overseas Development Institute 2001

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publishers.

Contents

Acknowledgements	6
Acronyms.....	7
1. Introduction	9
1.1 Background.....	9
1.2 Aims and objective of this report	11
2. Country profile	13
2.1 Environment and development context.....	13
Biophysical setting.....	13
Demographic profile	17
Socio-economic and development profile.....	17
2.1 Main environmental issues	22
National environmental issues and priorities	22
Poverty and the environment	26
National environmental policy and legislation	27
Participation in international environmental conventions.....	29
Climate-change and impact studies.....	29
3. Zimbabwe and the UNFCCC	35
3.1 Institutional framework	35
Ministry of Environment and Tourism	35
National Climate Change Office.....	35
National Climate Change Committee	35
Non-governmental organisations	36
3.2 Involvement in the UNFCCC	36
The Conference of Parties.....	36
Subsidiary bodies	37
Technical bodies.....	38
National Communication	38
Financial contributions to the UNFCCC.....	39
Designation and commitments.....	39
Domestic actions	40
Technology transfer	40
Capacity building initiatives	41
3.3 Manner of negotiations within the UNFCCC.....	45
Representation at the COPs.....	45
Preparations prior to the COPs.....	45
Relationships with regional groupings.....	46
Principles, policies and positions	47
National interests.....	48

Consultation	48
Role of the media	49
Strategy development.....	50
3.4 Constraints to effective negotiation.....	50
Imperfect policy framework.....	50
Insufficient capacity	51
Institutional and organisational deficiencies	52
3.5 Issues related to the UNFCCC.....	52
Links to national development	52
Emission reduction commitments	54
Carbon offsets and tradable permits.....	54
Technology transfer	56
Lessons from pilot activities	57
Capacity requirements.....	58
4. Impacts on poverty alleviation	59
4.1 Poverty in Zimbabwe.....	59
4.2 Poverty reduction policies and programmes in Zimbabwe	60
4.3 Links between climate change and poverty.....	66
4.4 Impact of climate-change policies on poverty alleviation.....	67
5. Discussion.....	69
5.1 Effectiveness in the UNFCCC.....	69
5.2 Limitations on negotiating capacity.....	70
5.3 Improvements	71
Policy development	71
Consolidating the Climate Change Office	72
Building negotiating skills	72
Enhancing and maintaining capacity.....	73
5.4 Links to poverty reduction.....	74
6. References	76

Figures

Figure 1: Probabilities of receiving at least (a) 400 mm rainfall and (b) 500 mm rainfall in during the summer growing season.	13
Figure 2: Total production of maize, sorghum and millet in Chiredzi District, 1980/81-1995/96, together with the amount of food aid distributed, 1980/81-1991/92, and food requirements by the population in the district at two levels, 155 and 220 kg person ⁻¹ yr ⁻¹	20
Figure 3: Long-term trend in national grain production in Zimbabwe.....	21

Tables

Table 1: Definitions of land-cover categories and the area covered by each land-cover type.	15
Table 2: Percentage of land in each natural region in Zimbabwe allocated to different land-use (tenure) categories.	16

Table 3: Changes in employment and average wage in various economic sectors in Zimbabwe, 1980-1998/9.....	18
Table 4: Selected development indicators for Zimbabwe, together with equivalent values for Africa as a whole and globally.	19
Table 5: Importance ratings for sustainable development objectives.....	23
Table 6: Ranking of individual development objectives by mean score among different stakeholder groups and overall.	24
Table 7: Ranking of environmental issues based on a national survey of key stakeholders groups in Zimbabwe, 1992-1993 (Marongwe and Milne, 1993).	25
Table 8: Indicators of commercial energy use and carbon dioxide emissions in Zimbabwe, with equivalent values for sub-Saharan Africa and globally.....	33
Table 9: Summary of anthropogenic greenhouse gas emissions by major sector for Zimbabwe in 1994	33
Table 10: List of projects related to climate change and implementation of the UNFCCC carried out in Zimbabwe.....	43
Table 11: Poverty indices for Zimbabwe, 1990/91 and 1995/96 (from van den Brink, 2000).	59
Table 12: Distribution of land among various land-use sectors at Independence (1980) and in 1988	62

Acknowledgements

I am grateful to the Department of International Development, UK, for financing this study. This paper forms part of the Effective Participation by Developing Countries in International Governance, Institutions and Negotiations study which is in turn part of the Globalisation and Poverty programme, which now includes fourteen projects on the relationship between the global economy, and global institutions, and poverty, and on how the developing countries can influence this. For further information on this project, please contact Sheila Page, s.page@odi.org.uk. For further information on the Globalisation and Poverty Programme, see www.gapresearch.org or email globpov@ids.ac.uk.

I am very grateful to Mrs Margaret Muhakanana-Sangarwe, Under Secretary for Environment, Ministry of Environment and Tourism, and Zimbabwe's chief negotiator at the UNFCCC, and Dr Todd Ngara, Climate Change Co-ordinator for Zimbabwe, for the time they gave me to discuss Zimbabwe's involvement in the UNFCCC. Their frank assessments of Zimbabwe's position and effectiveness in the negotiations is much appreciated. I am also grateful to the staff of the library of the Institute of Development Studies, University of Zimbabwe, for locating certain crucial references for me.

Acronyms

AIDS	Acquired Immuno-Deficiency Syndrome
AIJ	Activities Implemented Jointly
CBD	Convention on Biological Diversity
CCD	Convention to Combat Desertification
CDM	Clean Development Mechanism
CEP	Communicating the Environment Programme
CGE	Consultative Group of Experts
CH ₄	Methane
CIDA	Canadian International Development Agency
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CO	Carbon monoxide
CO ₂	Carbon dioxide
COP	Conference of Parties
CSO	Central Statistical Office
Danida	Danish International Development Agency
DFID	Department for International Development (United Kingdom)
DMS	Department of Meteorological Services
ELMS	Environment and Land Management Sector
ENDA	Environment and Development Activities (an NGO)
ESAP	Economic Structural Adjustment Programme
FY	Financial Year
G77	Group of 77
GCM	Global Climate Model
GDP	Gross Domestic Product
GNP	Gross National Product
HIV	Human Immuno-deficiency Virus
IMERCSA	India Musokwotane Environment Resource Centre for Southern Africa
INC	Initial National Communication
IPCC	Intergovernmental Panel on Climate Change
ISO	International Standards Organisation
IUCN	The World Conservation Union
JI	Joint Implementation
LULUCF	Land Use, Land-Use Change and Forestry
MEA	Multilateral Environmental Agreement
MERP	Millennium Economic Recovery Programme
MET	Ministry for Environment and Tourism
N ₂ O	Nitrous oxide
NANGO	National Association of Non-Governmental Organisations
NEPC	National Economic Planning Commission
NGO	Non-Governmental Organisation
NO _x	Nitrogen oxides
NR	Natural Region
NRC	Natural Resource Committee
NSS	National Strategy Studies
ODI	Overseas Development Institute

PAAP	Poverty Alleviation Action Plan
PPP	Purchasing Power Parity
SADC	Southern Africa Development Community
SAFIRE	Southern Alliance for Indigenous Resources
SANTREN	Southern African Network for Training and Research on the Environment
SARDC	Southern African Resource and Documentation Centre
SBI	Subsidiary Body for Implementation
SBSTA	Subsidiary Body for Scientific and Technological Advice
SDA	Social Dimensions of Adjustment
SDF	Social Development Fund
SIRDC	Scientific and Industrial Research Centre
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation
UNITAR	United Nations Institute for Training and Research
USAID	United States Agency for International Development
WB	World Bank
WRI	World Resources Institute
WTO	World Trade Organisation
ZESA	Zimbabwe Electricity Supply Authority
ZIMPREST	Zimbabwe Programme for Social and Economic Transformation
ZWD	Zimbabwe Dollar

1. Introduction

1.1 Background

The growing recognition that many natural resources are shared across political boundaries, together with the increase in international trade, tourism, other trans-boundary interactions – including transport and communications – and common interests in health and safety, has created the need for international institutions and rules to guide and govern these interactions. All countries are affected by this process but developing countries face special difficulties. They generally lag behind developed countries, both in their use of global environmental goods and in their participation in international transactions, so that their immediate needs for international governance structures and procedures are not so obvious. Furthermore, their more limited experience in the international arena often leaves them less able to identify where their long-term interests lie in negotiations over the form and function of these international institutions. Their ability to participate fully and effectively in international negotiations is often limited by shortages of human capacity and experience, a lack of information and the material resources needed to support negotiators, and weak or absent domestic institutions through which international agreements can be implemented.

For developing countries to avoid being disadvantaged in international negotiations therefore, they must have the capacity to identify and assess those current and future areas of national interest that need to be safeguarded in these negotiations, and to balance these interests and international obligations. The skills and capacity to negotiate effectively in the face of high actual and opportunity costs, and to assess when best to enter international negotiations, need to be developed and enhanced.

International institutions have both advantages and disadvantages. Advantages include having agreed frameworks for dealing with international problems; access by developing countries to, and their involvement in, multi-lateral negotiations; and an opportunity for those governments with mutual interests to develop and present a common front in their dealings with other governments, multi-national organisations and international pressure groups. There may be particular advantages for developing countries in becoming involved in such negotiations. Small countries may need the protection of international regulations in their dealing with larger and more developed countries. It may also be more efficient to work through a multilateral international institution, rather than to deal bilaterally with an issue every time it arises.

The main disadvantages lie in often having to cede some degree of national sovereignty; having to accept some constraints on the unfettered pursuit of national interests; and a reduction in flexibility to respond unilaterally to changes in these interests. For developing countries, the disadvantages may be somewhat greater because their national priorities may often more obviously take precedence over broader international considerations, thereby giving the appearance that their commitment to global environmental issues is weak. Moreover, the fixed costs of involvement, for example in having to adhere to international environmental standards, may be proportionately greater for the economically less-developed countries, at least in the short term, thereby serving as a disincentive.

On environmental issues, there is debate on the question of who should pay the costs of environmental protection, including the opportunity costs of foregone development. Developing countries may have to bear a disproportionate amount of the burden of climate change, both

because of higher vulnerability and because they have less capacity to counteract its potential impacts. Developed countries largely drive the debate about what measures are needed to mitigate or counter changes in climate, increasing desertification, the loss of biodiversity, and other adverse changes to the environment. Even if protocols such as that formulated at Kyoto under the United Nations Framework Convention on Climate Change (UNFCCC) are rendered ineffective by non-ratification, the increasing recognition by countries of the threats posed by climate modification and other adverse environmental changes will ensure that negotiations on mitigation measures will continue.

To address these issues the UK Department for International Development (DFID) has contracted the Overseas Development Institute (ODI) to undertake a study of the manner and extent of involvement of developing countries in international negotiations and associated institutions, with the aim of enhancing the effectiveness of participation by these countries in this arena. The overall study is focusing on the negotiations surrounding two key international conventions, the United Nations Framework Convention on Climate Change (UNFCCC) and the World Trade Organisation (WTO). It aims to address the following key questions.

- What constraints do developing countries face in international negotiations and what are their most significant impacts on the negotiating positions of these countries and the outcomes?
- How can developing countries, particularly those with limited resources, best prepare themselves, by way of research, analysis and synthesis, to fully understand the issues, identify their interests, articulate their concerns, and thereby develop informed, strategic positions on the issues?
- What institutional and human-capital investments are needed to achieve this?
- What is the appropriate allocation of resources to do this, given the opportunity costs of redirecting resources away from other priority areas?
- To what extent are the international negotiating positions of developing countries reconcilable with their domestic environmental and sustainable development policies?
- In what ways can the effectiveness of developing countries in current international negotiations be strengthened?
- What are issues that are likely to face negotiators from developing countries in the next five years; what kinds of information and capacity will be required by them to address these issues; and what kind of assistance, if any, is needed to strengthen their negotiating positions?
- What models of policy advice and networking among developing country experts and between them and developed countries would strengthen the negotiations and their outcomes?
- Are there advantages of joint action by developing countries to meet their needs, or are the costs of coordination greater than the savings?

Answers to these questions will help to identify what forms of participation have been more or less effective, to determine ‘best practice’, and what kinds of assistance donors could give to assist developing countries to make the necessary policy changes that would lead to better practice. They will also help in drawing up guidelines for establishing and maintaining research and negotiating capacity.

A second component of this study is to assess the possible impacts of the outcomes of these negotiations on national programmes to reduce poverty. Given the pressing need for developing countries to address issues of economic development and poverty reduction, there is concern as

to whether these international institutions and governance structures help or hinder a country's capacity and effectiveness in alleviating poverty. Some key questions in this regard are:

- What are the implications of global environmental issues and related international agreements for national policies aimed at alleviating poverty?
- Can the welfare or poverty concerns of developing countries be reconciled with the trade and environmental agendas being pursued by developed countries?
- What other national and international policies directly impact the reduction of poverty?

1.2 Aims and objective of this report

In addition to the global review and synthesis being carried out by researchers at ODI, a number of case studies have been commissioned to examine in detail the experiences of three developing countries – Bolivia, Guyana and Zimbabwe – in international negotiations at the WTO and the UNFCCC. This study is focused specifically on the involvement of Zimbabwe in the negotiations and functioning of the UNFCCC, although the information and insights gained will contribute to the broader assessment of the effectiveness of developing countries in these negotiations, the constraints they experience, and how best these can be overcome. A separate study is being undertaken on Zimbabwe's involvement in the WTO negotiations.

The ultimate objective of this sub-project is to help increase the effectiveness of Zimbabwe's participation in international governance and institutions. To do this requires a study of the country's involvement in the UNFCCC negotiations framed by the following questions.

- What forms of participation to date have been effective in attaining the country's goals?
- What constraints there are to more effective participation in the negotiations and agreements of the UNFCCC and how best these can be overcome?
- What types of assistance are needed to enhance and maintain the country's capacity to participate in international negotiations?
- What needs to be done to help establish and maintain national capacity for research, analysis and synthesis needed to support the country's negotiators at the UNFCCC.

A secondary objective is to consider the impact of climate-change policy on poverty. To this end the circumstances under which it is to Zimbabwe's advantage to participate in international agreements to manage the impact of external forces on poverty will be examined.

The negotiations surrounding climate change mitigation are particularly complex due to the clash of national and international objectives; the range of pressure groups and their objectives involved; and the intricacy of the technical and scientific issues. Some of the more specific questions and issues that this study attempts to address are as follows.

- What is the nature and extent of Zimbabwe's participation in the UNFCCC? Is this level of participation considered sufficient or could it be improved?
- Has the level and manner of participation changed since the UNFCCC was set up in 1992? What have been the driving forces behind these changes, if any?
- What is the organisational structure of the Zimbabwe Government's response to the issue of global climate change and the associated negotiations and activities to address this issues? In what ways could this structure be reorganised to function more effectively?

- What are Zimbabwe's principal concerns and objectives in relation to the UNFCCC? What is the balance between national and global concerns, and what are the priorities among them? How are these priorities decided? What necessary trade-offs are there between national and international objectives?
- What is the process by which national objectives and associated policy on climate change issues are decided? Which stakeholder groups are involved in this process, and how?
- To what extent and how is the public consulted, and their views taken into account, in formulating a national position? What role, if any, does the private sector play in this process, and is it generally supportive of national initiatives in this regard?
- What forms of support – briefings, information, research and training – are given to Zimbabwe's delegates prior to the Conferences of Parties and other meetings of the UNFCCC? From which organisations are briefings and information obtained? Is the amount, quality and timeliness of this information considered adequate, particularly on the interface between national and global concerns?
- What has Zimbabwe been able to achieve at the various Conference of Parties and other meetings of the UNFCCC? Is there satisfaction or frustration at the outcomes of these negotiations? In what ways could the outcomes be more favourable to Zimbabwe's interests?
- To what extent and in what ways do the UNFCCC processes of consultation help or hinder open and fair discussion and negotiation? How could they be improved? Has Zimbabwe had any impact on the negotiating process or its outcomes and, if so, how?
- What are the main limitations on Zimbabwe's negotiating capacity? In what ways could the country be better prepared for future Conference of Parties? What information and assistance would help Zimbabwe negotiate more effectively to achieve its objectives? For example, is there a need for more research and, if so, in what areas?
- Could Zimbabwe pursue its objectives more effectively through regional representation rather than acting on its own? To what extent does Zimbabwe work with other countries in southern Africa on UNFCCC-related issues? How does this cooperation work? Are there any preparatory meetings? How are differences in objectives within this group resolved? Are the more specific national objectives compromised when negotiating as a group? Do the benefits of negotiation through regional groupings outweigh the transaction costs involved? If none of this happens, why is this?
- Can poverty and welfare concerns in developing countries such as Zimbabwe be reconciled with the international environmental agenda being promoted by many of the industrialised nations? Are the supposedly mutually-beneficial and most cost-effective means of abating climate change that are being promoted by industrialised countries compatible with Zimbabwe's development agenda? What is Zimbabwe's position on the issue of carbon sequestration in forests in developing countries, both to offset carbon emissions elsewhere in the world and bring economic and development benefits to local communities in and around those forests?

To put the answers to these questions in context, an extended profile of the country, in environmental, demographic, socio-economic and development terms, is presented first. This is followed by an analysis of the main environment and development issues, and the range of activities being undertaken to address these. Finally, the nature, extent and outcomes of Zimbabwe's involvement in the UNFCCC are considered, along with an assessment of the constraints and how these might be alleviated.

2. Country profile

2.1 Environment and development context

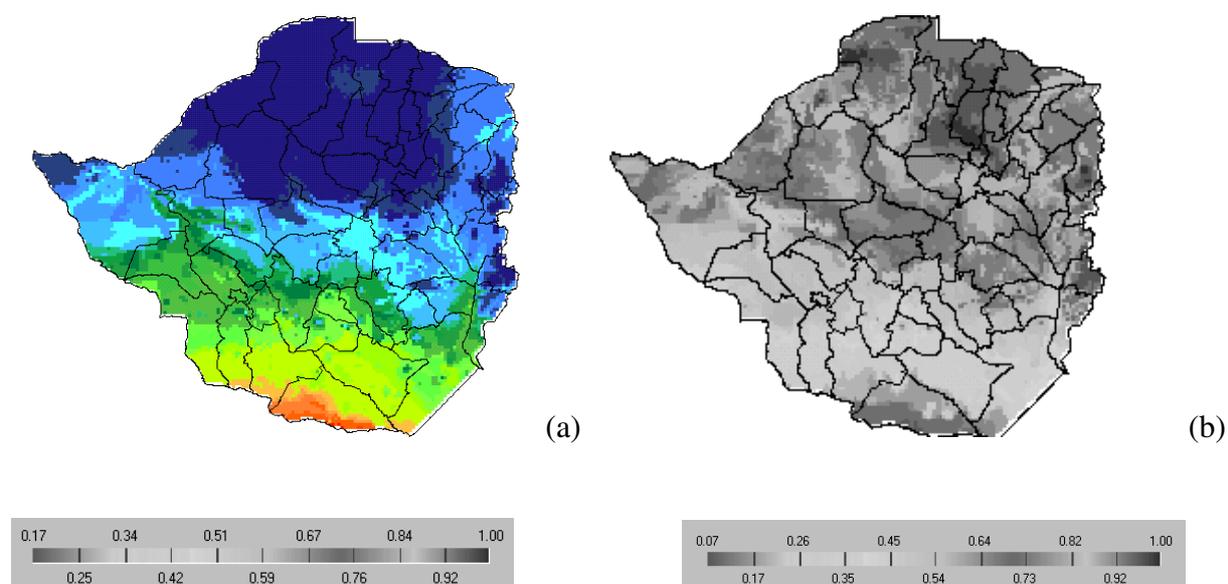
Biophysical setting

Zimbabwe is a land-locked southern African country with a total land area of just under 391,000 km². It is bounded on the north by the Zambezi River valley, and in the south by the Limpopo River. Almost one-third of the country lies below 800 m a.s.l. (lowest elevation 197 m); 23% of the land area lies above 1,200 m a.s.l. (highest point 2,592 m). Mean annual rainfall across the whole country is 655 mm but this varies greatly from as little as 325 mm p.a. near Beitbridge in the Limpopo River valley, to over 1,858 mm at Stapleford Forest on the east-facing slopes of the Eastern Highlands along the border with Mozambique (Department of Meteorological Services, 1977; Corbett *et al.* 1999).

Inter-annual variability in rainfall is relatively high, ranging from 16% on the northern plateau to 48% in the Limpopo River valley (overall mean 29%). Seasons in which rainfall is 20% or more below the long-term mean for the country occur on average about once in four years. Once in 7 years, rainfall will be more than 30% below the long-term mean. Not all parts of the country are equally affected. The south and south-west of the country is more prone to drought than other regions. A measure of this vulnerability is shown in Figure 1, which illustrates the probabilities of receiving more than 400 mm and 500 mm rainfall per annum during the growing season. For the south and south-west, even these relatively low rainfall amounts may happen only once every two to three years or longer.

Figure 1: Probabilities of receiving at least (a) 400 mm rainfall and (b) 500 mm rainfall in during the summer growing season.

Areas shaded in yellow, orange and red receive less than these amounts on average every two to three years. Data from Corbett *et al.* (1999).



More than 70% of the Zimbabwe population depends directly or indirectly on agriculture for their livelihoods. Agricultural production contributes almost 14% to the country's Gross Domestic Product (GDP) and accounts for over 42% of export earnings. With large areas of the country subject to relatively low and erratic rainfall, the country's economy and population are highly vulnerable to adverse changes in climate. This is well illustrated by the impact of the 1991-92 drought on the Zimbabwean economy. Gross domestic product fell by US\$ 1.7 billion during 1991 and 1992, from a peak of US\$ 7.83 billion in 1990. Agricultural output declined by US\$ 835 million over the same period, accounting for almost 50% of the reduction in GDP.

Climate and soils – together with fire, herbivory and land use more locally – determine much of the pattern in the natural vegetation of Zimbabwe. Soil attributes (texture, depth and fertility) are closely related to the nature of the underlying rocks and topography. Most of the soils on the central plateau are derived from gneissic granite embedded in a matrix of meta-igneous and meta-sedimentary rocks of the Pre-Cambrian Basement Complex, the original crustal rocks of the region. Soils derived from granite are generally pale-coloured, infertile, and sandy at the surface but with increasing amounts of clay in the subsoil that impede drainage. Soils derived from the Basement Complex rocks and the numerous igneous intrusions within the granite belt are generally darker, more fertile, and more clayey in texture. The soils of the Zambezi and Limpopo river valleys comprise a mosaic of fertile alluvium alongside the rivers and their tributaries, with deep infertile sands and shallow fertile clays elsewhere. The soils along the northern and eastern escarpments and mountains, where much of the underlying rock has been highly metamorphosed, are generally moderately fertile but shallow. Large areas in the north-west of the country are covered by deep, excessively drained and very infertile sands, characteristic of the Kalahari basin.

Woodland forms much of the natural vegetation of Zimbabwe (Table 1), with bushland becoming more prominent in the drier regions in the south and west. Grassland and wooded grassland occur in areas with restricted drainage and low daily minimum temperatures during the dry winter months (May-July). Natural forest is confined largely to sites in or adjacent to the mountains in the east: montane forest patches occur above 1,800 m a.s.l.; sub-montane forests cover the steep east-facing slopes below 2,000 m; and patches of lowland tropic forest occur in the valleys of the main rivers bisecting the Eastern Highlands.

Table 1: Definitions of land-cover categories and the area covered by each land-cover type. Determined from visual interpretation and mapping of land cover from Landsat 5 satellite imagery for 1992 (data from Forestry Commission of Zimbabwe).

Land cover category	Definition and notes	Area (km ²)	%
Natural moist forest	Tree height >15m, canopy cover >80%	11,554	<0.1
Plantations	Areas planted with exotic tree species	155,853	0.4
Woodland	Tree height 5-15m, canopy cover 20-80%	20,797,405	53.2
Bushland	Tree height 1-5m, canopy cover 20-80%	4,974,130	12.7
Wooded grassland	Tree height 1-15m, canopy cover 2-20%	1,204,762	3.1
Grassland	Tree canopy cover <2%	689,208	1.7
Cultivated land	Includes disturbed and fallow lands	10,738,077	27.5
Rock outcrops	Large areas of bare rock with little or no plant cover	78,481	0.2
Waterbodies	Surface area of large dams	300,900	0.8
Settlements	Areas of human habitation, mainly urban areas	139,205	0.3

Almost two-thirds of the country is covered with woodland (53%) or bushland (13%: Table 1). Woodland cover is most extensive in the State Forest reserves, National Parks and Safari Areas, which together account for about 15% of the country. Elsewhere, woodland cover is slightly negatively related to human population density, more so in the densely settled communal lands. The overall biomass of trees in natural forest, woodland, bushland and wooded grassland in 1992 has been estimated to be 1,168 million tonnes (Forestry Commission, 1996; Kunjeku *et al.* 1998). The mean annual loss of growing stock due to deforestation and land clearance for agriculture and settlement for the period 1985-1992 is estimated to have been 47 million tonnes (Kunjeku *et al.* 1998), almost exactly matching the current estimated mean annual increment of 47 million tonnes due to growth of the remaining stock (Ministry of Mines, Environment and Tourism, 1998a).

Climate and soils also influence the agricultural potential of the land and the patterns of human settlement and land use. In Zimbabwe in particular, climate, soils and the distribution of minerals such as gold, copper, nickel and chrome determined the process of land appropriation and division during the colonial era, and established the present patterns of land tenure and use. Much of the better quality land was appropriated for large-scale commercial farming, originally exclusively by colonial settlers; most of the poorer quality land was designated as reserves for indigenous peoples (called 'tribal trust lands' or, since Independence, 'communal lands') or maintained as undesignated Crown or State Land, forest reserves or national parks. Many present-day social, economic and political tensions in the country originate in decisions and actions taken during that time.

Almost 28% of the land cover has been substantially modified, largely by agriculture, deforestation and human settlement. The extent of land transformation has been most extensive in the densely settled communal lands, with proportionately more land transformed as the human population density increases. The same pattern holds when other land tenure categories are included, though population densities in these areas are relatively low when compared with those in the communal lands.

The widespread transformation of the natural land cover in the communal farming areas of Zimbabwe is clearly visible on satellite imagery of southern Africa . These graphically illustrate the consequences of the current land tenure system, which has left the majority of people to cultivate the more agriculturally marginal lands, and the present lack of alternatives to agriculture as a source of livelihood. They define clearly the challenge for both rural and urban/industrial development: to relieve pressure on land of limited agricultural potential by providing viable alternatives, either in farming better quality land elsewhere, with the necessary infrastructure and service support, or in seeking other means of making a living through employment, mostly in the non-agricultural sectors of the economy.

Table 2: Percentage of land in each natural region in Zimbabwe allocated to different land-use (tenure) categories.

Land designated for resettlement, but currently subject to legal proceedings, is still accounted for here in the large-scale commercial farming sector. Data from 1992 population census boundaries (Famine Early Warning System, Harare).

Land classification	NATURAL REGION ¹					Overall	Area (km ²)
	I	II	III	IV	V		
Communal Land	13.0	23.6	36.7	50.3	46.6	41.9	163,792
Large-scale Commercial Farms	51.3	58.6	34.7	15.5	30.1	29.4	114,790 ²
Small-scale Commercial Farms	0.7	3.3	5.4	2.1	0.8	2.6	10,042
Resettlement Areas	15.2	10.8	14.3	7.4	6.7	9.1	35,620
State Farms	0.0	0.4	0.5	1.6	0.2	0.9	3,469
National Parks Estate	9.7	0.5	6.0	17.8	14.0	11.9	46,434
Forest Land	8.3	0.0	1.6	4.7	1.0	2.6	10,211
Other (e.g. urban)	1.7	2.8	0.7	0.5	0.5	1.7	6,629
Area of Natural Region (km ²)	6,755	59,028	70,953	161,007	90,151		390,987

Demographic profile

The population of Zimbabwe at the time of the last complete national census in 1992 was 10,412,548 (49% male, 51% female). The population had increased by just over 2,8 million persons since the previous census carried out in 1982, giving an average annual growth rate of 3.14%. The growth rate in the year preceding the 1992 census was 2.5% (CSO, 1994). Making allowance for the impact of HIV/AIDS and generally improved family planning, the World Bank estimates the current population growth rate to be about 2.2% p.a. (World Bank, 2000). The present (2000) population of Zimbabwe is therefore about 12.4 million. Just over 45% of the population in 1992 was under 15 years of age; 3.3% were older than 65, giving an overall dependency ratio of 0.94 dependants per person in the 15-64 year-old age class.

In 1992, 69% of the population lived in rural areas, mostly in the communal farming areas (5.35 million people or 51.4% of the total population), large-scale commercial farms (11.3%), resettlement areas (4.1%) and small-scale commercial farms (1.6%). Overall population density ranged from 32.6 persons km⁻² in the communal lands, to 10.2 km⁻² on large-scale commercial farms. Settlement densities both in resettlement areas (12.2 persons km⁻²) and on small-scale commercial farms (17.5 persons km⁻²) were intermediate.

Just under 31% of the population lived in urban areas, though this figure may be somewhat inflated by the movement of people to towns in search of employment or an alternative livelihood following the 1991/92 drought. Proportionately more men than women live in urban areas (F:M sex ratio 0.94), reflecting a degree of migrant labour. Conversely, women predominate in the rural areas (sex ratio 1.16).

Socio-economic and development profile

Zimbabwe has a markedly dual economy, with a small, relatively well-developed commercial sector based on agriculture, mining, manufacturing and tourism, and a large informal sector centred mainly on small-scale subsistence agriculture in the communal lands. Gross national product in 1999 was estimated to be US\$ 6.1 billion, with no discernible growth from the preceding year (World Bank, 2000). This is equivalent to about US\$ 500 per person. Adjusted for population growth, per capita GNP declined by about 1.8% between 1998 and 1999 (World Bank, 2000). Measured in terms of US\$ at purchasing power parity, GNP and per capita GNP are about 4.8 times larger than when measured in nominal US\$.

Gross domestic product in 1999 was about US\$ 4.39 billion, down from US\$ 5.11 billion in 1990. The structure of output in 1997 indicated that industry (including mining, manufacturing, construction, electricity and water) contributed 27% to total GDP. Distribution, hotels and restaurants contributed a further 19% and agriculture and forestry almost 17%. Gross domestic product grew from US\$ 5.13 billion in 1980 to US\$ 7.16 billion in 1997, an average annual growth rate of 2.5% (CSO, 1987, 1989 and quarterly reports 1987-1997). This is less than the 2.9% average rate of growth of the population over the same period. After 1997, however, GDP declined substantially, to only an estimated US\$ 4.39 billion in 1999, 14.4% less than in 1980 and 38.7% lower than in 1997.

The structure of employment and average wages earned in the various economic sectors in 1980 and 1998 is shown in Table 3. Although the number of employees grew by about 34% over this period, this only represents an average annual growth rate of 1.6%, well below the rate of increase of the population. More problematically, the average wage earned, when adjusted for

inflation, was almost 11% lower in 1998 than 1980. Employees in the service industries (-25%), agriculture (-20%), manufacturing (-25%) and education (-25%) all earned significantly less on average, in real terms, in 1998 than they did in 1980; real earnings in the health sector were only below those in 1980. Only employees in the sector mining earned more. Conditions deteriorated sharply in 1999 and 2000, however, although full details are not yet available. Employment levels in 1999 declined overall by 2.5% but especially in the education (-7.9%) and manufacturing sectors (-3.3%). Average wages, in real terms, dropped by 10-12% in all sectors except health (-1%) and agriculture (data not available).

Table 3: Changes in employment and average wage in various economic sectors in Zimbabwe, 1980-1998/9.

When adjusted for inflation, using the consumer price index, average earnings in most sectors have declined substantially in real terms since 1980 (data from CSO quarterly reports, 1980-2000).

Sector	Number of employees		Average wage ¹		1998 average wage adjusted for inflation (1980 ZWD)	Change in real wages (%)
	1980	1998	1980 (ZWD) ²	1998 (ZWD) ²		
Agriculture	327,000	345,100	458	8,627	368	-19.5
Mining	66,200	61,000	1,757	48,470	2,070	17.8
Manufacturing	159,400	207,600	2,521	44,395	1,896	-24.8
Services	400,200	560,100	2,490	43,898	1,874	-24.7
Health	15,200	28,200	3,197	74,082	3,163	-1.1
Education	41,900	146,400	4,017	70,764	3,022	-24.8
Total/average ¹	1,009,900	1,348,400	1,863	38,695	1,652	-11.3

¹ Average wages weighted by the number of employees in each sector.

² In 1980, ZWD 1 = US\$ 1.59; in 1988 it was US\$ 0.55.

These measures of economic activity do not take into account that occurring in the informal sector. Most activity in this sector involves small-scale subsistence agricultural production concentrated largely in the communal lands. Although economic activity in the informal sector has expanded since Independence in 1980, including increases in agricultural production, this appears generally not to have kept up either with population growth or with inflation.

The causes for these trends are diverse: continued high population growth; low commodity prices; excessive dependence of the economy on agricultural production and mining, with little value added locally; frequent drought; and questionable economic policies and management. Recent internal political, social and economic pressures have forced a sharp downturn in the economy, particularly in agriculture, manufacturing and tourism. It remains to be seen what the long term consequences of this might be but the immediate prospects are dim.

Selected indicators of social and economic development are given in Table 4 where they are compared with equivalent weighted average and gross values for sub-Saharan African countries and globally. In demographic and per capita economic terms, Zimbabwe is similar to other sub-Saharan African countries, though the prevalence of a number of negative economic indicators reflects current uncertainties about the direction that the country is taking politically, socially and economically (see below). Indicators of health and education are generally above average for the

sub-continent and, in some cases, globally, though there are concerns about the ability of the country to sustain these gains under present circumstances. In particular, as with many countries in sub-Saharan Africa, the demographic, social and economic impact of HIV/AIDS is likely to be devastating. The current level of infection among sexually active adults is estimated to be 25-30%.

Despite the modest gains made since Independence in 1980, the sharp downturn in economic, social and political circumstances in the recent years has placed the country in crisis (van den Brink, 2000). Real GDP shrank by more than 20% from 1998 to 1999. A further decline of at least 5% is projected for 2000. Levels of unemployment and poverty, already unacceptably high before the crisis, are rising further. Inflation is currently about 60%. Exports shrunk by 20% in US\$ terms in 1998, did not recover in 1999, and are set to decline again in 2000. Foreign exchange reserves have declined sharply, leading to an acute shortage of foreign exchange for the import of critical inputs to the economy such as fuel. Servicing the country's foreign debt is becoming increasingly difficult to sustain, and Zimbabwe is in arrears in the repayment of a number of foreign loans. The World Bank has suspended further financial support.

Table 4: Selected development indicators for Zimbabwe, together with equivalent values for Africa as a whole and globally.

Data from World Development Report 2000/2001 (World Bank, 2000), supplemented by World Resources 1998-99 (WRI/UNEP/UNDP/WB, 1998).

Indicator	Units	Frame	Zimbabwe	Africa	World
Population size	millions of people	1999	12	642	5,975
Population density	people per km ²	1999	31	27	46
Average annual population growth rate	%	1980-90	3.3	2.9	1.7
		1990-99	2.2	2.6	1.0
Urban population	% of total	1980	22	23	40
		1999	35	34	46
Gross National Product	10 ⁹ US\$	1999	6.1	320.6	29,232.1
GNP per capita	US\$	1999	520	500	4,890
GNP per capita (measured at PPP)	US\$	1999	2,470	1,450	6,490
Gross Domestic Product	10 ⁶ US\$	1990	8,784	297,397	21,390,644
Average annual growth in GDP	%	1980-90	3.6	1.7	3.2
Average annual growth in gross domestic investment	%	1990-99	-0.7	3.6	2.9
Net private capital flows	10 ⁶ US\$	1990	85	1,283	-
		1998	-217	3,452	-
Foreign direct investment	10 ⁶ US\$	1990	-12	834	193,382
		1998	76	44,364	619,258
External debt	10 ⁶ US\$	1990	3,247	176,873	-
		1998	4,716	230,132	-
Official development assistance	US\$ per capita	1990	35	36	13
		1998	24	21	9
National poverty line (1990-91)	% population below national poverty line	Rural	31.0	-	-
		Urban	10.0	-	-
		Total	25.5	-	-
Population below US\$1 per day	% population	1990-91	36.0	-	-
Poverty gap at US\$1 per day	shortfall as % of US\$1	1990-91	9.6	-	-
Population below US\$2 per day	% population	1990-91	64.2	-	-
Poverty gap at US\$2 per day	shortfall as % of US\$2	1990-91	29.4	-	-

Gini coefficient of consumption expenditure	-	1990-91	56.8	-	-
Prevalence of child malnutrition	% children under 5 yr	1992-98	16	33	30
Infant mortality rate	per 1000 live births	1980	80	115	80
		1998	73	92	54
Under-5 mortality rate	per 1000	1980	108	188	123
		1998	125	151	75
Life expectancy at birth (1998)	yr	Male	50	49	65
		Female	52	52	69
Public expenditure on health	% of GDP	1990-98	3.1	1.5	2.5
Adult illiteracy rate (1998)	% of people 15 yr or above	Male	8	32	18
		Female	17	49	32
Public expenditure on education	% of GNP	1980	5.3	3.8	3.9
		1995	8.5	5.2	5.0
Food production index (1989-91 = 100)	-	1979-81	81.9	78.8	75.7
		1996-98	101.9	124.3	130.3
Arable land	hectares per capita	1979-81	0.36	0.32	0.24
		1996-98	0.27	0.25	0.24

Many people living in communal lands have insecure food supplies, particularly in the lower rainfall zones where reliance on food aid, when available, is becoming endemic (for example, Figure 2). *Per capita* grain production for the country as a whole has declined over the past three decades (Figure 3).

Figure 2: Total production of maize, sorghum and millet in Chiredzi District, 1980/81-1995/96, together with the amount of food aid distributed, 1980/81-1991/92, and food requirements by the population in the district at two levels, 155 and 220 kg person⁻¹ yr⁻¹ (Frost and Mandondo, 1999: data from Agritex crop production estimates obtained from Famine Early Warning System, Harare, and Drought Relief Programme, 1993a, b).

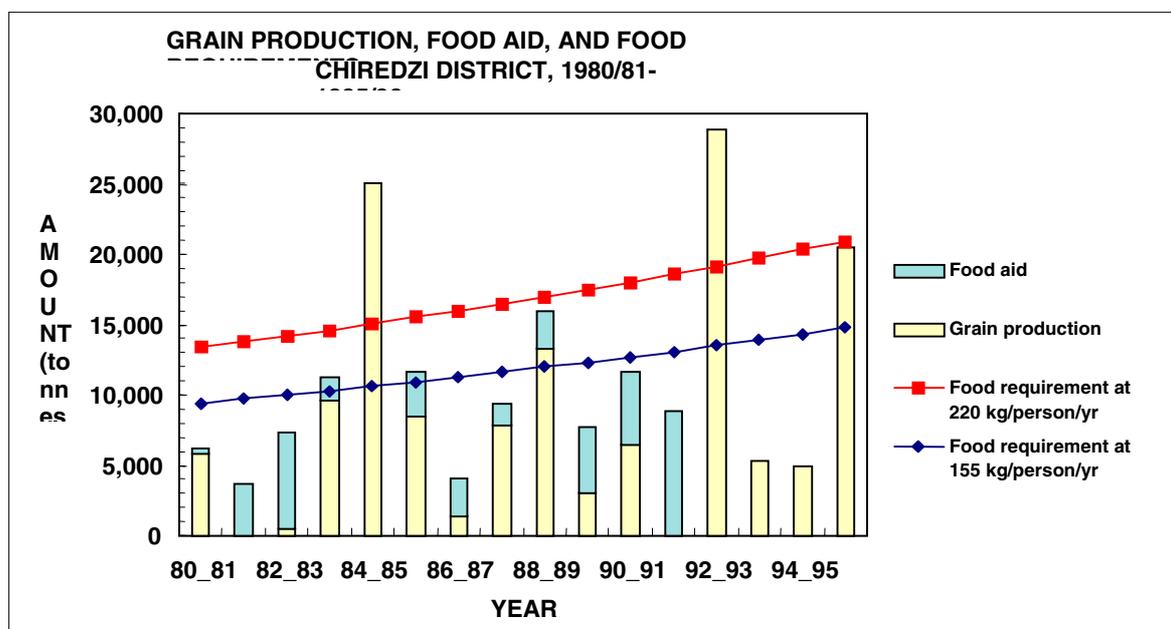
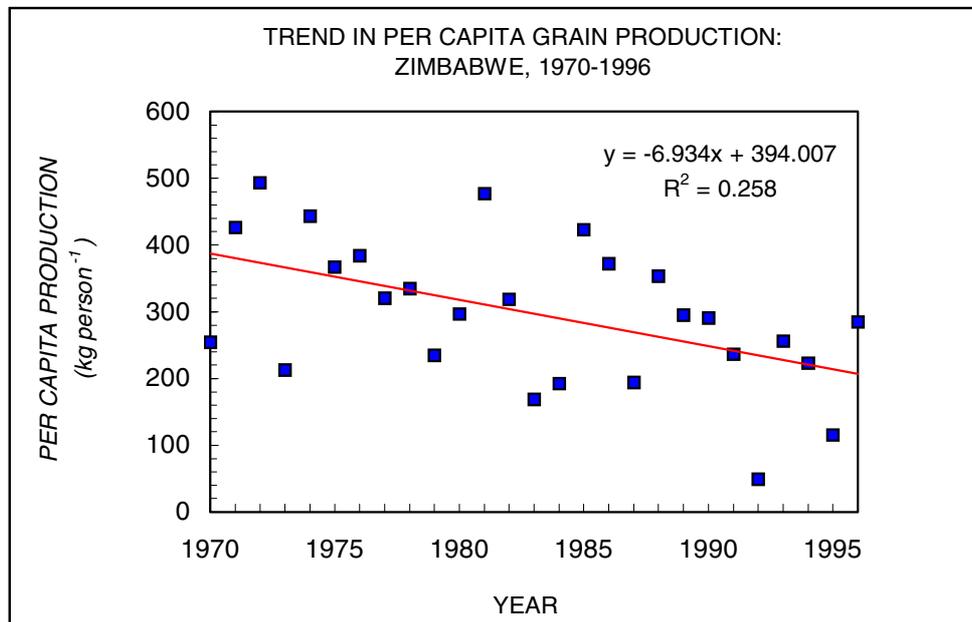


Figure 3: Long-term trend in national grain production in Zimbabwe.

Data from CSO (1987, 1989) and National Committee on Environmental Statistics database. Production figures include estimates for communal land and resettlement area farms.



Overall, poverty and inequality have increased sharply in recent years. For Zimbabwe as a whole, the prevalence of extreme poverty (people in households whose average per capita consumption expenditure is below the US\$ 1 per day poverty line, expressed as a percentage of the total population) increased by more than a third from almost 26% in 1990/91 to nearly 35% in 1995/96 (van den Brink, 2000). Most of the poverty is concentrated in the rural areas where 48% of people in 1995/96 were classed as extremely poor, a 34% increase since 1990-91, but the rate of increase has been greatest in urban areas, where the proportion of people in extreme poverty more than doubled from 3.4% in 1990/91 to 7.9% in 1995/96. Indices of the depth and severity of poverty increased by similar magnitudes (van den Brink, 2000). The Gini coefficient of consumption expenditure rose from 0.57 in 1990/91 to 0.63 in 1995/96 (van den Brink, 2000; World Bank, 2000). Given the contraction in the economy since 1995/96, these conditions are likely to have worsened considerably, but precise figures are not yet available.

These dire economic and social circumstances are compounded by concerns for political stability, the rule of law, government accountability, transparency and honesty. The contentious way in which the needed land reforms have been implemented has eroded confidence and diminished direct foreign investment. Agricultural production, the country's largest earner of foreign exchange, is likely to decline, at least in the short to medium term as land is transferred from large-scale commercial enterprises to small-scale production that, as yet, has neither the infrastructure nor the financial and technical support to enable it to make up the shortfall. Tourism, formerly the second-largest earner of foreign exchange, has declined sharply in response to concerns about political stability and personal safety, compounded by the shortage of fuel. A crisis of confidence currently pervades society at all levels. Paradoxically, this will constrain the ability and willingness of people in the country to take the long view at a time when it is just such a view and associated actions that are needed to get the country out of crisis.

2.1 Main environmental issues

National environmental issues and priorities

A survey of the perceptions of key stakeholders in Zimbabwe on what were considered to be the main environmental issues and associated environmental, social and economic objectives was carried by the Ministry of Environment and Tourism in 1992 in the aftermath of the UN Conference on Environment and Development held in Rio de Janeiro (Marongwe and Milne, 1993). The survey comprised an initial questionnaire aimed at identifying what were perceived to be the important economic, social and environmental aspects of sustainable development among three main stakeholder groups – Government, non-governmental organisations (NGOs), and representatives of rural conservation or natural resource committees (NRCs) – (Table 5). This was followed by a more detailed survey of those who responded to the first questionnaire and focused on a) identifying the perceived relative importance of the economic, social and development aspects of sustainable development; b) rating the 34 individual development objectives identified from the results of the first questionnaire (Table 6); and c) rating 18 environmental issues identified from the first questionnaire in terms of their perceived important and urgency (Table 7). The first questionnaire was posted to 345 individuals and organisations (25% government, 22% NGO and 53% NRCs) of whom 170 responded. All 170 respondents were polled in the second survey; 120 responded. One weakness of the survey was the inadequate representation of the perceptions, interests and priorities of the poorer members of society, especially in rural areas.

In general, there was marked agreement among the three main stakeholder groups both in their rating of the issues and in the ranking of priorities. Government rated the inadequacy of policy and legislation somewhat lower than did the other stakeholder groups, while NGOs rated the environmental impacts of small-scale mining lower than did Government or private enterprise. Some potentially important development objectives were not identified, however. For example, there was no direct mention of land reform, though inequality of land distribution was identified as an issue. Likewise, neither increased gender equality in education, employment and decision-making (though this perhaps could be encompassed in ‘promoting equal opportunity’), nor encouraging foreign investment was mentioned; generating foreign exchange *is* listed, however.

Climate change and related concerns were not identified as issues in either survey. Concerns about emissions were expressed primarily in the context of pollution of the local environment, rather than as a contribution, albeit minor at this stage, to global environmental change. Given that concerns within the general public about global warming are relatively recent, and that this survey was conducted soon after UNCED and before activities under the UNFCCC has been initiated, this apparent lack of concern is perhaps understandable.

Table 5: Importance ratings for sustainable development objectives.

Slightly re-worded, based on responses to a questionnaire sent out to representatives of key stakeholder groups by the Zimbabwe Ministry of Environment and Tourism, 1992. A total of 170 questionnaires were returned (Marongwe and Milne, 1993)

DEVELOPMENT GOAL AND OBJECTIVES	Level of agreement (% of total responses, N = 170)			
	Agree and strongly agree	Neutral	Disagree and strongly disagree	Don't know
1. <u>ECONOMIC DEVELOPMENT</u>				
▪ Improving the standard of living of Zimbabweans	98	1	1	0
▪ Contributing to long-term economic growth	95	4	1	1
▪ Creating employment	95	4	1	0
▪ Generating foreign exchange through the export of goods and services	80	16	6	1
▪ Distributing income fairly within society	69	15	15	1
2. <u>SOCIAL DEVELOPMENT</u>				
▪ Meeting the basic needs of people (health, nutrition, education, shelter, sanitation and water)	99	1	0	0
▪ Alleviating poverty	93	4	3	0
▪ Increasing local participation in decision-making	78	16	6	0
3. <u>ENVIRONMENTAL PROTECTION</u>				
▪ Maintaining the long-term ability of natural resources to support human, plant and animal needs	98	1	0	1
▪ Avoiding irreversible environmental damage	96	2	1	1
▪ Not harming environmental processes such as recycling of air, water and soil nutrients	94	5	0	2
▪ Preserving a broad diversity of plants, animals and ecosystems	94	3	1	3

The overall comparative rating of the three broad sustainable development goals was environmental protection 42%, economic development 32% and social development 26%. Rankings differed somewhat among the various stakeholder groups. Whereas government representatives apparently rated environmental goals higher than either economic or social ones (this probably reflects a bias in the composition of the respondents), they rated environmental protection as less important than did NGOs and landowners. Conversely, they scored economic and social goals higher.

Table 6: Ranking of individual development objectives by mean score among different stakeholder groups and overall.

Economic development objectives are shown in regular type, social development objectives are shown in italics, and environmental objectives are in bold.

DEVELOPMENT OBJECTIVE	Mean scores			Overall score	
	Govern-ment	NGOs	NRCs	Mean (n=120)	s.d.
Maintain natural resource base	9.0	9.1	9.5	9.2	1.1
Conserve natural resources	9.0	8.7	9.4	9.1	1.4
Avoid irreversible environmental damage	8.7	8.8	9.1	8.9	1.8
Preserve broad biodiversity	8.0	8.4	8.6	8.4	1.9
Environmental education and awareness	8.2	8.4	8.6	8.4	1.7
<i>Meeting the basic needs of people</i>	8.3	8.6	8.2	8.3	1.7
Improving food security	8.3	7.9	8.3	8.2	1.7
Not harming basic environmental processes	8.0	7.6	8.7	8.2	2.1
Improving people's standard of living	8.3	8.1	8.1	8.2	1.7
Reduced public expenditure and improved government efficiency	7.8	7.7	8.5	8.0	2.3
Commitment to sustainable development	8.4	8.2	7.6	8.0	2.4
Long-term balanced economic growth	7.9	7.7	7.8	7.8	2.0
Economic diversification based on sound long-term planning	8.2	7.4	7.8	7.8	1.9
Correcting past environmental damage	7.4	7.6	8.3	7.8	1.9
<i>Reducing population growth</i>	7.6	7.4	7.9	7.7	2.6
Increasing skills and training of resource managers	7.7	7.9	7.4	7.7	2.1
Better disposal of waste products	7.7	7.3	7.5	7.5	2.0
<i>Improved local management and institutional capacity</i>	7.6	7.7	7.0	7.4	1.9
Human resource development	7.6	7.4	7.2	7.4	2.0
<i>Promoting low-cost technology and local knowledge</i>	7.4	7.4	7.4	7.4	2.0
Commitment to economic development	8.0	7.8	6.4	7.3	2.4
<i>Protect human rights and an impartial judiciary</i>	7.0	6.8	7.6	7.2	2.6
<i>Increase local participation in decision-making</i>	7.3	7.5	6.6	7.0	2.4
Improving basic infrastructure	7.4	6.5	7.0	7.0	2.1
<i>Alleviating poverty</i>	7.5	7.5	6.3	7.0	2.3
<i>Increasing income options</i>	6.9	7.3	6.1	6.7	2.2
Creating employment at fair wages	6.7	6.6	6.9	6.7	2.4
<i>Decentralising services and facilities</i>	6.7	6.8	6.3	6.6	2.5
<i>Political commitment to sustained social development</i>	7.6	7.3	5.3	6.6	2.7
Generating foreign exchange	6.3	5.6	6.9	6.4	2.5
<i>Promoting equal opportunity</i>	6.3	5.9	6.2	6.2	2.3
<i>Maintaining moral and cultural values</i>	6.2	5.5	6.8	6.2	2.3
Fair income distribution	6.4	5.7	5.6	5.9	2.4
Reducing dependency on imports	6.2	5.5	6.0	5.9	2.3

Table 7: Ranking of environmental issues based on a national survey of key stakeholders groups in Zimbabwe, 1992-1993 (Marongwe and Milne, 1993).

Each environmental issue was assessed independently of the others and was based on a maximum score of 5, indicating an issue of highest importance or urgency. The overall value is the weighted average of the mean Importance and Urgency values. Results based on returns from 120 completed questionnaires (Marongwe and Milne, 1993).

ENVIRONMENTAL ISSUE	IMPORTANCE	URGENCY	OVERALL
Deforestation	4.8	4.8	4.8
Soil degradation	4.7	4.7	4.7
Water deficiencies	4.6	4.5	4.6
Poverty and environment	4.6	4.5	4.5
Inequitable land distribution and insecure land tenure	4.6	4.5	4.5
Inadequate environmental policy and legislation	4.4	4.4	4.4
Environmental impacts of small-scale mining	4.4	4.4	4.4
Inadequate water supply for daily use and sanitation	4.4	4.3	4.3
Lack of political commitment on environmental issues	4.4	4.3	4.3
Loss of biodiversity	4.3	4.1	4.2
Agro-chemical pollution	4.2	3.8	4.0
Industrial pollution	3.9	3.7	3.8
Bushfires	3.9	3.7	3.8
Environmental impacts of large scale mining	3.7	3.4	3.6
Urban non-industrial pollution (emissions, solid waste, etc.)	3.6	3.4	3.5
Impacts of environmental control and regulation (and lack thereof)	3.3	3.2	3.2
Visual and aesthetic pollution	3.4	3.1	3.2
Planting of exotic trees (impact of alien plant species)	3.3	3.0	3.1

Based partly on the results of the 1992 survey, but also on apparent changes in public perception since then, Chenje, Sola and Paleczny (1998) identified eight clusters of environmental issues when compiling Zimbabwe's 2nd State of Environment Report. These were:

- growing poverty and its attendant problems of resource over-exploitation;
- land degradation due both to human activities and natural phenomena, and to the impact of these on food security;
- continued loss of forests due to over-exploitation;
- conservation of biodiversity to minimise losses caused by human activities, including several plant and animal species that have become endangered;
- the threat posed by alien species, such as water hyacinth, *Eichornia crassipes*, to the integrity of several of the country's water bodies;
- water scarcity due to the variability of rainfall and ineffective water management measures, including pricing and pollution control;
- atmospheric pollution due to industrial processes and other factors;
- drought and climate change.

Climate change is listed here but, significantly, it is in the context of drought, a local- to regional-scale phenomenon. This emphasises again that national concerns about a global problem depend on how it is perceived to link to local issues. The prevalence of drought was also the main theme of an early assessment of Zimbabwe's vulnerability to climate change (Department of Meteorological Services, 1994).

Poverty and the environment

The poverty-environment linkage ranked fourth among the environmental issues identified in the 1992 national survey of environmental issues and priorities for sustainable development (Table 7 – but alleviating poverty only ranked seventh among the social development objectives, although meeting people's basic needs, another dimension of poverty alleviation, ranked first among the development objectives, however: Table 6). This poverty-environment linkage reflects the reality that much of the economy of Zimbabwe and a majority of its people depend directly on the productivity of the environment for their livelihoods. For the rural poor, this dependence is nearly absolute, to the extent that they depend on subsistence agriculture and the extraction of natural resources (food, fodder, fibre, fuelwood, timber, and medicinal plants) from their environment for little more than the cost of their time and labour. Most of these natural products are extracted from common land. Almost every survey of rural livelihoods carried out in Zimbabwe has shown that poorer households depend on natural resource extraction to a much greater extent than the relatively wealthier households (*e.g.* Clarke *et al.* 1996; Cavendish, 1997). Moreover, this dependence increases during times of stress, for example in years of drought when agriculture fails, or in times of economic recession when income in the form of remittances from relatives in employment is reduced (Campbell *et al.* 2000).

Given the widespread dependence of people in Zimbabwe on the environment, especially the rural poor, a range of programmes and activities have been being undertaken over the years aimed at maintaining environmental productivity (with an presumed positive impact on poverty, though this is rarely stated as a goal). Early initiatives sought to organise settlement and land use in the communal farming areas into settlement, cropland and communal grazing zones, but with increasing population pressures the commons have been gradually encroached by expanding settlement areas and cropland. Moreover, because of the coercive nature of these land-use planning initiatives, they have seldom had the intrinsic support of the people. More recently, the Department of Natural Resources has been facilitating communities to draw up district and local-level environmental action plans in a number of pilot project areas. Again, the focus is more on planning for environmental protection than for poverty alleviation. Where there has been a more direct emphasis on poverty, this has often been aimed at alleviating the symptoms (*e.g.* through providing drought relief and other food aid) than addressing the causes.

This focus is somewhat reversed in the case of programmes being implemented by non-governmental organisations such as Environment and Development Activities (ENDA-Zimbabwe), Southern Alliance for Indigenous Resources (SAFIRE) and CARE International, among others, where the development needs of people and poverty alleviation are the priority, supported by environmental management and conservation activities where necessary. In many instances, however, the programmes have ended up targeting institutional development and the building of local capacity rather than tackling the issue of how best, if at all, people can derive sufficient benefit from their natural resources, and use this judiciously, to move out of poverty. Other programmes focus on improving agricultural production, both through changes in crop, livestock and land management, and through the introduction of new crop varieties and cropping practices. In almost all cases, unfortunately, the programmes and activities are limited to selected

areas and communities, and address only parts of the problem. Given the widespread nature of poverty in Zimbabwe, encompassing both rural and urban areas (and often linked), and that poverty is the product of a complex of factors – small land holdings, inequitable land distribution, lack of title to the land, poor land quality, high climate variability, local institutional weaknesses, deteriorating macro-economic conditions, little or no economic growth, few opportunities for wage-earning employment, declining educational and health services, faltering infrastructure, distant markets with small and uncertain demand, and many others – it is doubtful that the present localised, disconnected and uncoordinated efforts, however well-intended, will have much impact.

National environmental policy and legislation

Zimbabwe has a long history of government concern for, and involvement in, environmental issues. This is reflected in the number and diversity of laws on the statute books governing access to, and the conservation and use of, natural resources (for summaries, see Gore, Katerere and Moyo, 1992; Chenje *et al.*, 1998). Most of the early laws focused on the preservation of wildlife, protection of forests, prevention of soil erosion, the maintenance of water supply, and land apportionment, thereby regulating access to land and its resources. Concerns about air and water pollution arose later. Policy was usually driven by the concerns of politically powerful special-interest groups, rather than reflecting the interests and considerations of the broader range of national stakeholders. From the publication of Zimbabwe's National Conservation Strategy in 1987 onwards, however, issues of environment and development became more inextricably linked, at least in rhetoric if not reality.

Five main laws currently govern the protection of the environment in Zimbabwe: the Natural Resources Act (Chapter 150); the Forest Act (Chapter 125); the Atmospheric Pollution Prevention Act (Chapter 318); the Parks and Wildlife Act (Act 14 of 1976); and the Water Act (2000). Other legislation with more specific provisions include, among others, the Mines and Minerals Act, the Communal Land Forest Products Act, the Rural District Councils Act, the Hazardous Substances Act, and the Water (Effluent and Wastewater Standards) Regulations. In all, more than 20 Acts and Regulations govern various aspects of environmental management and use. Responsibilities for implementing the provisions of these Acts lies with different ministries, departments and agencies, among which coordination is minimal. Many date from the colonial era, and reflect circumstances and thinking that prevailed then but which are different now. As a result, the relevance and extent to which these laws are enforced varies; many are ineffective. The provisions of some Acts, such as the Mines and Minerals Act, takes precedence over those of almost all other Acts, where they conflict.

To address these problems, the Government is currently drafting a comprehensive Environmental Management Bill. This is aimed at consolidating and revising much of the existing legislation, developing an enabling framework for environmental management, and providing for the devolution of responsibility for environmental management to the most appropriate level (Ministry of Mines, Environment and Tourism, 2000). The current draft establishes a number of general principles, including integrated management of the environment; wider public participation (though provisions for this are not well instituted in the detailed sections); environmental education; and the polluter-pays principle. Provision is made for more systematic environmental planning, including a requirement to develop National Environmental Action Plans aimed at formulating strategies and measures for protecting, restoring and rehabilitating the environment. Included among the measures are ones aimed at preventing climate change and the protection of the ozone layer, and implementing those conventions to

which Zimbabwe is a party. Where any agency, private person or class of persons undertakes activities that may affect the environment, they would have to prepare an Environmental Management Plan aimed at complying with environmental standards and, consistent with the Act, promoting and protecting the environment.

Three new institutions would be established under the Act: an Environmental Board; and Environmental Protection Unit and Inspectorate; and a Committee for Environmental Co-ordination. These would function in conjunction with the Minister concerned, who would have the primary responsibility and accountability for policy development, co-ordination of the relevant authorities, monitoring, and establishing environmental management practices. Other provisions include ones for environmental impact assessment, audit and monitoring; and mechanisms for conserving and improving the environment and natural resources, though such means as setting aside land, constructing conservation works, and serving conservation orders on landowners. Finally, the draft Bill provides for the establishment of an Environmental Fund, to pay the Board and environmental committees for expenditures incurred, or for any other purpose that the Minister considers will promote environmental management and resource conservation. The Bill is due to go before Parliament sometime during the current session, but it is still being refined following a long process of public consultation and government review and modification.

The initial draft of the impending Environmental Management Bill was founded on ten principles (Ministry of Mines, Environment and Tourism, 1998b).

- Sustainability and consideration of the development needs of current and future generations are the cornerstones of environmental management.
- Zimbabwe's dependence on complex and diverse ecosystems requires management approaches that integrate economic, social, cultural and natural environments.
- Anticipating and preventing negative environmental impacts is less costly and more effective than correcting problems. This is particularly relevant given the present limited understanding of nature.
- The ability to monitor, evaluate and ultimately sustain the Zimbabwean environment depends upon setting effective and practical environmental standards.
- Monitoring environmental quality and controlling pollution must be supported by high quality laboratories which may be run by state entities or private individuals on a cost-recovery basis.
- The effectiveness of environmental legislation and cooperation on environmental issues depends upon a fair yet effective system of penalties and incentives which encourage sustainable development and focus the burden on those that abuse the environment.
- All Zimbabweans should have a constitutional right to a clean and healthy environment and they share an obligation to keep it that way.
- Effective and efficient environmental management relies upon a well coordinated and integrated system of institutional arrangements.
- Zimbabwe's ability to make well-informed decisions about the environment depends on meaningful public participation in the environmental management process.
- Zimbabwe's domestic law must recognise and seek to implement international environmental conventions to which the Government of Zimbabwe is party.

Not all of these are clearly articulated in the present draft of the Bill, though that is still being debated. Nevertheless, these principles clearly reflect the reality that most Zimbabweans depend

directly or indirectly on the use of natural resources, and implicitly recognise that the pattern of social and economic development will be closely related at least initially to how these resources are used. National environmental policy is therefore clearly and inextricably linked to the broader issues of achieving social and economic development. This nexus forms the cornerstone of the Government's position in multi-lateral environmental negotiations.

Participation in international environmental conventions

Zimbabwe is an active party in a range of international environmental conventions and it is a signatory to the following global multilateral environmental agreements (MEAs):

- Convention Concerning the Protection of the World Cultural and Natural Heritage
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- United Nations Convention on the Law of the Sea (UNCLOS)
- Vienna Convention for the Protection of the Ozone Layer
- Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol)
- United Nations Framework Convention on Climate Change (UNFCCC)
- Convention on Biological Diversity (CBD)
- United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (CCD)

Zimbabwe is also a signatory to a number of regional multilateral environmental agreements including, among others, the Bamako Convention on the Ban of the Importation into Africa of Hazardous Waste, the Southern African Convention for Wildlife Management, the Lusaka Agreement on Co-operative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora, the Protocol on Wildlife Conservation and Law Enforcement in Southern Africa, and the Protocol on Shared Watercourse Systems in the Southern African Development Community. Most of these are focused on wildlife.

Zimbabwe has not signed the Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto). This apparently does not reflect any particular reservation about the Protocol on the part of the Zimbabwe Government, but rather an administrative lag within the Office of the Attorney General. Other global environmental conventions that Zimbabwe has so far not signed include the Convention on Wetlands of International Importance especially as Waterfowl Habitat (RAMSAR), the Convention on the Conservation of Migratory Species of Wild Animals (CMS), and the Basel Convention on the Transboundary Movements of Hazardous Wastes and their Disposal. In the case of the Basel Convention, Zimbabwe and other countries in the region have raised concerns about the inadequacy of the provisions for compensation in the event of breaches in the convention's rules.

Climate-change and impact studies

Scenarios of climate change and some of their potential impacts and implications for southern Africa have been explored to varying levels of detail by Tyson (1991), Magadza (1994), Hulme (1996), Zinyowera *et al.* (1998) and as part of the US Country Studies Program (Lenhart *et al.* 1996). Impacts on agriculture and food security have been analysed by Makadho (1996) for Zimbabwe, and Schulze, Kiker and Kunz (1993, 1996) for neighbouring South Africa. The vulnerability of Africa in general and Zimbabwe in particular to climate change, and the kinds of adaptations that might be needed in response, have been considered by the Department of

Meteorological Services (1994), Matarira *et al.* (1996) and Zinyowera *et al.* (1998). UNEP (1993) has evaluated the options for, and costs of, greenhouse gas abatement. Further discussion on vulnerability, adaptation and mitigation options for Zimbabwe are contained in Zimbabwe's Initial National Communication to the UNFCCC (Ministry of Mines, Environment and Tourism, 1998a). Unfortunately, the impact of these studies and their findings on policies and practices within government, industry, agriculture and other key components of society has so far been limited.

Hulme and colleagues used a simple climate model to project the likely trend in global temperatures, atmospheric carbon dioxide concentrations and the rise in mean sea level using the Intergovernmental Panel on Climate Change IS92a greenhouse gas emissions scenario (Hulme, 1996). This scenario assumes only a modest reduction in the current rise in emissions, so that by the decade starting in 2050 global atmospheric levels of carbon dioxide are projected to be 196 – 256 ppmv higher than the average concentration of 334 ppmv recorded for the period 1961 – 1990. The combined effect of all greenhouse gases, expressed in carbon dioxide equivalent units, would be about 90% higher than the 1961-1990 average. As a result, global temperatures are projected to increase by 1.7°C on average, while mean sea level could rise by 0.4 m. To consider how climate might change across southern Africa, simulations from three global climate models were then used with these inputs to project a) a 'core' scenario, produced by the UK Hadley Centre 1992 model; b) a 'wet' scenario, using the Oregon State University GCM; and c) a 'dry' scenario produced by the Canadian Climate Centre model. The results were expressed as the difference between the model's simulation of current and the future climates, standardised for the respective global warming produced by each model and then re-scaled using the 1.7°C rise in temperature projected by the simple climate model under the IS92a greenhouse gas emissions scenario. These changes were then applied to the 1961 – 1990 baseline climate data for southern Africa to estimate that in the 2050s. A fuller explanation of, and justification for, the approach used is given by Hulme (1996).

In the 'core' scenario, mean surface air temperature is projected to increase by over 2°C across the interior upland plateaux of southern central Africa, including western Zimbabwe, mostly due to a rise in dry season – May to September – temperatures. Temperatures in the region have already risen by almost 1°C from the early 1900s to the late 1980s (Hulme, 1996; Unganai, 1997). Rising temperatures in turn are likely to increase evapo-transpiration rates by 5 – 20% across southern Africa, with the largest increases (>12%) occurring over the interior plateaux of Angola, Zambia and Zimbabwe. The impact of this increase on moisture availability depends on how rainfall changes. Under the 'core' scenario, an increase in rainfall is projected to occur during the peak of the wet season (December to March) across Tanzania, Malawi and northern Zambia, while decreases of about 5% are anticipated for Namibia, Mozambique, and parts of Zimbabwe and South Africa. Rainfall variability could decline by 5 – 10% over much of Botswana, Zambia and Zimbabwe, but increase 5 – 15% elsewhere. Conversely, the 'wet' scenario suggests possible increases in rainfall of 2.5 – 22.5% or more across the region, while the 'dry' scenario projects a 2.5 – 7.5% reduction in rainfall centred on Zimbabwe. Mean rainfall has already declined slightly through the 20th century, more so in the last few decades (Unganai, 1996; Chenje *et al.*, 1998).

These scenarios project significant and, in some instances, contrasting changes in the distribution and composition of natural vegetation, regional hydrology, agricultural productivity, the distribution of vectors of disease, wildlife distribution and diversity, and on rangeland functioning. Details are given in Hulme (1996). Key points are as follows.

- Across Namibia, Botswana, southern Zimbabwe, Mozambique and much of South Africa, where runoff is currently low, the decline in runoff projected under the core scenario, although small in absolute terms, is substantial (~30%) relative to current levels. This would exacerbate the periodic serious water shortages experienced in this region. Conversely, runoff in Zambia, northern Mozambique and southern Tanzania is projected to increase. Across the region, greater inter-annual variability in runoff is anticipated, which would decrease the reliability of extreme above- and below-average runoff events. This means that in those areas where runoff is likely to decline, such as southern Zimbabwe, droughts could become more extreme and less predictable. The change in runoff could impact electricity production, industrial activity and greenhouse gas emissions in a variety of inter-linked ways. Although hydropower currently accounts for just under 10% of total electricity output in southern Africa (the balance comes from thermal power stations using either fossil fuels – 86%, mostly coal – or nuclear reactors – 4%), it provides nearly all the electricity generated in the Democratic Republic of the Congo, Malawi and Zambia, and substantial proportion of the electricity output in Tanzania (87%) and Zimbabwe (29%: data from WRI/UNEP/UNDP/WB, 1998). Lower regional runoff could jeopardise this production, resulting in lower and more uncertain electricity supply, which would adversely impact industry, and the impetus for further increase in the use of fossil fuels for thermal power generation, which would increase emissions.
- Higher atmospheric carbon dioxide concentrations and an increase in mean temperature suggest that the main grain crops, such as maize, sorghum and wheat, will grow faster and yield more per unit of water transpired (because of increased water-use efficiency of plants under higher carbon dioxide concentrations). The effect is likely to be greater for crops with a C₃ photosynthetic pathway, such as wheat, than those with a C₄ pathway, such as maize and sorghum. The net effect will depend on associated changes in climate, particularly in rainfall and potential evapotranspiration. As a result, grain yields are likely to decline in semi-arid regions because of the combination of reduced rainfall, higher daily temperatures and evapotranspiration rates, and a shorter rainy season. If this happens it would further compromise the already precarious food security situation in these regions.
- Changes in the distribution of natural vegetation types, where these have not already been modified or transformed by human activities, are expected under all three scenarios, depending on assumptions about the nature of the plant responses. If there is no increase in growth rates and plant water-use efficiencies due to elevated CO₂ concentrations, grassland will be replaced either by scrub savanna, under the ‘core’ and ‘dry’ scenarios, or by seasonal and dry forests under the ‘wet’ scenario. Seasonal and dry forests both expand also in the ‘core’ and ‘dry’ scenarios, though not to the same extent as under wetter conditions. If increases in plant growth and water-use efficiency also occur, then the outcome is different. Seasonal forest becomes the dominant biome under all three scenarios, with increases also in grassland and rainforest under the ‘wet’ scenario. Additional interactions with soil nutrients, fire, herbivory and human land use, all of which are known to modify vegetation structure and composition, were not considered, which introduces considerable uncertainty into the results.
- All three scenarios project a spread of woody plants and shrubs at the expense of grasslands. This would extend and intensify a trend that is already apparent in many southern African rangelands, and could drive a change from holding cattle towards small livestock. This would have many potentially deleterious consequences: reduced agricultural production because of less animal draught power; constrained development potential because of a narrowing of livelihood options; the loss of useful biomass; a

reduction in biodiversity; reduced incomes; less livelihood security; and increased inequalities. The impacts would depend on how readily people cope with and adapt to the changes, itself dependent on the broader social, economic and political conditions prevailing as the changes occur. This indicates an important role for government to create those conditions under which people can best cope and adapt: a productive and growing economy; social stability; and political openness and responsiveness to people's changing needs.

- The likely changes in climate, moisture regimes and vegetation are expected to alter the distribution and abundance of the vectors of human and livestock diseases. For the mosquito *Anopheles gambiae*, the carrier of malaria, regions to the south and west of its present range generally become more suitable because of the rise in mean temperatures, common to all three scenarios. Conversely, suitable habitat for tsetse fly, *Glossina morsitans*, the vector for the parasite causing trypanosomiasis or sleeping sickness, declines in the west of its present range under the 'core' and 'dry' scenarios, or in the central and northern parts under the 'wet scenario'. The tick *Rhipicephalus appendiculatus*, which carries the parasite *Theileria parva*, the cause of theileriosis in cattle, is likely to spread westwards under all scenarios, and to decline in the east, especially under the 'core' and 'wet' scenarios.
- Changes in ungulate diversity are expected to be closely associated with the projected changes in natural vegetation; responses to climate alone are likely to be secondary, if at all. A reduction in species associated with the grassland-dominated savannas of south-eastern South Africa is projected under all three scenarios. A reduction is also likely in those species associated with the arid highlands of Namibia and Angola. Again, the assessment is limited by not having considered interactions with other components that are likely to change at the same time, such as land use, animal disease and surface water availability.

In terms of carbon dioxide emissions, Zimbabwe contributes minimally to global emissions, in both absolute and *per capita* terms (Table 8). Commercial energy use in the country accounts for only about 0.1% of global energy consumption, and just over 3% of energy consumption in Africa. In 1990, the country produced just over 0.1% of total global anthropogenic CO₂ emissions but this had fallen to 0.08% by 1997 (World Bank, 2000). Emissions *per capita* are about half the global average, but twice the average for the rest of Africa. Most people, especially in rural areas, depend almost entirely on biomass fuels to meet their daily household energy needs. In 1992, 1.43 million households in Zimbabwe (66% of the total) used fuelwood for cooking, compared to 1.17 million households (73%) in 1982 (CSO, 1994).

A more comprehensive view of the sources and strengths of Zimbabwe's anthropogenic greenhouse gas emissions is given in the country's Initial National Communication to the UNFCCC (Table 9). The striking feature of this assessment is the apparently large carbon sink in the land-use change and forestry sector. This is because the estimate of CO₂ emissions from the conversion of forest and grassland to agricultural land is derived from a measure of only 18,290 ha of converted land in three areas of the country, rather than estimating the conversion of land across the country as a whole. Kunjuku *et al.* (1998) estimated a mean annual loss of growing stock due to deforestation and clearing land for agriculture and settlement to have been 47 million tonnes annually between 1985-1992. This is almost the same as the current estimated mean annual increment of 47 million tonnes in natural vegetation due to the growth of the remaining stock (Ministry of Mines, Environment and Tourism, 1998a). If the latter estimate for biomass loss due to land clearance and other changes in forest and other woody biomass stocks is correct, then CO₂ emissions would be about 49,820 Gg more than that claimed, which would

make Zimbabwe a net emitter of carbon (25,462 Gg CO₂ equivalents) rather than a net sink. Clearly, given the relatively extensive woodland cover across the country, Zimbabwe has the potential to be a carbon sink, but current pressures for more agricultural land and for wood for various purposes, including fuelwood, make this unlikely.

Table 8: Indicators of commercial energy use and carbon dioxide emissions in Zimbabwe, with equivalent values for sub-Saharan Africa and globally (World Bank, 2000; WRI/UNEP/UNDP/WB, 1998).

Indicator	Units	Frame	Zimbabwe	Africa	World
Commercial energy usage	10 ³ t.o.e.	1990	8,934	273,093	8,608,414
		1997	9,926	323,921	9,431,190
Per capita commercial energy use	kg oil equivalent	1990	917	705	1,705
		1997	866	695	1,692
GDP per unit energy use	PPP\$ per kg o.e.	1990	2.6	2.5 ^a	4.3 ^b
		1997	3.1	2.6 ^a	5.1 ^b
Total CO ₂ emissions	10 ⁶ metric tonnes	1990	16.6	465.3	16,183.10
		1997	18.4	471.7	22,690.10
Per capita CO ₂ emissions	metric tonnes	1990	1.7	0.9	3.3
		1997	1.6	0.8	3.4

Notes: ^a Average of 12 Sub-Saharan countries

^b Average of 20 UNFCCC Annex I countries

Table 9: Summary of anthropogenic greenhouse gas emissions by major sector for Zimbabwe in 1994 (Ministry of Mines, Environment and Tourism, 1998a). All emission estimates are in Gg (10⁹g).

Greenhouse gas source sector	Greenhouse gas (global warming potential)					
	CO ₂ (1.0)	CH ₄ (24.5)	N ₂ O (320.0)	NO _x (40.0)	CO (3.0)	CO ₂ equivalents
Energy (fuel combustion and fugitive emissions)	14,772.13	77.19	1.18	10.08	544.46	19,076.68
Industrial processes	2,316.35	19.08	6.05	0.21	1.38	4,732.20
Agriculture	0.00	236.84	2.39	66.91	1,381.81	13,388.96
Land-use change and forestry	-62,269.00	1.26	0.01	0.20	18.44	-62,171.75
Waste	0.00	25.15	0.00	0.00	0.00	616.06
Total	-45,180.52	359.52	9.63	77.40	1,946.08	-24,357.85

Given the amount of research, analysis and synthesis on the likelihood and potential impacts of climate change on the climate, environment, resources and human activities in southern Africa, and particularly in Zimbabwe, it is an important question why so little of this information seems

to have been taken into account in formulating national economic, environmental and other policies and practices. The issues and outcomes are complex, more so when they have to be integrated with the more immediate issues of promoting economic and social development. Nevertheless, it must give cause for concern that the science of climate change, even when the subject of local and regional studies, is apparently having so little effect at national level, in contrast to its much greater impact internationally.

3. Zimbabwe and the UNFCCC

3.1 Institutional framework

Ministry of Environment and Tourism

Overall responsibility for negotiating multilateral environmental agreements on behalf of the Government of Zimbabwe rests with the Ministry of Environment and Tourism (MET). Nevertheless, any agreement has to be ratified by Cabinet, preceded by a review of the legal implications by the Office of the Attorney General. Although other ministries may manage some of these agreements, MET remains responsible for co-ordinating the national positions and programmes related to these agreements. Within the Ministry, specific responsibility for climate change issues lies with the Deputy Secretary for Environment. In addition to serving as the chief negotiator for Zimbabwe at meetings of the UNFCCC, the Deputy Secretary is also the National Focal Point for the UNFCCC, as well as being responsible for the Convention on Biodiversity and the Convention to Combat Desertification.

In addition to the role of the Ministry for Environment and Tourism, the Department of Meteorological Services (DMS) liaises closely with the World Meteorological Organisation and the Intergovernmental Panel on Climate Change on some of the technical issues related to climate change. At a regional level, DMS also links with the Southern Africa Development Community's Environment and Land Management Sector (SADC-ELMS).

National Climate Change Office

Technical issues and the co-ordination of specific national projects established within the framework of the UNFCCC are handled by the National Climate Change Office within the Ministry of Environment and Tourism. The Office was established with funding from the Global Environmental Facility, through the United Nations Development Programme, to co-ordinate and administer the preparation of Zimbabwe's Initial National Communication to the UNFCCC. This funding covered the appointment of a Climate Change Co-ordinator and a secretary, as well as the various functions and activities associated with preparing the report for the UNFCCC. The support ended when the report was submitted to the UNFCCC. Since then, the Climate Change Office has subsisted on marginal funds derived from projects, though the costs of office space, water, electricity and telephone are borne by MET. Because there are insufficient funds at present to support a full-time appointment, the co-ordinator currently serves in a part-time capacity. This limits the present extent to which the Climate Change Office can function.

National Climate Change Committee

National activities related to climate change are coordinated through the National Climate Change Committee. The committee comprises officials from the Ministry of Environment and Tourism; the Climate Change Office; the departments of Meteorological Services, Natural Resources, and Energy; the Ministry of Agriculture; and the National Economic Planning Commission, together with a representative each from the Confederation of Zimbabwe Industries and the Southern Centre for Energy and Environment. The committee is chaired by the Deputy Secretary for Environment, Ministry of Environment and Tourism. Administrative details are dealt with by the Climate Change Office. Technical inputs are provided, where necessary, by

various other national institutions, universities, research organisations, industry associations and NGOs. The main function of the committee is to provide a forum for an exchange of views on climate change issues, to seek consensus on national positions, where possible, and to advise the Ministry accordingly. The committee is scheduled to meet once every three months, but in reality it meets less frequently than this, usually immediately prior to and after the Conference of Parties.

Non-governmental organisations

Climate change activities in Zimbabwe are also carried out in close cooperation with a number of research organisations and non-governmental organisations. Foremost among these has been the Southern Centre for Energy and Environment, a non-profit, Zimbabwe-based research organisation set up in 1992 to undertake high-level research on issues related both to climate change and to the sustainable use of energy. The Southern Centre co-operates closely with Government, industry and other non-governmental organisations in and outside Zimbabwe in searching for an equitable solution to the balance between economic development and environmental protection. Through its studies and programmes, the Southern Centre has investigated and obtained technical information to support Zimbabwe's contributions to the UNFCCC. It has also assisted neighbouring countries in their research activities. Many other non-governmental organisations in Zimbabwe are also active in the environmental field, but few of these have climate change as part of their development or research agendas. The Directory of NGOs in Zimbabwe prepared by the National Association of NGOs (NANGO) lists over 180 active NGOs, many of which are involved in resource management in the communal areas.

3.2 Involvement in the UNFCCC

The Conference of Parties

The United Nations Framework Convention of Climate Change was adopted in New York on 9th May 1992. It was signed by Zimbabwe on 12th June 1992 at the United Nations Conference on Environment and Development and subsequently ratified on 3rd November later that year. The convention came in to force on 21st March 1994. In contrast to the speed with which it signed the UNFCCC, Zimbabwe has not yet signed the Kyoto Protocol to the UNFCCC, adopted at the 3rd Conference of Parties (COP 3) held in Kyoto, Japan, in December 1997. This does not necessarily reflect a specific reservation on the part of the Zimbabwe Government but rather a delay apparently within the Office of the Attorney General caused mainly by the need to address other more pressing issues.

Zimbabwe has been represented at ministerial level at all six Conferences of Parties to the UNFCCC. The country was represented at COP 1, held in Berlin in March-April 1995, by the Minister of Transport and Energy, but subsequent meetings by the Minister of Environment and Tourism (Minister of Mines, Environment and Tourism at COPs 3-5). In 1996, the then Minister of Environment and Tourism, Mr Chen Chimutengwende, was elected President of the Second Conference of Parties held in Geneva, 8-19 July 1996. A member of the Zimbabwean delegation was appointed Rapporteur to the Bureau for COP 1.

At each COP, the Minister is supported by senior officials from the responsible ministry, currently the Ministry of Environment and Tourism, and other government departments, where necessary. This includes the Deputy Secretary for Environment and Tourism who is both the chief negotiator for Zimbabwe at meetings of the UNFCCC Subsidiary Bodies and the national

focal point for the UNFCCC. Where possible, meetings of the Conference of Parties are also attended by a representative of the Ministry of Foreign Affairs, usually the Zimbabwean Ambassador in the country concerned, or the senior ambassador in the region. Overall, the size of the delegation is relatively small, usually 3-5. The UNFCCC Trust Fund currently provides funding for two delegates from each developing country to attend the Conference of Parties, an increase from a single supported delegate at previous COPs.

Subsidiary bodies

The Conference of Parties is served by two standing ‘subsidiary bodies’ which meet between the COPs to consider technical and other details on implementing the provisions of the UNFCCC. The Subsidiary Body for Implementation (SBI) is responsible for the review and assessment of policies and mechanisms, including examining the National Communications and Emissions Inventories submitted by Parties. It also advises the Conference of Parties on the financial mechanism operated by the Global Environmental Facility, and on administrative and budgetary matters. The Subsidiary Body for Scientific and Technological Advice (SBSTA) is advises the COP on scientific, technological and methodological matters relating to the Convention. As such, it serves as the conduit to COP for scientific information on climate change issues provided by expert groups such as the Intergovernmental Panel on Climate Change (IPCC) and specially-constituted working groups of the UNFCCC.

The chief negotiator at the Conference of Parties, currently the Deputy Secretary for Environment, Ministry of Environment and Tourism, and the National Focal Point for the UNFCCC, attends all meetings of the subsidiary bodies. In the past, the size of the Zimbabwe delegation was larger; eight delegates attended the 5th session of the subsidiary bodies in February 1997, soon after Zimbabwe took over the presidency of the COP. Since then, however, the numbers have dropped to the present single delegate. Nevertheless, despite the small size of the delegation, the current delegate has served as co-chair of an informal contact group to consider the adequacy of Article 4, sub-paragraphs 2 (a) and (b) of the Convention¹ and of an informal consultative group Actions Implemented Jointly under the Pilot Phase². (The Zimbabwe delegate also helps to co-ordinate positions among countries with the Group of 77 and China on these issues.) This trust presumably reflects some measure of recognition of Zimbabwe’s contribution overall to discussions and negotiations within the UNFCCC and its subsidiary bodies.

¹ Article 4, sub-paragraphs 2 (a) and (b) of the Convention concerns the commitment of developed country Parties and other Parties included in Annex I to adopt policies and measures to mitigate climate change by limiting their anthropogenic emissions of greenhouse gases and protect and enhance their greenhouse gas sinks and reservoirs, and to report periodically on such policies and measures. Some Annex I Parties argue that action by them alone will not be sufficient to meet the objective of the Convention. They would like to see the provisions of the article extended to include some commitments from non-Annex I Parties. Others, most notably the Group of 77 and China, argue that Annex I should first undertake concrete measures to reduce anthropogenic emissions of greenhouse gases to their 1990 level, and that no new commitments for non-Annex I Parties should be introduced.

² The Conference of the Parties, at its first session (COP 1), decided to established a pilot phase for activities implemented jointly (AIJ) among Parties in terms of meeting their commitments under Article 4.2(a) of the Convention, and to consider the relevant methodological issues and questions of a uniform reporting format.

Technical bodies

Representatives from Zimbabwe participate in a range of working groups and technical meetings organised by the UNFCCC Secretariat and the Intergovernmental Panel on Climate Change (IPCC). These have included UNFCCC expert meeting on technology information centres and networks, and various meetings of the IPCC working groups convened to develop guidelines for emission inventories, especially for land-use change and forestry sector, and on biomass burning, agricultural soils, harvested wood products, and the reassessment of emission factors and conversion coefficients. A number of Zimbabweans have also been accepted on the Roster of Experts on Methodologies (18), Roster of Experts on Technology and Technology Transfer (1), and the List of Experts nominated by governments to undertake in-depth reviews of National Communications (1).

The past Director of Meteorological Services served as co-chair of Working Group II of the Intergovernmental Panel on Climate Change and was involved in producing the Second Assessment Report of the IPCC, on Impacts, Adaptation and Mitigation of Climate Change (Watson, Zinyowera and Moss, 1996) and the report assessing the vulnerability of different regions to climate-change impacts (Watson, Zinyowera and Moss, 1998). A number of other Zimbabweans contributed as lead authors or contributing authors. Some of these, and others, have also contributed to the upcoming Third Assessment Report of the IPCC and the Special Report on Land Use Change of Forestry.

National Communication

Zimbabwe was the eighth non-Annex I country to submit its Initial National Communication to the UNFCCC, presenting it on 25 May 1998 (Ministry of Mines, Environment and Tourism, 1998a). The report was prepared with funding provided by the Global Environmental Facility (GEF) through the United Nations Environment Programme (UNEP) and the UN Development Programme (UNDP) in terms of its mandate from the COP to expedite the production of national communications by non-Annex I Parties. A proposal has been submitted by Zimbabwe for interim funding of enabling activities under a Phase II, aimed at strengthening those activities initiated in the preparation of the initial communication and potentially leading to preparation of a second national communication.

A key component of GEF support for the preparation of Zimbabwe's Initial National Communication was the establishment of a Climate Change Office within the then-Ministry of Mines, Environment and Tourism (now just Ministry of Environment and Tourism). This allowed a Climate-Change Co-ordinator to be appointed, to facilitate production of the national communication and to promote climate-change activities generally. The GEF funding ended once the Initial National Communication had been submitted to the UNFCCC, and with it support for running the Climate Change Office and the co-ordinator. Currently, the co-ordinator works only part time in the Climate Change Office, funded by specific projects rather than through a core budget. The Ministry of Environment and Tourism supports the Climate Change Office to the extent of providing an office and basic running costs (*e.g.* water, electricity, telephone), but under present budget restrictions it is not able to institutionalise the office or the post of co-ordinator. Funding for meetings, workshops and materials, as well as remuneration for the co-ordinator and secretary, all comes from project funds. This lack of an established institutional base is a serious constraint on building the necessary national-level organisation and capacity to support climate-change activities in the long term.

Financial contributions to the UNFCCC

Parties to the UNFCCC pay an annual contribution to the Trust Fund for the core budget of the UNFCCC, each country's share being based on the UN scale of assessment, itself based on a country's per capita gross domestic product. Zimbabwe's contribution currently amounts to 0.009% of the core budget or, for 2000, US\$ 976. Up to 2000, Zimbabwe paid its annual contribution as required, and was even in credit to an amount of US\$ 303 following a re-adjustment in the scale of country contributions. It is currently one year in arrears, owing US\$ 673, one of 42 countries still outstanding on their 2000 payments. (A further 18 parties are outstanding in their 1999 and 2000 contributions; 21 have not paid their 1998-2000 contributions, 6 have not paid since 1996, and 34 have not paid since 1995; 63 parties have paid their 2000 contributions: FCCC/SBI/2000/INF.12 dated 6 September 2000.) Although the Zimbabwe Government has budgeted for the required amount, the extreme shortage of foreign exchange in the country at present has meant that even this relatively small sum cannot be paid, given other national priorities for the available foreign exchange. There is no provision for Parties to pay their contributions in their national currencies.

Designation and commitments

Zimbabwe is classed as a non-Annex I or developing country in terms of the UNFCCC. Taking into account the common but differentiated responsibilities of the Parties, and their specific national and regional development priorities, objectives and circumstances, Article 4.1 of the UNFCCC requires all Parties to develop, periodically update, publish and make available to the Conference of Parties a national inventory of the anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using agreed protocols, and to formulate, implement, publish and regularly update national programmes to mitigate climate change by addressing these emissions and removals. It also requires Parties to promote and co-operate in the development, application, diffusion and transfer of technologies, practices and processes that control, reduce or prevent such emissions, and to promote sustainable management to conserve and enhance, as appropriate, sinks and reservoirs of these greenhouse gases.

Parties are also committed to co-operate in preparing to adapt to the impacts of climate change; developing and elaborating appropriate and integrated plans for the management of agricultural and water resources; and protecting and rehabilitating areas affected by desertification, droughts and floods. This includes commitments to promote and co-operate in scientific, technological, technical, socio-economic and other research; contributing to systematic observations and development of data archives related to the earth's climate system; full, open and prompt exchange of such information, including that on the economic and social consequences of various response strategies; and education, training and public awareness of climate change, and encouraging the widest public participation in the process. In terms of Article 12, developing countries may also propose projects for financing, including provisions for specific technologies, materials, equipment, techniques or practices needed to implement such projects, and, where possible, estimates of all their incremental costs and associated benefits in reducing emissions or enhancing the removal of greenhouse gases. The ongoing involvement of scientists from Zimbabwe in international programmes contributing to the UNFCCC (*e.g.* the Intergovernmental Panel on Climate Change) and the early compilation of an initial national communication to the UNFCCC, including a greenhouse gas emissions inventory for the country, is evidence that Zimbabwe is willing to fulfil its international commitments.

Domestic actions

In its FY 2001 budget, the Zimbabwe Government introduced a Carbon Tax on all vehicles. The levy depends on the engine capacity of the vehicle, ranging from ZWD 1,200 (about US\$ 22)³ per year for vehicles with engine capacities less than 1,5 litres, ZWD 2,400 (almost US\$ 44) for vehicles 1.5 – 3.0 litres, to ZWD 4,800 (US\$ 87) for vehicles with engine capacities above 3 litres. The levy is collected by insurance companies along with Third Party premiums for onward transmission to the Treasury. At present it is unclear how the funds will be used, though they are supposed to contribute to ensuring a cleaner environment. The tax could have the effect in the long run of encouraging a switch to vehicles with smaller engine capacities, thereby lowering per vehicle emissions. With an estimated 930,000 vehicles on the road at present the Government could collect as much as ZWD 3 billion (US\$ 54.5 million) per year (Zimbabwe Independent, 2001), though a more realistic figure would be closer to ZWD 2 billion (US\$ 36 million) given the structure of the vehicle fleet. If used for their stated purpose, through appropriately targeted interventions, these funds could have a major impact in combating air pollution and helping to mitigate climate change. With the current pressures on the government exchequer, however, concern has been expressed that the funds could be used to supplement current expenditure (Zimbabwe Independent, 2001).

Technology transfer

One project is currently being implemented under the Pilot Phase of Actions Implemented Jointly⁴. This involves the construction of a mini-hydroelectric power station at the Manyuchi Dam in southern Zimbabwe (see <http://www.unfccc.int/program/aij/aijact00/zwefradeucan-01-00.html>). The dam was built in the late 1980s to store water for irrigation of 2,000 ha sugar cane, part of an agro-industrial complex situated 40 km downstream from the dam. The project, being financed by EDF (France), Ontario Power Generation (Canada), RWE (Germany) and Hydro-Québec (Canada), four companies belonging to the E7 Group (comprising the world's eight most important electric utility companies), involves an investment of US\$ 2 million (US\$ 1.6 million in plant, equipment and construction; US\$ 0.4 million in oversight and administrative costs). The scheme is anticipated to produce 4,200 MWh of electricity per year over a project lifetime of 25 years. This electricity will be sold to the Zimbabwe Electricity Supply Authority (ZESA) at 80% of the prevailing national sales rate and fed in to the national grid through a 25 km medium voltage powerline. A regional distribution network, comprising a total of 120 km of medium voltage lines, will be constructed to supply electricity to surrounding villages and industry.

The baseline assumption is that, in the absence of the project, electricity derived from the coal-fired power station at Hwange in northwest Zimbabwe would be used to meet these needs. On this assumption, and using the current efficiency of the Hwange power station, the Manyuchi

³ At the current (Feb 2001) exchange rate of ZWD 1 = US\$ 0.018

⁴ Article 4.2(a) of the UNFCCC provides for Parties to the Convention to implement jointly with other Parties policies and measures to mitigate climate change, both by limiting anthropogenic emissions of greenhouse gases and by protecting and enhancing greenhouse gas sinks and reservoirs. By Decision 5/CP.1 the 1st Conference of Parties decided to establish a pilot phase for activities implemented jointly (AIJ) among Annex I Parties and, on a voluntary basis, with non-Annex I Parties. The Subsidiary Body for Scientific and Technological Advice was tasked with establishing a framework for transparent, well-defined and credible reporting of the possible global benefits and the national economic, social and environmental impacts of such joint activities, as well as any practical experience gained or technical difficulties encountered. No Party would be able to get credit for any resulting reduction or sequestration of greenhouse gas emissions during the pilot phase, however. Provision for credit to be given to such activities was later incorporated into Article 6 of the Kyoto Protocol but restricted to activities undertaken jointly among Parties listed in Annex I of the UNFCCC and subject to satisfactory guidelines being worked out by the Conference of Parties meeting as parties to the Protocol.

mini-hydroelectric power project would avoid the emission of 126,578 t CO₂ over its 25 year lifetime. The 20% difference between the purchase and sales price of the electricity will be used by ZESA to maintain the local distribution grid and cover its related operational costs. The profit from operating the power station, together with funds budgeted for replacing equipment, will be invested in a trust fund to finance appropriate local development fund projects.

A second AIJ Pilot Phase project is currently being planned. This will involve the use of wood waste from the timber industry around Mutare in eastern Zimbabwe to generate electricity in a small thermal plant. The electricity will be distributed to surrounding communities through the national grid. Given that wood waste produces CO₂ anyway when it decomposes, the CO₂ produced in the thermal power station would not be additional, but the saving on CO₂ emissions from coal-fired power stations supplying the national grid would. No information on the expected level of emissions reduction, or any other details of this project, are available at present.

Research on cleaner production technologies is being carried out at the Scientific and Industrial Research Centre (SIRDC), in conjunction with the Southern African Network for Training and Research on the Environment (SANTREN) with funding provided by Carl Duisberg Gessellschaft (CDG), Germany, and the Danish International Development Agency (Danida). A number of companies in Zimbabwe, for example in the sugar industry, have expressed interest in reducing their emissions, though this is largely in response to their need to meet the ISO 14000 series of environmental standards, so as to ensure continued access to global, especially European, markets for their products. The current uncertain economic environment, however, is an important constraint on companies being willing to undertake the measures needed to reduce emissions.

The World Bank has recently funded a study to identify other potential CDM projects, though none of these have yet been implemented. The Netherlands Government has funded a study aimed at identifying technical and non-technical barriers to the uptake and implementation of CDM options, and what role government and industry can play in encouraging the development of CDM projects. There has been discussion about setting up a CDM office, to serve as a conduit for CDM projects, to provide relevant information to industry, and to encourage companies to start preparing proposals and locate overseas partners. The funds required to do this still need to be secured, however.

Capacity building initiatives

Zimbabwe has been involved in, and has benefited from, a wide range of activities initiated under the UNFCCC, aimed at building capacity in various fields to enable developing countries to address climate-change issues more effectively (Table 10). Many of these initiatives were pilots studies aimed at identifying opportunities for, and constraints on, undertaking activities in support of the objectives of the UNFCCC. They provide a number of lessons for both donors and hosts (see section 3.5.5). Under the UNFCCC CC:INFO initiative the Southern African Network for Energy and Environment, located in Zimbabwe, set up the Zimbabwe FCCC Web Site (see FCCC/SBI/1998/INF.3 dated April 1998 and <http://www.unfccc.int/resource/ccsites/zimbab/>). The site has not been updated recently, however.

Following on from these early initiatives, and in response to a decision at COP 4 by which the Conference of the Parties requested the secretariat to compile and make available to Parties a list of projects submitted by non-Annex I Parties in accordance with Article 12.4 of the Convention

(decision 12/CP.4: FCCC/CP/1998/16/Add.1), Zimbabwe put forward four projects, all in the energy efficiency and renewable energy sectors. These were: investing in demand side management in the electricity sector; investment in small-scale hydroelectric power plants to supply rural and peri-urban consumers; installing solar mini-grid utilities to serve rural centres not connected to the national electricity grid; and accelerated promotion of biogas technology in rural low income households (document FCCC/WEB/2000/2, 12 September 2000).

Considerable progress was made during the preparation of Zimbabwe's Initial National Communication in building capacity locally to conduct inventories of greenhouse gas emissions and to undertake the associated mitigation, vulnerability and adaptation studies. Much of this momentum has been lost, however, by the delay in making available funds for follow-up activities, including the preparation of a second and improved National Communication, and in implementing some of the proposed mitigation and adaptation measures. With the imminent release of these funds, a new round of activities is anticipated, though much of the capacity developed initially will need to be rebuilt as many of the people involved have moved on to other things.

Table 10: List of projects related to climate change and implementation of the UNFCCC carried out in Zimbabwe (based mainly on information given in UNFCCC document FCCC/SB/2000/INF.8)

Project Title	Initiating organisation and country	Objective	Status
Institutional strengthening	CIDA, Canada	To strengthen the capacity of the Ministry of Environment and Tourism, including the capacity to address issues in the energy sector	1991-1998: completed
The meteorology development project for SADC countries	Finland	To strengthen the national meteorological services of the SADC countries in their responsibilities to support national food production, drought monitoring and sustainable development	
Regional biomass energy conservation programme for Southern Africa	Germany	To enhance capacities and commitments of governments and institutions to plan and implement integrated biomass energy conservation programmes	1998-2001: on-going
Support for adaptation to climate change: promotion of photovoltaic rural electrification in Zimbabwe	Japan	To conduct feasibility surveys and evaluate the potential of solar power generation as a means of rural electrification	
Netherlands climate change studies assistance program	Netherlands	To enable developing countries to create greater awareness of climate change issues and to increase the involvement of policy makers, scientists and the general public, through support of the responsible ministry.	
South-North Knowledge Network on Climate Change	Norway	To enhance capacity in developing countries and increase understanding by promoting cooperation on projects between institutions from developing and industrialised countries	
Building capacity in Sub-Saharan Africa to respond to the UNFCCC	UNDP	To support limited components of the preparation of the First National Communication to the UNFCCC	1992-1995: project completed and evaluated as successful
Enabling activity for the preparation of the Initial National Communication to UNFCCC	UNEP	To facilitate preparation of Zimbabwe's Initial National Communication to the UNFCCC	1997-1998: Initial National Communication submitted May 1998
CC:INFO/Web	UNFCCC secretariat	To assist Parties wishing to set up national Web sites on climate change and the implementation of the Convention, and to foster the growth of the network of such sites for sharing information and ideas, including those for the preparation of national communications	National web page established in 1997

Table 10 (cont.)

Project Title	Initiating organisation and country	Objective	Status
Integrating renewables into energy systems	United Kingdom	To analyse renewable energy schemes in different countries to obtain insights into the application of best practices for overcoming market, technical and financial barriers to the establishment of the sustainable markets required for large-scale deployment of renewable energy technologies.	1996-1999: project completed
Sustainable development and climate change finance	UNEP	To consider sources of finance available to fund climate change activities, with special emphasis on the Clean Development Mechanism	Two regional seminars convened in Nairobi 1999; national workshops held in the four participating countries
Developing national capacity to implement industrial clean development mechanism projects in selected African countries	United Nations Industrial Development Organisation (UNIDO)	To assist African countries that are potential hosts for industrial projects under the Clean Development Mechanism to build methodological, technical, process and institutional capacity to enable them to benefit from the mechanism	1999-2000
Certificate training course on climate change vulnerability and adaptation assessment	United Nations Institute for Training and Research (UNITAR)	To develop and establish courses on climate change at selected tertiary educational institutions	
Economic of climate change	USAID	To run a training course to introduce economic policy makers to climate change and its potential impact on economies.	Workshop originally scheduled for March 2000
Livestock nutrition improvement and methane reduction project	US Environmental Protection Agency	To examine livestock feeding practices to determine the potential for improving livestock productivity and reducing emissions	
Landfill gas utilisation in Zimbabwe	US Environmental Protection Agency	To undertake a feasibility study of installing a full recovery system for landfill gas use at a landfill facility in Harare, Zimbabwe.	
National CDM/JI strategy studies (NSS program)	The World Bank	To advance, deepen and broaden the national process/dialogue regarding the country's role in the international climate change cooperation, including: compiling and/or updating the national greenhouse gas inventory, identifying and addressing existing CDM barriers, assessing legal, regulatory and institutional needs, developing national strategy regarding the CDM/JI, establishing a pipeline of potential CDM/JI projects, and proposing a program of further activities/actions	1997 – on-going but studies in Zimbabwe completed

3.3 Manner of negotiations within the UNFCCC

Representation at the COPs

Zimbabwe has been represented at ministerial level at all of the Conference of Parties to date. The Minister concerned, currently the Minister of Environment and Tourism, is supported by a chief negotiator (currently the Deputy Secretary for Environment in the Minister of Environment and Tourism), the Climate Change Co-ordinator (currently a part-time post), and sometimes one or more other functionaries from the Minister of Environment and Tourism, the Department of Meteorological Services, and the Zimbabwe diplomatic mission in the host country, where present. The size of the Zimbabwe delegation is similar to that of most other African countries, but considerably smaller than those delegations representing Annex I countries. Figure 8 illustrates the disparity in the size of delegations among countries attending the last Conference of Parties, COP 6. Most developing countries had fewer than four delegates at COP 6. In contrast to the delegations from Annex I countries, which comprise professional negotiators, lawyers, technical experts, scientists, lobbyists and politicians, developing country delegations often consist of a senior government figure, usually a Minister, the country's chief climate change negotiator, and one or two technical experts. Given the complex nature and fast pace of negotiations, as well as the increasing importance of informal consultations and side events, including discussions with potential project partners and donors, the small size of delegations must place developing countries such as Zimbabwe at a disadvantage.

Preparations prior to the COPs

Before a Conference of Parties, the Climate Change Office organised a meeting of the National Climate Change Committee for the Ministry of Environment and Tourism. At this meeting, representatives from the relevant government ministries, industry and key environmental NGOs discuss the issues on the agenda at the upcoming COP, and agreement is sought on what Zimbabwe's position should be on these issues. The Ministry of Environment and Tourism outlines the official position on the various issues and invites comments. Zimbabwe's position on issues is partly shaped already by its ongoing involvement in the discussions of the UNFCCC subsidiary bodies, as well as being somewhat influenced by its membership of the Group of 77 and China, though the principal determinant is national interest and the need to achieve equitable social and economic development. In general, while the NCCC usually endorses the Government's position, the process allows for a wide-ranging exchange of views and discussion that has the potential to shape the country's position.

In the past, the Ministry of Environment and Tourism received briefings from the Southern Centre for Energy and Environment on some of the technical issues and their policy implications. These were provided primarily on a consultancy basis, in relation to specific issues. A number of research papers and other publications from Southern Centre staff and associates helped in developing Zimbabwe's positions on a number of key provisions of the UNFCCC and Kyoto Protocol. In recent years, however, increasing experience with the issues in the Ministry of Environment and Tourism, together with Zimbabwe's participation in the Group of 77 and China within the UNFCCC, have been more influential. The Centre continues to be involved with climate change issues, but to a lesser extent than before, and with a narrower focus on energy policy and industrial development.

Relationships with regional groupings

Zimbabwe is a member of the African Group within the Group of 77 and China and has worked largely through this group to establish a common negotiating position with other developing countries on issues of mutual interest, particularly those related to financing of activities and technology transfer. Given the diversity of this group, agreement on the best approach to climate change issues is not always possible. For example, there is currently disagreement within the Africa Group, between southern and East African states and those from West Africa, over the question of allowing carbon credits under the CDM for projects that promote carbon sinks in developing countries. The present position of the G77 and China is that carbon sink projects in the land-use change, forestry and agriculture sectors in developing countries should not be used by Annex I countries to obtain credit in offsetting their domestic emissions, at least not without significant domestic action first being undertaken by the Annex I countries.

With the rise to prominence of regional groupings in the negotiations at the Conference of Parties of the UNFCCC, Zimbabwe has worked closely both with the Group of 77 and China, and with the Africa Group, to establish a common position among developing countries on the various issues. Within the G77 and China, Zimbabwe is responsible for co-ordinating the Group's position on Articles 4.8 and 4.9 of the UNFCCC⁵. Despite the size and heterogeneity of this group, and accepting that it has not always been able to achieve unanimity on all issues, especially that of admitting carbon-sink projects under Article 12 of the Kyoto Protocol⁶, it has nevertheless managed to forge a relatively strong alliance on many of the more important issues.

This has at least two important consequences. First, for the G77 and China to accommodate divergent interests, the Group's positions are usually stated in general terms rather than in specifics. This does not help move the debates forward to a resolution. That usually requires making detailed proposals, not simply a statement of principles (Gupta, 2000). As a result, the Group tends to react to specific suggestions put forward by Annex I Parties, rather than leading the debate by proposing detailed measures. Second, for Zimbabwe, its close involvement with the Group of 77 and China, and the Africa Group within that, means that its policies and positions are somewhat circumscribed by those adopted by the larger group, although the country can choose to intervene independently in the debates in situations where its position is at variance with group overall. Nevertheless, the effect may be to circumscribe the country's position somewhat by the need to maintain solidarity with its partners in the process.

Zimbabwe is also a prominent member of the Southern African Development Community (SADC). Until recently, SADC as a whole had not formulated any firm position on the issues being discussed within the UNFCCC. Immediately prior to COP 6, however, a consultative meeting was convened by the SADC Environment and Land Management Sector (SADC-

⁵ These articles address the issues of what actions are necessary under the Convention, including those related to funding, insurance and transfer of technology, to meet the specific needs and concerns of developing country Parties arising from the adverse effects of climate change and/or the impact of the implementation of measures taken to respond to climate change, especially those countries that are likely to be particularly vulnerable either to the impacts of climate change or to the response measures (Article 4.8). Article 4.9 makes special reference to the specific needs and special situations of the least developed countries in their actions with regard to funding and the transfer of technology.

⁶ Article 12 defines a Clean Development Mechanism (CDM). The purpose of the CDM is to assist non-Annex I Parties both to achieve sustainable development and to contribute to the ultimate objective of the Convention – to stabilise green house gas concentrations in the atmosphere at levels that will prevent dangerous anthropogenic disturbance of the climate system – and to enable Annex I Parties to comply with their quantified emission limitation and reduction commitments by being able to offset some of those commitments through investing in projects in non-Annex I countries that will result in certified emissions reductions, the so-called 'clean development' option. Negotiations are currently underway within COP 6 to include projects that will result in carbon sequestration, primarily within the land-use change and forestry sector.

ELMS) in collaboration with IUCN-The World Conservation Union, to review the COP 6 agenda and identify areas of common interest among the SADC states (SADC/IUCN, 2000). Representatives from eight SADC countries, including Zimbabwe, attended the meeting. Unfortunately, the meeting coincided with a preparatory meeting of the Africa Group on COP 6, in Dakar, Senegal, as well as with consultations on the implementation of Articles 4.8 and 4.9 of the Convention and on matters relating to Article 3.14 of the Kyoto Protocol, held in Geneva by the UNFCCC, which were attended by the Zimbabwe's chief negotiator to the Convention. As a result, Zimbabwe was represented at the SADC meeting by a deputy. Attention at the SADC consultative meeting focused on the issues surrounding the implementation of Articles 4.8 and 4.9 of the UNFCCC; capacity building for developing countries; the development and transfer of technology; land use, land-use change and forestry; and the clean development mechanism. As this was a consultative meeting, no policy positions were formulated.

Principles, policies and positions

Although Zimbabwe has been involved with the UNFCCC from the outset, there is currently no formally stated policy on climate change or any other issues ancillary to the UNFCCC. Climate change is not a priority issue for the Zimbabwe Government, though its potential importance globally is recognised. There are almost no domestic or external pressures at present to formulate a policy, given the low level of greenhouse gas emissions in Zimbabwe and the possibility that the country is a net sink for carbon dioxide. Drawing up a policy is being held over until the National Environmental Policy framework has been finalised. This will enable issues related to climate change to be addressed more coherently and consistently. The process of framing a National Environment Policy is under way, starting with draughting and promulgating the upcoming Environmental Management Bill.

The closest to an expression of principles and policy is to be found in the statement made to COP 5 in Bonn, November 1999 by the country's then Minister of Mines, Environment and Tourism. In his statement the Minister indicated that, for developing countries, eradicating poverty and achieving sustainable development are priorities. To accomplish these requires the transfer of up-to-date, environmentally-sound technologies, both to minimise emissions as the countries develop and to enable adaptation to climate change. This in turn needs to be supported by adequate financing as well as building the necessary capacity to ensure that the technology is used efficiently and that issues of vulnerability and adaptation to climate change are adequately addressed. Given the current low levels of emissions of most developing countries, the primary responsibility for reducing greenhouse gas emissions is considered to lie with the developed countries. Developing countries can best contribute by avoiding future emissions through pursuing sustainable development and the use of environmentally-sound technologies.

The Minister also raised the issue of the equitable distribution of opportunities and benefits under the Clean Development Mechanism (CDM) and the need to ensure that projects are allocated evenly among and within regions. Nevertheless, he suggested that the CDM will not solve many of Africa's development problems. The transfer of technology and know-how were seen the only guarantee that developing countries would not develop in unsustainable ways and contribute further to climate change. Concern was expressed that undue attention was being focused on the CDM, and that the other provisions of the Convention and the Protocol were being sidelined.

More recently, the debate on the CDM has widened to consider the proposal to admit carbon-sink projects in the land-use change and forestry sectors in its provisions. Zimbabwe has not

been centrally involved in this debate, perhaps because of the marginal location of the country as a potential host for such projects. It is also consistent with the view that the primary issue for developing countries is how to achieve industrial development without adding greatly to carbon dioxide emissions to the atmosphere, rather than how to offset, through carbon sequestration, the carbon being released by developed countries.

There is no evidence that the absence of a formally stated policy has seriously impeded the country in its negotiations within the UNFCCC to date, given the country's tactic of negotiating largely through the Group of 77 and China and, within that, the Africa Group. Group positions on issues largely represent a consensus built from the common denominators of individual country positions. Moreover, not having a formal policy has not translated into any lack of commitment by Zimbabwe to the negotiations and other activities of the UNFCCC, as the material in the preceding sections of this report show. The provisions of the various multilateral environmental agreements are seen as obligations of being part of the international community, but ones that may also provide opportunities for national development. Current initiatives are therefore a trade off between international commitments and national goals to achieve economic and social development.

National interests

It is recognised and accepted, both within the relevant sections of the Zimbabwe Government and more broadly, that climate change poses a threat on many fronts, and that it will require a concerted effort on the part of all governments to mitigate this threat and adapt to its more unavoidable consequences. The key interest shaping Zimbabwe's position in the climate change negotiations, however, is the immediate requirement to achieve rapid economic growth to meet the aspirations and needs of an expanding but still largely impoverished population. To do this, Zimbabwe needs to secure the necessary technology, resources and know-how. The prospect of being able to access technology, funding and technical assistance under the UNFCCC and other multi-lateral environmental agreements creates a strong incentive to become involved in these negotiations and activities.

This position has been articulated by Government and others on a number of occasions, and has been endorsed at successive national consultative workshops (Maya, 1994; Maya and Churie, 1995; Kureya, 1997; Chenje *et al.*, 1998). To the extent that successful and sustainable development is an essential prerequisite for the country to be able to contribute to achieving the broader aims of the Convention and the Protocol, this priority is compatible with those aims. This position has not changed fundamentally over time, though the country's objectives have become more sharply focused as the issues for the country have become clearer. They are unlikely to change substantially in the foreseeable future.

Consultation

A number of workshops on issues related to climate change were held at both national and sub-national level early on in Zimbabwe's involvement with the UNFCCC, particularly during the preparation of Zimbabwe's Initial National Communication to the UNFCCC (Maya and Churie, 1995; Hulme, 1996; Matarira *et al.* 1996; Maya and Gupta, 1996; see also FCCC/SBI/1997/INF.3, October 1997). Since then, however, there has been little activity, largely because there has been no particular pressing issue or activity to form a focus for such meetings, and because of the lack of resources to fund them. Current consultations and workshops are largely project-related and therefore involve a smaller number of more specialised

stakeholders. With the prospect of activities being implemented under the Clean Development Mechanism, a renewed process of public consultation is envisaged. Two national consultative workshops have already taken place in the context of both the World Bank and Netherlands projects on the CDM and a further national workshop is currently being considered, targeted mainly at industry, to provide information on the CDM and to encourage companies and others to start to formulate projects and look for overseas partners.

A wide range of stakeholder groups have been involved in these consultations. In addition to officials from various government departments (*e.g.* the departments of Natural Resources, National Parks and Wild Life Management, Agricultural Technical and Extension Services, Energy) and parastatal organisations (*e.g.* Zimbabwe Forestry Commission, Zimbabwe Electricity Supply Commission), participants have included representatives from the Confederation of Zimbabwe Industries, the Environmental Forum of Zimbabwe, environmental NGOs, and universities. Regional workshops have also included local government officials and private individuals. Some non-governmental organisations, particularly the Southern Centre for Energy and Environment, have been particularly active in providing both policy and technical analyses of the issues, and in lobbying for certain positions (Maya, 1994; Maya and Churie, 1995; Maya and Gupta, 1996; Kureya, 1997). An affiliate of the Southern Centre, the Southern African Network for Energy and Environment, was largely responsible for establishing the Zimbabwe FCCC Web Site (<http://www.unfccc.int/resource/ccsites/zimbab/>) under the UNFCCC CC:INFO initiative (document FCCC/SBI/1998/INF.3 dated April 1998).

Role of the media

The media has not played a significant role in the climate-change debate so far. Occasional articles on climate change, almost always excerpted from the international news agencies, appear in the local papers but usually without comment. In contrast, the current season's rainfall pattern and its likely impact on crop production is regularly reported, particularly where there is the prospect of a drought. Because of the current shortage of personnel and resources, there is no concerted initiative on the part of the Climate Change Office or the Ministry of Environment and Tourism to provide regular briefings and updates for the local media, though occasional contacts are made. In contrast, during the preparation of Zimbabwe's 1998 State of Environment Report, done with the support of the Government of Canada through the Canadian International Development Agency and the Ontario Ministry of Natural Resources, a newsletter was produced to inform stakeholders of progress. A similar initiative on climate-change issues could have considerable benefits in promoting public awareness and understanding of the issues.

The India Musokwotane Environment Resource Centre for Southern Africa (IMERCSA), a subsidiary of the Southern African Resource and Documentation Centre (SARDC), runs the Communicating the Environment Programme (CEP). In addition to providing fact sheets on various environmental issues, SARDC-IMERCSA also produces the series Focus on Environmental Law. This series highlights a number of global and regional multilateral environmental agreements believed to be of interest to Zimbabwe, as part of a project to assess the impacts of these agreements on Zimbabwe. The third in this series focused on the United Nations Framework on Climate Change and the Kyoto Protocol (SARDC-IMERCSA, undated). The series is widely distributed to relevant government departments, non-governmental organisations, research institutes, and interested individuals within Zimbabwe and other SADC countries.

Strategy development

As indicated earlier, Zimbabwe has no formally stated policy on climate change or the associated negotiations on mitigation and other measures. Nevertheless, the Government is committed to being involved in the negotiations and in contributing to their successful outcome, to the extent that this is consistent with its perceived national interests. As a non-Annex I country, Zimbabwe currently has no commitment to limit emissions, though it is committed to the more general measures specified in Articles 4.1, 4.8 and 4.9. Zimbabwe's position concurs with that of the Group of 77 and China that there should be no new commitments for non-Annex I Parties, but rather that definitive measures should be implemented by Annex I Parties towards achieving the necessary reductions in emissions (see FCCC/SBI/1998/6, August 1998). For Zimbabwe, the aim is to acquire the relevant technology and know-how to enable the country to develop economically while avoiding or minimising future emissions. This position is consistent with domestic interests and concerns as expressed by industry and local environmental NGOs. Most of the activities funded as part of the UNFCCC process (Table 10) have been in support of this position.

Zimbabwe's strategy at the UNFCCC therefore appears to be to work actively within the Group of 77 and China and, within that, the Africa Group, to pressure developed countries to follow through with their commitments to transfer technology and know-how to developing countries, together with adequate funds to support this, and to ensure that this is done equitably. Outside that, the country attempts to fulfil its more general obligations to the international community, and to take advantage of any resulting opportunities to promote economic and social development within the country. Given the uncertainties in the current round of international negotiations, in particular over the long-term viability of the Kyoto Protocol, which has yet to come in to force, this somewhat opportunistic strategy may be the best available for the moment.

3.4 Constraints to effective negotiation

Imperfect policy framework

The policy of the Zimbabwe Government on climate change is implied rather than stated. The guiding principle is the need to achieve relatively rapid economic and social development by acquiring the requisite technology, know-how and funds to support this. It is not clear, however, just how these principles are being translated into specific negotiating positions within the UNFCCC. Zimbabwe is an active member of both the Group of 77 and China and the Africa Group. It is debatable whether this strengthens or weakens the country's ability to achieve its goals. By being a member of the largest group within the negotiating forum of the UNFCCC, Zimbabwe may be more effective in promoting its aims, provided that the positions adopted by G77 and China coincide with its own. To date, that has been largely the case. Nevertheless, the positions adopted by the G77 and China (and the Africa Group within that) are a compromise among the many positions of the individual states and regional groupings. To this extent, Zimbabwe risks having its position diluted by the need to achieve consensus on issues before they are negotiated more widely. As a result, the positions of the G77 and China are stated largely in generalities rather than specifics, and tend to be in response to specific suggestions put forward by Annex I countries rather than being advanced proactively. This tactic is more likely to produce sub-optimal outcomes for developing countries (Gupta, 2000).

It could be argued that a flexible position is more appropriate at this stage, particularly given the current uncertainties in the negotiating process. Being a relatively minor player in the broader

negotiations, there is also perhaps less pressure on Zimbabwe to specify its policy formally. Nevertheless, the lack of a formal policy has certain drawbacks. First, the country's position is open to different interpretations, even within its own team, simultaneously or through time. Second, there is the risk that rather than advancing its own agenda, worked out beforehand in relation to its policy aims, the country is placed in the position of having to react largely to the positions and proposals of others during negotiations. This has been a particular criticism of many developing countries (Gupta, Maya, Kuik and Churie, 1996).

Insufficient capacity

Insufficient capacity is probably the main constraint to more effective negotiation. The shortage of capacity is reflected primarily in the relatively few people involved in climate-change issues on a continuing basis. Within the Ministry of Environment and Tourism only the Deputy Secretary for Environment and the Climate Change Co-ordinator (currently functioning part time) are regularly involved. Others in the Ministry are engaged much less regularly and then usually only on specific matters. The Deputy Secretary for Environment is the National Focal Point for the UNFCCC, as well as being responsible for negotiations under the Convention on Biological Diversity and the Convention to Combat Desertification. Outside the Ministry, but still within government, the Director of Meteorological Services was involved in discussions and negotiations at the earlier Conference of Parties and subsidiary bodies, but not at present. Beyond that, there is almost no-one.

The issue of adequate capacity is a particular concern in relation to the time taken up with meetings of the UNFCCC. Currently, the Conference of Parties lasts about 11 days a year. The preparatory meetings of the subsidiary bodies (SBSTA and SBI) prior to COP 6 took up 30 days (including two weeks of informal meetings prior to the 12th and 13th sessions with Part II of the 13th session being concluded over the first week COP 6). This is a substantial increase from 2 days for meetings of the subsidiary bodies in 1995 and 17 days in 1996. The decision at COP 5 to intensify the negotiating process within the UNFCCC (Decision 1/CP.5), with proposed increases in the number of sessions, workshops and consultations, will place an burden on those developing countries, such as Zimbabwe, with already-limited capacity. The risk is that such countries could end up contributing even less to the negotiations and their outcomes.

There are also limitations in the amount of technical expertise on climate change and related issues within Zimbabwe, although the country is perhaps less constrained in this respect than many other developing countries. The UNFCCC Roster of Experts lists 18 Zimbabweans as experts on methodologies, one on technology and technology transfer, and one on the in-depth review of National Communications (http://www.unfccc.int/program/roster/full_loe.pdf), though the UNFCCC list does not fully reflect all the expertise available in the country. Few of the people listed, however, are involved with climate change issues on a regular basis. Given the emphasis in Zimbabwe on the need to acquire clean production technology in the energy and industrial sectors, additional expertise in these fields at least is needed.

Much of the momentum that developed during the production of Zimbabwe's Initial National Communication (INC) has been lost, largely due to the delay in follow-up funding. This was expected to be available soon after submission of the INC to enable the country to begin implementing some of the proposed mitigation and adaptation measures, and preparing for a second and improved national communication. Interim funding of US\$ 100,000 is apparently in the final stages of approval, though almost three years after the INC was submitted to the

UNFCCC. People involved in the process have moved on to other things, so that that much of the expertise will have to be rebuilt.

Institutional and organisational deficiencies

Although the Ministry of Environment and Tourism maintains a Climate Change Office, funding for staff and activities has to be obtained through projects. As a result, the Climate Change Co-ordinator only works part-time, much of it on trying to secure funds to maintain the office. Under these circumstances, the co-ordinator is not able to undertake any long-term planning. This includes developing a national strategy on climate change, working to put in place the programmes and other initiatives that are needed to achieve its goals, and ensuring the necessary coordination and liaison among interested parties. The Climate Change Office needs to be put on a more secure footing. Adequately staffed and supported, it could help to address some of the other key needs: drawing up an appropriate policy framework; ensuring stronger intra-governmental co-ordination; promoting more effective linkages and trust between public and private sector institutions; improving the flow of information; and providing for greater continuity. At present, much of Zimbabwe's input to the UNFCCC depends on the knowledge and experience of one or two key people who have been engaged in the process for some time. With so few people engaged on climate-change issues, and with no understudies, the nature and effectiveness of Zimbabwe's involvement with the UNFCCC could be seriously compromised if for some reason these people were to leave.

Climate change is not yet seen as a sufficient priority by the Zimbabwe Government for it to commit the resources needed to fully support the Climate Change Office. Given other more pressing domestic concerns, as well as pressure from international financial institutions such as the World Bank and the International Monetary Fund to reduce government expenditure, it is difficult to see the Government at this juncture being willing or able to institutionalise and fund the Climate Change Office beyond its present limited extent. Nevertheless, under current circumstances, the sustainability of the Climate Change Office is questionable. Its human resources and infrastructure need to be maintained and, if possible, expanded to cover the increasingly complex and detailed issues involved, and to ensure that these are taken into account in national development planning. Having to rely primarily on external sources to meet recurrent expenditure, makes the future of the office vulnerable to the vagaries of donor funding.

A similar predicament exists in relation to the personnel and infrastructure needed to support Zimbabwe's active involvement in the other international conventions to which it is a signatory (*e.g.* CITES, CBD, CCD, Ozone). Assuming that these are all, in their own ways, as important as the UNFCCC, and that the international community anticipates, and Zimbabwe responds with, sufficient interest and commitment to be fully engaged in the functioning of these conventions, then each would require similar support to fulfil both Zimbabwe's needs and the international community's expectations. Unless carefully coordinated and rationalised, to prevent duplication, and with clear priorities established, this could be an expensive exercise.

3.5 Issues related to the UNFCCC

Links to national development

From the perspective of a developing country with currently low emissions and no commitments to emissions reduction, though with a more general commitment to help mitigate climate change

in ways that are consistent with national development programmes (UNFCCC Article 3.4), the involvement of Zimbabwe in the UNFCCC process raises a number of questions.

- What opportunities for sustainable development does addressing climate change create, and what might be some of the constraints on these?
- What is the optimal pathway between maximising national development and minimising greenhouse gas emissions? Can economic development be achieved without a significant increase in emissions?
- Will the proposed policies and measures for dealing with climate change, either through mitigation or through adaptation, enhance or hinder progress towards sustainable development?
- What forms of economic development, within the framework of a country's natural resource base, can Zimbabwe aspire to without incurring unnecessary or avoidable emissions?
- Where are the appropriate points of entry and avenues for such development? What kinds of industrial technology should Zimbabwe be aiming to access in this regard?

These questions are at the heart of any policy debate on how the country should engage the UNFCCC process. Comprehensive answers to most of these questions are not yet available, though research and analysis of some of these issues was undertaken in Zimbabwe soon after the UNFCCC was established, mainly through the Southern Centre for Energy and Environment (see UNEP, 1993; Maya, 1994; Maya and Churie, 1995; Maya and Gupta, 1996; and other publications listed on the Zimbabwe FCCC Web site:

<http://www.unfccc.de/resource/ccsites/zimbab/resource/studies.htm>). This early momentum seems to have waned. Nevertheless, some of the conclusions from these studies seem to have helped shape Zimbabwe's general position in negotiations at the UNFCCC. Incorporating these findings into specific policy aims, and in turn translating these aims into clear negotiating positions is still outstanding.

An over-riding concern in developing countries is the need to protect the limited but hard-won gains in industrialisation to date (UNEP, 1993; Maya, 1994; Maya and Churie, 1995; Maya and Gupta, 1996). These young industrial sectors are considered essential to further economic and social development. Any abatement strategies which burden them or increase their financial and operational risk are considered unacceptable. For example, the coal mined in Zimbabwe is the source of almost 40% of CO₂ emissions in the country (Ministry of Mines, Environment and Tourism, 1998a). Taxing the coal industry and users, so as to raise prices and encourage less use of coal and therefore lower emissions, would be unacceptable because of the strategic importance of the industry and its contribution to industrial and social development, particularly as much of the industry is situated in a remote area of the country (Maya and Churie, 1995). For this reason, taxes are not considered to be appropriate policy instruments at present for enforcing or encouraging abatement measures in developing countries (UNEP, 1993). The recently-introduced Carbon Tax may be an exception, being broad based, though it too will have some negative downstream economic impacts.

This points up a limitation in the use of the national greenhouse gas emissions inventories to identify what policy options should be pursued in reducing carbon emissions or enhancing carbon uptake (Maya and Churie, 1995). Emissions inventories focus on the anthropogenic sources and sinks of greenhouse gases. They do not provide any information on what factors influence emission rates within particular economic sectors, and therefore on what measures might be taken to reduce emissions. They are also no basis for assessing the sensitivity of

different target sectors to particular interventions. For example, in Zimbabwe, coal is both an economic resource and a widely used source of energy in industry, agriculture and the domestic sector. It supports a number of strategic industrial operations both directly, as feedstock, and indirectly, as a major source of energy. Disrupting this through rigid emissions control regulations could have far-reaching negative downstream economic and social effects.

Emission reduction commitments

Developing countries, especially in Africa, see the changes in greenhouse gas concentrations in the atmosphere and the ensuing possibility of climate change as directly reflecting the present skewed distribution of wealth and development among nations resulting from disparities in their use of global resources (Kuik and Gupta, 1996). Thus, while recognising that climate change is a global problem which will require cooperation among all countries to resolve, developing countries are wary of making any commitments, including those under Article 4.2(a) of the UNFCCC (AIJ)⁷ and Article 12 of the Kyoto Protocol (CDM)⁸, without clear and effective steps being taken first by developed countries to reduce their domestic emissions. This position has been emphasised repeatedly in statements made to the Conference of Parties and other meetings of the UNFCCC by the Group of 77 and China, in which Zimbabwe is an active member. There is understandable wariness about taking on emission-reduction projects where these might inadvertently worsen domestic economic and social conditions. This barrier of mistrust and suspicion is reinforced by a shortage of both information and analytical capacity with which to assess the possible costs, benefits, risks and downstream impacts of such joint activities. Progress on these issues will not be made until developing countries have the capacity and relevant information to permit such assessments, and are convinced that, overall, they will gain at least as much from these activities as they commit.

Carbon offsets and tradable permits

The issue of tradable permits is also controversial. These have been suggested as a means for developed countries or the private sector to acquire carbon credits by investing in CDM projects in developing countries that result either in the transfer of more energy efficient technologies or in some other initiative that reduces the level of emissions. The developing countries in turn are assumed to benefit economically from the investment. These joint activities are premised on the assumption that the marginal cost of a unit reduction in CO₂ emission is lower in developing than in developed countries, and that it is therefore more cost-effective to seek emission reductions by appropriate investments in developing countries. But apart from the uncertainties surrounding these interventions, particularly their downstream economic and social costs, there is the risk that developed countries will only invest in the low-cost, high-gain options, leaving the more costly options to be adopted later by the developing countries alone as their economies mature (Maya and Churie, 1995).

A major constraint to informed discussion and rational decision making in this regard is the shortage of information on the various costs, benefits and risks associated with different

⁷ See footnote 4.

⁸ Article 12 of the Kyoto Protocol defines a Clean Development Mechanism by which non-Annex I Parties can benefit from joint project activities funded by Annex I Parties that result in emissions reductions while assisting the non-Annex I Parties to achieve sustainable development and contribute to the ultimate objective of the convention. An Annex I Party can use the certified emission reductions to comply with part of its quantified emission limitation and reduction commitments. At present Article 12 refers explicitly to "certified emissions reductions", a proposal is being considered at COP 6 to give credit to project activities in the land use, land-use change and forestry sector, including afforestation and reforestation activities.

abatement options. Negotiators for developed countries appear to be much better informed than developing countries' representatives in being able to weigh up these costs, benefits and risks. Because of this, developing countries have been more cautious in making commitments and taking on responsibilities. Improving both the amount and quality of information available on an ongoing basis, as well as enhancing the capacity to analyse and evaluate such information, would help to relieve a key constraint to fuller and more effective participation by these countries in international negotiations and agreements. The problem has been amplified recently with the debate over expanding the CDM to include carbon-sink projects in the land use, land-use change and forestry sector. Not only is there a shortage of information on the carbon-sequestration potential of different plant species and vegetation types under various biophysical and socio-economic conditions, but there is also no clear understanding of the costs involved or the magnitude and extent of the possible net social, economic and environmental benefits that could accrue. Procedures for making these assessments need to be developed.

At a recent workshop held in Ghana on Africa and the CDM (Anon. 1998), a number of other important issues were raised. Concern was expressed that financing the CDM could reduce the funds available under official development assistance programmes or other financial mechanisms, such as GEF, designed to help developing countries meet their commitments under the various international environmental treaties. Issues of equity, both in relation to the costs, benefits and risks of projects, and in terms of the geographic distribution of CDM projects among developing countries, were also raised. There was concern that Africa might end up being marginalised yet again by a combination of the comparatively weak private-sector infrastructure in the continent (through which CDM projects are more likely to be implemented); the relatively small potential for emission reductions (because of Africa's currently low levels of emissions at a global scale); and the weak negotiating power of countries in the continent (for various reasons including the shortage of information and skills needed for analysing and evaluating the various options under discussion, and the lack of a coherent regional position on many of the issues).

There was also concern about the concepts and measurement of two key elements of the CDM, 'baselines' and 'additionality', and how these might relate in practice to issues of monitoring, verification and certification. The shortage of data with which to determine baseline conditions was considered to be a major problem. Overall though, much of the discussion focused on definitions, modalities and other institutional issues, rather than on the more technical questions. This reflects prevailing uncertainty about just how the CDM will operate. It also highlights the concern that the principal beneficiaries will be the developed countries and that, at best, only marginal benefits would accrue to the developing countries. This indicates the need for more independent information and assessment of the issues involved.

To build the necessary capacity to address all these issues requires stimulating the private sector; raising awareness of climate change and CDM in governments, the private sector, and among the general public; developing skills in baseline calculation, monitoring, verification and certification; research and development of technology; and creating of national, sub-regional and regional institutions to channel CDM activities (Anon., 1998). The meeting in Ghana emphasised that CDM should contribute not only to emission reductions but also to sustainable economic growth, poverty reduction, transfer of technology, and building the necessary capacity to sustain these gains. The sustainable development objectives were considered to be the priority.

Technology transfer

Provisions for transfer of technology is a recurring theme in both the Convention (Articles 4.3, 4.7, 4.8, 4.9 and 11.1) and the Kyoto Protocol (Articles 3.14 and 11.2(b)). Article 4.7 of the Convention is explicit: " The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties." Few of the activities carried out in Zimbabwe in the framework of the Convention have focused on technology transfer (Table 10), and only one project has been implemented (see section 3.2.8). Although it takes time to implement such projects, the paucity of such projects, especially in Africa, is striking. Of the 144 projects registered under the AII Pilot Phase, only eight are located in Africa (in Burkina Faso, Mauritania, Mauritius (2), Morocco, South Africa (2) and Zimbabwe); six are concerned with using energy more efficiently and two with renewable energy (see <http://www.unfccc.int/program/aij/aijproj.html>). Of the estimated 366 million metric tons of CO₂ equivalents to be offset globally over the lifetimes of the 133 projects for which there is quantitative data, the eight projects in Africa will contribute only 0.4%, emphasising their comparatively small scale.

The relative failure of many developing countries to attract technological projects aimed at reducing future emissions is a cause for concern. The issue was discussed at an African Regional Workshop on the Transfer of Technology, held in Arusha, Tanzania, in August 1999 (document FCCC/SBSTA/1999/11/ Annex 1). The aim of the workshop was to get a better understanding of the particular circumstances and needs of African countries in relation to the transfer of technology, and to generate information and ideas on how best to enhance the process. The workshop considered a number of questions related to technology needs, barriers to the development and transfer of technology, capacity and information requirements, transfer mechanisms, and the role of the private sector. A major constrain is that, for many African countries, including Zimbabwe, the issues of climate change are generally considered separately from those dominating the mainstream economic development agenda – how to attain sustainable economic growth, employment, security of food, water and energy supplies, and a better quality of life and human habitat. Thus opportunity for synergy between climate change and development issues has not yet been fully exploited. This is made more difficult by a shortage of capacity and resources need to assess what technology is required in relation to a country's circumstances and development options. Where these needs and priorities have been identified they are found to encompass the full spectrum of greenhouse gas limitation and adaptation technologies. For Africa generally, the priorities include rural electrification, reducing household dependence on biomass fuels, and more efficient use of energy in the industrial sector. Technologies to improve agricultural production, and food and water supplies, on a sustainable basis, are also needed.

Many barriers exist within the continent to the transfer of environmentally-sound technologies: economic and financial; organisational and institutional; technological; limited knowledge and skills; and a shortage of relevant information. Many countries have weak economies paying low wages. This leads to low levels of savings and investment, so that there is often little domestic financing available. Where it is, the local financial institutions are generally disinclined to finance technology projects, which are perceived to be risky. The structure and size of the markets in many African countries also inhibits technology development and uptake. The markets are usually relatively small, incurring additional transaction and development costs.

There are few of incentives to investment. Instead there are often market disincentives, including monopolistic or oligopolistic market structures.

Among the organisational and institutional barriers to technology transfer are unfavourable macro-economic policies; institutional inertia; insufficient coordination; inadequate communications; lack of transparency; relatively weak enforcement of laws relating to investments and companies; unclear property rights; long arbitration processes; high legal fees; poorly developed capacity for research and development; and a general shortage of capacity and skills. Few countries have specific national policies on the acquisition and development of technology, or the skills and knowledge needed to use it.

This catalogue of shortcomings can be contrasted with the reasons put forward by Parties to the UNFCCC for the uneven distribution of activities undertaken jointly under the pilot phase. These include: (a) differences in investment climates among countries; (b) lack of investment companies; (c) insufficient infrastructure; (d) inadequate institutional capacity; (e) cultural differences; (f) lack of both a policy on AIJ and a clear and transparent set of operational rules in the host country; (g) lack of awareness by the private sector in host countries on opportunities represented by AIJ; (h) difference in the level of knowledge and acceptance of AIJ by local stakeholders; (i) lack of capacity to produce comprehensive AIJ project proposals; (j) existing preferences by investors for particular areas, based on established business partnerships, strategic concerns or political priorities; and (k) the current lack of credit for achievements in reducing greenhouse gas emissions or sequestering carbon. Getting around these constraints often incurs high transactions costs (see document FCCC/SB/1995/5). Many of these points mirror those raised by participants in the Arusha workshop.

The negative impact of inadequate capacity, both in the number of people with the knowledge, understanding and skills to identify, promote and participate in technology transfer, and in the different qualities required to facilitate this, is obvious in the poor results to date. The goals of technology transfer, as envisaged in the Convention, also need to be more closely aligned with existing national development policies, particularly on economic growth, energy and the environment. This would help ensure that the acquired technologies contribute to achieving the national goals for sustainable development, including poverty reduction. A national office, such as that currently being considered for the CDM, could help to bring about the necessary coordination and integration, both among potential investors and in-country partners. More emphasis is needed on exchanging information among countries and companies within the region, not only with respect to the lessons learnt so far but also in relation to best practices in technology transfer.

Lessons from pilot activities

The various projects and activities undertaken during the pilot phase provided a valuable opportunity to learn lessons about the opportunities for, and constraints on, building capacity. An review and assessment of those activities carried out in, or involving, Zimbabwe, particularly in the context of the CDM (see UNFCCC document FCCC/SB/2000/Inf.8 and Table 10), brings out the following points. They have been somewhat generalised from the original statements in the project reports.

- The CDM remains one of the important targets for future capacity-building initiatives.
- More effort is needed to identify institutional needs and establish necessary institutional structures to allow host countries to cope with the CDM.

- The degree of commitment of host-country institutions is crucial to the success of an initiative, as is good coordination among donors.
- The widespread dependence on foreign funding often makes it difficult to achieve the necessary continuity within host institutions.
- There is growing national expertise and potential for sharing information and experiences among countries concerning the CDM, but greater commitment to and flexibility in financing regional networks by donors would help to make better use of this potential.
- Despite a growing awareness by Government and industry of their roles in relation to CDM and joint implementation, there is a need for further focused training.
- The interests of industry are often not adequately reflected in national climate-change programmes.
- There is interest in some countries to explore the potential for carbon sinks in the land-use change and forestry sector in the context of the CDM. (This does not apply generally to Zimbabwe, which is opposed to linking the issue of carbon sinks with the CDM. The local forestry industry, however, has expressed an interest in carbon-sink projects.)
- The needs of small-scale industries for technology enhancement need more consideration when planning CDM projects.
- Interventions should be selected and targeted according the local context.
- Interventions in markets, to encourage the adoption of renewable energy technologies, for example, need to be carefully thought through and controlled, so as to achieve maximum stimulation and minimum distortion within a defined time frame.
- The use of local expertise in projects contributes substantially to building capacity within the working environment.
- No single approach to capacity building can be guaranteed to provide universal benefits.

The challenge remains to incorporate these lessons into domestic policies and programmes, and to build the mechanisms for doing so.

Capacity requirements

A substantial and wide-ranging initiative is clearly required to address the many shortcomings identified above. Additional capacity and skills are needed to define the requirements and opportunities for technology transfer, and the constraints currently limiting this in specific cases. More broadly, there is a need to encourage and empower people in government and industry to create the enabling environments required for such initiatives to succeed. Unfortunately, too many capacity-building initiatives are undertaken in isolation, often as one-off events, and seldom with provision for follow-up training and support. A more integrated and sustained approach is required. In this respect, building on existing initiatives both nationally and regionally, including some that are not focused primarily on climate-change issues, would be advantageous. The many original contributions on climate-change issues in the region made by the Southern Centre for Energy and Environment in Zimbabwe and its partners in neighbouring countries – the Centre for Energy, Environment, Engineering (Zambia); Energy, Environment, Computer and Geophysical Consultants (Botswana); Centre for Energy, Environment, Science and Technology (Tanzania) – show what can be achieved in this regard.

4. Impacts on poverty alleviation

4.1 Poverty in Zimbabwe

Poverty takes many forms and can be defined in many different ways, not always consistently. At a general level, the term embodies concepts of material and social deprivation. Poverty can be both absolute, when people's circumstances place them substantially below some generally accepted level of well-being, or relative, when marked disparities of wealth and opportunity exist within a society. Material poverty is commonly indexed by some measure of income or consumption relative to an appropriate poverty datum line. Widely used indicators in this sense are the proportion of people with an income of less than US\$ 1 and US\$ 2 per day, the higher level usually being applied in lower-middle income countries (World Bank, 2000). Given the difficulties of measuring income among the poor, it is more usual to base estimates of poverty on measures of consumption expenditure derived from household surveys, though still indexed against the US\$ 1 and US\$ 2 per day poverty datum lines. Using these measures, the World Bank estimated that in 1990/91, the proportion of Zimbabweans with incomes below the US\$ 1 and US\$ 2 per day poverty lines were 36% and 64% respectively (World Bank, 2000). Van den Brink (2000), using the same data but with a different formulation – percentage of people, in adult equivalents, in households whose per capita consumption expenditure is below the poverty line – showed that poverty increased sharply between 1990/91 and 1995/96 (Table 11). Given the marked downturn in the economy in recent years, together with the rise in the incidence of HIV/AIDS and the decline in the quality of social services, the incidence of poverty can only have worsened since the last survey was carried out.

Table 11: Poverty indices for Zimbabwe, 1990/91 and 1995/96 (from van den Brink, 2000).

Sector	Index	1990/91	1995/96	Change (%) ³
Rural areas	Prevalence ¹	35.8	48.0	34.1
	Depth ²	12.4	16.6	33.9
	Severity ²	5.9	7.7	30.1
Urban areas	Prevalence	3.4	7.9	133.2
	Depth	0.8	1.9	144.9
	Severity	0.3	0.7	150.0
Zimbabwe	Prevalence	25.8	34.9	35.4
	Depth	8.8	11.8	34.0
	Severity	4.2	5.4	29.4

¹ Prevalence is defined as the percentage of people in households with a daily per capita consumption expenditure below the US\$ 1 per day poverty line as a proportion of the total population in the relevant sector.

² The depth and severity indices are measures of the amount by which the incomes of the poor fall below the poverty line as a proportion of the total population, calculated as follows:

$$\frac{1}{N} \sum_{i=1}^Q (\bullet - y_i)^\alpha$$

where N = total population, \bullet = the poverty line, y_i = income of an individual i , Q = total population below the poverty line, and $\alpha = 1$ (depth) and 2 (severity) (see World Bank, 2000: 207).

- ³ It is unclear if the increase in population has been taken into account, since the size of the populations differ between the two periods.

The World Bank encourages the use of national indicators of poverty (World Bank, 2000). The Poverty Assessment Survey, carried out in Zimbabwe in 1995 (Ministry of Labour, Public Service and Social Welfare, 1995), provided the basis for calculating two indices of human development in Zimbabwe at a district level (UNDP, 1998). The Human Poverty Index is calculated as follows:

$$\text{HPI} = \frac{(P_1^3 + P_2^3 + P_3^3)^{1/3}}{3}$$

where P_1 = percentage of people not expected to survive to 40 years of age, P_2 = percentage of illiterate adults, and P_3 = the arithmetic mean of the percentage of underweight children, percentage of population without access to safe water, and the percentage of the population without access to health care. The Human Development Index is the arithmetic mean of three other indices, a life expectancy index, an educational attainment index, and an income level index. Details of how the indices are calculated from the variables used – life expectancy, adult literacy, average years of schooling, and adjusted per capita income – are given in UNDP (1998).

The HPI for Zimbabwe as a whole is 17.4, though there is considerable regional difference in the incidence of poverty, as measured by this index. Not surprisingly, populations in the main towns and cities have a much lower HPI on average (11.5) than the rural areas (21.1). The most impoverished populations are those living towards the periphery of the country, especially in the north and south-east. Not surprisingly, the HDI shows the opposite trend, being highest in and around the main towns and cities, and declining towards the periphery.

Poverty in Zimbabwe has three main causes: weak macro-economic performance; high and rising levels of unemployment, which leaves most people dependent on subsistence agriculture in climatically marginal areas, often with poor soils, and without access to credit, inputs, technology, clean water and adequate health care; and a highly skewed pattern of distribution of income, wealth and access to high quality agricultural land. In terms of inequality of income and consumption, as measured by the Gini coefficient, Zimbabwe ranks fourth among 26 African countries, and eighth among 104 countries world-wide (data in World Bank, 2000). Addressing poverty, therefore, requires measures to boost economic growth, fostering employment and small-business development, and addressing the inherent inequalities in access to better quality land and other resources on which so many of the poor currently depend. This cannot happen until the present unsettled macro-economic environment is stabilised and conditions are created that encourage both domestic and foreign investment by providing an open and enabling policy and administrative environment, technical support, and financial assistance, particularly for small-business development. Until this happens, programmes will be needed to protect the poor from the impacts of the present adverse economic conditions. The challenge is to provide that support without further institutionalising poverty. Moreover, if the poor are to benefit directly from economic expansion, the deficits in education and health services will need to be sharply reduced.

4.2 Poverty reduction policies and programmes in Zimbabwe

Since Independence in 1980, the Government of Zimbabwe has drawn up and partially implemented a number of programmes notionally intended to stimulate economic growth, promote a more equitable distribution of income and the means of production, redress past

imbalances in the distribution of land and other economic opportunities, and reduce poverty. In 1981, the Government established its 'Growth with Equity' economic policy programme, incorporating the Transitional National Development Plan, aimed at transforming the economy from its pre-Independence war structure to a more normal economic structure; achieving rapid growth in GDP; increased and more equitable distribution of income; greater expenditure on social services, particularly health and education; and development of the rural areas, especially the communal lands. Some of the planned elements of this programme included land reform, decentralisation, and direct involvement of the state in economic activity (UNDP, 1998).

Under these policies and measures, GDP grew in real terms by just over 37% between 1980 and 1990, a compounded annual rate of growth of about 2.9% but with marked year-to-year changes. This rate of growth was less than the rate of growth of the population, and especially the rate at which people were entering the job market. Employment grew on average at only 1.4% per year. Recurrent annual expenditure in education rose in real terms by 32%; in the health and child welfare sector it increased by 44%. The number of children enrolled in primary school grew by 75%, but in secondary schools it rose by a massive 830% (UNDP, 1998). Average real annual earnings increased by 22% in the first two years after Independence, but then declined. By 1990 they were only 3% higher overall than in 1980. For many individual sectors, however, particularly in the public services, real wages in 1990 were 7-39% below their 1980 levels. Wages in the agricultural and domestic worker sectors, although somewhat improved throughout most of the 1980s, were still below the established poverty datum line (UNDP, 1998).

The distribution of land among the various racial groups in Zimbabwe at Independence was highly inequitable, both in the area of land allocated to the different land-use sectors, and in the productive capacity of that land (Table 12). The large-scale farming sector in 1980 comprised just over 6,000 farms, owned or leased almost entirely by people of European descent, and employing about 230,000 full-time workers (80% of the total large-scale commercial farm labour force). About half this land was located in the more productive Natural Regions 1-3. By contrast, more than 4 million peasant farmers lived in the communal lands, almost three-quarters of which is situated in Natural Regions 4 and 5. The small-scale farming sector, established in the 1930s to cater for the aspirations of African commercial farmers, encompassed over 9,000 farms on an area of only 1,42 million hectares in 1980, and supported a population of over 60,000 people. By 1988, the large-scale commercial farming area had been reduced by 4.37 million hectares km^2 (28%) to 11,2 million hectares, with the State acquiring the excised land on a willing buyer-willing seller basis for resettlement. About 49,000 families had been resettled on 3,29 million hectares of this acquired land (which included just over 180,000 hectares excised from the small-scale commercial farming sector). This was far below the target of 162,000 families on 10 million hectares set by the Government in 1982. Financial constraints, together with the unsuitability of some of land offered for purchase, account partly for the shortfall. As it is, more than 40% of the land resettled in the 1980s was situated in Natural Regions 4 and 5 (CSO, 1987; World Bank, 1991). Although crop yields by resettlement farmers have been on par with, or above, those achieved by communal land farmers, they are generally well below those obtained in the commercial sector, a reflection of the shortages of finance, equipment and inputs. The impact on poverty so far has been minimal.

Table 12: Distribution of land among various land-use sectors at Independence (1980) and in 1988

Showing the inequitable distribution in relation to the more productive Natural Regions (NR) 1-3 (data from CSO, 1987; World Bank, 1991)

Land-use sector	1980			1988		
	Area (10 ³ km ²)	% of total	% in NR 1-3	Area (10 ³ km ²)	% of total	% in NR 1-3
Large-scale commercial farming ¹	152,800	39.1	51	112,134	28.7	56
Small-scale commercial farming	14,200	3.6	56	12,387	3.2	54
Communal land	163,500	41.8	26	163,550	41.9	26
Resettlement areas	-	-	-	32,900	8.4	57
State farms	-	-	-	5,000	1.3	36
Other ²	66,590	15.4	15	64,821	16.5	17

¹ Figures for 1980 include state farms and state land leased to large-scale commercial farmers

² National Parks and Wildlife Estate, State Forests, other state land, and urban areas

By 1990, it was clear that many of the approaches to stimulating development and reducing poverty were not producing the desired results. Moreover, the twin policies of controlling agricultural commodity prices, interest and exchange rates, and committing substantial public expenditure to social welfare programmes, particularly health and education, were both incompatible and ineffective (UNDP, 1998). Continued borrowing from the World Bank and International Monetary Fund, much of it used to support recurrent expenditure, eventually resulted in pressure from these institutions for the Government to undertake economic structural adjustment. The resulting Economic Structural Adjustment Programme (ESAP) was based on the standard formula of economic and fiscal policy reforms; public sector restructuring; trade liberalisation; deregulation of prices, wages, interest and exchange rates; and cost-recovery in public sector services. It also included provision for establishing a social safety net, the Social Development Fund (SDF), through the concurrent Social Dimensions of Adjustment (SDA) programme. This aimed to provide some degree of protection for those most likely to be vulnerable to the short-term effects of structural adjustment. Quantitative targets for ESAP for the period 1990-1995 included: GDP growth of at least 5% annually, including growth of exports by 9% per year; increases in both investment and savings of 25% of GDP; halving the budget deficit to 5% of GDP; slowing the rate of inflation to 10%; reducing the size of the civil service by 25%; and reducing direct subsidies by more than 90% (UNDP, 1998). None of these targets were achieved.

This failure was due largely to the partial and inconsistent way in which ESAP was implemented by the Government, compounded by a devastating regional drought in 1991/92 that required Government and others to divert large amounts of resources to alleviate famine. Not only were the most of the macro-economic goals missed, but so were key institutional ones. Under ESAP, the growth in employment slowed and there was significant retrenchment of workers in some sectors. Gross Domestic Product barely grew in real terms, averaging only 1.3% per annum between 1991 and 1995 but with marked year-to-year changes (Figure 10). Average wages continued to decline in real terms, although productivity increased; the distribution of income shifted from wages to profits (UNDP, 1998). Per capita private consumption declined by more than one-third (Botchwey *et al.* 1998, cited in UNDP 1998). Among low-income groups in urban

areas average household incomes declined substantially below both the Food Poverty Line and the Total Consumption Poverty Line (those in rural areas were always below these lines).

Public expenditure on the social services fell sharply in real terms. The insistence on cost-recovery in the provision of health and education services placed an added burden on the low-income groups that was not offset by the social safety net notionally introduced through the SDF. Funding for the SDF, which was growing rapidly at the outset, soon fell below the levels required to protect for the poor, especially in rural areas. Resources initially allocated for the fund through the SDA programme were diverted largely to famine relief in response to the 1991/92 drought. The drought intensified rural poverty and magnified the impacts of ESAP. Remittances from relatives employed in urban areas fell sharply, while prices for agricultural inputs increased. The almost complete failure of crop production experienced by communal-land farmers in 1991/92 left many effectively destitute. The widespread loss of livestock during the drought, with more than 50% mortality in many areas, affected agricultural production in subsequent years and slowed the rate of recovery. Many families turned increasingly to exploiting natural resources within the commons to survive (Campbell *et al.*, 2000).

The impacts of ESAP and the 1991/92 drought were further compounded by a rise in the incidence of HIV/AIDS. This has drained both household and national resources through the need for increased expenditure on medicines, loss of productivity at work, and ultimately, though death, to labour shortages and loss of remittances in many households (Campbell *et al.*, 2000). The full human, social, economic and even environmental cost of the HIV/AIDS epidemic has yet to be assessed but it is likely eventually to overshadow those of structural adjustment and drought.

The number and vulnerability of the poor has increased sharply in recent years as a result of the marked economic, social and political upheavals taking place within the country. A complex series of events and circumstances – Zimbabwe's involvement in the war in the Democratic Republic of the Congo; the rise of, and resistance to, substantial political opposition to the Government at home; widespread invasions of commercial farms by veterans of the struggle for independence, and others, with attendant disruption of farming operations; the contested appropriation of over 1,700 large-scale commercial farms by Government for resettlement; real concerns over the apparent breakdown in law and order; and increasing isolation internationally, leading to suspension of economic assistance from the IMF and World Bank, cut-backs in bilateral aid from donors, and almost complete cessation of direct foreign investment – have all contributed to a massive economic downturn that has seen GDP decline by more than 20% per year since 1997 in US\$ terms, and by 2-9% in Zimbabwe dollars (real, 1980 base).

In response, the Government introduced the Zimbabwe Programme for Economic and Structural Transformation (ZIMPREST: Government of Zimbabwe, 1998), the objective of which was to "achieve a sustained high rate of economic growth and speedy development in order to raise incomes and standards of living of all people and expand productive employment of rural peasants and urban workers, especially the former" (Chitauru, 1998: 8). Many of the measures introduced under ZIMPREST, however, reversed the policies on trade liberalisation pursued under ESAP. Price controls were reintroduced on selected goods, the surtax on imported goods was raised, the duty on imported finished products was increased substantially, import tariffs were extended on luxury items and those with local substitutes, exchange rate controls were reintroduced, and foreign currency accounts were suspended, among others.

Provisions for poverty reduction were made through the introduction of a Poverty Alleviation Action Plan (PAAP). This plan, which evolved out of the SDA programme, aimed to reduce poverty and unemployment by increasing the involvement of the poor and vulnerable in the economy. Specific measures that were proposed included social mobilisation, literacy programmes, raising awareness, community development, support for development of the informal production and services sectors, capacity building, institutional strengthening, establishing targeted social safety nets, and poverty assessment and monitoring (UNDP, 1998). A major element was the Community Action Project, intended to provide small grants and technical assistance for investments aimed at developing social and economic infrastructure, improving natural resource management, and other small-scale, community-based economic activities (UNDP, 1998). Overall, PAAP was estimated to cost US\$ 150 million over three years, but in the event few funds were committed from the national exchequer. Instead, the Zimbabwe Government relied largely on funding from donors, an unsustainable approach. As a result, insufficient funds have been generated to address effectively the growing level of poverty in the country.

Like its predecessors, ZIMPREST also failed to reverse the ongoing decline in economic performance, with the impacts of the relentless rise in unemployment and prices continuing to fall disproportionately on the poor. In early 2000, the Government announced its Millennium Economic Recovery Programme – MERP (Government of Zimbabwe, 2000). This programme, the details of which are still being refined, has 10 objectives.

- Consolidate the fiscus.
- Accelerate and complete the Public Enterprise Reform.
- Stabilise prices at lower levels.
- Lower interest rates.
- Stabilise the value of the Zimbabwe dollar and resolve the foreign currency crisis.
- Deepen financial sector reforms.
- Stimulate the growth of productive sectors.
- Build confidence.
- Protect vulnerable social groups.
- Establishment of implementation, accountability and monitoring institutions.

Whereas fulfilling any of these goals could potentially have a positive impact on reducing poverty, only Objective 9 addresses the issue of poverty directly. To achieve this objective, the Government proposes a 5-point plan of action that builds on earlier initiatives.

- *Increase fiscal expenditure targeted at the poor* through increasing the Social Dimensions Fund and re-focussing its assistance programmes in health and education to reduce costs and increase their impact and effectiveness. This would include re-allocating US\$ 20 million from the Community Action project to finance interventions under the Enhanced Social Protection Programme, to prevent irreversible loss of welfare by poor households. Health and education fees would be waived for certain poor households and orphans. Funds would also be made available to finance urban public works programmes and agricultural input support programmes for smallholder farmers.
- *Protect the poor from rising prices* by designing a pro-poor Value Added Tax that would target certain food products identified with the poor. Consumer activism would be encouraged, including setting up buying associations to purchase goods at competitive prices. Anti-inflationary measures would be enforced. Food security would be enhanced

by increasing the production of basic foodstuffs, removing distortions in the distribution chain, acting against oligopolistic pricing practices, and encouraging the establishment of food markets in the central business districts of the main cities. Pension funds and others that lease premises to fast-food businesses, many of which are currently run by non-indigenous companies, would be urged to create opportunities for indigenous companies to enter the market. Children from poor households would be protected against rapidly rising non-tuition educational costs, by making such costs non-compulsory for these groups.

- *Improve access of vulnerable social groups to capital and land* by allocating more funds to the Employment and Training Programme to help train and re-orientate people who have been retrenched to become self-employed. A revolving fund would be established to finance new business ventures by unemployed graduates, retrenchedes and others. These initiatives would be supported by a databank of investment opportunities in all sectors, establishing an integrated network of training, advisory and financial services for retrenchedes and other unemployed persons planning or undertaking income-generating projects. The programme would also help to accelerate land reform, both by servicing and establishing infrastructure on land that has already been secured, and by acquiring more land and additional resources needed for resettlement. Urban authorities would be encouraged to make more serviced land available for urban housing.
- *Elaborate social safety nets* through designing a National Social Protection Strategy to ensure cost-effective policies and programmes to reduce the risks to households severely affected by economic changes and shocks such as drought. A Poverty Analysis and Monitoring System would be set up to help co-ordinate policies and produce an annual report on poverty aimed at identifying key policy issues to guide the country's development programmes.
- *Ensure access to decent housing by the vulnerable social groups* by requiring a fixed percentage of pension funds to be set aside as a pool for a National Housing Trust. These would be loaned at concessionary rates to contributors to the fund. This represents a movement by Government away from indirect to direct subsidies for first-time home owners and young adults. These funds would be packaged and loaned at subsidised interest rates. Other proposed measures include increasing grants to local authorities and relevant non-governmental organisations for social housing to cater for the elderly, disabled and destitute, particularly in rural areas; and reforming interest rate policies to direct funds to new mortgages. This is intended to support the establishment of a secondary mortgage market by attracting liquidity to building societies, enabling them to finance housing rather than invest in short-term money markets.

Key criticisms of the MERP include the lack of quantitative targets and associated time frames, particularly in relation to interest rates and inflation, and lack of clarity on how fiscal and monetary policy will be coordinated, particularly on the crucial question of the sequencing of interventions. The level of capital expenditure budgeted for in FY 2000 (8%) is much less than that required for the proposed MERP (25% over 18 months). Finally, there are concerns that present poor economic and political climate will discourage private investment, and that controls on prices and interest rates will deter production and savings (Poverty Reduction Forum and Friedrich Ebert Stiftung, 2000).

Specific criticisms on the proposed means of tackling poverty include the emphasis on alleviating the symptoms of poverty rather than addressing the root causes; the institutionalisation of poverty, by focusing on actions aimed at ensuring that the poor survive poverty rather than creating circumstances that will allow them to surmount it; the lack of direct

involvement of the poor, both in drawing up these provisions and in implementing them (in contrast to the earlier intentions of PAAP); and in the impracticalities in many of the provisions, including their capacity to generate perverse outcomes that would deepen poverty and social differentiation (Sibanda, 2000). To this one could add the excessive reliance on public expenditure and state control rather than creating incentives for private initiatives and investment, particularly at a time when the Government's capacity to fund such programmes is becoming increasingly limited.

Against this background of erratic economic performance, sharp declines in economic output and the failure of successive government policies to reverse the trend, continuing high population growth (the impact of HIV/AIDS notwithstanding), deepening poverty, and great political uncertainty, it is not surprising that concern for climate change and related environmental issues are accorded low priority. Given that the poor depend largely on natural resources for a significant part of their livelihoods, the link between the potential for adverse climate change and continuing poverty is obvious. Unfortunately, many other more pressing issues intervene and complicate the search for a long-term strategy to address poverty and take the variability of and change in climate into account.

4.3 Links between climate change and poverty

The potential impact of adverse changes in climate – higher temperatures, lower and more erratic rainfall, increased frequency of extreme climate events such as drought or floods – on poverty in Zimbabwe is likely to be high, given the considerable dependence of the Zimbabwean economy on agriculture and related primary production activities (*e.g.* forestry, fisheries, wildlife). Both economic output and employment (including small-scale and subsistence farming in communal lands and resettlement areas) is at risk, with the rural poor likely to be most vulnerable. Factoring climate variability and change into national economic plans and projections, or into programmes aimed at alleviating poverty. Even the known risks associated with current climate variation, including the certain frequent occurrence of drought, is not taken into account despite evidence over the past two decades of the adverse impact that climate variability can have on economic growth, employment and poverty.

The relationship between year-on-year changes in agricultural output (real ZWD, 1980 base) and annual rainfall is weakly curvilinear, suggesting that output is depressed in years of significantly below- and above-average rainfall. Not surprisingly, the relationship with overall GDP is similar but weaker, accounting for only 26% of the variance, compared with 41% in the case of agricultural output.

The impact of climate variability on agricultural output and, in turn, its downstream effects on the economy overall is well illustrated by the marked reductions in output between 1982-83, 1986-87 and 1991-92. Rainfall across the country in these three seasons was 40%, 33% and 48% respectively below long-term average. In each of these three periods, agricultural output fell by 16-18% from the previous season's level. Gross Domestic Product in turn fell, by 3.6%, 0.5% and 5.8% between 1982-83, 1986-87 and 1991-92 respectively. Rainfall and the level of agricultural production are clearly not the only determinants of GDP, but they have an influence. The relationship between the percentage year-on-year change in real GDP ($dGDP$) and the corresponding change in agricultural output (dAP) for the years 1975-1997 is significant:

$$dGDP = 1.85 dAP - 0.25 \quad (r = 0.540, p < 0.001, df = 20)$$

Year-on-year changes in agricultural output are also correlated with changes in employment in the commercial agricultural sector (dAE):

$$dAE = 3.06 dAP + 2.25 \quad (r = 0.657, p < 0.001, df = 19; \text{data for 1980/81 omitted})$$

There is no direct relationship between year-on-year change in agricultural output and national employment, however.

Although formal employment has grown slowly over the past 20 years, it has been marked by periodic falls associated with adverse macro-economic conditions and declining GDP. The elasticity of employment, as a function of year-on-year change in real GDP in Zimbabwe is 0.34, a significant relationship that accounts for 53% of the variance in the year-on-year change in employment.

The available data, however limited, clearly suggest multiple links between climate (rainfall), agricultural output and employment, agricultural output and overall GDP, and overall GDP and national employment. Given these relationships, and that the lack of employment opportunities, combined with periodic retrenchments, is one of the main perceived causes of poverty in Zimbabwe, the risk that adverse climate change poses to efforts intended to reduce poverty is real. Not only does climate change threaten to undermine efforts to reduce poverty, but it is very likely to intensify the circumstances giving rise to poverty in the first place, and thus exacerbate poverty itself.

Poverty alleviation programmes are therefore needed that take the risks of climate variability and change into account; development initiatives that help to buffer the poor against the changes, and which make allowance for periods of heightened vulnerability. Under this scenario, developments in the agriculture and forestry sectors would seem to be risky, though given the reality that most people are currently tied to agriculture, there may be few viable alternatives, at least in the short-term. The longer-term objective, however, has to be increased economic development in non-agricultural sectors, preferably ones that do not rely directly on agricultural inputs. This does not remove the risk that climate change poses to the poor, since there are other ways in which climate can adversely impact the economy (*e.g.* through affecting the production of hydroelectricity), but it may provide them with a wider margin of tolerance.

4.4 Impact of climate-change policies on poverty alleviation

As indicated earlier, the Zimbabwe Government has no formal policy on climate change issues. Nevertheless, the principle of linking certain provisions of the Kyoto Protocol, particularly the Clean Development Mechanism (Article 12), to a reduction in poverty was clearly articulated by the then Minister of Mines, Environment and Tourism of Zimbabwe in his statement to the 5th Conference of Parties in Bonn, November 1999⁹. It is clear both from the Minister's statement and from other sources, that Zimbabwe sees the Clean Development Mechanism (CDM) as one, but not the only, means of promoting industrial development through gaining access to state-of-the-art industrial technology and the necessary financial and other resources to use it effectively, both to increase industrial output and to do so in a way that will limit future emissions.

⁹ The statement says "*The eradication of poverty should be the primary focus for all CDM projects.*" (Statement by the Zimbabwe Minister of Mines, Environment and Tourism, Hon. Simon Khaya Moyo, delivered to 5th Conference of Parties, UNFCCC, Bonn, Tuesday 2nd November 1999, 16h56 CET)

The list of projects identified by Zimbabwe for funding, as provided for in Article 12.4 of the Convention, emphasises the country's priorities. All of these are in the energy and renewable energy sector: investing in demand side management in the electricity sector; investment in small-scale hydroelectric power plants to supply rural and peri-urban consumers; installing solar mini-grid utilities to serve rural centres not connected to the national electricity grid; and accelerated promotion of biogas technology in rural low income households (document FCCC/WEB/2000/2, 12 September 2000). Significantly, three of these projects are aimed at improving the supply of energy, in various forms, to rural communities and households. If implemented, these projects could contribute to alleviating the conditions surrounding poverty in these communities, by providing additional and more flexible energy supplies, which could benefit schools, clinics and small businesses, and through employment (though the shortage of relevant technical skills in rural areas could be a constraint).

Equally significantly, there is little domestic support for land use, land-use change, and forestry (LULUCF) projects under an expanded CDM. The exception is in the commercial forestry sector, though this is constrained by a shortage of suitable land, concerns about the impact of expanded plantations on biodiversity and hydrology, and questions about additionality in terms of Article 12.5(c) of the Protocol. More broadly, there are concerns about whether such project would bring real and sustainable benefits to the communities concerned, and whether an emphasis on LULUCF would detract from other options to achieve emission reductions and sustainable development.

The 1st Consultative Meeting of the Southern African Development Community (SADC) on Climate Change stressed that southern Africa, compared to other regions, is at a disadvantage in regards to potential LULUCF-sector projects. Most of the ecosystems in the region have low carbon densities and growth potentials as a result of the generally low and unreliable rainfall, strongly seasonal climate, poor soils, and regular disturbance in the form of fire, herbivory and human use of land. Although a case can be made for initiating carbon-sink projects in collaboration with rural communities, both as a means of sequestering carbon and as a way of bringing financial and other benefits to these communities, the process is hedged with major uncertainties about the long-term viability of such projects; the nature, size and distribution of the benefits; and what the environmental and social impacts of such projects would be. Until there is greater clarity on the structure and modalities of such projects, the SADC countries, including Zimbabwe, are unlikely to support the move to include LULUCF projects in the provisions of the Clean Development Mechanism. The paradox is that without initiating such projects in the first place, many of the uncertainties will remain. Results from other regions in the world are unlikely to be a reliable guide, given the differences in socio-economic and environmental circumstances.

Finally, initiatives undertaken in response to the threat of climate change are unlikely to reduce poverty by themselves. Other actions – stabilising the macro-economy, creating conditions for long-term domestic and foreign investment, undertaking land reform in an equitable and open manner, and reforming government functioning – are needed to support these initiatives and create the conditions in which they can succeed. Issues of sequence and timing may be crucial in this regard.

5. Discussion

5.1 Effectiveness in the UNFCCC

Has Zimbabwe been effective in its engagement with the UNFCCC? The answer to this depends on the criteria for assessing ‘effectiveness’. Because of the absence of any clearly and formally defined policy goals, it is not possible to judge how effective Zimbabwe has been in achieving its goals. Moreover, because of the complex manner of negotiations within the UNFCCC, in which decisions are arrived at through consensus, few countries are able to achieve their preferred outcomes unilaterally. Most decisions are the result of bargaining and trade-offs among competing positions on a range of issues (*e.g.* commitments on climate-change mitigation measures, including commitments to reduce emissions, and the incentives to undertake these, such as carbon-offset credits and the prospects of technology transfer and financial assistance). This has been described as ‘integrative bargaining’ (Saner, 2000, cited by Gupta, 2000). Parties attempt to expand the area of agreement by identifying and negotiating a range of alternatives through sharing information and seeking to influence the position of others. As Gupta (2000) notes, however, if only some Parties bargain in this way, the negotiations may not favour the passive parties. A formal national policy, with clearly defined goals, is therefore needed to develop the necessary proactive integrative bargaining positions and avoid being placed in the position of having mostly to react to the proposals put forward by Annex I Parties during the negotiations.

Zimbabwe’s capacity to achieve its goals, in whatever form, is also influenced by its membership of Group of 77 and China, and the Africa Group within that. The same process of integrative bargaining and a search for consensus characterises negotiations within these groups. Again, the outcome is usually a trade-off among the individual positions of the countries involved, often as the common denominator among these. Thus whatever position Zimbabwe holds, it is circumscribed by the need to achieve consensus and maintain solidarity with these groups. To date, the positions adopted by these groups on the various issues being negotiated within the UNFCCC correspond broadly with Zimbabwe’s positions on these issues (M. Sangarwe, personal communication¹⁰). Given Zimbabwe’s active involvement in the functioning of these groups, this could reflect some degree of effectiveness.

The recognition given to Zimbabwe through the appointment of various public officials to positions of responsibility in the UNFCCC process (*e.g.* President of COP 2, rapporteur to the Bureau for COP 1, co-chair of various informal contact groups, co-chair of Working Group II of the IPCC for its Second Assessment Report) is also some measure of the effectiveness with which the country has interacted within the UNFCCC. Similarly, the ability of individual scientists has been recognised through their involvement in various technical bodies contributing to the UNFCCC. This does not mean that there is no scope for improving both the nature and extent of the country’s involvement, only that among the smaller developing countries Zimbabwe has been relatively prominent. This has not been wholly by chance.

The key national goals for development in Zimbabwe are to achieve a competitive, sustainable and industrialised economy in which there is increased employment, more equitable distribution of income and opportunity, reduced poverty, fair competition, and long-term productive investments (National Economic Planning Commission, 1997; Government of Zimbabwe, 1998;

¹⁰ Ms Margaret Sangarwe, Deputy Secretary for Environment, Ministry of Environment and Tourism, Zimbabwe.

UNDP, 1999). Given that Zimbabwe's environmental policies are designed to support these aims, one measure of effectiveness in negotiations within the UNFCCC could be the extent to which these have resulted in opportunities being created for progress to be made in achieving these national development goals. By this measure, Zimbabwe has been relatively effective. A range of activities have been undertaken in the context of the UNFCCC (Table 10), involving the injection of funds, know-how and opportunities for developing local capacity in various fields. Zimbabwe is only one of six countries in Africa to have attracted a project under the AIJ Pilot Phase; another project is currently being planned. One weakness, however, is that most of these activities have been initiated externally, rather than being planned and driven from inside the country in relation to clearly stated national priorities. Moreover, many of these have been singular initiatives with little follow-up activity. The sustainability of the current approach is therefore questionable.

Whether the country's engagement in the UNFCCC process has had any discernible impacts on poverty reduction is more debatable. The proposed Manyuchi Dam Mini-hydroelectric Power project, being set up under the AIJ Pilot Phase, could have beneficial effects locally, through providing employment, electricity to local businesses, clinics and schools, and funds for small business development. The other activities listed in Table 10, while having brought some funds into the national economy, have probably not had any direct impact. Given the many interacting causes of poverty in Zimbabwe, it would be surprising if a single initiative would have any major impact. Nevertheless, there would seem to be opportunities to contribute to a more integrated programme on poverty reduction. These are dealt with below.

5.2 Limitations on negotiating capacity

A number of factors limit the capacity of Zimbabwe's negotiators at the UNFCCC. First, the size of the national delegation is relatively small compared to those of most Annex I countries. This is a characteristic of most developing country delegations (Figure 8). With relatively few delegates, it is often difficult for them to attend all of the important side meetings, including meeting with potential donors and collaborators on projects. Cooperation among developing country Parties, rationalising their attendance at these meetings and sharing the resulting information and insights about the proceedings, could be one way of overcoming this constraint, but this requires time to negotiate and a substantial degree of common interest.

There are at least two reasons for the small size of developing country delegations. It is costly to send delegates to the Conference of Parties and meetings of the subsidiary bodies, and most governments do not have, or will not commit, the resources to allow for a larger delegation. At present, the UNFCCC supports two delegates from each non-Annex I Party to attend the Conference of Parties, and one to participate in the meetings of the subsidiary bodies. For those countries with only one or two delegates, this means that their governments are providing almost no support. This is currently the case for Zimbabwe. The third delegate to COP 6, the Co-ordinator of the Climate Change Office, was supported by project funds. The second reason is the shortage of people with the relevant knowledge and skills to function effectively at these meetings. Whereas this limitation could be addressed by introducing an appropriate capacity building programme, it first requires identifying what skills are needed, preferably in relation to a planned strategy of engagement on the basis of a well-defined national policy and objectives.

The second factor potentially limiting Zimbabwe's effectiveness is the decision to work through a larger regional group to achieve a critical negotiating mass, thereby overcoming the limitations of a small negotiating team. The potential disadvantage is that national interests and objectives

have to be traded off against those of other Parties in the group. Moreover, there are considerable transaction costs of working through a larger group, particularly if there is commitment to ensuring that the group's evolving position does not compromise national interest. The additional time and effort needed to negotiate an acceptable position by the group must be a significant drain on already limited resources.

The third limitation on Zimbabwe's effectiveness must be the lack of a formal policy on climate change. Not only does this make it difficult to define achievable policy goals, and to develop a strategy to attain them, but it may result in too much latitude and lack of consistency in the positions adopted by the negotiators. It also makes it difficult to integrate activities on climate-change issues with the broader goals of national development, including poverty alleviation. The goals may be implied rather than stated, but this can lead to different interpretations and assumptions about them, potentially causing delegation members working at cross-purposes. It can also lead to a drift in a country's position over time. The problem is recognised by the Ministry of Environment and Tourism, which is currently drawing up a National Environmental Policy framework within which climate-change issues can be addressed more coherently and consistently.

Finally, there is a shortage of locally-relevant information and analysis on climate-change issues, including what might be the most appropriate policies and measures on mitigation and adaptation, and what technologies Zimbabwe should be aiming to acquire to minimise future emissions. Providing such information should be a primary function of the Climate Change Office. The Southern Centre for Energy and Environment and the Department of Meteorological Services provided much of this kind of information in the first few years of UNFCCC activity in Zimbabwe, and during preparation of its Initial National Communication, but this activity has diminished. The Climate Change Office currently does not have the personnel or the resources to carry out or commission such assessments, or to acquire and maintain the necessary databases and documentation. Developing this capacity should be a priority.

5.3 Improvements

Four key areas for improvement have been noted in the preceding sections: formalising a policy on climate change that is consistent and well integrated with other national environment and development policies; securing the future of the Climate Change Office within the Ministry of Environment and Tourism; building negotiating skills; and developing strategies and actions to address the various capacity constraints identified.

Policy development

As already indicated, a policy on climate change is due to be drafted once the broader framework of a National Environmental Policy is in place. No timeframe has been put on this. Policy development is a process, however, in which the various perceptions and interests of different stakeholders need to be reviewed, evaluated and reconciled, both among themselves and with established policies. To assist the process of developing a policy on climate change, the range of stakeholders need to be consulted and their views taken into account. This process would provide a significant opportunity to engage the different government departments, industry, business, local community leaders, and others in discussions on climate change and its implications. The human and financial resources to conduct such a wide-ranging process of consultation are currently not available but should be acquired as a priority.

Consolidating the Climate Change Office

Securing the future of the Climate Change Office within the Ministry of Environment and Tourism is more problematic. Under current economic circumstances, it is unlikely that the Government will be willing or able to assume the full costs of running this office. At present, funds for the staff (currently only a part-time co-ordinator and a secretary) and for running expenses other than overheads have to be obtained through project financing. Apart from the uncertainty that this creates, given the short-term nature of many projects, it also means that much of the co-ordinator's time is taken up with project administration and developing new proposals. While this is necessary, it does detract from other important tasks. These would include helping to develop an appropriate policy framework and corresponding national strategy on climate change; setting up the necessary programmes and other initiatives to achieve goals of this policy; ensuring the necessary coordination and liaison among stakeholders, including the relevant government departments; promoting more effective linkages and trust between public and private sector institutions; improving the flow of information; and building the framework to ensure continuity.

If the Government does not have the capacity to ensure the long-term future of the Climate Office, and if the present insecure basis on which the office functions is accepted as being undesirable, then moves need to be made to secure the office over the medium-term. Two options seem possible: to secure bilateral assistance; or to apply for funds from the Global Environmental Facility to set up an office to service the country's needs in relation to key multilateral environmental conventions. Since Zimbabwe is also a signatory to the Convention on Biological Diversity and the Convention to Combat Desertification, and has been active in promoting the aims of both, the latter option seems more feasible, particularly under current circumstances. Because of the specialist nature of the issues involved, the three conventions would need to be serviced by different desks, but by bringing these together duplication costs could be reduced. Such a facility could also increase the effectiveness of the Global Environmental Facility itself, by helping to develop the capacity to manage GEF-funded projects and improve coordination among them.

Building negotiating skills

Most negotiators from developing countries are scientists, usually environmental scientists or meteorologists (some are administrators and policymakers, while industrialists and economists are rare). Few have any experience in negotiations (Gupta *et al.*, 1996; Gupta, 2000). Yet the issues extend beyond science to include politics, economics, technology and international law. Broadening the base of experience within country delegations is important. In particular, because arriving at an agreement by consensus is such a key principle in negotiations at the UNFCCC, skill in negotiation is at a premium. Given the rapid pace of negotiations, inexperienced negotiators risk being left behind. The present negotiator for Zimbabwe has assimilated many of these skills through regular and extended involvement in the UNFCCC process, but she is an exception. Having more personnel trained in negotiation would be a distinct advantage.

A start has been made within the UNFCCC to provide this training. A workshop was held in Dakar, Senegal, in July 2000, to train national negotiators from Africa in negotiation theory, skills and international law in the context of the UNFCCC; to strengthen their knowledge about climate change and its links to development; and to enhance the capacity of the negotiators to work together to strengthen the cohesiveness and effectiveness of the Africa Group (Carpenter and Churie, 2000). What is not clear is whether this workshop will be followed by others, to

build capacity incrementally. Many participants to the workshop called for this. Capacity building needs to move from being project- to programme-based.

Enhancing and maintaining capacity

The importance of capacity-building and the transfer of technology to developing countries has been emphasised repeatedly both at the Conference of Parties and in sessions of the Subsidiary Body for Implementation. It is also a priority for Zimbabwe (see the policy statement by the Zimbabwe Minister of Mines, Environment and Tourism to COP 5). The UNFCCC has produced a list of capacity-building needs of developing country parties based on a submission by the Gambia on behalf of the Group of 77 and China (see document FCCC/CP/1999/6/Add.1). Among the needs listed, the following would seem to be most pressing for Zimbabwe:

- Skills in project identification, formulation and design.
- Skills in identifying and assessing relevant technologies for climate-change mitigation and economic development.
- Analysis of constraints on the transfer of technology.
- CDM demonstration projects in which capacity can be developed in an active learning environment, including the capacity to assess project costs and risks.
- Development of criteria and indicators for sustainable development.
- Strengthening key relevant academic and research institutions and non-governmental organisations.
- Studies designed to build capacity to detect and assess climate change, climate variability, climate-change impacts, vulnerability, and other technical issues associated with the identifying and implementing adaptation and mitigation measures.
- Skills in policy analysis and policy formulation.
- Integration of climate-change policies into national development strategies and plans.
- Public awareness programmes, including the development and production of appropriate educational materials.

This list is not comprehensive; there are many other lesser requirements. Although some of these skills already exist within the country, there are simply not enough persons with the necessary knowledge, ability and interest, nor the establishment to support and sustain them at present. Some programmes are already under way to build this capacity.

Early initiatives by various UN agencies (UNDP, UNEP, UNITAR *etc.*), focused mainly on building the capacity to address climate change issues and, particularly, servicing the needs of the Convention (*e.g.* preparation of the Initial National Communication to the UNFCCC). Likewise, the current focus of the UNFCCC sub-programme on Non-Annex I Implementation is providing technical support to non-Annex I countries to help them build the capacity to prepare their national communications, particularly the inventory of emissions. The programme also includes assistance for, and follow-up negotiations on, possible procedures to be used in preparing and evaluating these national communications, and support on matters related to the operation of the financial mechanisms. In this regard, Decision 8/CP.5 from COP 5 mandated the Consultative Group of Experts (CGE) to hold three regional workshops annually one each in Asia, Africa, and Latin America and the Caribbean, aimed at improving the national communications from non-Annex I Parties to the UNFCCC. (The first regional workshop, for Latin America and the Caribbean region, was held in Mexico City, Mexico, from 8 to 12 May 2000. A similar workshop for Africa is planned for 2001.)

For developing countries to be able to contribute more effectively to climate-change mitigation overall, the UNFCCC consultative process and machinery needs to go beyond this, however. For example, the current guidelines for preparing initial national communications (decision 10/CP.2, annex) do not provide the necessary framework for assessing the impacts of climate change, nor sufficient guidance on how to decide what are the most appropriate adaptation measures or response strategies and how best these can be integrated into the national planning process. The focus on national inventories of greenhouse gas emissions needs to be balanced with concern for how this information can be used to decide on which policies and measures can be pursued to reduce emissions and enhance carbon uptake, and what other information is needed in evaluating these options. As a basis for doing this, the national greenhouse gas emissions inventories are limited (Maya and Churie, 1995). The inventories focus on the sources and sinks of greenhouse gases. They provide no information on what factors influence emission rates within particular economic sectors, and therefore on what measures could be taken to reduce emissions. They also do not provide any basis for assessing how sensitive different target sectors might be to particular interventions. The techniques, databases and capacity to make these kinds of assessments needs developing.

The problem, however, is more than just building capacity. To be useful, the capacity has to be maintained and extended. In many cases there are no supporting national programme, or the programmes are short-lived. Thus many of the gains are ephemeral: people receive training but soon move on to doing other things because there are no posts, formal responsibilities or supporting infrastructure through which they can consistently exercise their newly acquired skills. In some instances, there may be no suitably qualified or appropriate persons to take up the opportunities presented by these initiatives. As one respondent put it: "What capacity can they build if the people are not there?" Thus there are broader structural limitations: there must more than one or two people working part time on climate change and related issues, and there must be the necessary infrastructure to support them.

5.4 Links to poverty reduction

Almost none of the current activities on climate change within Zimbabwe have any direct links to poverty reduction. Only one AIJ Pilot Phase project has been secured, and one other is being considered. Little technology has been transferred, so there are no discernible benefits yet in terms of economic growth and increased employment. Zimbabwe currently opposes the inclusion of carbon-sink projects in the CDM, yet an argument could be made that such projects have the greatest immediate potential to deliver benefits direct to local communities. In essence, people would be paid to grow and protect trees.

There are a number of concerns within Zimbabwe about carbon sink projects. People use forests and woodlands in Africa in multiple ways. Local communities could be disadvantaged if they were to be prevented from using the forests as they have always done. Given the relative shortage of fertile land in communal areas, these projects could compete with other forms of land use, especially agriculture. Much of that land is communally owned, and considerable transaction costs could be incurred in reaching agreement on the form and function of such projects in a given area. Moreover, there is concern that investors, out of ignorance, could insist on inappropriate management regimes for these carbon-sink forests. The low rates of tree growth could mean that many countries in Africa, especially in the more arid zones, would be unlikely to benefit from such projects as potential investors would be deterred by the slow and uncertain rates of carbon sequestration. This raised concern about equity in the distribution of benefits through the CDM. There is also a concern that if Annex I Parties can get carbon-offset credits

from investing in carbon-sink projects, they would be less inclined both to take measures to reduce domestic emissions, and to consider projects involving the transfer of technology to reduce future emissions in developing countries. Above all, what these concerns highlight is the lack of information about the carbon-sink projects under the CDM: How will these project function? How will credits be assigned? Who will benefit and how? More information is needed to enable people to make rational decisions about the potential for different kinds of CDM projects to enhance livelihoods and contribute to alleviating poverty.

One aspect of poverty that needs more attention is that of vulnerability, particularly in relation to the impacts of climate variability and change on agricultural production, food security and macro-economic performance. Zimbabwe hosts the SADC Regional Drought Monitoring Centre, as well as the Southern African office of the USAID-funded Famine Early Warning System, which provide short- and medium-term projections of the likelihood of drought and assessments of food production and shortfalls. While neither these offices were set up in the framework of the UNFCCC, they represent part of the larger global response to the issues of climate variability, climate change, human vulnerability and poverty. The information, knowledge and experience of personnel in these organisations should be used to help define more precisely how Zimbabwe's ongoing involvement with the UNFCCC could contribute to addressing issues of vulnerability and poverty. The Climate Change Office is the obvious institution to initiate such discussions.

The overriding need is for a more integrated national programme on climate change, in which the different elements link more clearly on one side to national development policies and programmes, particularly those aimed at alleviating poverty in different ways, and on the other side to international programmes intended to mitigate human impacts on the global climate system. Such linkages would enable the global programmes to make a more direct contribution to sustainable development and thereby to the processes that influence emissions. They would also enable Zimbabwe's negotiators to project the country's development assistance needs more precisely. The challenge is to access and organise the necessary human, financial and other resources to carry this out.

6. References

Anon. (1998) 'The Clean Development Mechanism and Africa'. Report from a Regional Workshop on New Partnerships for Sustainable Development: The Clean Development Mechanism under the Kyoto Protocol, Accra, Ghana, 21-24 September 1998. UNEP Collaborating Centre on Energy and Environment, Roskilde, Denmark.

Botchwey, K., Collier, P., and Gunning, J.W. (1998) 'External Evaluation of the Enhanced Structural Adjustment Facility'. International Monetary Fund, Washington DC (cited in UNDP, 1998).

Campbell, B., Frost, P.G.H., Goebel, A., Standa-Gunda, W., Mukamuri, B., and Veeman, M. (2000) 'A conceptual model of woodland use and change in Zimbabwe'. *International Tree Crops Journal*, 10: 347-366.

Carpenter, C. and Churie Kallhauge, A. (2000) 'Climate Change Capacity Project-Africa'. Report of a workshop, July 12-21, 2000, Dakar, Senegal. IISD and ENDA Tiers-Monde. International Institute for Sustainable Development, Winnipeg, Canada.

Cavendish, W. (1997) 'The Economics of Natural Resource Utilisation by Communal Area Farmers of Zimbabwe'. PhD thesis, University of Oxford, U.K.

Central Statistical Office (CSO) (1994) 'Census 1992. Zimbabwe National Report'. Government of Zimbabwe, Central Statistical Office, Harare, Zimbabwe.

Chenje, M., Sola, L., and Paleczny, D. (eds) (1998) 'The State of Zimbabwe's Environment 1998'. Government of the Republic Zimbabwe, Ministry of Mines, Environment and Tourism, Harare, Zimbabwe.

Chitauo, F. (1998) 'Zimbabwe Government's position on poverty reduction'. In: UNDP (1998) *Zimbabwe Human Development Report 1998. Zimbabwe*, pp. 8-9. United Nations Development Programme, Poverty Reduction Forum and Institute of Development Studies, University of Zimbabwe, Harare.

Clarke, J., Cavendish, W., and Coote, C. (1996) 'Rural households and miombo woodlands: use, value and management.' In: B. Campbell (ed.) *The Miombo in Transition: Woodlands and Welfare in Africa*, pp. 101-135. Centre for International Forestry Research, Bogor, Indonesia.

Corbett, J.D., Collis, S.N., Bush, B.R., Muchugu, E.I., Jeske, R.Q., Burton, R.A., Martinez, R.E., White, J.W., and Hodson, D.P. (1999). 'Almanac Characterization Tool: A resource base for characterizing agricultural, natural, and human environments' Texas Agricultural Station, Texas A&M University System, Blackland Research Centre Report 99-06, documentation and CDROM.

CSO (1980-2000) 'Quarterly Digest of Statistics'(various). Central Statistical Office, Harare, Zimbabwe.

CSO (1987) 'Statistical Yearbook 1987'. Central Statistical Office, Harare, Zimbabwe.

CSO (1989) 'Statistical Yearbook 1989'. Central Statistical Office, Harare, Zimbabwe.

CSO (1994) 'Census 1992. Zimbabwe National Report' Central Statistical Office, Harare, Zimbabwe.

Department of Meteorological Services (1977) 'Mean Rainfall in Rhodesia'. Rainfall Handbook Supplement 8, Department of Meteorological Services, Salisbury (now Harare), Rhodesia (now Zimbabwe).

Department of Meteorological Services (1994) 'Zimbabwe's vulnerability to climate change'. UNFCCC Fact Sheet 128 (see <http://www.unfccc.int/resource/ccsites/fact/fs128.htm>)

Drought Relief Programme (1993a) 'A Statistical Overview of Department of Social Welfare Drought Relief Operations, 1982-93: Masvingo Province.' Department of Social Welfare, Ministry of Public Service, Labour, and Social Welfare, Government of Zimbabwe, Harare.

Drought Relief Programme (1993b) 'A Statistical Overview of Department of Social Welfare Drought Relief Operations, 1982-93 Matabeleland South Province.' Department of Social Welfare, Ministry of Public Service, Labour, and Social Welfare, Government of Zimbabwe, Harare.

Environment Research Coordinating Committee (1998) 'Strategic Directions for Environmental Research in Zimbabwe'. Institute of Environmental Studies, UZ, Harare, Zimbabwe.

Forestry Commission (1996) 'Vegetation Cover Map of Zimbabwe'. Forestry Research Centre, Harare, Zimbabwe.

Frost, P.G.H. and Mandondo, A. (1999) 'Emerging issues in natural resource management in semi-arid production systems'. IES Working Paper 12, 18 pp.

Gore, C., Katerere, Y. and Moyo, S. (eds) (1992) 'The Case for Sustainable Development in Zimbabwe. Conceptual Problems, Conflicts and Contradictions.' Report prepared for the United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, June 1992. ENDA-Zimbabwe and ZERO, Harare, Zimbabwe.

Government of Zimbabwe (1998) 'ZIMPREST: Zimbabwe Programme for Economic and Social Transformation 1996-2000'. Government Printer, Harare, Zimbabwe.

Government of Zimbabwe (2000) 'Zimbabwe Millennium Economic Recovery Programme'. Working Draft/Rev 5, 4 February 2000. Government of the Republic of Zimbabwe, Harare. 81 pp. Typescript.

Gupta, J. (2000). "On behalf of my delegation,..." A Survival Guide for Developing Country Negotiators.' CD-ROM. Centre for Sustainable Development in the Americas and the International Institute for Sustainable Development with the Climate Change Network (<http://www.cckn.net/>)

Gupta, J., Maya, R.S., Kuik, O., and Churie, A.N. (1996) 'Overview of results from national consultation on Africa & JI'. In: R.S. Maya and J. Gupta (eds), *Joint Implementation: Carbon Colonies or Business Opportunities?* pp. 43-61. Southern Centre for Energy and the Environment, Harare, Zimbabwe.

Hulme, M. (ed.) (1996) 'Climate Change and Southern Africa: An Exploration of Some Potential Impacts and Implications for the SADC Region'. A Report Commissioned by WWF International and Co-ordinated by the Climate Research Unit, University of East Anglia, Norwich, UK.

Kuik, O. and Gupta, J. (1996) 'Perspectives on Africa and the global debate on joint implementation'. In: R.S. Maya and J. Gupta (eds), *Joint Implementation: Carbon Colonies or Business Opportunities?* pp. 2-19. Southern Centre for Energy and the Environment, Harare, Zimbabwe.

Kunjeku, E., Frost, P.G.H., Nabane, N., Murwira, H.K., Mushove, P., Chidziya, E., Gambiza, J., Mkwanda, R., Semwayo, D.T. and Bond, I. (1998). 'Research, inventory and monitoring'. In: M. Chenje, L. Sola and D. Paleczny (eds), *The State of Zimbabwe's Environment 1998*, pp. 311-403. Government of the Republic of Zimbabwe, Ministry of Mines, Environment and Tourism, Harare, Zimbabwe.

Kureya, T. (1997) 'Activities Implemented Jointly (AIJ) or Joint Implementation (JI): Carbon Colonies or Business Opportunities?' Document on the Zimbabwe UNFCCC Website (<http://www.unfccc.int/resource/ccsites/zimbab/activity/jointly.htm>)

Lenhart, S., Huq, S., Mata, L.J., Nemesova, I., Toure, S., and Smith, J.B. (eds) 'Vulnerability and Adaptation to Climate Change: a Synthesis of Results from the U.S. Country Studies.' U.S. Country Studies Program, Kluwer, Norwell, MA, USA.

Magadza, C. (1994) 'Climate change: some likely multiple impacts in southern Africa'. *Food Policy*, 19: 165-191.

Makadho, J.M. (1996) 'Potential effects of climate change on corn production in Zimbabwe'. *Climate Research*, 6: 147-151.

Marongwe, D.A. and Milne, G.R. (1993) 'Environmental Sustainable Development Objectives and Environmental Priorities in Zimbabwe'. Government of the Republic of Zimbabwe, Ministry of Environment and Tourism, Working Paper 001-93, Harare, Zimbabwe.

Matarira, C.H., Kamukondiwa, W., Mwamuka, F.C., Makadho, J.M., and Unganai, L.S. (1996) 'Vulnerability and adaptation assessments for Zimbabwe'. In: S. Lenhart, S. Huq, L.J. Mata, I. Nemesova, S. Toure and J.B. Smith (eds) *Vulnerability and Adaptation to Climate Change: a Synthesis of Results from the U.S. Country Studies*, pp. 129-140. U.S. Country Studies Program, Kluwer, Norwell, MA, USA.

Maya, R.S. (1994) 'Joint Implementation. Cautions and Options for the South'. Southern Centre for Energy and the Environment, Harare, Zimbabwe.

Maya, R.S. and Churie, A. (1995). 'Strategic Approach to Joint Implementation. Perspectives for Developing Countries'. Southern Centre for Energy and the Environment, Harare, Zimbabwe.

Maya, R.S. and Gupta, J. (eds) (1996) 'Joint Implementation: Carbon Colonies or Business Opportunities?' Southern Centre for Energy and the Environment, Harare, Zimbabwe.

Ministry of Labour, Public Service and Social Welfare. (1995). 'Poverty Assessment Report'. Government Printer, Harare, Zimbabwe.

Ministry of Mines, Environment and Tourism. (1998a). 'Zimbabwe's Initial National Communication on Climate Change.' Government of Zimbabwe, Ministry of Mines, Environment and Tourism, Harare, Zimbabwe.

Ministry of Mines, Environment and Tourism. (1998b). 'Environmental Law Reform: the Way Forward'. Government of Zimbabwe, Ministry of Mines, Environment and Tourism, Harare, Zimbabwe.

Ministry of Mines, Environment and Tourism (2000). 'Draft Environmental Management Bill'. Government of Zimbabwe, Ministry of Mines, Environment and Tourism, Harare, Zimbabwe.

National Economic Planning Commission (1997) 'Vision 2020. Zimbabwe Vision 2020 and Long-term Development Strategies'. Draft dated 5 December 1997. Government of the Republic of Zimbabwe, Harare, Zimbabwe.

Poverty Reduction Forum and Friedrich Ebert Stiftung (2000) 'Seminar on the Millennium Economic Recovery Programme.' 30th May 2000, Bronte Hotel, Harare, Zimbabwe. Poverty Reduction Forum, Institute of Development Studies, University of Zimbabwe, Harare. 51 pp. Typescript.

SADC/IUCN (2000) 'Conclusions and Recommendations from the 1st Consultative Meeting of the Southern African Development Community (SADC) on Climate Change', 20 October 2000, Gaborone, Botswana. Mimeograph, 3 pp. SADC, Gaborone, Botswana.

Saner, R. (2000) 'The Expert Negotiator'. Kluwer Academic Publications, The Hague (cited by Gupta, 2000).

SARDC-IMERCSA, no date. 'Focus on Environmental Law: #3 The United Nations Framework on Climate Change.' Communicating the Environment Programme, Southern African Resource and Documentation Centre – India Musokotwane Environment Resource Centre for Southern Africa, Harare, Zimbabwe, 10 pp.

Schulze, R.E., Kiker, G.A., and Kunz, R.P. (1993) Global climate change and agricultural productivity in southern Africa. *Global Environmental Change*, 3: 330-349.

Schulze, R.E., Kiker, G.A., and Kunz, R.P. (1996) 'Global climate change and agricultural productivity in southern Africa: thought for food and food for thought'. In: T.E. Downing (ed.) *Climate Change and World Food Security*, pp. 421-447. Springer-Verlag, Heidelberg, Germany.

Sibanda, A. (2000) 'The Millennium Economic Recovery Programme (MERP): Focus on Poverty and Human Development Issues.' Paper presented at the Seminar on the Millennium Economic Recovery Programme. 30th May 2000, Bronte Hotel, Harare, pp. 41-51 (Typescript). Poverty Reduction Forum, Institute of Development Studies, University of Zimbabwe, Harare.

Tyson, P.D. (1991) 'Climatic change in southern Africa: past and present conditions and possible future scenarios'. *Climatic Change*, 18: 241-258.

UNDP (1998) 'Human Development Report (1998) Zimbabwe'. United Nations Development Programme, Poverty Reduction Forum and Institute of Development Studies, University of Zimbabwe, Harare.

UNDP (1999) 'Human Development Report 1999. Zimbabwe' United Nations Development Programme, Poverty Reduction Forum and Institute of Development Studies, University of Zimbabwe, Harare.

UNEP (1993) 'UNEP Greenhouse Gas Abatement Costing Studies. Zimbabwe Country Study Phase Two'. Southern Centre for Energy and the Environment, Harare, Zimbabwe.

Unganai, S.L. (1996). 'Historic and future climatic change in Zimbabwe'. *Climate Research*, **6**: 137-145.

Unganai, S.L. (1997) 'Surface temperature variation over Zimbabwe between 1897 and 1993'. *Theoretical and Applied Climatology*, **54**: 89-101.

van den Brink, R. (2000) 'Critical Success Factors for Zimbabwe's Economic Recovery: a World Bank Perspective' Paper presented at the Economic Recovery Seminar, Confederation of Zimbabwe Industries, Harare, 28th September 2000.

Watson, R.T., Zinyowera, M.C. and Moss, R.H. (eds) (1996) 'Climate Change 1995. Impacts, Adaptations and Mitigation of Climate Change: Scientific and Technical Analyses.' Contribution of Working Group II to the Second Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, U.K.

Watson, R.T., Zinyowera, M.C. and Moss, R.H. (eds) (1998) 'The Regional Impacts of Climate Change: An Assessment of Vulnerability'. Special Report, IPCC Working Group II. Cambridge University Press, Cambridge, U.K.

WRI/UNEP/UNDP/WB (1998) *1998-99 'World Resources. A Guide to the Global Environment'*. Oxford University Press, Oxford, UK.

World Bank (1991) 'Zimbabwe Agricultural Sector Memorandum. Volume II: Main Report.' Report No. 9429-ZIM. Southern African Department, Agricultural Operations Division, The World Bank, Washington DC.

World Bank (2000) 'World Development Report 2000/2001 – Attacking Poverty'. The World Bank. Washington, DC.

Zimbabwe Independent (2001) 'Carbon tax another govt sting.' Zimbabwe Independent. Newspaper article published March 23, 2001 (p.11).

Zinyowera, M.C., Jallow, B.P., Maya, R.S., and Okoth-Ogendo, H.W.O. and others (1998) 'Africa'. In: R.T. Watson, M.C. Zinyowera and R.H. Moss (eds) *The Regional Impacts of Climate Change: An Assessment of Vulnerability*, pp. 30-84. Special Report, IPCC Working Group II. Cambridge University Press, Cambridge, U.K.