

Climate Change Law in Zimbabwe:

Concepts and Insights

Edited by
Tumai Murombo,
Mutuso Dhiwayo and
Tafadzwa Dhlakama

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ZIMBABWE:
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Acronyms

A

AE	Accredited Agency
AfDB	Africa Development Bank
AGCM	Atmospheric Global Climate Model
AOGCM	Atmosphere Ocean coupled
AOSIS	Alliance of Small Island States

B

BURs	Biennial Update Reports
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C

CADDP	Comprehensive Africa Agriculture Development Programme
CBDR-RC	Common but Differentiated Responsibility Principle and Respective Capabilities
CBM	Coal Bed Methane
CCA	Climate Change Adaptation
CCCM	Canadian Climate Centre Model
CCMD	Climate Change Management Department
CDKN	Climate and Development Knowledge Network
CDM	Clean Development Mechanisms
CER	Certified Emission Reduction
CFF	Climate Finance Facility
CH ₄	Methane
CIFs	Climate Investment Funds
CO ₂	Carbon Dioxide
COP	Conference of Parties
CPI	Climate Initiative Policy
CSA	Climate Smart Agriculture Manual
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSOs	Civil Society Organisations

D

DBSA	Development Bank of Southern Africa
DFI	Development Finance Institution
DRR	Disaster Risk Reduction

E

ECHAM5OM	Max-Planck-Institute für Meteorologie
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EIA	Environmental Impact Assessment
EMA	Environmental Management Agency
ENSO	El Niño-Southern Oscillation
F	
FAO	Food and Agriculture Organisation
FONERWA	Rwanda Environment and Climate Change Fund
G	
GCC	Global Climate Coalition
GCF	Green Climate Fund
GCMs	Global Climate Models
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GFDL3	Geophysical Fluid Dynamics Laboratory Model
GHG	Green House Gases
GOZ	Government of Zimbabwe
H	
H ₂ O	Water Vapour
HFCs	Hydrofluorocarbons
I	
ICMM	International Council on Mining and Metals
ICT	Information and Communications Technology
IDBZ	Infrastructure Development Bank of Zimbabwe
IFAD	International Fund for Agricultural Development
ILO	International Labour Organisation
INDCs	Intended Nationally Determine Contributions
IPCC	Intergovernmental Panel on Climate Change
IPPs	Independent Power Producers
IRCs	Independent Research Centres
ITCZ	Intertropical Convergence Zone
ITUC	International Trade Union Confederation
J	
JI	Joint Implementation
K	
KfW	German Development Bank
L	
LDCs	Least Developed Countries
LEDRIZ	Labour and Economic Development Research Institute
LEDS	Low Emission Development Strategy
LULUCF	Land Use, Land Use Change and Forestry
M	
MIRO3.2 hires	National Institute for Environmental Studies
MMA	Mines and Minerals Act

MMAB	Mines and Minerals Amendment Bill
MoFED	Ministry of Finance and Economic Development
MPGs	Paris Agreement Rule Book Modalities, Procedures and Guidelines
MPGs	Modalities, Procedures and Guidelines
MRV	Monitoring, Reporting and Verification
MW	Mega Watt
N	
N ₂ O	Nitrous Oxide
NAMAs	Nationally Appropriate Mitigation Actions
NAP	National Adaptation Plan
NCCRS	National Climate Change Response Strategy
NCE	New Climate Economy
NCP	National Climate Policy
NDA	National Designated Authority's
NDCs	Nationally Determined Contributions
NEMA	National Environmental Management Act
NEPAD	New Partnership for Africa's Development
NGOs	Non-Governmental Organisations
NHRIs	National Human Rights Institutions
NIEs	National Implementing Entities
NOCZIM	National Oil Company of Zimbabwe
NPS	National Project Status
NR	Natural Regions
NREP	National Renewable Energy Policy
O	
O ₃	ozone
OGCMs	Ocean Global Climate Model
OGIDP	Oil and Gas Industry Development Policy
OND	October-November-December
P	
PFCs	Perfluorocarbons
PoAs	Programme of Activities
ppb	Parts Per Billion
ppm	Parts Per Million
PPPs	Public-Private-Partnerships
R	
RCPs	Representative Concentration Pathways
RCPs	Representative Concentration Pathways
RCPs	Representative Concentration Pathways
REDD+	Reducing Emissions from deforestation and forest degradation
REF	Rural Electrification Fund
RPOs	Renewable Purchase Obligations

S	
SDGs	Sustainable Development Goals
SF ₆	sulphur hexafluoride
SI	Statutory Instrument
SRES	Special Report on Emission Scenarios
SSTs	Sea Surface Temperatures
SWIO	South West Indian Ocean
T	
TSP	Transitional Stabilization Programme
U	
UKMO-HadCM3	UK Meteorological Office
UNDP	United Nations Development Program
UNEP	United Nations Environment Programme
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
UNGPs	United Nations Guiding Principles on Business and Human Rights
UNICEF	United Nations Children’s Fund
UPR	Universal Periodic Review
W	
WHO	World Health Organisation
WIM	Warsaw International Mechanism for Loss and Damage
WMO	World Meteorological Organization
Z	
ZAIP	Zimbabwe Agriculture Investment Plan
ZCTU	Zimbabwe Congress of Trade Union
ZERA	Zimbabwe Energy Regulatory Authority
ZERA	Zimbabwe Energy Regulatory Authority
ZESA	Zimbabwe Electricity Supply Authority
ZETDC	Zimbabwe Electricity Transmission and Distribution Company
ZEVs	Zero Emission Vehicles
ZHRC	Zimbabwe Human Rights Commission
ZPC	Zimbabwe Power Company

Preface

Climate change is threatening the livelihoods of an increasing number of people globally. Legal instruments under the United Nations Framework Convention on Climate Change (UNFCCC) seek to address the global climate change problem. International law is complemented by various domestic legal instruments. There is need for a broad familiarization with their implications within the climate change discourse. A comparative overview of the current legal position and potential position that climate change specific legislation in Zimbabwe may take, is imperative to understand. It is against this background that the Konrad-Adenauer-Stiftung Zimbabwe, commissioned this publication focused on promoting a climate-resilient low carbon economy in Zimbabwe, as reflected in the Zimbabwe climate Policy.

This book seeks to provide relevant analysis to different audiences on how the law can be utilized to address the negative effects of climate change. Various concepts and insights regulating the different economic sectors in Zimbabwe affected by climate change are addressed. This includes essential aspects such as climate science, agriculture, energy, insurance, labour, human rights and finance. In the near future, policymakers, members of the legal fraternity, educators, civil society organisations, the business community and the media can contribute to the ongoing process of identifying concepts and strategies in order to adapt to and mitigate climate change in Zimbabwe.

David Mbae

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October, 2019

Foreword

Human induced climate change is inextricably linked to the era of the Anthropocene. As repeatedly pointed out by the International Panel on Climate Change and others, the phenomenon of climate change is unequivocal, its drastic effects widespread and likely to worsen unless immediate and concrete action is taken. The chapters in this volume confirm that the challenges posed by the climate phenomenon are uniquely global, multi-disciplinary, uniquely long-term, irreversible and embedded in deep scientific uncertainties.

The cross-cutting nature of managing carbon budgets, emission of greenhouse gases and numerous related issues, including socio-economic consequences require a multi-disciplinary and multi-pronged approach to meet the challenges posed by climate change. Among the questions to be addressed is how to reconcile the notion of state sovereignty with the need to act co-operatively in the global community interest. In short, climate change is connected to everything: social upliftment, economic development, food and water security, energy security and sustainability, international and local law as well as governance. Virtually each of the seventeen UN Sustainable Development Goals (SDGs) are relevant to or related to climate change. However, reconciling and aligning the SDGs on climate action, access to affordable and clean energy, and economic growth underpinning the developmental aspirations of developing countries remains a major challenge.

While the emphasis of the 2015 Paris Agreement is on mitigation, the developing world, in particular African countries, need to focus on adaptation and climate funding. Zimbabwe is a case in point given the country's economic reliance on natural resources, the agricultural sector, forestry and other sectors. Zimbabwe, like most other African countries, is extremely vulnerable to the effects of climate change despite having very low greenhouse gas emissions. The effects on the region and Zimbabwe are manifesting in extreme weather events such as persistent droughts and cyclones as vividly illustrated recently by Cyclone Idai. Zimbabwe,

like other countries in the region, was ill-prepared and seemingly had no effective disaster management programme in place. This puts adaptation and climate risk management into the spotlight.

Central to addressing the climate change challenge is the need to develop a low-carbon, climate resilient energy economy. Zimbabwe is currently suffering from a crippling energy crisis in the electricity sector due to low water levels in Kariba Dam attributable to successive droughts in the Zambezi river catchment. Yet, despite having access to abundant solar radiation the country's progress towards transitioning to renewable energy has been slow and the country remains heavily reliant on hydro-electrical and coal power. This, and other sectoral and disciplinary aspects are ably dealt with in this volume, which is going to be useful to academics, climate law practitioners, civil society researchers, policymakers and climate negotiators.

While the focus of this work is Zimbabwe, the various chapters rightfully having been written by Zimbabweans, the lessons therefrom can be extrapolated and drawn out to other countries in particular and Africa as a whole.

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4 October 2019

Zimbabwe – Climate Change, Law and Policy

Tumai Murombo

1. Concepts and Insights on Climate Change

Climate change is one of the most urgent global environmental challenges facing humanity. It is not the only environmental or non-environmental challenge, yet the prospect of its devastating impacts and its potential to change the biophysical and man-made environments is unfathomable. Other global challenges include poverty, insecurity, and inequality – evinced by the persistence of socio-economic stratification: the ‘haves’ continue to aggrandise more wealth while the ‘have-nots’ continue their descent into poverty and want. Human security and the resurgence of nationalism are further threats to global human well-being and peace.

In the context of Zimbabwe, especially the past nineteen years, it may sound elitist to be writing of, and about climate change mitigation, adaptation¹ and action when the country could be focusing on economic recovery and dealing with social inequality. However, a realisation that the country’s economy is driven by resource extraction and resource dependent economic activities makes one understand the urgency of climate change. It is inevitable that Zimbabwe, among other low to middle income countries, will face greater impacts from climate change.²

1 Defined by the IPCC as ‘any adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.’

2 Ayers & Dodman (2010), p. 163.

The scientific evidence that has accumulated over decades of studies, monitoring and reporting demonstrates that human induced emissions of greenhouse gases is contributing proportionately the highest to global warming and its aftermath, climate change. It has also been overwhelmingly proven that the single largest source of these gases is the energy industry and the unrelenting reliance on fossil fuels³ and certain agricultural methods. Therefore, concrete action in the energy industry – how we produce and consume energy – will have a material impact on mitigating greenhouse gas emissions. Beyond the energy industry, other sectors also contribute to climate change and across these sectors international studies have distilled the key challenges for Africa.

1.1 Key Challenges for Africa and the International Regime

Climate change is not only an environmental problem but a larger challenge transcending disciplinary boundaries and frontiers of knowledge. In a review of the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5), the Climate and Development Knowledge Network (CDKN) identified key lessons for Africa from the AR5. These are that:

- Africa's climate is already changing, and the impacts are already being felt.
- Further climate change is inevitable in the coming decades.
- Climate change poses challenges to growth and development in Africa.
- Adaptation will bring immediate benefits and reduce the impacts of climate change in Africa .
- Adaptation is fundamentally about risk management.
- Adaptation experience in Africa is growing.
- Some low-carbon development options may be less costly in the long run and could offer new economic opportunities for Africa.
- Africa stands to benefit from integrated climate adaptation, mitigation and development approaches.
- International co-operation is vital to avert dangerous climate change and African governments can promote ambitious global action.⁴

3 Griffin (2017).

4 Climate and Development Knowledge Network (CDKN) (2015),pp. 4–6.

Among other impacts, economic growth is seen slowing down by over 30% for South Africa and Zimbabwe.⁵ These key lessons for Africa and the forecasted impacts on Zimbabwe demonstrate the need for more research, development and policy formulation to implement concrete steps towards climate change mitigation and adaptation. These steps must be driven and informed by the internationally established climate change regime.

At the international level, the original climate change convention, the United Nations Framework Convention on Climate Change (UNFCCC), set the tone and provided the foundational principles of law and policy that should inform action on climate change. One of the fundamental principles anchoring the convention is seeking to ensure that the capability of each state party is taken into account in assuming obligations. The Common but Differentiated Responsibility Principle and Respective Capabilities (CBDR-RC)⁶ was instrumental in enabling agreement and consensus on the UNFCCC as developing countries assumed less onerous obligations than developed state parties.

Key provisions were inserted into the treaty to enable developing states to implement their obligations. The provisions of financial assistance and transfer of relevant technologies⁷ are central to any steps that developing countries may take to mitigate or adapt to climate change. Nevertheless, the prognosis of the international climate change regime has seen a gradual shift from a strong north-south divide to a more unified approach which recognises that climate change is a global concern which every state should deal with regardless of its development status.

From the Copenhagen Conference of Parties (COP) proceedings to the Paris COP, states have realised that bottom-up driven targets and proposals carry better prospects of effectiveness than imposed targets and goals. To some,⁸ these shifts from strict legal targets to flexible politico-legal undertakings represents an ‘erosion’ of the CBDR-RC principle, while to others it could very well indicate a maturity of the principle.⁹ The latter is more apposite as under the Paris Agreement states, based on their own capabilities, can determine individually what they are

5 IPCC (2014), p. 20.

6 Article 3 (1) and 4 (1) UNFCCC.

7 Article 4(3) of the UNFCCC.

8 Bodansky (2016), pp. 298-299.

9 Article 4 of the Paris Agreement purports to retain the CBDR-RC principle. See also generally Voigt & Ferreira (2016) and Ari & Sari (2017), pp. 175-182.

prepared to do to mitigate and adapt to climate change. While this could very well release developed countries from more stringent obligations, we should not forget that the clauses on funding and technology transfer in the UNFCCC remain binding treaty provisions. Hence, many Individual National Determined Contributions (INDCs) submitted since 2015 retain as condition precedents the expectation by developing countries that developed countries will provide funding mechanisms and enable technology transfer.¹⁰

Another development since the UNFCCC and subsequent protocols, is the increasing realisation by developing countries and small island states that adaptation is more urgent than mitigation. This is premised on the intertwinement of economic development and adaptation – the argument that development is the best adaptation strategy.¹¹¹ Therefore, many developing countries have directed their energies at developing legal and policy frameworks and strategies to enable adaptation to the impacts of climate change rather than taking mitigating measures. This is largely because adaptation includes steps that may not be contingent on funding and technology transfer as many of the mitigation measures do. To this end, Zimbabwe's climate change policy, and any legal instruments, show a prioritisation of adaptation whilst recognising the need for mitigation.

This edited volume is a culmination of several engagement among stakeholders, policy-makers, and academics on the state of knowledge and research on climate change in Zimbabwe. While international concepts, principles and methodologies of addressing climate change appear settled, national level dialogue and insights are necessary to align international concepts and principles to lived social, economic and cultural realities. It is one thing to assume treaty obligations and an entirely separate process to transpose treaty provisions into domestic policy and law that can function to achieve concrete results.

10 GoZ (2015) INDC pp. 8 and 12; South Africa INDC (2015) p. 9 stating that, 'In accordance with the Convention, it is assumed that the extent to which developing country Parties will effectively implement their commitments will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources, capacity building 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.'

11 For detailed discussion of this debate see, Millner & Dietz (2015), p. 382; generally, Sherman, M., et al, (2016), pp. 707-726.

1.2 Central Hypotheses of the Volume

Our central hypothesis is that Zimbabwe must treat climate change as an urgent challenge that calls for immediate action in terms of creating an enabling legal framework and policy environment. Certain assumptions underpin this hypothesis. In particular the authors are reminded of the urgency of the climate change problem by recent extreme weather events such as Cyclone Idai and perennial debilitating droughts that have handicapped agricultural production.

This book was conceptualised on the assumption that law, governance and other regulatory constructs and social institutions that mediate the human/environment interface can, and should, play a central role in achieving climate mitigation, adaptation and the transition towards a low carbon developed economy. Secondly, we assumed that the pace of international climate change discussions and scientific evidence on the significant impacts of climate change is far ahead of what Zimbabwe is doing at national level to address climate change. This, in turn, has compromised the country's capacity to sustainably meet its national developmental goals and global competitiveness. Granted that there are also other national and internationally motivated geopolitical developments in the last decades that have disabled the country's economy.

Zimbabwe must undertake a range of regulatory initiatives towards a climate resilient and low carbon economy, without compromising social and economic capabilities of its citizens. As such, there is an urgent need to develop a comprehensive, systematic and (increasingly) multi- and trans-disciplinary understanding of the legal and extra-legal issues on climate change – the facts, science, law and policy.

1.3 Central Research Questions

The broad overarching research questions that informed this volume show the transdisciplinary nature of climate change and the need to bring scholars and scientists from different disciplines together. The main questions that the authors seek to engage with include:

- (i) What are the international and regional developments in the climate change regime and their consequent impact for Zimbabwe? How has and can Zimbabwe influence these developments in order to create a climate resilient and low carbon development economy?

- (ii) How does climate change and the need to create a climate resilient and low carbon economy fit within the existing constitutional and regulatory framework? Is there need for specific climate change law regime in Zimbabwe or how else can existing laws and policies be used to grapple with the impacts of climate change?
- (iii) What is the ‘climate relevance’ of selected topics to the Zimbabwean context? How can the disciplinary and sectoral tools and methods of each identified discipline or sector be brought to bear on enabling Zimbabwe to take measures to mitigate and adapt to climate change?
- (iv) What policy and legislative reforms are required to move Zimbabwe closer towards a climate resilient and low carbon sustainable economy? In the particular sector tackled by each chapter – where is the primary need for intervention – is it new policy or law; or strengthening implementation of existing instruments.
- (v) How can Zimbabwe leverage international law and other regulatory instruments to improve its domestic law, policy, science and other mechanisms to address climate change?

It is hoped that by engaging with these questions and others specific to each chapter the authors will stimulate debate and policy action on climate change in the country. By so doing they collectively hope to offer the first comprehensive multidisciplinary treatment of climate change in Zimbabwe. The authors also intended to proffer ways for the country to respond to climate change, mechanisms towards a climate resilient and low carbon sustainable economy.

Ultimately, this book should provide the first reference for climate change negotiators; post-graduate students; academics from across disciplines; legal and environmental management practitioners; climate change consultants; government officials; non-governmental and community based organisations. While there is a dominance of legal perspectives, sufficient scientific and policy perspectives have been included.

1.4 Structure and Organisation of Content

Consistent with efforts to make this research agenda multidisciplinary, the book opens with a chapter that provides Zimbabwe's past climate by examining historical records, the present climate and future projections. Chapter 2 provides the scientific conceptual context, including detailing Zimbabwe's climate, geographic profile and demographics, all of which are examined in the context of aspects that contribute to the country's vulnerability to climate change. This chapter then concludes by emphasising the inevitable impacts of climate change with which southern Africa and Zimbabwe will have to contend. It contextualises the findings of the reports of the IPCC to the social, economic, environmental and cultural context of the region.

Chapter 3 provides the governance framework for climate change demonstrating the influences of recent international outcomes such as the Paris Agreement and the Katowice Rule Book on developments in Zimbabwe. Importantly, this chapter highlights what steps Zimbabwe should take to effectively implement some of the international principles and best practices. Among other possibilities, the chapter discusses whether or not Zimbabwe needs a dedicated Climate Change statute and what principles should inform such a law, should it be deemed necessary. A particularly important recommendation by the author is the need for a monitoring and evaluation framework for policies and laws on climate change to ensure their effectiveness.

Chapter 4 explores climate change in the context of Zimbabwe's agriculture sector. It is the first of several chapters that focus on selected sectors to demonstrate how climate change is impacting the sector and what steps can be taken to mitigate climate change and enable adaptation. The discussion in this chapter is crucial given the importance of agriculture to Zimbabwe's economy and livelihoods. That climate change impacts water and rainfall patterns is one major challenge for which effective adaptation plans and mechanism are required. This include raising awareness and education of farmers and local communities on climate resilient methods of farming and adapting current practices to changed ecological and environmental contexts.

Chapter 5 discusses the justiciability of climate change and developments in climate change litigation globally. Climate change raises new legal challenges that test established conceptions of legal procedure

and provision of contractual and delictual remedies. There is a need for legal procedure to be reformed and adapted to the unique nature of climate caused damage and appropriate remedies. This chapter should be read with Chapter 6 that centres on the linkages between climate change and the attainment of human rights. These chapters unpack how climate change impacts the realisation of rights enshrined in the Constitution and international law such as the right to water and to food with a keen focus on the right to an environment that is not harmful to one's health or well-being.

Chapter 7 focuses the reader's attention on the extraction and consumption of resources that significantly release greenhouse gas emissions thereby affecting the aforementioned constitutional rights. The chapter also sheds light on the complex challenges facing the extractive industry in the context of climate change. One such is the need to transition to a green economy that has implications on the labour force.

Climate change impacts all sectors of life and the economy and economic productivity may compromise rights of workers and employees. and Chapter 8 explores these. A key issue at the convergence of labour and climate change is the question of just transitions for, as we move from carbon-intensive industries to low-carbon economies, jobs will be lost. These must be replaced with employment in the new technologies, yet such a possibly long-term transition will have implications including unemployment and poverty. Questions remain as to whether green jobs are necessarily decent relative to jobs in coal mines and heavy industries. A low carbon economy does not necessarily entail a revolution of labour conditions and rights to a new utopia.

Given the centrality of energy to climate change, Chapters 9 and 10 engage with the question of how law and policy in the energy industry can enable a transition from fossil-heavy industry to a low-carbon energy economy. Chapter 9 explores the interaction of property rights and climate change. Property law is conceived broadly to include aspects of investment and economic law as well as constitutional implications of rights and corporate behaviour. With a focus on the electricity sector, Chapter 10 demonstrates how climate change action needs to balance often competing interests and rights. While the Sustainable Development Goals call for access to affordable, reliable energy, climate change action may require measures to promote renewable energy sources which are not necessarily affordable especially in the context of Zimbabwe. These two

chapters should be read together.

Whatever legislative or policy steps Zimbabwe is taking on climate change, implementation of such will require extensive funding and new technologies that are not easily accessible. Chapter 11 addresses this intricate question of climate funding and what the possibilities are for Zimbabwe. The chapter explains the international climate financing architecture and discusses in detail the funding mechanisms under the UNFCCC and other global facilities such as the Global Environmental Facility.

Chapter 12 addresses the seemingly unimportant topic of insurance and its role in addressing the impacts of climate change. The role of insurance is enormous especially when we consider that loss and damage, as well as the provision of remedies is necessary in the face of climate change. Agricultural insurance as well as other forms of risk require an overhaul of long-established principles of insurance law and indemnity to align to uncharted territory heralded by climate change.

The volume is brought full-circle by the conclusion which makes connections between the sectoral chapters and the underlying core principles of climate change policy drawing from international to national instruments. It is the hope of the editors and the authors that this volume will be updated regularly to reflect changes in science, law and policy and possibly introduce other sectoral perspectives to ensure a holistic integrated approach to the problem of climate change.

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Zimbabwe's Climate: Past, Present and Future Trends

Collen Mutasa

1. Introduction

This chapter summarises Zimbabwe's past climate by examining historical records, the present climate and future projections. Zimbabwe's climate, geographic profile and demographics are examined in the context of revealing aspects that contribute to the country's vulnerability to climate change. Introductory concepts relating to climate change, which include its causes, greenhouse gases, the greenhouse effect and global warming are discussed and the country's contribution to global emissions highlighted. Next, we analyse the evidence available, which demonstrates Zimbabwe's changing climate. Records show that the annual mean temperature rose by about 0.4°C between 1900 and 2000; and October to April precipitation decreased by 10% between 1900 and 1994. Moreover, during the twentieth century, the frequency of droughts marginally increased. Heavy precipitation events have increased, the number of cold days and nights have decreased while hot days and nights have increased.

The onset of the rainy season has shifted towards a later start while cessation is now occurring earlier. The length of the growing season has also decreased, and the Natural Regions have changed in size, with Regions II and III shrinking while Region I, IV and V have expanded. Finally, future climate projections under the Special Report on Emission

Scenarios and the Representative Concentration Pathways are analysed using Global Climate Models for the future periods, 2011 to 2040, 2041 to 2070 and 2071 to 2100. Results indicate that temperatures are projected to increase by up to 3.5°C while rainfall is expected to decrease by up to 10% by 2100. Tropical cyclones are expected to become more intense although their number and those making landfall on the south-east coast of southern Africa is expected to decrease. Heat wave days are set to increase and so are the instances of flooding.

2. Geographic Profile and Demographics

Zimbabwe is situated in southern Africa between latitudes 15° and 23° south of the equator and longitudes 25° and 34° east of the Greenwich Meridian. The country occupies an area of 390,757 square kilometres and its population, according to the 2012 census was 13,061,239.¹ An increasing population growth rate from an average annual growth rate of 1.1% over the past two decades to 2.2% in the next two decades is, however, likely to push the population to 19.2 million by 2032.² The country shares borders with South Africa to the south, Botswana to the south-west, Mozambique to the east and Zambia to the north and north-west. Figure 2.1 shows Zimbabwe's position in southern Africa.

One major topographical feature in Zimbabwe is the central plateau which is 1,000 to 1,500 m above mean sea level. From this central plateau, altitude decreases northward towards the Zambezi River Valley and southward towards the Limpopo River where altitudes are around 500m. The country's east is mountainous with Mount Nyangani being the highest point in the country at 2,592 m.³

3. Climate

Zimbabwe is generally semi-arid with four seasons namely a cool season which stretches from mid-May to August, a hot season from September to mid-November, a main rainy season from mid-November to mid-March and a post-rainy season from mid-March to mid-May.⁴ Rainfall in Zimbabwe is unimodal, that is one wet season per year and the bulk of the rain falls between December and February.⁵

1 ZIMSTAT (2012) p. 14.

2 ZIMSTAT (2015) p. 48.

3 GoZ (2016) p. 4.

4 Ibid.

5 Unganai and Mason (2002); Davis and Hirji (2014) p. 1.



Figure 2.1: Map of Zimbabwe (Source: Street Savvy)

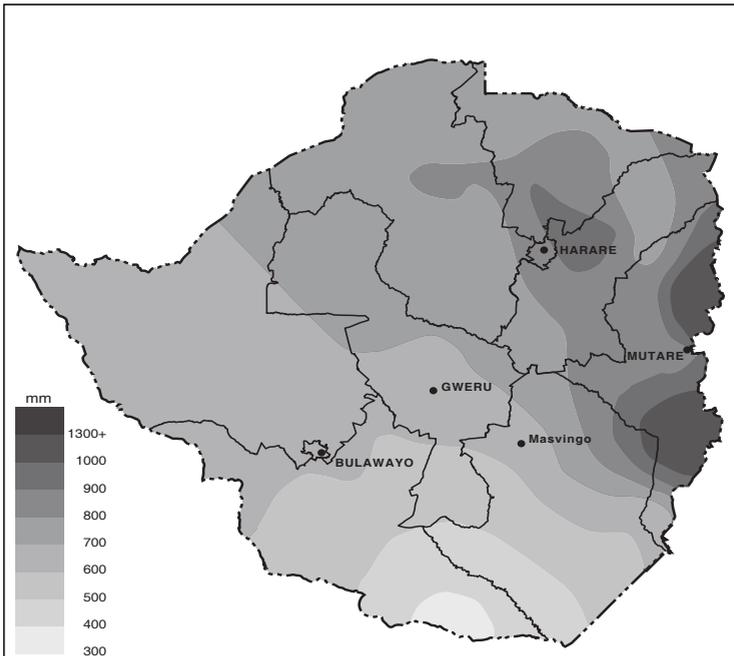


Figure 2.2: Zimbabwe Mean Annual rainfall (Source: Zimbabwe Meteorological Services Department)

The mean annual rainfall is about 657 mm but ranges from around 350 to 450 mm per year to the south, to over 800 mm in the eastern Highlands as illustrated in Figure 2.2 above. The average seasonal amounts however vary from year to year as shown in Figure 2.3.

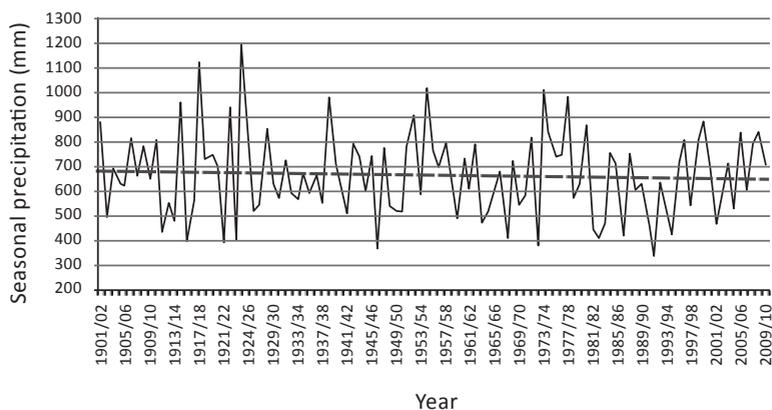


Figure 2.3: Variations in Zimbabwe's average seasonal rainfall from 1900/1 to 2009/10 (Source: Zimbabwe Meteorological Services Department)

The first part of the rainy season stretches from October to December with westerly cloud bands providing the main rain-bearing system; from January to March, the Intertropical Convergence Zone (ITCZ) provides the main rain-bearing system.⁶ The ITCZ is the point of convergence of easterly trade winds from the northern hemisphere (north-east trades) and the southern hemisphere (south-east trades) in a belt of low pressure.⁷ During the rainy season, tropical cyclones occasionally make landfall on the Mozambican and South African coastlines and, depending on their proximity and relative position, they may induce an extended dry spell or give widespread and heavy rainfall across the country within a very short space of time.⁸ On average, one to three droughts occur every ten years, largely due to changes in the phases of the El Niño-Southern Oscillation (ENSO) phenomenon and periodic sea surface temperature changes.⁹

The lowest minimum temperatures are recorded in June or July and the highest maximum temperatures in October although in some years

6 GoZ (2016) p. 1.

7 Godwin (2005) p. 369.

8 GoZ (2016) p. 2.

9 Chagutah (2010) p. 3. An example is Cyclone Idai which affected Mozambique, Malawi and Zimbabwe in March 2019.

they may be recorded in November or December. The mean monthly temperature varies from 15°C in July to 24°C in November while the mean annual temperature varies from 18°C in the Highveld to 23°C in the Lowveld.¹⁰

Cooler temperatures are experienced in the eastern Highlands where altitudes are the highest over the country.

4. Weather, climate variability, climate change and global warming

A list of terms used throughout the chapter and their definitions is included in Box 2.1 (overleaf) for reference.

5. Climate Change

In simple terms, climate change can be defined as a long-term shift in the earth's climate. It differs from climate variability in the time frame considered, following definitions in Box 2.1. While climate change is defined over long periods of time i.e. 30 years or more, climate variability refers to shorter-term variations and is associated with phenomena such as El Niño and La Niña.

5.1. Causes of climate change

Climate change can result from natural processes and/or anthropogenic (human induced) factors. The main anthropogenic factors are atmospheric greenhouse gases (GHGs), aerosols due to pollution emissions (e.g. sulphates, nitrates, organic aerosols) and changes in land use (e.g. deforestation, agricultural practices).¹¹

Natural causes of climate change include volcanic eruptions which result in the injection of small aerosol particles into the atmosphere, changes in the earth's orbit, continental drift and variations in solar intensity. According to the latest Intergovernmental Panel on Climate Change (IPCC) report, it is extremely likely that human influence has been the dominant cause of the observed warming since the mid-twentieth century.¹²

10 GoZ (2016) p. 2.

11 Giorgi (2010) p. 2.

12 IPCC (2013) p. 17.

Box 2.1: Definitions of Weather, Climate, Climate Variability, Climate Change and Global Warming
Weather
The state of the atmosphere at a particular place and time. It is described in terms of variables known as weather elements that include precipitation, temperature, wind, cloud cover, atmospheric pressure and a number of other elements.
Climate
The average pattern of the weather conditions for a particular region taken over a period of time. The standard averaging period as defined by the World Meteorological Organization (WMO) is 30 years. The main difference between weather and climate is the timescale to which they each refer. 'Weather' describes the conditions of the atmosphere over short periods of time; while 'climate' is the average of these conditions over longer periods of time.
Climate Variability
Variations in the mean state and other statistics (e.g. standard deviations or the occurrence of extreme events) of the climate on all temporal and spatial scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or due to variations in natural or anthropogenic external forcing (external variability).
Climate Change
<ol style="list-style-type: none">1. A change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties and that persist for an extended period, typically decades or longer (IPCC).2. A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and is in addition to natural climate variability observed over comparable time periods (UNFCCC).
Global Warming
Refers to the rise in the average temperature of the earth and oceans. It is primarily caused by the increasing concentrations of greenhouse gases in the atmosphere due to human activities such as burning fossil fuels, deforestation and farming.

5.2. Greenhouse gases and climate change

Human activities contribute to global warming and hence climate change through increasing greenhouse gas emissions into the atmosphere. Emissions of greenhouse gases (GHGs) resulting from many areas of human activity alter atmospheric chemistry, ultimately altering precipitation patterns and causing unprecedented global warming.¹³

Greenhouse gases are so called because they allow sunlight to pass through them onto the earth's surface but do not allow the reflected

13 'Summary for Policymakers', in IPCC (2014a).

component of sunlight to escape back into the atmosphere. In this way, they act like a blanket trapping heat energy and causing the temperature of the earth and oceans to rise, much like the plastic or glass walls of a greenhouse. The more greenhouse gases there are in the atmosphere, the more heat is trapped and the greater the warming. The 'greenhouse effect' is therefore the warming that occurs when greenhouse gases in the earth's atmosphere trap heat. This greenhouse effect is a natural phenomenon and is essential for the sustenance of life on earth because in its absence the earth would be much cooler and therefore less habitable. In the absence of the greenhouse effect the global average temperature of the earth would be much colder at about -18°C .¹⁴ The problem is that humans are adding more greenhouse gases into the atmosphere creating what is called the enhanced greenhouse effect.

The main greenhouse gases are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), water vapour (H_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). Each of these GHGs once emitted, can remain in the atmosphere for durations ranging from a few hours to thousands of years. CO_2 is the greenhouse gas most commonly produced by human activities and it accounted for 76% of total anthropogenic GHG emissions in 2010.¹⁵ Most of the anthropogenic carbon dioxide comes from burning fossil fuels such as oil, coal and natural gas for energy. Carbon dioxide is also released into the atmosphere through deforestation. By reducing the number of trees available to absorb carbon dioxide in the atmosphere during the process of photosynthesis in plants, deforestation results in the accumulation of this gas. Decaying plant material also releases carbon dioxide into the atmosphere.

5.3 Trends in GHG emissions

Some GHGs are naturally occurring while some are man-made. However, since the Industrial Revolution in the mid- to late-1700s, greenhouse gas emissions by humans into the atmosphere have increased. Figure 2.4 (overleaf) shows how the atmospheric concentration of the major greenhouse gases; carbon dioxide, methane and nitrous oxide has changed over the past 2000 years.

Figure 2.5 (overleaf) shows concentrations of carbon dioxide from

14 Ibid.

15 Ibid. p. 46.

1958 until 2018. As of April 2018 carbon dioxide concentration had increased by 30% (reaching an all-time high of 411.24 parts per million) in the atmosphere since recording began in 1958 at the Mauna Loa Observatory in Hawaii.

5.4 Zimbabwe's Contribution to Global Emissions

Zimbabwe's GHG emissions are very small, constituting about 0.062% of the global total while Africa as a whole contributes less than 7%.¹⁶ The major sources of GHG emissions in Zimbabwe are energy (49%); agriculture (40%); waste (6%) and industry (5%).¹⁷ According to Zimbabwe's Third National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) whose reporting year was 2006, the country's estimated emissions were 22,019 GgCO₂ eq (Giga tonnes of CO₂ equivalent) whereas emission removals from the atmosphere through Land Use, Land Use Change and Forestry (LULUCF) sector were estimated at 83,000 GgCO₂ eq making Zimbabwe a net carbon sink.¹⁸ Despite Zimbabwe and Africa's minimal contribution to global emissions, research shows that the continent is one of the regions of the world most vulnerable to the impacts of climate change.¹⁹ This is because greenhouse gases, once emitted do not remain in one place where they have been emitted but rather, become mixed into the atmosphere as air moves around resulting in their concentration becoming roughly the same throughout the world.

6. Observed Changes in Zimbabwe's Climate

This section gives a detailed account of trends in indicators that provide evidence that Zimbabwe's climate is changing.

6.1 Detection of Climate Change

Long-term trend analysis of atmospheric variables such as temperature and rainfall have been used extensively as proxies for detecting changes in climate. In particular, changes in average temperatures or rainfall and frequency of extreme weather events have often been cited as evidence of climate change. With regards to Zimbabwe, long-term changes in

16 AfDB (2011) p. 2.

17 GoZ (2012).

18 GoZ (2016), p. 21.

19 IPCC (2014a), p. 151; IPCC (2014b).

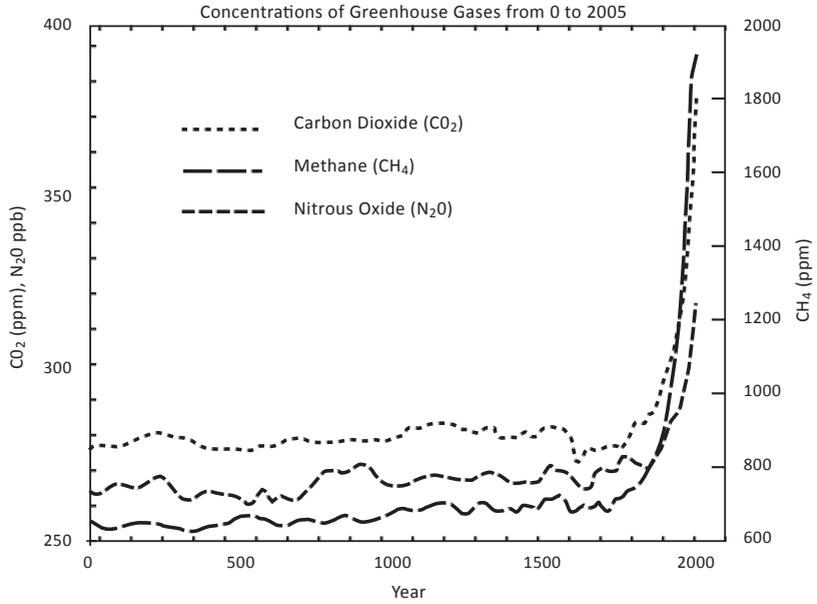


Figure 2.4: Changes in the atmospheric concentration of carbon dioxide, methane and nitrous oxide over the last 2000 years, measured in parts per million (ppm) or parts per billion (ppb) (Source: IPCC, 2007,135)

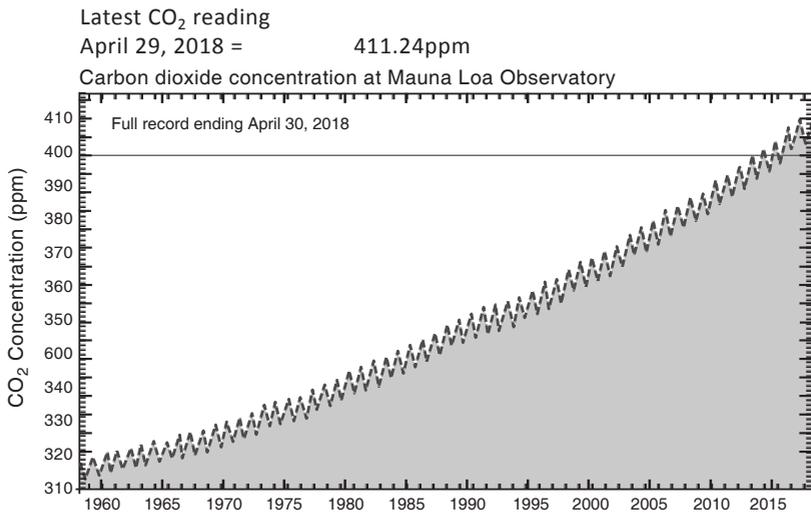


Fig 2.5: Recent CO₂ measurements at Mauna Loa Observatory in Hawaii (Source: Scripps Institution of Oceanography)

time-series data of minimum and maximum temperature, rainfall, start and cessation of the rainy season, length of season and extreme weather events are described in this section as evidence of climate change, and so are the shifts in agro-ecological zones.

6.2 Temperature

A number of research reports show that Zimbabwe is experiencing more hot and fewer cold days than earlier last century.²⁰

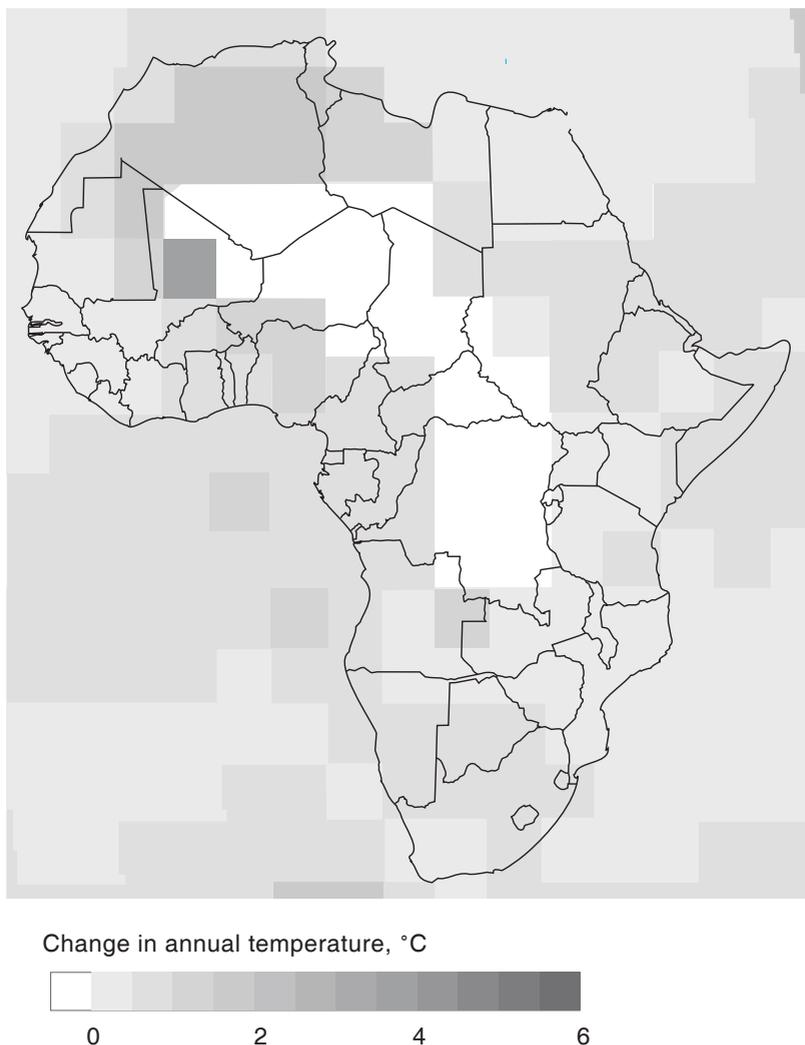


Figure 2.6: Change in average annual temperature in Africa: 1901-2012 (Source: 2014; IPCC, 2014, 64-65)

²⁰ Aguilar et al. (2009).

The period from 1980 to date has been the warmest on record. The country's annual mean surface temperature warmed by about 0.4°C from 1900 to 2000, with the warming being greatest during the dry season. The warming trend has continued even beyond the year 2000 as shown in Figure 2.6 which shows the average annual temperature change over Africa from 1901 to 2012.

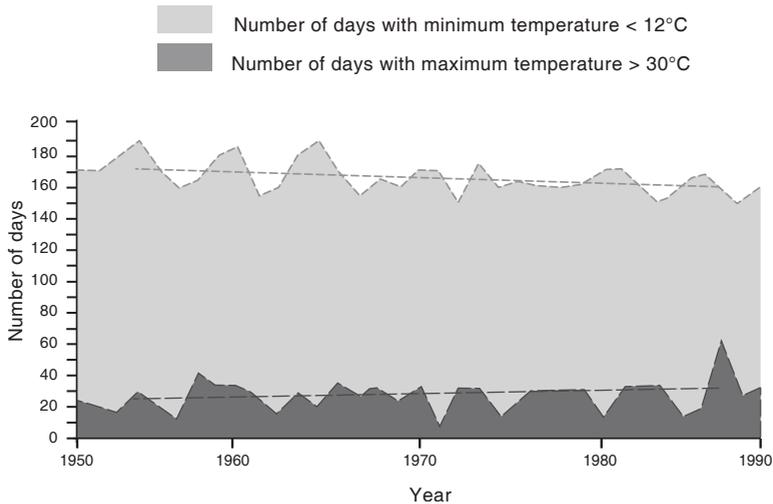


Figure 2.7: Evolution of the number of cold and warm days (Source: Zimbabwe Meteorological Services Department)

An analysis of daily temperature (maximum and minimum) data over the country by New et al. from 1961 to 2000 shows that extreme cold days and nights have decreased and hot days and nights have increased.²¹ In another separate study of minimum and maximum temperatures between 1950 and 1990, it was shown that the number of days with a minimum temperature <12°C has decreased while the number of days with a maximum temperature >30°C has increased as illustrated in Figure 2.7 which shows the evolution of cold and warm days.

6.3 Rainfall

The national average rainfall has declined by about 10% during the October to April season from 1900 to 1994.²² Other three-month aggregated rainfall totals from October, shown in Table 2.1, have also declined during the same period with the exception of October-November-December (OND) rainfall which has not shown any change. According to Hulme

²¹ New et al. (2006) p. 5.

²² Uganai (1996) p. 141.

& Sheard, observations show that average rainfall across Zimbabwe has decreased by around 5% during the twentieth century, with the 1990s being the driest decade of the century.²³ Data from Met Office Hadley Centre and the Climatic Research Unit, University of East Anglia in UK (Figure 2.8) also shows a decrease from 1901 to 2010.

Table 2.1: Rainfall change over Zimbabwe between 1900 and 1994 (Source: Uganai, 1996,141)

Season	OND	NDJ	DJF	JFM	FMA	Oct - Apr
% Change	0	-10%	-10%	-16%	-10%	-10%

Other observations on aspects regarding rainfall trends in Zimbabwe include:

- (i) An analysis of daily rainfall data from 1961 to 2000 shows that average dry spell length, average rainfall intensity, and annual one-day maximum rainfall all show statistically significant increasing trends;²⁴
- (ii) The timing and amount of rainfall is increasingly becoming uncertain;²⁵
- (iii) There have been increasing departures from mean annual precipitation and prolonged periods of wet years alternating with periods of rainfall deficits since 1910 (see Figure 2.9). Some of the wet and dry years have coincided with flood and drought periods respectively.

6.4 Extreme Weather Events

6.4.1 Droughts and Dry Spells

Droughts and dry spells are among the most common hazards affecting Zimbabwe. Much of Zimbabwe lies in agro-ecological regions IV and V, characterised by low and erratic rainfall and poor soils. From 1950 to 2010, the length and frequency of dry spells during the rainfall season has been increasing while the frequency of rain days has been decreasing.²⁶ An analysis of droughts from the 1900/1901 season to the 2000/2001 season reveals a marginal increase in their frequency of occurrence.

²³ Hulme and Sheard (1999) p. 1.

²⁴ New et al. (2006) p. 8.

²⁵ Manjengwa et al. (2014).

²⁶ Tadross et al. (2009) p. 153; see also Manjengwa et al. (2014).

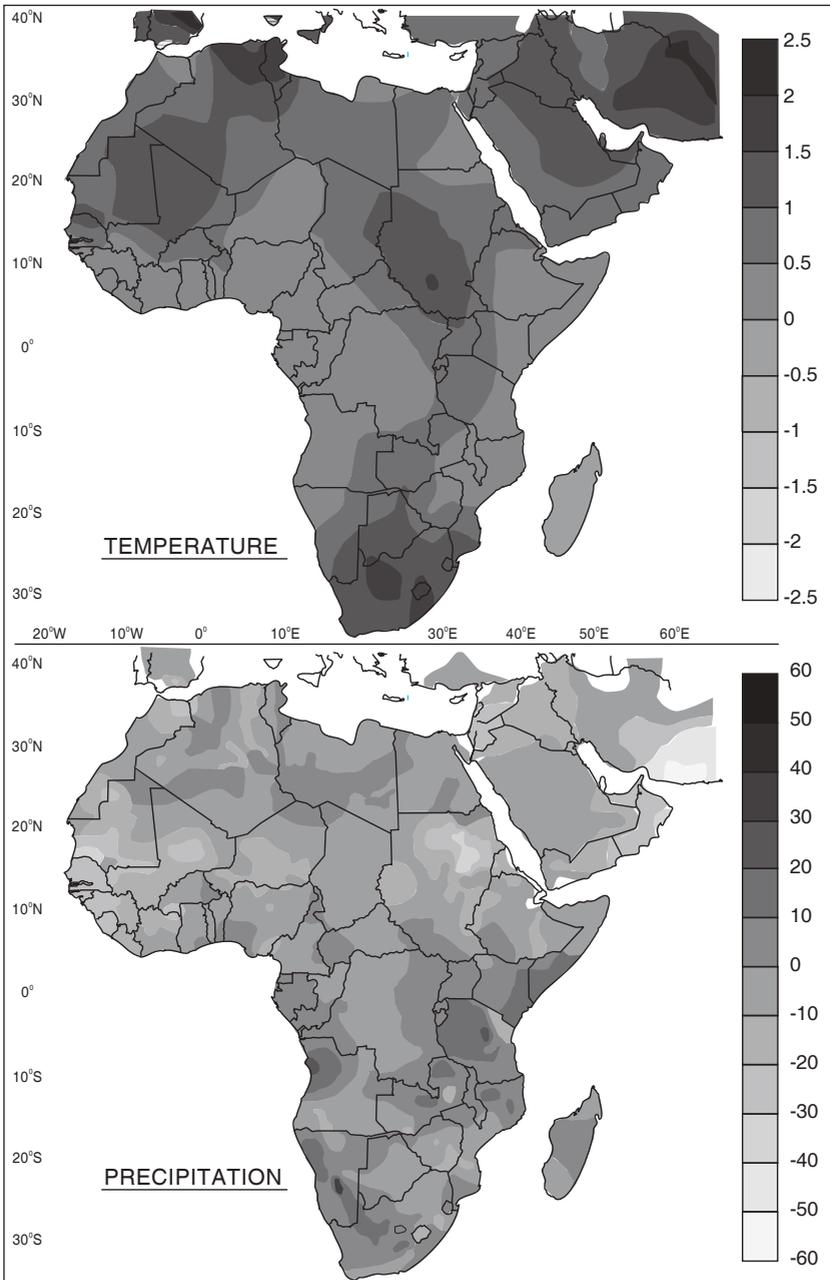


Figure 2.8: Mean linear trends in annual temperature ($^{\circ}\text{C century}^{-1}$) and annual rainfall ($\% \text{ century}^{-1}$), calculated over the period 1901–2010 (Source: Met Office Hadley Centre, UK, and Climatic Research Unit, University of East Anglia, United Kingdom)

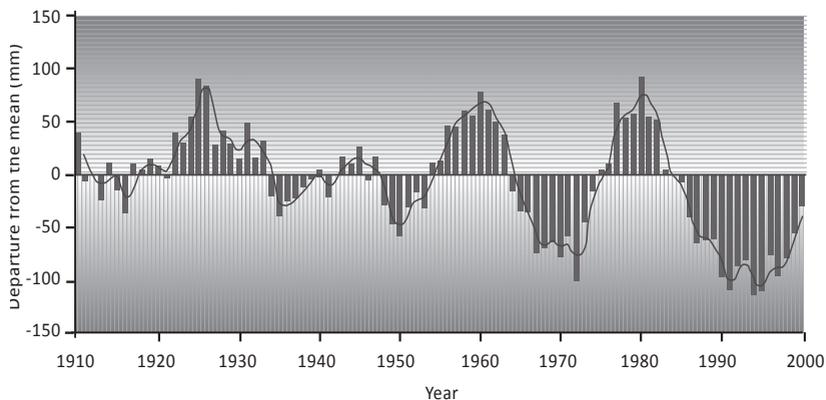


Figure 2.9: National rainfall deviation from the mean 10 years running mean (Source: Zimbabwe Meteorological Services Department)

6.4.2 Floods

Floods are affected by several factors, some of which are non-climatic. This makes the assessment of causes of changes in floods complex and difficult.²⁷ Floods occur more frequently than droughts, usually every year and sometimes result in displacement or death of people, death of livestock and destruction of crops, infrastructure, roads, homes and bridges. They tend to occur in the southern and northern low-lying areas of the country and are caused either by intense precipitation, tropical cyclones from the Indian Ocean or by dam failure.²⁸ The major flood-prone areas in Zimbabwe are Muzarabani, Middle Sabi, Tsholotsho in Matebeleland North, Malipati, Chikwalakwala and Tuli-Shashe.²⁹ The flood prone areas are shown in Figure 2.10. Major floods in Zimbabwe have occurred in 2000, 2001, 2003, 2007, 2010, 2011, 2013, 2014 and 2016, with those of 2000 and 2003 being caused by tropical cyclones Eline and Japhet respectively.

No gauge-based evidence however has been found for a climate-driven global change in magnitude/frequency of floods during the last decades. Rozenzweig et al., Bates et al. and Di Baldassarre et al. also found no evidence of an increase in the magnitude of African floods during the

²⁷ IPCC (2012) p. 175.

²⁸ Mavhura et al. (2013).

²⁹ Megan (2009).

twentieth century.³⁰ There is therefore low confidence (due to limited evidence) that anthropogenic climate change has affected the magnitude or frequency of floods, although it has altered other components of the hydrological cycle such as precipitation (medium to high confidence) which can affect flood trends.³¹

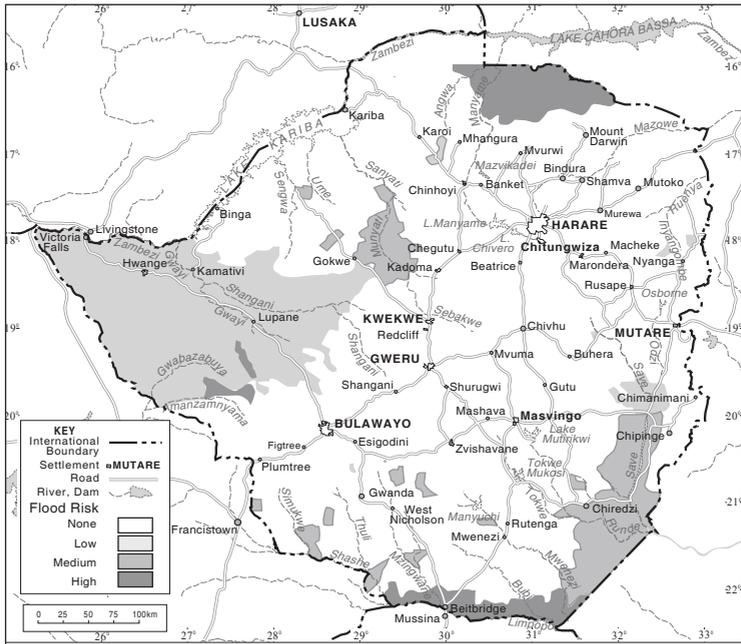


Figure 2.10: Areas prone to flooding in Zimbabwe (Source: ZINWA and IOM)

6.4.3 Tropical Cyclones

Tropical cyclones that affect Zimbabwe originate from the South West Indian Ocean (SWIO) Basin, an area in the Indian Ocean stretching from 0°S to 40°S and 30°E to 100°E. On average, nine tropical cyclones occur in this basin with the number increasing to eleven if tropical storms are included.³² The tropical cyclone season is from November to April, peaking in January and/or February. Since 1960 Sea Surface Temperatures (SSTs) have increased by 0.3°C over the south Indian Ocean³³ and by

30 Rosenzweig (2007) p. 90; see also Bates et al. (2008) p. 38, and Di Baldassarre et al. (2010) p. 3.

31 IPCC (2012) p. 178.

32 Reason and Keibel (2004); Mavume et al. (2009) (8) p. 16.

33 Ibid., 15.

0.5°C between 1970 and 2004 over the tropical ocean.³⁴ Datasets of varying lengths and starting year have been used by different authors to study trends of occurrence, intensity and the number of tropical cyclones making landfall over the Mozambique and Madagascar coastlines in relation to global warming and increasing SSTs in the SWIO.

Reported results indicate:

- (i) An increase in the occurrence of *intense tropical cyclones* over the years, where intensity is measured in terms of strength of maximum winds.³⁵ An intense tropical cyclone is defined as one that has wind speeds of between 166 and 212 km per hour. There have been disagreements however over whether this increase in tropical cyclones of high intensity can be attributed to global warming or not with some authors finding no link between the trends and global warming.
- (ii) Either no change or a decrease³⁶ in the number of tropical cyclones that occurred.³⁷
- (iii) Either a decrease³⁸ or no change in tropical cyclones that have made landfall over the Mozambique and Madagascar coastlines.³⁹

Differences in reported results in (ii) and (iii) above can be explained by length of data sets used, improvements in storm detection methods over the years or changes in data quality, with some authors viewing data before the satellite era as unreliable.⁴⁰

6.5 Start of season dates

A comparison of the likelihood of start of the season dates according to Vincent and Thomas with observed start of season dates for five representative stations in each of the five agro-ecological zones of the country for the period 1997 to 2014 shows that there has been a shift towards late start of season for all the agro-ecological zones.⁴¹ The

34 Webster et al. (2005).

35 Mavume et al. (2009) p. 15; Webster et al.(2005) p. 1846.

36 Malan et al. (2013) p. 6745; Fitchett and Grab (2014) p. 3614.

37 Kuleshov et al. (2010) p. 8.

38 Mavume et al. (2009) p. 33.

39 Reason and Keibel (2004) p. 804; Fitchett and Grab (2014) p. 3608.

40 Mavume et al. (2009) p. 16.

41 Vincent and Thomas (1960).

determination of start of season was done using the DEPTH method⁴² which defines the start of season as the first day of a four-day period with a cumulative rainfall of 36 mm. According to the Zimbabwe Meteorological Services Department, there has been a shift in the mean rainfall start dates for the main rainfall season from 22 November in the 1960s to 27 November under the present climate regime.

6.6 Cessation of season dates

A comparison of two 30-year periods namely 1921 to 1950 and 1941 to 1970 for five stations in each of Zimbabwe's Natural Regions shows a shift towards early cessation for the 1941 to 1970 period when compared to the 1921 to 1950 period.

6.7 Length of growing season

Using the same stations and 30-year periods as those used in the analysis of cessation of season dates shows a change in the length of the growing season with some stations showing a longer season and others a shorter season when comparing the more recent 1941 to 1970 with the earlier 1921 to 1950 period.

6.8 Agro-ecological zones

The country is divided into five agro-ecological zones also known as Natural Regions (NR) on the basis of annual rainfall, soil type and vegetation.⁴³ These zones are shown in Figure 2.11. Rainfall patterns and crop production progressively deteriorate from Region I to V. Characteristics of the different regions are shown in Table 2.2.

A study by Mugandani et al. reclassified the agro-ecological regions of Zimbabwe using soil, mean-annual rainfall and length of growing season data.⁴⁴ Results show that the number of regions remained the same although the sizes of the regions had changed. In particular, Regions I, IV and V expanded in size by 106%, 5.6% and 22.6% respectively while Regions II and III, the main food producing regions for the country, decreased by 49% and 13.9% respectively. These changes in the sizes of the zones provides evidence of climate change and variability.

42 Raes et al. (2004) p. 179.

43 Vincent and Thomas (1960).

44 Mugandani et al. (2012) p. 368.

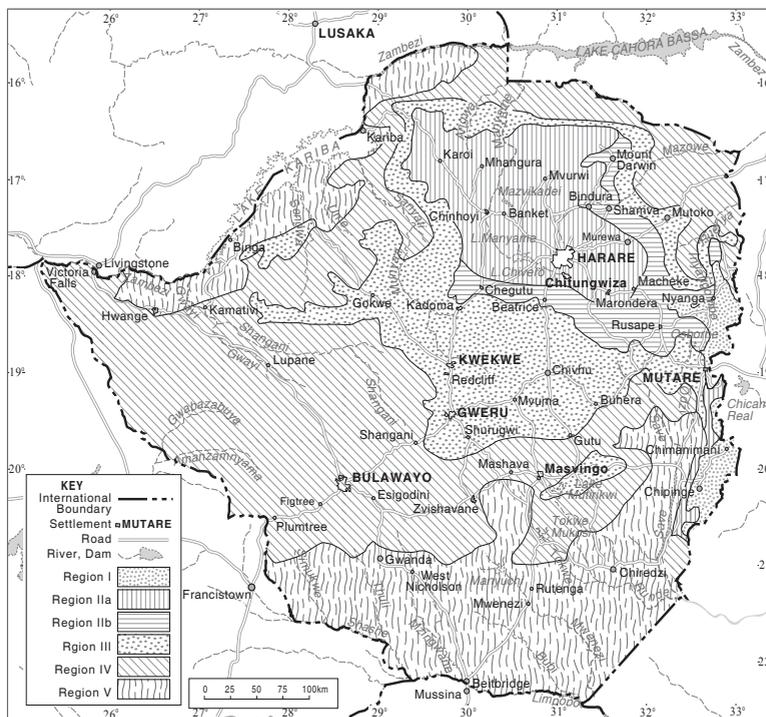


Figure 2.11: Map of the 5 Natural Regions of Zimbabwe (Source: FAO, 2006)

Table 2.2: Characteristics of Natural Regions of Zimbabwe (Source: Vincent and Thomas, 1960)

Natural Region	Area (km ²)	Rainfall (mmyr ⁻¹)	Farming system
I	7000	>1000	Specialised and Diversified farming
II	58 600	750 – 1000	Intensive farming
III	72 900	650 – 800	Semi-intensive farming
IV	147 800	450 – 650	Semi-extensive farming
V	104 400	<450	Extensive farming

7. Projections of Future Climate

This section provides information on how Zimbabwe’s climate is projected to change in future under global warming. Before giving the future projections of temperature, precipitation and extreme weather events

for Zimbabwe, it is important to explain some background concepts that will be used throughout the discussion of the projections. This will assist the reader to fully understand the projections. Sections 7.1 to 9, namely Global Climate Models and how they work, Downscaling of GCM output, Emission scenarios, The Intergovernmental Panel on Climate Change (IPCC) and its scenarios and the Representative Concentration Pathways, are dedicated to describing these background concepts.

7.1 Global Climate Models

Global Climate Models (GCMs) are the tools used for assessing the causes of past change and to project long term future change in climate.⁴⁵ They are complex computer models, consisting of mathematical equations that represent interactions between different components of the climate system such as the land surface, the atmosphere and the oceans.⁴⁶ Early types of GCMs included atmospheric GCMs (AGCMs) and ocean GCMs (OGCMs) which can now be coupled together to form an Atmosphere-Ocean coupled Global Climate Model (AOGCM). Climate models have undergone continuous development in the past couple of decades and now incorporate interactions between the atmosphere, oceans, sea ice and land surface. There are several GCMs in existence and these have been developed by different organisations and countries. Examples of some GCMs widely used in simulating future climate are shown in Table 2.3.

Table 2.3: Examples of GCMs

Model	Sponsor(s), Country
Geophysical Fluid Dynamics Laboratory Model (GFDL3)	USA
Canadian Climate Centre Model (CCM)	Canada
Commonwealth Scientific and Industrial Research Organisation (CSIRO-MK3.5)	Australia
Max Planck Institute für Meteorologie (ECHAM5OM)	Germany
National Institute for Environmental Studies (MIRO3.2 hires)	Japan
UK Meteorological Office (UKMO-HadCM3)	United Kingdom

⁴⁵ Davis (2011) p. 30.

⁴⁶ Ibid.

7.2 How do GCMs work?

In order to run a GCM, we need to give it some input. The main inputs into models include solar radiation, volcanic emissions and greenhouse gases. Common outputs produced by climate models include temperature and humidity at different levels of the atmosphere, estimates of rainfall, wind speed and direction, all of which are generated at different time intervals.

7.3 Downscaling GCM output

The output from GCMs is typically applicable and useful at global scales, i.e. 200 to 300 km grids. This spatial resolution is too low to accurately capture the physical processes and features of the topography, which are important determinants of local and regional climate. Therefore, the technique of downscaling is typically used to produce projections at a finer spatial scale, smaller than that of global models. Downscaling is the term used to describe the process through which the projections of change from GCMs are translated to the regional and local scales. The downscaled scenarios are more useful for assessing local and regional impacts, adaptation and developing policies. There are two possible approaches for downscaling, namely, statistical/empirical and dynamical downscaling and each has its strengths and limitations. These approaches have both been used in deriving future climate projections for southern Africa.⁴⁷

7.4 Emission scenarios

GCMs simulate climate under a range of emission scenarios, each representing a possible future.

A scenario is an estimate of possible alternative future emissions as a result of natural and anthropogenic sources of GHGs based on assumptions about future driving forces.

Future GHG emissions are determined by driving forces such as demographic development, socio-economic development, technological change and land use change, among other factors. Two scenarios commonly used with GCMs to simulate future climates are the Special Report on Emission Scenarios (SRES) and the Representative Concentration Pathways (RCPs), described in section 8.3 and 9 respectively.

⁴⁷ Ibid., pp. 37-46.

8. The Intergovernmental Panel on Climate Change (IPCC)

8.1 Background

The Intergovernmental Panel on Climate Change is a scientific intergovernmental body established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts. It is open to all member countries of the United Nations and WMO and currently has a membership of 195.

The IPCC provides on a regular basis of about five-year intervals, Assessment Reports of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation. Its work is divided into three Working Groups and a Task Force. Working Group I deals with The Physical Science Basis of Climate Change, Working Group II with Climate Change Impacts, Adaptation and Vulnerability and Working Group III with Mitigation of Climate Change. The Task Force on National Greenhouse Gas Inventories develops and refines methodology for the calculation and reporting of national greenhouse gas emissions and removals.

The IPCC also prepares Special Reports and Technical Papers on specific topics agreed by its member governments. To date, five IPCC Assessment Reports have been produced, with the first one having been released in 1990, and the fifth, from 2013 to 2014.

8.2 The IPCC Scenarios

The IPCC developed long-term emission scenarios in 1990 and 1992 which have been widely used in the analysis of possible climate change, its impacts and options to mitigate climate change. A new set of scenarios was agreed upon by IPCC in 1996 and are presented in the Special Report on Emission Scenarios (SRES) which was published in 2000. These scenarios cover a wide range of the main driving forces of future emissions from demographic to technological and economic development. Four different narrative storylines were developed to describe the relationship between emission driving forces and their evolution. The SRES are baseline scenarios, which means that they do not take into account any current or

future measures to limit GHG emissions. Many alternative scenarios have been generated independently of the IPCC and used in various regional impact studies.

8.3 Summary of the main SRES Scenarios

The four scenarios are denoted by A1, A2, B1 and B2 with the A1 storyline being subdivided into three sub-groups that are distinguished by their technical emphasis (A1F1, A1B and A1T). The four scenarios also project different warming rates by 2100 with B1 producing the least warming and A1F1 accounting for the greatest warming. A1B and A2 are also high emission pathways. The SRES were used in coming up with future temperature and precipitation projections for Zimbabwe in this chapter. The SRES were superseded by the Representative Concentration Pathways (RCPs) in 2014 as the latest generation of scenarios used as input to climate models. The RCPs were adopted by the IPCC for the 5th Assessment Report.

9. The Representative Concentration Pathways (RCPs)

These describe four scenarios of how the planet might change in the future. The scenarios prescribe trajectories for the concentration, rather than the emissions and unlike the SRES in which no mitigation policies are implied, the RCPs cover the full range of stabilisation, mitigation and baseline scenarios available in the scientific literature. The four differ greatly in their emission rates and are named according to their 2100 radiative forcing level where ‘radiative forcing’ is the difference between incoming solar energy received by the earth and the energy radiated back to space, and is a measure of the size of human activities and natural factors’ contribution to global warming. RCP2.6 represents the lowest emission pathway, followed by RCP4.5, then RCP6.0 and the highest emission pathway is represented by RCP8.5.

10. Climate change projections for Zimbabwe

Several models have been used to produce scenarios for Zimbabwe and southern Africa.⁴⁸ Since future changes in climate are dependent on future levels of GHG emissions in the atmosphere and the specific GCM used for the simulation, often times there are differences on projected trends particularly in rainfall projections. In this section, projections are given

48 Engelbrecht et al. (2009) p. 1029; Hulme and Sheard (1999) pp. 2-4.

for three future time intervals namely; 2011–2040, 2041–2070 and 2071–2100, also called the 2020s, 2050s and 2080s respectively. The temperature and precipitation projections are based on observed climate data held by the Climatic Research Unit, GHG emission scenarios prepared for the IPCC and climate change experiments conducted using seven GCMs.

10.1 Temperature

GCMs can reliably and skillfully project changes in temperature, because the physical processes responsible for warming are well-captured by the models. Temperature projections for Zimbabwe when using a medium emission scenario (A1), with Low (B1) and High (A2) emission scenarios as the lower and upper limits give results shown in Table 2.4.⁴⁹ These projections show that temperature is expected to increase by 1.6°C on average in the 2020s, by 2.8°C on average in the 2050s and by 3.5°C on average in the 2080s. Figure 2.12 shows a pictorial view of the projected temperature increases over sub-Saharan Africa according to Engelbrecht and Bopape under an A2 scenario when compared to a 1961 to 1990 baseline. The temperature increases are generally in agreement with the projections by Hulme and Sheard. The future temperature projections translate to about 0.1 to 0.5 °C increase per decade, meaning Zimbabwe's annual temperatures are predicted to increase more rapidly than the global average. Warming is projected to be greatest in the dry season and the least in the wet season.⁵⁰

Table 2.4: Future temperature projections for Zimbabwe (Hulme and Sheard, 1999)

Period	Average Temperature change (°C)	Range (°C)
2020s (2011 – 2040)	1.6	0.9 to 2.2
2050s (2041 – 2070)	2.8	1.4 to 4.1
2080s (2071 - 2100)	3.5	1.9 to 6.2

10.1.1 Effects of a 1.5°C versus a 2°C temperature increase

In 2018 the IPCC released a Special Report on the impacts of global warming of 1.5°C above pre-industrial levels. The report also examines

49 Hulme and Sheard (1999) p. 2.

50 Ibid., p. 3.

pathways available to limit warming to 1.5°C. In particular, the Report notes that a warming of 1.5°C or higher increases the risk associated with long lasting or irreversible changes.

The Report also notes that:

- (i) Current emission commitments under the Paris Agreement are not enough to limit warming to 2°C by 2100 and this will lead to disastrous effects on the planet.
- (ii) Southern Africa will be among the worst affected regions where the strongest warming of hot extremes is expected to occur.
- (iii) There are significant increases in projected risks of increased meteorological drought in southern Africa at 2°C versus 1.5°C of warming.
- (iv) Livestock in southern Africa will experience increased water stress under both 1.5°C and 2°C of global warming with resultant negative economic consequences.
- (v) Southern Africa is projected to experience reduced maize and sorghum cropping area suitability as well as yield losses under 1.5°C of warming with further decreases occurring towards 2°C of warming.
- (vi) Vulnerability to decreases in water and food availability is reduced at 1.5°C versus 2°C for southern Africa, whilst at 2°C these are expected to be higher.
- (vii) In order to limit warming at 1.5°C, the world will have to reduce CO₂ emissions by 45% by 2030 from the 2010 levels and reach net-zero emissions by 2050.⁵¹

10.2 Rainfall

Model experiments suggest that annual rainfall will decrease across Zimbabwe in future. Taking the B1 and A2 scenarios as lower and upper limits and the A1 as the average gives the projections shown in Table 2.5 when compared to a 1961–1990 baseline.⁵² Rainfall in the 2020s, 2050s and 2070s is projected to decrease by 5%, 8% and 10% on average respectively.

⁵¹ IPCC (2018) p. 32.

⁵² Hulme and Sheard (1999) p. 4.

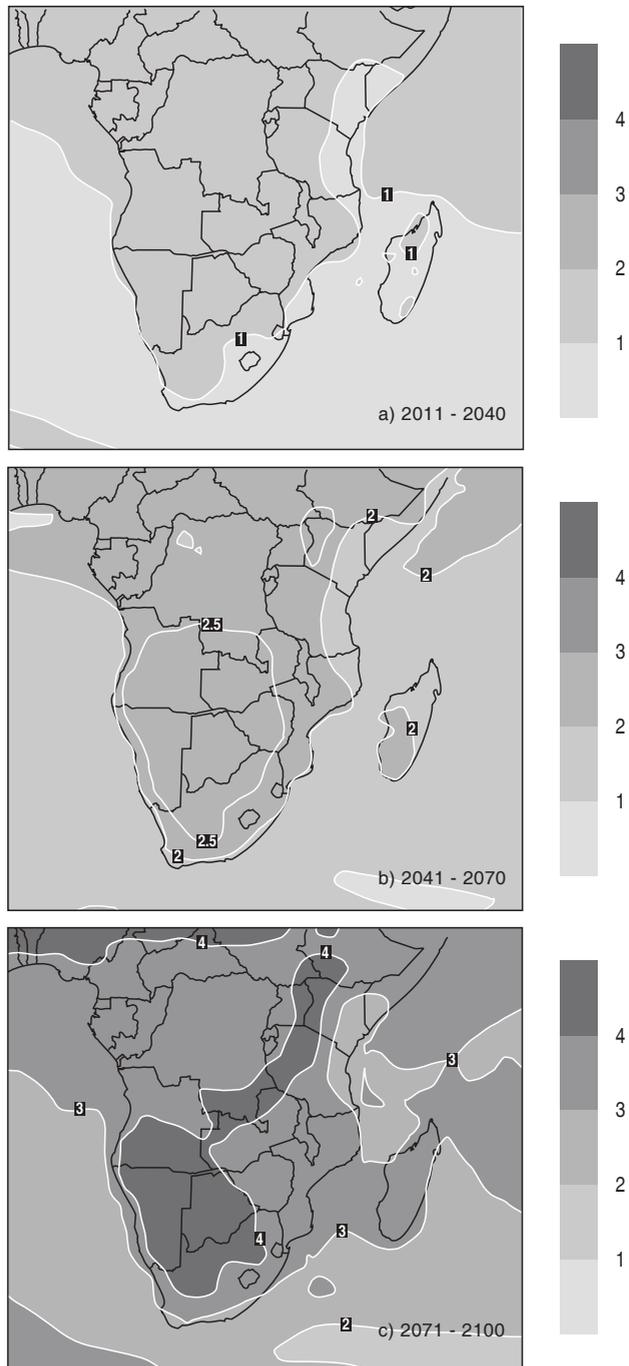


Figure 2.12: Projected Changes in Annual Average Temperature for periods a) 2011–2040 b) 2041–2070 and c) 2071–2100 from the 1961–1990 Baseline (Source: Engelbrecht and Bopape, 2009)

Table 2.5: Future rainfall projections for Zimbabwe (Hulme and Sheard, 1999)

Period	Average rainfall change(%)	Range (%)
2020s (2011 – 2040)	-5	-3 to -6
2050s (2041 – 2070)	-8	-4 to -12
2080s (2071 - 2100)	-10	-5 to - 18

According to Hulme and Sheard,⁵³ decreases will occur in all seasons but will be more conclusive for the early and late rains than for the main rainy season months of December to February.

It must be noted that there is considerable uncertainty relating to rainfall changes simulated by global climate models for Zimbabwe, Africa and the whole globe. In general, there is greater confidence in projections for larger regions than for specific locations and in making temperature projections than rainfall projections. Inconsistencies in rainfall projections are explained partly by the inability of GCMs to reproduce the mechanisms responsible for rainfall including, for example, the hydrological cycle,⁵⁴ or to account for orography.⁵⁵ They are also explained partly by model limitations in simulating the different teleconnections and feedback mechanisms which are responsible for rainfall variability in Africa.

10.3 Extreme Weather Events

10.3.1. Droughts

Future changes in drought characteristics are mainly driven by changes in climate variability modes such as the ENSO phenomena, projected reductions in precipitation and future higher temperatures and the resultant increased evaporation. According to the IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, there is medium confidence that droughts in southern Africa will increase in duration and intensity due to reduced precipitation and/ or increased evapotranspiration.⁵⁶

Using an ensemble of hydrological and climate models and the RCP8.5 scenario, droughts over southern Africa are also projected to

⁵³ Ibid.

⁵⁴ Lebel et al. (2000) p. 276.

⁵⁵ Hudson and Jones (2002) p. 3.

⁵⁶ 'Summary for Policymakers', in IPCC (2014a) p. 13.

increase in frequency and severity during the 2070 to 2099 period when compared to the 1976 to 2005 reference period.⁵⁷ Sheffield and Wood, using eight AOGCMs that participated in the IPCC's Fourth Assessment Report (AR4) also projected increased drought frequency over southern Africa under the B1, A1B and A2 scenarios for the 2070 – 2099 period when compared with the 1961 – 1990 reference period.⁵⁸

10.3.2. Floods

Projections of future changes in flooding episodes are made difficult by the fact that both climatic and non-climatic factors determine flooding risk. These factors include precipitation (intensity, duration, amount, timing, phase – rain or snow), pre-existing water levels in rivers, soil moisture content, land use and land cover change, dikes, dams and reservoirs that regulate flow processes and soil character among other factors.⁵⁹

It is likely that the frequency of heavy precipitation or the proportion of total rainfall from intense events will increase in the 21st century over many areas of the globe.⁶⁰ These future projected increases in heavy rainfall or intense precipitation events in some catchments or regions could contribute to increases in rain-generated local floods.⁶¹

There is low confidence in global projections of changes in flood magnitude and frequency because of insufficient evidence.⁶² Hirabayashi et al., however, conclude that the low confidence is as a result of the use of a single AOGCM model in the modeling process.⁶³ In another simulation using 31 models and the RCP4.5 emission scenario, southern Africa is projected to experience future increases in intense extreme precipitation events and more frequent flooding for the periods, 2016–2035, 2046–2065 and 2080 to 2099 when compared to the 1986 to 2005 reference period.⁶⁴

10.3.3 Tropical Cyclones

Despite some recent advances in modelling of the global climate, predicting future characteristics of tropical cyclones remains a challenge.

57 Prudhomme et al. (2014) p. 3263.

58 Sheffield and Wood (2007) p. 87.

59 Bates et al. (2008) p. 37.

60 IPCC (2012) p. 13.

61 'Summary for policymakers', in IPCC (2104a) p. 178.

62 Ibid., p. 119.

63 Hirabayashi et al. (2013) p. 816.

64 Chen et al.,(2014), p. 2741.

However, an ensemble of six CGCMs used to study the projected changes in the characteristics of tropical systems over the SWIO and their landfall over southern Africa under the A2 scenario indicated the following:⁶⁵

- (i) A projected reduction in the occurrence of tropical cyclones under enhanced anthropogenic emissions is expected over most parts of the SWIO basin especially near southern Africa over the central and southern parts of the Mozambique Channel by the end of the 21st century.⁶⁶
- (ii) There will be a decrease ranging between 25% and 50% in the number of tropical cyclones making landfall over southern Africa.⁶⁷
- (iii) A separate study⁶⁸ showed that there is a projected increase in the frequency of the most intense (category 4 to 5) tropical cyclones in most basins by the late 21st century. Decreases however will occur in the Southwest Pacific, eastern South Indian Ocean and southern sections of the Northwest Pacific as shown in figure 2.13.
- (iv) In yet another study⁶⁹ it was shown that there will be an increase in the maximum intensity (as indicated by mean tropical cyclone maximum wind speed) particularly of the most intense tropical cyclones in the late 21st century.

Projections of the occurrence of more intense tropical cyclones and an increase in the frequency of the most intense tropical cyclones has implications on the nature of disasters that are likely to be experienced in future. The disasters are likely to be more severe than at present and this calls for upscaling of planning of disaster prevention and management.

10.3.4. Heat waves

A heat wave can be defined as an event where the maximum temperature at a specific location exceeds the average maximum temperature of the warmest month of the year by 5°C, for a period of at least three days.⁷⁰

65 Malherbe et al. (2013).

66 Caron and Jones (2008) p. 94; Malherbe et al. (2013); Muthige et al. (2018) p. 12..

67 Muthige et al. (2018) p. 6.

68 Christensen et al. (2013) p. 1244; Knutson et al., (2015a) p. 7221)

69 Tsuboki et al., (2015) 651,

70 Engelbrecht et al. (2015).

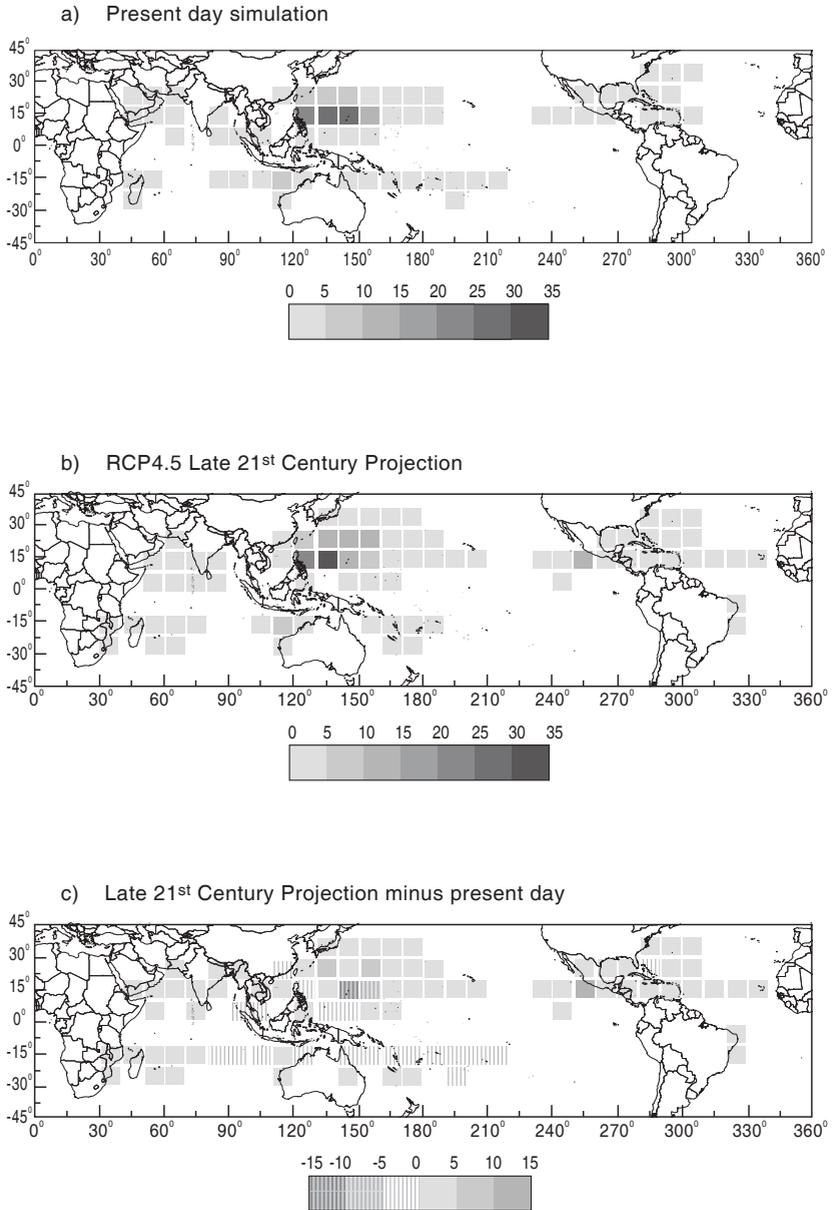


Figure 2.13: Simulated occurrence of tropical cyclones of at least category-4 intensity (surface winds of at least 59m/s) for (a) present-day (b) late-twenty-first-century (c) difference in occurrence rate between late 21st century and present day (Source: Knutson et al., 2015a; 7217)

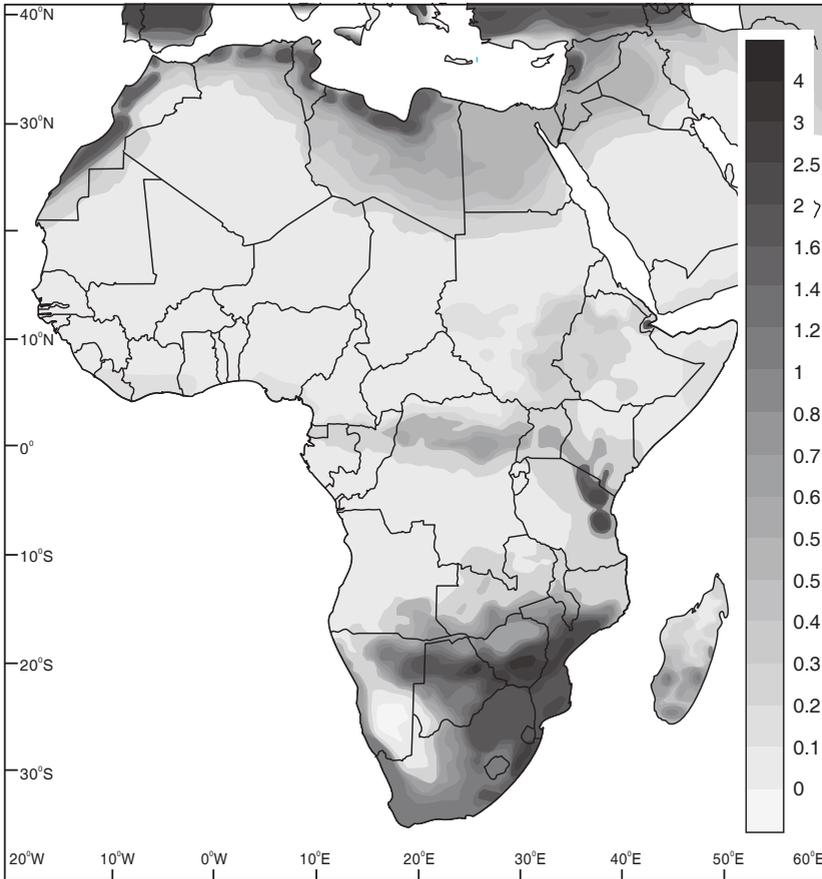


Figure 2.14: Annual-average number of heat-wave days (number of events per grid point per year) (Source:Met Office, Hadley Centre, UK and Climatic Research Unit, University of East Anglia, UK.)

Model-simulated baseline climatologies for the period 1961–1990 show that over southern Africa, the highest numbers of heat-wave days (about three days per year on average) occur over the Limpopo river basin region in southern Africa, the eastern interior and east coast regions of South Africa (see Figure 2.14). Projections for the time period 2071–2100 relative to 1961–1990, indicate the occurrence of 20–80 annual heat-wave days over subtropical southern Africa.⁷¹

11. Uncertainties in future climate projections

When using computer models to make predictions about future climate there are always a number of sources of uncertainty to be considered. In

⁷¹ Ibid., p. 12.

fact, according to Pittock and Salinger,⁷² and Tucker,⁷³ no method exists yet to provide confident predictions of future climate.

The uncertainties include:

(i) Future emissions of GHGs and other pollutants

It is not known with certainty how emissions will change with future changes in economic development, technological development and demographic changes. The level of emissions will determine how much the climate will change.

(ii) Natural climate variability resulting from natural processes within the climate system which can cause changes in climate over relatively short time-scales.

(iii) Choice of GCM

This arises from limitations in our ability to model the climate system.

Each climate model has different representations of dynamical and physical processes thereby responding differently to the same GHG forcing.

(iv) Downscaling approach

The downscaling approach used determines the result of future projections.

Due to these uncertainties, (Giorgi, 2010, 1) suggests that projections of a future climate should be addressed in probabilistic as opposed to a deterministic approach.⁷⁴

12. Conclusion

Southern Africa is a region that is very vulnerable to the impacts of climate change. Long-term climatic records have revealed that Zimbabwe's climate is changing. Temperature, in particular, has increased by about 0.4°C between 1900 and 2000, which is more than the global average. Annual rainfall decreased by up to 10% during the same period. Other observed changes include shifts in the onset and cessation dates of the rainy season and shifts in the areal extent of the Natural Regions. Future climate projections for the country under the SRESs highest emission scenario will result in an average annual temperature increase of more

72 Pittock and Salinger (1991) p. 209.

73 Tucker (1991).

74 Giorgi (2010).

than 3°C by 2100 and a precipitation decrease of up to 10% by 2100. Other future projections include an intensification of droughts and more annual heat wave days by 2100. A Special Report released by the IPCC in 2018 indicates that southern Africa, where Zimbabwe lies, is one of the regions that will experience the largest warming. The Report also points at the dangerous impacts the region is likely to experience, such as water stress, reduction in cropping areas and yields associated with a temperature increase of more than 1.5°C above pre- industrial levels. A projected population increase, reaching 19.2 million by 2032 might result in increased emissions and hence further temperature increases. Against this background, it is imperative that the Government of Zimbabwe must put in place enabling policies that will limit emissions in order to stay below a 2°C temperature increase above pre-industrial levels in accordance with the Paris Agreement. Zimbabwe's Nationally Determined Contributions (NDCs), National Climate Change Response Strategy (NCCRS) and National Climate Policy are steps in the right direction but they must be backed by a strong implementation framework.

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Governing Climate Change: General Principles and the Paris Agreement

Washington Zhakata

1. Introduction

Africa is experiencing an unprecedented climate change phenomenon that is likely to lead into crisis of human survival and national development unless urgent steps are taken to curtail human behaviours impelling climate change. Whilst Africa, and in particular Zimbabwe, has not significantly contributed to climate change, the continent remains highly vulnerable to frequent extreme weather events such as floods and droughts.¹ This has been exacerbated by poverty and limited adaptive capacities of communities. Zimbabwe has not been spared from the negative impacts of climate change which have been further enhanced by its geographical position in the semi-arid belt of southern Africa and the country's reliance on rain-fed agriculture.²

Zimbabwe views climate change as a direct threat to its socio-economic development with the potential of reversing the developmental gains achieved over the past decades.³ The Government of Zimbabwe and its people are committed to addressing climate change challenges in pursuit of achieving Sustainable Development Goals (SDGs)⁴ as well as obligations

1 Government of Zimbabwe (GoZ) (2014).

2 GoZ (2016).

3 GoZ (2017).

4 Specifically, Sustainable Development Goal (SDG) 13 that calls for the need

under the Paris Agreement with particular reference to Zimbabwe's Intended Nationally Determine Contributions (INDCs) of 2015.⁵

In an attempt to address the impact of climate change, the country has adopted the National Climate Policy that seeks to create a pathway towards a climate resilient and low carbon development economy in which the people have enough adaptive capacity and continue to develop in harmony with the environment.⁶ To achieve this goal of transforming the country into a climate resilient and low carbon development pathway, the policy is supported by the National Climate Change Response Strategy,⁷ the National Environmental Policy,⁸ Renewable Energy Policy,⁹ Biofuels Policy¹⁰ and the draft Forestry Policy among other related policies and strategies that are aimed at achieving sustainable development. A Child Friendly Climate Change Handbook has also been developed, which aims to introduce children to the National Climate Policy and its provisions.¹¹

2. Framework for Climate Governance in Zimbabwe

2.1 National Climate Policy

The vision of the National Climate Policy of Zimbabwe is to attain 'A climate resilient and low carbon Zimbabwe'.¹² The aim of the policy is to:

*climate-proof all the socio-economic development sectors of Zimbabwe to address the national challenge of reducing Zimbabwe's vulnerability to climate and climate related disasters, while developing in a low carbon pathway.*¹³

The motivation for this policy is to reduce the socio-economic impacts of climate variability and contribute to global emissions reduction. The purpose of the policy is to guide climate change management in the country, enhance national adaptive capacity, scale up mitigation actions, facilitate domestication of global policies and ensure compliance to the global mechanisms.

to 'take urgent action to combat climate change and its impacts'.

5 GoZ (2015).

6 GoZ (2017).

7 GoZ (2014).

8 GoZ (2009).

9 GoZ (2019).

10 GoZ (2019).

11 UNICEF (2017).

12 GoZ (2017) p. 3.

13 Ibid.

The main aspects that the Climate Policy identifies include:

- (i) **Climate Change Adaptation.** In the agriculture sector, the policy promotes building of more dams, strengthened irrigation infrastructure, water harvesting and harnessing of ground water resources. In the health system, the policy advocates for strengthening of Zimbabwe's surveillance system and enhancing understanding of climate-health interlinkages. Climate proofing of infrastructure and human settlements will also be promoted.
- (ii) **Climate Change Mitigation and Low Carbon Development.** According to Zimbabwe's Third National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), the country is an emitter of greenhouse gases with the major contributors being fuel combustion or energy (48.4%), agriculture (44%), waste handling (3.4%) and industrial processes (4.1%) in carbon dioxide equivalent.¹⁴ The Climate Policy sets to accelerate mitigation measures by adopting and developing low carbon development pathways in the Industrial, Energy, Waste, Agriculture, Land Use, Land Use Change and Forestry (LULUCF) sectors.
- (iii) **Climate Education, Training and Awareness.** The policy links with Article 6 of the UNFCCC which provides for implementation of programmes on education, awareness and training, including the development and exchange of educational and public awareness materials on climate change and its effects.
- (iv) **Weather, Climate Research and Modelling.** Weather and climate information is vital in planning for agricultural productivity, water resource management, electricity power generation, infrastructure development, and aviation, among other significant activities. The policy seeks to strengthen climate science and promote relevant home-grown solutions to the negative impacts of climate change by Zimbabwean institutions. Knowledge and skills

14 GoZ (2016).

enhancement at all levels of the education system and in relevant government and non-governmental institutions are also priorities.

- (v) **Technology Transfer and Information Sharing.** The policy seeks to remove barriers to technology transfer and encourage collaboration with the private sector, universities and research institutions as development partners in sharing appropriate technology and technical support for climate-related infrastructure development, preparedness and resilience.
- (vi) **Climate Change Governance.** The climate policy aims to strengthen climate change management in the country.

2.2 National Climate Change Response Strategy

The government developed the National Climate Change Response Strategy (NCCRS) to guide national response measures in addressing the impacts of climate change. In operationalising the National Climate Policy, the NCCRS guides the implementation of the provisions of the policy with special attention on mainstreaming climate change adaptation and mitigation strategies in economic and social development at national and sectoral levels through multi-stakeholder engagement.¹⁵ Currently, Zimbabwe is in the process of developing a National Adaptation Plan (NAP) which will guide mainstreaming of climate change in development planning in line with the NCCRS. The Nationally Determined Contributions (NDCs) and the Climate Smart Agriculture Manual¹⁶ (CSA Manual) also further unpackage the response strategy.

2.3 The Paris Agreement

Paris Agreement on Climate Change was adopted at the 21st Conference of Parties (COP21) that took place in December 2015, in Paris.¹⁷ The Agreement builds upon the UNFCCC and for the first time brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort through greenhouse gas emission reductions.

¹⁵ GoZ (2014).

¹⁶ Ngara (2017).

¹⁷ UNFCCC (2015).

The Paris Agreement entered into force on 4 November 2016. A total of 196 Country Parties reached a consensus on the need to reduce greenhouse gas emissions, thereby making the Paris Agreement a unifying treaty in the world's efforts to combat climate change. Zimbabwe is a signatory to the Paris Agreement and prioritises adaptation actions with mitigation co-benefits in addressing climate change whilst subscribing to the principle of common but differentiated responsibilities in line with national capabilities as enshrined in the UNFCCC. The implementation of the various provisions of the Paris Agreement commences in 2020.

The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2°Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°Celsius.¹⁸ Additionally, the Agreement aims to strengthen the ability of countries to deal with the impacts of climate change. To reach these ambitious goals, appropriate financial flows, a new technology framework and an enhanced capacity-building framework will need to be put in place, thus supporting action by developing countries and the most vulnerable countries, in line with their own national objectives. The Agreement also provides for enhanced transparency of action and support through a more robust transparency framework.

The Rule Book for implementation of the Paris Agreement, which was agreed upon at the 24th Conference of Parties (COP 24), calls upon all countries to report on their domestic actions to curb the rises of emission levels under the transparency framework. It stipulates that reporting greenhouse gas emissions and climate finance has to be done both thoroughly, and more frequently.¹⁹ Countries are called upon to increase their ambition levels in greenhouse gas emission reduction and adaptation efforts within the framework of the economy-wide nationally determined contributions and the global goal on adaptation respectively.

2.4 Zimbabwe's Nationally Determined Contribution (NDC)

Among the key elements of the Paris Agreement are the Nationally Determined Contributions (NDCs): these present the Parties' Greenhouse Gas (GHG) emission reduction ambitions i.e. those that are to be achieved by 2030. Zimbabwe has an obligation, by 2030, to reduce greenhouse

¹⁸ Ibid., Article 2.

¹⁹ Ibid., Articles 7 and 9.

gas emissions by 33% per capita below the projected business-as-usual scenario.²⁰ The target is envisaged to be achieved through renewable energy development, energy efficiency and Climate Smart Agriculture (CSA) practices.

Development of a Low Emission Development Strategy (LEDS) also aims to ensure that the NDC target is achieved by 2030. The framework links the NDC and LEDS to existing and planned mitigation activities, including Nationally Appropriate Mitigation Actions (NAMAs) and Clean Development Mechanisms (CDM). Selected actions for implementation of the NDCs are aligned to the country's development plans like the Vision 2030,²¹ Transitional Stabilization Programme (TSP),²² Comprehensive Africa Agriculture Development Programme (CAADDP)²³ and the Zimbabwe Agriculture Investment Plan (ZAIP)²⁴ among others.

In view of the energy sectors' high GHG emissions (in comparison to other sectors), the mitigation component of Zimbabwe's NDC focuses on this sector and is supported by a number of initiatives such as the National Climate Policy, the Renewable Energy Policy, the Biofuels Policy, the draft Forestry Policy and other instruments seeking to keep GHG emissions at a minimal level and ensuring green development.

Furthermore, in its NDC, Zimbabwe presented an adaptation component that seeks to upscale national planning and implementation of adaptation actions that enhance resilience of all sensitive socio-economic sectors to improve the national adaptive capacity. At the same time, the agricultural sector provides opportunities for climate change mitigation through initiatives such as Climate Smart Agriculture and sustainable agro-forest-based adaptation and management practices. The sector thus has multiple benefits, and Zimbabwe foresees Greenhouse Gas (GHG) emission reductions whilst improving agricultural productivity and enhancing national food security.

3. Current Status of Negotiations after Paris

Countries continue to meet every year to deliberate on climate change issues, especially on how the world can mitigate climate change through

20 GoZ (2015) p. 9.

21 GoZ (2018a).

22 GoZ (2018b).

23 NEPAD (2013).

24 GoZ (2013).

implementation of green technologies and reduction of fossil-fuel use. Discussions also cover the areas of vulnerability and adaptation to climate change in developing countries, financial and technical means of implementation, technology development and transfer, compensation for loss and damage, capacity building, among other issues. The discussions are guided by the UNFCCC.

These meetings called the Conference of Parties (COP) have continued to discuss climate action and support over the past 24 years. The 24th Conference of Parties (COP 24) that was held in December 2018 adopted provisions of the rulebook for operationalising the Paris Agreement.

Three declarations have been presented to Parties during COP 24 with the intention of raising political will in climate change implementation. The declarations speak to climate change, although they are not related to the UNFCCC climate change negotiations process. They are as follows:

3.1 Driving Change Together – Katowice Partnership for E-Mobility

The declaration seeks to promote the movement towards electrification of modes of transport in a sustainable manner. It encourages parties and non-parties to act in a manner that promotes zero greenhouse gas emissions in the transport sector, provide incentives for zero emission vehicles (ZEVs), research and development, delivering greener public transport to improve public health and the related smart infrastructure network. This declaration seeks to promote the movement towards electrification of all modes of transport, zero greenhouse gas emissions in the transport sector, zero emission vehicles, greener public transport and the related smart infrastructure networks.

The zero emission vehicle (e-mobility) initiative is in line with the draft transport master plan that seeks to modernise the transport system and promote sustainable urban development. The transport sector is one of the key categories in terms of emissions hence e-mobility becomes a priority as it seeks to enhance achievement of the NDCs. Zimbabwe's Nationally Determined Contributions site the electrification of the country's railway system as a measure of reducing greenhouse gases whilst the introduction of electric urban buses and light rail are some of the green options suggested for emission reduction in cities. With the announcement by several vehicle manufacturing companies of their intention to stop manufacturing petroleum and diesel driven vehicles by

2030, it is imperative that Zimbabwe positions itself in the production chain of battery manufacturing as the country has abundant lithium deposits, which is an important raw material used in making batteries.

3.2 Solidarity and Just Transition – Silesia Declaration

The declaration stresses that just transition of the workforce and the creation of decent work and ‘quality’ jobs is crucial to ensure an effective and inclusive transition to low greenhouse gas emission and climate resilient development. It recognises the challenges related to the transition from fossil fuels and high-emitting industries, and the importance of ensuring a decent future for workers impacted by the transition. Social dialogue and the engagement of the workforce is important in nationally determined contributions, long-term low greenhouse gas emission development strategies and adaptation planning processes.

In line with the national vision to attain an upper-middle income status by 2030,²⁵ Zimbabwe is already developing a Low Emission Development Strategy (LEDS) that seeks to transform the economy towards a low emission pathway, anchored on the creation of sustainable green jobs. The LEDS programme requires transition along the technology value chain from education, skills enhancement, and training in order to support the transition. As highlighted by the Inter-governmental Panel on Climate Change (IPCC) Special Report on Global impacts of Global Warming of 1.5°C, there is need for enhanced climate action, substantial reduction in the use of fossils and upscaling of renewable energies. Global economic trends are beginning to skew towards renewable energy, and Zimbabwe should not be left out of the transformation and the economic benefits thereof. Abandoning fossil fuels as a source of energy will, however, require the creation of an equal number of green and alternative jobs in order to attain the objective of eradicating poverty and provision of energy.

3.3 The Ministerial Katowice Declaration on Forests for the Climate

The declaration recognises the important role of forests in climate change mitigation as carbon sinks, climate change adaptation through their social, economic and ecological benefits as well as the role of local communities in managing them. In light of this, the declaration pledges to accelerate

25 GoZ (2018a)

action to ensure that the global contribution of forests and forest products is maintained, supported and enhanced by 2050, to support the achievement of the long-term goal of the Paris Agreement.

Zimbabwe relies heavily on forests for livelihoods and energy. Forest sustainable utilisation and preservation is in line with our socio-economic aspirations. The State acknowledges the crucial role of forests as carbon sinks and reservoirs of greenhouse gases. As part of its greening strategy, it will enhance carbon sinks in the forestry sector through the Reducing Emissions from Deforestation and Forest Degradation (REDD+) mechanism. There is an urgent need to address the impact of climate change on forests in order to provide livelihood options and mitigate climate change. Provision of alternative livelihoods and energy sources will bolster socio-economic development with benefits to health and the environment.

4. Need for Climate Change Law

It is imperative for Zimbabwe to create a Climate Change Act to manage climate change risks, maximise the opportunities that arise from decisive action, and drive the country's transition to a net zero emissions, climate-resilient community and economy. The Act should set out a clear policy framework and a pathway to 2030 that is consistent with the Paris Agreement to keep global temperature rise well below 2°Celsius above pre-industrial levels. It should provide a platform for subsequent action by government, community and business and the long-term perspective and policy stability needed to drive innovation and investment.

According to the National Climate Policy, the proposed Climate Change Governance Framework is centred around the Department of Climate Change Management with guidance from committees and sub-committees. These committees include the:

- (i) Cabinet Committee on Climate Change;
- (ii) Minister responsible for Climate Change;
- (iii) National Climate Change Platform and Technical Sub-Committees (Sub-Committee on Capacity Building, Resource Mobilisation, Advocacy and Awareness);
- (iv) Provincial Climate Change Platform and Technical Sub-Committees (Capacity Building, Resource Mobilisation, Advocacy and Awareness, Local Urban and Rural Authority Climate Change Platform).

Currently, the Climate Change Management Department and the Cabinet Committee on Climate Change have been established. The National Adaptation Plan will provide further guidance on mainstreaming climate change and consequently, operationalisation of the rest of the platforms, committees and sub-committees.

4.1 Key Issues the Climate Change Act needs to Address

The development of a climate specific legislation needs to be cognisant of the many cross-cutting areas on which this legislation has a bearing. Many economic sectors of the economy and their specific sectorial legislation will need to comply with the provisions of this legislation. In the view of the author, the climate change legislation will not be adequate if it does not capture issues such as:

- (i) **Long-term Targets:** The long-term emissions target of 33% per capita greenhouse gas emissions reduction by 2030 and further communicated targets, as mentioned in our NDC. The mandate should be placed on the President and the Minister responsible for Climate Change to ensure that this target is met. This is consistent with the Paris Agreement and with the steps being taken by comparable jurisdictions and many other African governments i.e. South Africa, Kenya and Nigeria.
- (ii) **Interim Targets:** The President and the Minister responsible for climate change should set interim targets to ensure Zimbabwe remains on track to meet the long-term target. The interim targets will set the precedence for mandatory climate change mitigation and adaptation interventions.
- (iii) **Policy Objectives and Guiding Principles:** A new set of policy objectives and guiding principles to help embed climate change into government decision-making, and to inform action taken under the Act. Some of the policy objectives and principles are already mentioned in the Climate Policy and the Environmental Management Act.²⁶ It is one such piece of legislation with guiding principles that indicate how the legislation should be implemented.

²⁶ Section 4, Environmental Management Act. [Chapter 20: 27].

- (iv) **Climate Change Strategy:** A country Climate Change Strategy will be required with clear timeframes to set out how Zimbabwe will meet its emissions reduction targets, adapt to the impacts of climate change, and transition to a low emissions future.
- (v) **Adaptation Action Plans:** System-based Adaptation Action Plans to be prepared by nominated Ministers for key systems (for example, primary production, transport, water, etc.) that are either vulnerable to the inevitable impacts of climate change, or essential to ensure Zimbabwe is better prepared.
- (vi) **Pledges:** A pledging model to reduce emissions from state and local government's own operations as well as from key emitting sectors of the economy (for example, energy, waste, industry and land use). The committed pledges should also be backed up with implications on failure to leave up to mentioned pledges.
- (vii) **Information and Reporting:** A system of periodic reporting to provide transparency, accountability and ensure the community remains informed. This introduces:
 - (a) Stand-alone reports on the science and data relevant to climate change in Zimbabwe;
 - (b) Annual greenhouse gas emissions reporting; and
 - (c) Assessment reports at the end of each interim target period.
- (viii) **Carbon Sequestration Rights:** This should focus on the recognition of forestry rights, soil carbon rights and carbon sequestration rights on public and private land in Zimbabwe.
- (ix) **Climate Change Authority:** To enable the establishment of an Authority or use existing Environment Management Act to regulate the emission or discharge of greenhouses gas substances to contribute to the long-term target and interim targets as directed by the government of the day.

5. Conclusion: next steps for Zimbabwe

The National Climate Policy provides a framework that calls for multi-stakeholder collaboration, inter-agency cooperation, governance systems and a means to integrate and mainstream climate change into different socio-economic sectors. Based on this National Climate Policy, climate change response strategies will be reviewed regularly, and their effectiveness monitored to achieve a climate resilient nation that pursues a low carbon development pathway. To ensure the effectiveness of the National Climate Policy, the development and deployment of an appropriate Monitoring and Evaluation Framework for the relevant strategies is imperative.

In line with the provisions of the Paris Agreement and the subsequent negotiations, the country will maintain a Monitoring, Reporting and Verification (MRV) system for climate change mitigation and adaptation actions. This serves to ensure transparency of NDCs implementation. The government will put the requisite legal framework to ensure continuous monitoring for biennial reporting on NDC progress, integrated within already existing reporting processes and structures. Development of capacities in MRV systems will link into already existing processes, including the preparation of National Communications, Biennial Update Reports (BURs), Sustainable Development Goals (SDGs), Agenda 2063 and TSP among others. The MRV system will reflect the accounting rules to be agreed internationally under UNFCCC, and establishment of a National Registry System in which all information will be readily accessible.

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The Economic Impacts of Climate Change in Zimbabwe's Agricultural Sector

Byron Zamasiya and Kefasi Nyikahadzoi

1. Introduction and Background

Climate Change is one of the major challenges inhibiting agricultural-led socio-economic transformation, poverty alleviation and human development in southern Africa.¹ In this region, rain-fed agricultural production accounts for 95% of all agricultural production and is a major source of livelihood for over 70% of the population.² The agricultural sector provides employment, raw materials to other sectors, generates foreign currency and provides food to the majority of the people.³ The high dependency on climate-sensitive agricultural production, low technology,⁴ limited information on climate change and lack of access to institutions dealing with climate change⁵ makes the region very susceptible to changes in climatic factors.⁶ Countries, such as Zimbabwe, are very susceptible to climate change due to their location within the tropics.⁷ Scholars observe that the changes in climate are negatively affecting

1 Mtisi and Prowse (2012); Deressa et al. (2011).

2 WMO (2009).

3 Deressa et al. (2011) pp. 23-31.

4 Ibid.

5 Maddison (2006).

6 Gbetibouo (2009).

7 Deressa et al. (2011) 23-31.

crop yield, per capita food production and food security.⁸ The effect of climate change is largely felt largely by millions of small-scale producers in agriculture-based economies.

Climate models as reflected in Chapter 2 point to a warmer, drier future for southern Africa. Since 1991, this region has been experiencing cyclical drought which is increasing in intensity and frequency.⁹ Mean annual temperature has increased and is expected to increase by at least 0.05°C per decade.¹⁰ Mean annual rainfall is already erratic and is expected to further decrease by 5-10% per annum.¹¹ These changes are expected to have devastating effects on the livelihoods of over 70% of the African population which relies on rain-fed agricultural production.¹² The rising temperatures and the declining rainfall will adversely affect agricultural production and exacerbate food insecurity.¹³ Climate change in the form of increased rainfall variability, reduced precipitation and increased temperatures is also causing increased budgetary pressures on rainfed economies. Most countries are struggling with high levels of food insecurity as they are net food importers. Thus, the advent of climate change is an unwelcome additional constraint to agricultural production.

Attempts have been made to investigate the economic impact of climate change in the agricultural sector using complex algorithms such as the Ricardian Models.¹⁴ Results from these studies show that soils, climate, hydrological and socio-economic variables affect net farm revenues in Zimbabwe. While the results from these studies provide useful insights, the findings are based on modeling which may not fit reality. In this chapter, we make an attempt to show the economic impacts of climate change on agricultural output using trend analysis for maize and soybean production. Maize (*Zea mays* L.) has been chosen on the basis that in Zimbabwe, it is the staple crop, an important cash crop and is grown by almost every farmer throughout the country.¹⁵ Soybean has also been chosen based on its propensity to restore soil fertility, improve household nutrition and generate cash for the household.¹⁶ Our analysis seeks to provide an understanding of the trends between agricultural output and mean rainfall. Although climate change has many dimensions, our focus is

8 Di Falco and Chavas (2009).

11 Boko et al. (2007).

13 Boko et al. (2007).

14 Mano and Nhemachena (2007).

16 Zamasiya et al. (2017).

on mean national rainfall. This is because rainfall is a major determinant of crop production in Zimbabwe.¹⁷ We appreciate that the crop portfolio for farmers in Zimbabwe is very wide. In this chapter, we restrict our analysis to maize and soybeans.

1.1 Background to Climate Change and Agriculture in Zimbabwe

Climate change response is of paramount importance to the Government of Zimbabwe (GoZ) as it is the main stressor to agricultural production, a sector which contributes 10-15% of the country Gross Domestic Product and 70% of employment, direct and indirect.¹⁸ The agricultural sector supports national food self-sufficiency and provides much-needed inputs to industry. It is, however, dominated by smallholder farmers who suffer from alternating dry spells, floods, crop and livestock disease outbreaks. Further, farmers are failing to harness scientific and/or indigenous knowledge to increase productivity and stimulate industrial growth. The high sensitivity of the agricultural sector to rainfall variability and change makes the issue of adaptation a national priority.

1.1.1 Climate change and food security

Climate change is a major driver of household and country level vulnerability to food insecurity especially in southern Africa.¹⁹ It affects availability, access, and utilisation of food by smallholders who rely on rain-fed agricultural production for food, nutrition, and income.²⁰ Without adaptation, the effects of climate change can be devastating.²¹ Boko et al. estimate that climate change will lead to a reduction in yields by as much as 50% by 2020.²² For instance, during a bad agricultural season, per capita, food production is drastically reduced due to a decline in crop yields. With reduced production, food insecurity and malnutrition increase among the poor households,²³ which then rely on food handouts from non-governmental organisations and government during droughts.²⁴ Climate change also disempowers households from making a choice of the kind,

17 GoZ (2015).

18 GoZ (2015).

19 Mano and Nhemachena (2007).

20 Shisanya and Mafongoya (2016).

21 Mano and Nhemachena (2007).

22 Boko et al. (2007).

23 GoZ (2015).

24 Ibid.

quality and quantity of food that they eat due to reduced incomes.²⁵ The net effect of the impact of climate change on households is increased food insecurity and increased government expenditure on imported food.

1.1.2 Responses to managing the effects of climate change

The IPCC notes that farmers can either adapt or mitigate the effects of climate change.²⁶ Adaptation refers to adjustments in farming activities or methods to suit the changes in climatic conditions in order to lessen the resultant potential damages.²⁷ With adaptation, a farmer reduces the impacts of climate change by using different farming practices. The use of adaptation practices can be done at a micro-level and does not require international co-operation. Strategies that smallholder farmers are using include staggering planting dates, changing crop cultivars, crop diversification, irrigation, using drought-resistant cultivars, among others.²⁸ ²⁹ Mitigation refers to all actions aimed at reducing the source of Green House Gas (GHG) emissions. In the agricultural sector, mitigation strategies include afforestation, the creation of carbon sinks, and minimum tillage among others. Unlike adaptation, the use of mitigation strategies requires the co-operation of other players to yield effective results.

In its efforts to address the effects of climate change, the GoZ ratified the United Nations Framework Convention On Climate Change (UNFCCC) and acceded to the Kyoto Protocol in 2009.³⁰ Zimbabwe supports international efforts to reduce GHG emissions and attends the Conference of Parties (COPs).³¹ Further, the government established the Climate Change Department to handle issues on climate change adaptation and mitigation.³² In the year 2015, the GOZ then launched the National Climate Change Response Strategy that identifies key implementation targets for climate change adaptation and mitigation action in the country.³³

The Climate Change Department also spearheaded the development of the Intended Nationally Determined Contributions (INDCs).³⁴ These

25 Shisanya and Mafongoya (2016).

26 IPCC (2018).

27 Vincenta et al. (2013); Mabe et al. (2102)

28 Vincenta et al. (2013); see also Gbetibouo (2009).

29 Gbetibouo (2009)

30 GoZ (n 2015).

31 Mtisi and Prowse (2012).

32 The department was established in 2013 and started operating in 2015.

33 GoZ (2015).

34 These are climate mitigation actions, strategies or policies that culminate in the

INDCs were presented to the UNFCCC in response to the Warsaw decision and the Lima Call for Action. The INDCs have an ambitious goal of strengthening climate action and keeping the global surface temperature rise to below 1.5°C.³⁵ The INDC focus on mitigation and adaptation components.

1.2 Limitations to Farmers' Efforts in Managing the Impacts of Climate Change

Despite the government taking action in addressing the economic impacts of climate change, there are several challenges that farmers in Zimbabwe face in adapting to climate change. These include lack of access to climate information, lack of access to crop and livestock extension services, lack of access to agricultural finance services, poor technology, lack of access to government support, dysfunctional input and output markets and dilapidated infrastructure. In this chapter, attention is given to lack of access to reliable climate information, lack of access to crop and livestock extension services, low income, and lack of access to agricultural credit facilities. Our assumption is that in addition to the effects of climate variables on agricultural output, these challenges inhibit effective adaptation process and therefore increase the economic costs of climate change in the agricultural sector.

1.2.1 Access to climate information

Access to reliable climate data is a major challenge affecting farmers from adapting to climate change.³⁶ Unreliable information makes it difficult for farmers to adequately prepare for a season and make informed decisions on crop choice, time of planting and when to execute other agronomic operations.³⁷ When farmers have access to reliable climate information, they improve their knowledge on impacts, indicators, and decision-making³⁸ and can adequately prepare for seasons using different adaptation options to minimise the economic impact of climate change on agriculture.

reduction in GHG emissions and the slowing down in global warming.

35 GoZ (2015).

36 Salau et al. (2012); Gwimbi (2009).

37 Mudombi and Nhamo (2014).

38 Kibue et al. (2015).

1.2.2 Poor access to crop and livestock extension services

The impacts of climate change on agriculture can be very devastating to smallholder farmers who rely on rain-fed agricultural activities and the country at large. Zamsiya et al. notes that farmers in low-income countries such as Zimbabwe have low access to crop and livestock extension services.³⁹ Without access to agricultural extension services, most farmers are not in a position to manage the effects of climate change accordingly. When farmers have access to extension services, they can get information on how they can respond to climate change using different adaptation strategies.⁴⁰ With access to agronomic information, farmers will be able to make informed decisions on how they effectively address the impacts of climate change on their production.⁴¹ In situations where adaptation requires highly technical information, extension services become key. This is because extension officers provide the link between research and farmers. They decode agricultural information into a format that farmers can easily understand.⁴²

1.2.3 Low income and poor access to agricultural finance

Adaptation is a process that requires investment in the appropriate technologies in order to manage the impacts of climate change.⁴³ Scholars observe that the majority of smallholder farmers in developing countries, such as Zimbabwe, are poor or face resource constraints⁴⁴ and access to credit facilities.⁴⁵ This makes it difficult for the farmers to access adequate resources for investment in the purchase of appropriate crop cultivar or crop type⁴⁶ and herbicides, pesticides and inorganic fertilisers.⁴⁷ In the case of Zimbabwe, the majority of smallholder farmers have no collateral security for them to access agricultural credit facilities from the Agricultural Bank of Zimbabwe. Without collateral security, smallholder farmers are left with no option but to rely on their

39 Zamsiya et al. (2017) and Fatuase and Igbekele (2013).

40 Mabe et al. (2012).

41 Fatuase and Igbekele (2013).

42 Zamsiya et al. (2014).

43 Maddison (2006).

44 Gbetibouo (2009).

45 Gwimbi (2009).

46 Salau et al. (2012).

47 Fatuase and Igbekele (2013).

meagre incomes to finance adaptation. As such, the farmers often fail to adequately respond to climate change.

1.3 Materials and Methods

This chapter is based on secondary crop data on area harvested and production obtained from the Faostat website.⁴⁸ Meteorological data on mean annual precipitation for Zimbabwe obtained from the Department of Meteorological Services was also used to analyse data in Microsoft Excel. Trend analysis was done for maize and soybeans for area harvested and yield. The period covered in the analysis is 1961 to 2018. The rainfall graphs were superimposed on area harvested and yield. This approach enabled the comparison of patterns in rainfall and crop graphs. Figure 4.1 presents maize area harvested and rainfall, Figure 4.2 maize yield and rainfall, Figure 4.3: soybeans area harvested and rainfall and Figure 4.4 soybeans area harvested and rainfall.

1.4 Trend Analysis for Maize

The area under maize production in Zimbabwe has been increasing since 1961 (positive slope). Figure 4.1 shows the trend analysis of the area under maize production in Zimbabwe from 1961 to 2018. Hectarage under maize has been falling particularly during drought periods such as 1992, 2002 and 2013. In Figure 4.2, our analysis is showing that generally, maize production is declining at a time when the overall rainfall pattern is becoming poor. Our analysis of the mean annual rainfall in Figure 4.3 shows that mean annual rainfall is on a downward trend. Although one year, the rainfall could surpass that of the previous year, generally Zimbabwe is becoming drier. The general trend exhibited by the rainfall graph in Figure 4.3 is that generally, the rainfall is falling. This trend is in line with the findings of Parry et al⁴⁹ and Deressa et al.⁵⁰

1.5 Trend Analysis for the Area under Soybean and Soybean Production

The trend analysis in Figure 4.4 shows that the area under soybean production has been increasing since 1961. Generally, the trend exhibits a positive slope. This implies that the area under soybean is increasing. However, a look at Figure 4.5 shows that soybean production is falling

48 <<http://www.fao.org/faostat/en/#home>>

49 Parry et al. (2006).

50 Deressa et al. (2011).

Time series analysis of Maize output and mean rainfall

Figure 4.1: Maize area harvested (ha)

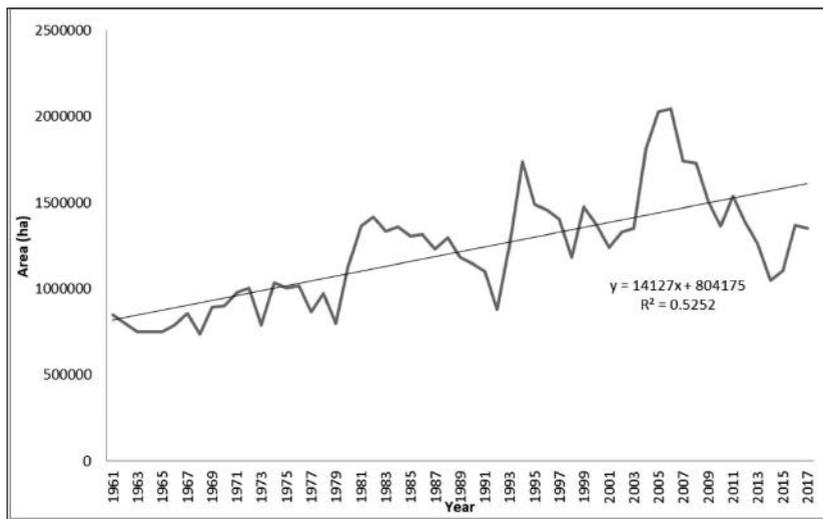


Figure 4.2: Maize production (tonnes)

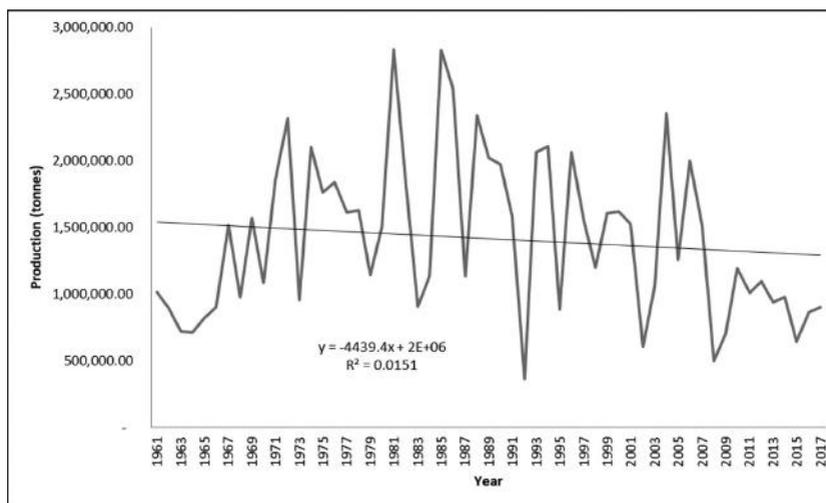


Figure 4.3: Distribution of mean annual rainfall in Zimbabwe

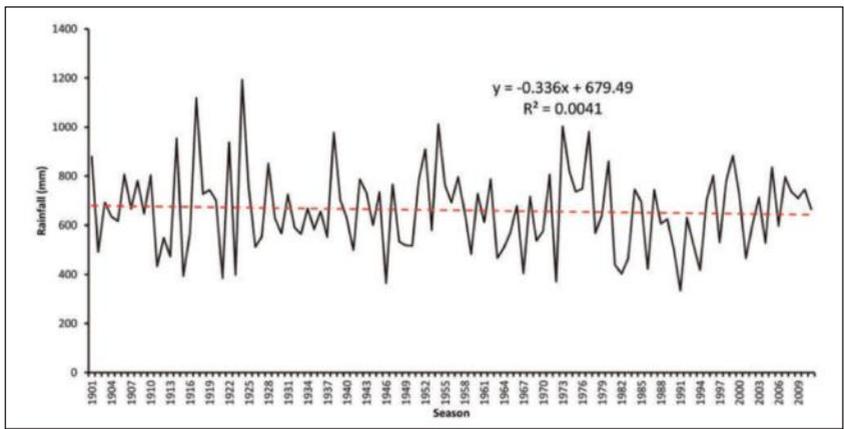
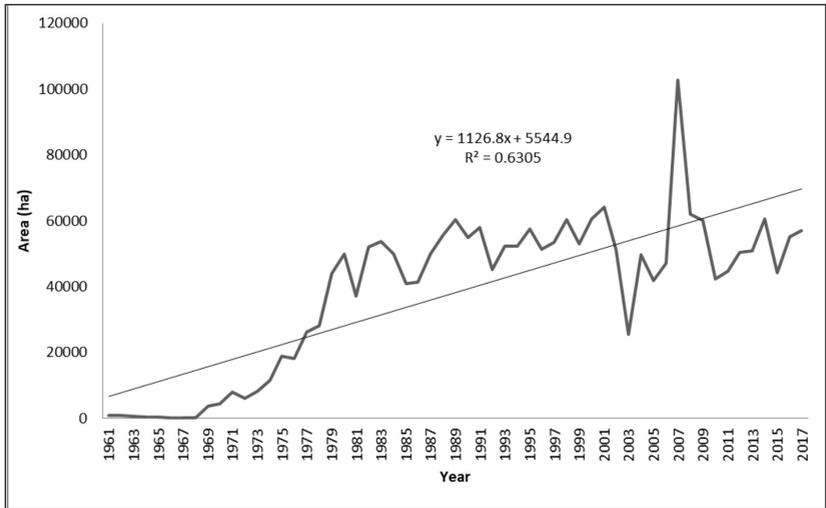
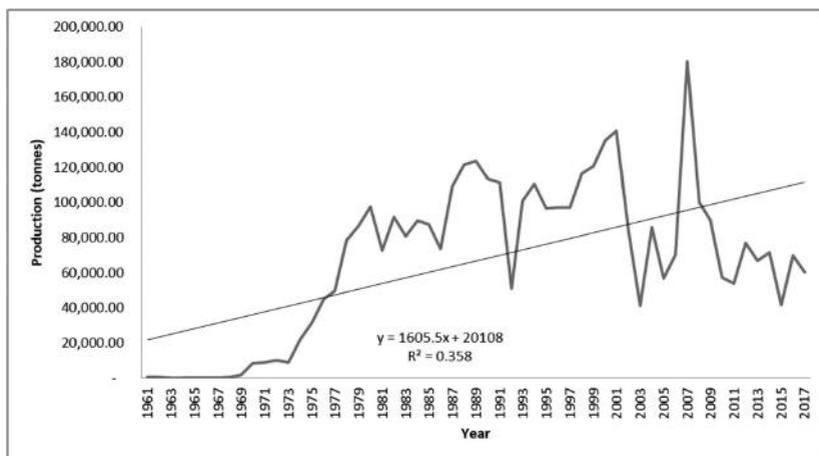


Figure 4.4: Soybean area harvested (ha)



even if the area under soybean is increasing (negative slope). Comparing Figure 4.3 and Figure 4.5, we observe that although soybean production is falling, it is very sensitive to variations in rainfall.

Figure 4.5: Soybean production (tonnes)



1.6 Discussion

Our findings confirm that the area under maize and soybean is increasing at a time when per capita food production and rainfall are declining. In the case of maize, the probable explanation is that the Land Reform Programme of 2002 resulted in the redistribution of land resources from the commercial white farmers to landless black farmers.⁵¹ Although the resettled farmers have challenges in accessing agricultural credits, seed and fertilizer inputs, government-led support programmes such as Operation Maguta, Command Agriculture improved access to maize inputs to farmers. This, in turn, increased the area under maize and soybean. However, although the area under maize increased, production has been falling for many different reasons. Mano and Nhemachena observe that the decline in net crop revenue is a result of climate, soils, hydrological and socio-economic factors.⁵² Our trend analysis on maize production confirms that climate change is also having adverse effects i.e. during droughts years, maize output drastically fell. During good years the output increased significantly.

The area under soybean has been increasing as observed in Figure 4.4.

⁵¹ Hove and Gwiza (2012).

⁵² Mano and Nhemachena (2007).

This is due to a number of factors. Unlike maize, soybean price was not controlled by the state through the Grain Marketing Board. The absence of a price control made the crop lucrative to farmers given its high propensity to generate cash from minimum farming inputs.⁵³ Farming programmes such as the Zimbabwe Soybean Promotion Taskforce also increased both the area and production of soybean.⁵⁴ This is because the programme facilitated the acquisition of inputs for farmers over 55,000 farmers, and offered production and marketing knowledge to farmers.⁵⁵ ⁵⁶ Since soybean is very sensitive to moisture stress, this, in turn, affects production. For instance, Figure 4.5 shows that soybean production fell in bad rainfall years and improved in good rainfall years. The fall in production affects the operations of stock feed producing companies.⁵⁷ During the bad years, the government fills the production gap through imports from Malawi and South Africa.

1.7 Recommendations

Based on our findings, we recommend that the agricultural sector adapt to climate change to reduce the economic impacts of climate change in the sector. As argued by Mabe et al.,⁵⁸ adaptation has the effect of minimising the adverse effects of climate change among smallholder food producers. For instance, it is through adaptation that strategies can be tested on how to improve maize and soybean production in the face of climate change. Promoting adaptation by smallholders farmers will likely improve food security, nutrition and reduce the decimation of natural resources. Through adaptation, the susceptibility of agro-based economies to climate change can, therefore, be reduced.

53 Zamasiya and Nyikahadzoi (2017).

54 Giller et al. (2011).

55 Zamasiya and Nyikahadzoi (2017).

56 Giller et al. (2011).

57 Technoserve (2011).

58 Mabe et al. (2012).

1.7.1. Promote institutional support

The success of maize and soybean production reveals that smallholder farmers need support in the production-market chain. For farmers to be able to adequately produce maize and soybean, the government needs to first provide input support to farmers through the provision of low-cost agricultural credit services. Access to agricultural credit can help farmers to purchase improved and appropriate crop varieties. This is the case with maize crop whose yield drastically declines with the use of recycled seed.

Further, the government should also improve the provision of technical services in crop extension to farmers. Provision of crop extension services to farmers will improve technology transfer between farmers and extension. The provision of extension services can assist farmers to improve their choice of appropriate agronomic practices and adaptation technologies. Such services can improve maize and soybean production in the face of climate change and lower the economic costs of climate change.

1.7.2 Improve dissemination of climate information

Given that climate change is a reality affecting agricultural production, the government needs to improve the reliability, timeliness, and usability of climate information. Farmers rely on extension officers, electronic media and other farmers for climate information. If the information is reliable, timely and usable, it will positively affect farmers' decision making in terms of choice of crop and timing of agronomic operations. Without access to appropriate, accurate and timely climate information, farmers will make wrong decisions on crop choice and timing of operations. This will exacerbate the vulnerability of farmers through reduced crop yields and increased food insecurity and malnutrition.

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The Justiciability of Climate Change in Zimbabwe

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1. Introduction

Litigation has been used by legal practitioners as a tool to steer political, economic and social change for a considerable period of time.² The right for one to live in a clean and healthy environment is not a new phenomenon, given its recognition in various constitutions and subsidiary legislation.³ In instances where constitutions do not specifically provide for the environmental right, the judiciary has purposively interpreted the right in a way that the environment is protected.⁴ Currently, the judiciary is faced with a new emerging challenge called climate change, ‘the most pressing environmental challenge of our time’.⁵

Globally, there has been an increase in the number of cases in which litigants approach the courts seeking relief aimed at curbing climate change impacts since the coming into force of the United Nations Framework Convention on Climate Change (UNFCCC).⁶ Despite the

1 The author would like to thank the support of the Raoul Wallenberg Institute of Human Rights and Humanitarian Law who provided insight and expertise that greatly assisted part of this chapter.

2 Davis et al. (2010).

3 Jeffords and Gellers (2017).

4 Awuku (1994).

5 *Massachusetts v Environmental Protection Agency* 22 Ill.549 U.S. 497, 127 S. Ct. 1438, 167 L. Ed. 2d 248, 63 ERC 2057 (2007) at 1446.

6 Setzer and Byrnes (2019).

Kyoto Protocols pitfalls,⁷ the swift ratification and entry into force of the Paris Agreement raised hopes that action would be taken to address climate change. Whilst both developed and developing countries agreed to keep the global temperature well below 2°C while pursuing efforts towards a 1.5°C, the report by Intergovernmental Panel on Climate Change (IPCC) scientifically indicates that, at the current state of development, the Paris Agreement objective is unlikely to be attained.⁸ In light of such overwhelming evidence, courts will once again be the frontier to which citizens turn for redress in cases where political and economic priorities fail to reach a consensus. Cases that are increasingly finding their way to the judiciary seek a reduction of existing greenhouse gas emissions, enforce existing climate commitments, set higher climate commitments and read into policies in a way that incooperates climate change impacts.⁹

Climate litigation has the potential of raising climate action to the echelon of societal discussions, which in most instances is currently overshadowed by economic, social and political rhetoric.¹⁰ Whilst acknowledging that climate litigation is by no means a panacea to the twenty-first century climate change challenge, it is a way in which strides can be made towards ensuring that future generations inherit a healthy environment. This chapter seeks to provide a foundation for people who may seek to use litigation as a strategy towards holding the government or the private sector to task in considering climate change impacts in decision making processes. A detailed background on climate change litigation, taking important lessons from other jurisdictions, will be provided. Moreover, consideration will be given to the challenges that a climate litigant may have to overcome before bringing a case to court.

2. Background to the Global State of Climate Change Litigation

Climate litigation is a subset of environmental litigation that can be traced back to the *Hudson Preservation Conference v Federal Power Commission* case.¹¹ Markell and Ruhl define climate litigation as court decisions arising

7 Coghlan (2002).

8 IPCC (2018).

9 Peel (2011). Such expansion includes the consideration of greenhouse gas emissions within the scope of environmental impact assessment regulations.

10 Tarlock (2002), p. 580.

11 *Hudson Preservation Conference v Federal Power Commission* 407 US 9256, 92 S Ct 2453 (1972).

from a ‘federal, state, tribal, or local administrative or judicial litigation in which the...tribunal decisions directly and expressly raise an issue of fact or law regarding the substance or policy of climate change causes and impacts.’¹² This definition is comprehensive enough to include decisions at all levels of the judicial hierarchy that seek to address disputes of actions contributing to climate change and consequent impacts.

Climate litigation can be identified by the keywords used in the cases which appear before the judiciary. Commonly used words in climate litigation include ‘climate change’, ‘greenhouse gas’, ‘sea-level rise’, ‘emissions’, ‘global warming’, ‘adaptation’, ‘mitigation’, ‘climate refugees’ and ‘environmental migrants’.¹³ On this note, questions relating to the scientific matters of fact, industrial manufacturing, policy targets and even environmental relations and natural disasters, fall within the broad definition of climate litigation.¹⁴ Setzer and Byrnes noted that as of May 2019, 1,328 cases had been recorded in 28 countries, with the majority – 1,023 – being recorded in the United States of America.¹⁵

While climate litigation can be identified using the various words and phrases listed above, the majority of cases continue to fall within five broad categories: those seeking to hold governments to account on their legislative and policy commitments; linking impacts of resource extraction to climate change and resilience; establishing particular emissions as proximate cause of particular adverse climate change impacts; establishing liability for failures (or efforts) to adapt to climate change; and applying the public trust doctrine to climate change.¹⁶ These categories centre around the same issue, namely reducing greenhouse gas emissions for the benefit of preserving the environment for the benefit of future generations.

The Paris Agreement has created another foundation that litigants have been using to hold their governments to account.¹⁷ The agreement makes it mandatory for nations to submit their Nationally Determined Contributions (NDCs) that show the emission reduction pathway.¹⁸

12 Markell and Ruhl (2012).

13 See Faure and Nolkaemper (2007).

14 Setzer and Byrnes (2019).

15 *Ibid.*, p. 3.

16 Blumm and Wood (2017); Clarke et al. (2018).

17 Adoption of the Paris Agreement, UNFCCC Conference of the Parties, Decision 1/CP.21 Preamble and Article 4.

18 *Ibid.*, Article 4.2.

Furthermore, the emission targets need to be incremental; they cannot be regressive.¹⁹ There is going to be an increase in domestic cases such as the *Irish Environment v Ireland*²⁰ that created a precedent for how citizens can seek not only an incremental increase in the Paris Agreement targets but a significant increment that can ensure that the emission gap that currently exists is curtailed.²¹ This is relevant to the situation in Zimbabwe, where the 33% per capita target will have to be reviewed before the end of 2020.

In the cases identified above, the government is usually the main defendant.²² Private companies have also been attracting attention, particularly those which produce a significant amount of greenhouse gas emissions, such as power and vehicles producers, and those seeking to change current land use.²³ For example, of the 201 climate litigation cases sampled in the USA in 2010, a significant number related to permits issuance, rules and impact assessments.²⁴ Climate litigation is thus seen as a means by which the legislative and regulatory deficit in policy can be filled, as noted in *Urgenda Foundation v. The Netherlands*.²⁵ In future, more cases are expected to deal with climate migration, with more cases emanating from the global south.²⁶

3. Climate Litigation: A Litmus Test for Judicial Legitimacy

Given the rate at which climate litigation is gaining momentum, and is likely to peak after 2020, second NDCs submissions will place the judiciary in the spotlight.²⁷ The prospect of the judiciary being called upon to adjudicate on such matters in Zimbabwe, given the rise in awareness level around the issues of climate change, is high.²⁸ The recent Cyclone Idai,

19 Ibid., Article 3.3.

20 *Friends of the Irish Environment CLG V Government of Ireland & Ors* 2018/291 JR.

21 See *Union of Swiss Senior Women for Climate Protection v. Swiss Federal Council No. A-2992/2017* at para 60.

22 Setzer and Byrnes (2019), p. 4. The report indicates that in over 80% of the cases the government is involved during the period 1994- May 2019 with the private sector diminishing. See also Wilensky (2015).

23 Burger and Gundlach (2017), p. 14.

24 Markell and Ruhl (2012), p. 74.

25 *Urgenda Foundation v. The Netherlands* [2015] HAZA C/09/00456689.

26 Oliver-Smith (2012).

27 Paris Agreement, Article 4.9.

28 Nachmany and Setzer (2018).

for instance, has made climate action a priority for many Zimbabweans.²⁹ Hence, courts will be called upon to adjudicate on executive policy responses to such climate-induced disasters, inescapably bringing to the fore the issue of separation of powers.

The issue of the separation of powers in a constitutional democracy, is a fundamental one that cannot be taken lightly, especially in the context of interpreting fundamental rights. In cases where the executive has been flagging, citizens are entitled to approach the courts for redress, and even to seek an expansive interpretation of existing legislation and policy frameworks where these are failing to address the issue of climate change.³⁰ Whilst applicants in climate litigation cases may seek mandatory remedies from the executive, courts are cautious in utilising a purposive approach to executive policy decisions, opting to refer the matter back to the executive to cure the defect.³¹ Thus, courts have to strike a balance between pronouncing on executive policy decisions that fall short of required standard so that they are not labelled as the de facto arm of policy making, and making sure they protect citizen's constitutional rights.

The court in *Minister of Home Affairs v Austin and another*³² stated emphatically that the court has the duty:

... to decide on the rights, according to law, of all people including those who are charged with the onerous duty of managing the affairs of the State for the good and benefit of its citizens; and to decide whether, as between the individual and the State, the individual is right or wrong or the State is right or wrong.

On the other hand, Rumble and Summers indicate that the courts will increasingly be called upon:

*... to make findings upon issues of scientific uncertainty and in this context, are often required to rule upon administrative decisions heavily laden with domestic (and international) policy issues, as opposed to law. It is no surprise, therefore, that legal disputes involving climate change considerations will entail competing interpretations of scientific evidence and alternative claims regarding the significance of anticipated consequences of climate change.*³³

29 UNICEF Zimbabwe Cyclone Idai Situation Report #7 (31 May 2019) <<https://reliefweb.int/report/zimbabwe/unicef-zimbabwe-cyclone-idai-situation-report-7-31-may-2019>>

30 Rumble and Summers (2016), p. 6.

31 See Massachusetts, 127 S. Ct. at 1477–78 (Scalia, J., dissenting).

32 *Minister of Home Affairs v Austin and another* 1986 (4) SA 281 (ZS) . See also Dumbutshena (1989).

33 Rumble and Summers (2016), pp. 6-7.

Climate litigation is an area in which courts have to be cautious in seeking to protect citizens' rights and exercising judicial restraint in a field dominated by scientific debate, whilst being innovative through framing new remedies where climate change issues are inadequately addressed.³⁴ This is true in the case of Zimbabwe, where current climate change policy-making processes are ongoing.³⁵ The courts can play a key complementary role in ensuring that existing obligations placed on the government and private players are fulfilled, a role which climate litigation can nurture.³⁶

4. Lessons from Other Jurisdictions

4.2 *Massachusetts v Environmental Protection Agency*

The case of *Massachusetts v Environmental Protection Agency*³⁷ is described as the model for climate change litigation, having received wide attention because of the issues it raises.³⁸

The applicant, the state of Massachusetts joined by a group of private organisations, required the Environmental Protection Agency (EPA) to regulate emissions from motor vehicles in terms of section 202(a)(1) of the Clean Air Act. The applicants argued that the release of gases, including carbon dioxide, was a pollutant that put people's health and welfare at risk.³⁹ The respondent's defence was that the Clean Air Act did not give permission to enact regulations seeking to address climate change. In the alternative, the defendants argued that even if it had that permission, a causal link between the rise in air temperature and greenhouse gasses was yet to be established.⁴⁰

In delivering the judgement, Justice Stevens indicated that the applicants, of the State of Massachusetts, but not the individuals, had standing. Referring to the common law categorisation of standing, the court made reference to the case of *Lujan v Defenders of Wildlife*,⁴¹ which

34 Markell and Ruhl (2012), p. 26.

35 The country is in the process of developing the Climate Change Bill, Low Emission Development Strategy, National Adaptation Plan and the Climate Finance Facility which are all at different stages.

36 De Wit (2018).

37 *Massachusetts v Environmental Protection Agency* 22 Ill.549 U.S. 497, 127 S. Ct. 1438, 167 L. Ed. 2d 248, 63 ERC 2057 (2007).

38 Cannon (2007).

39 *Massachusetts*, p. 1.

40 Ibid.

41 *Lujan v Defenders of Wildlife* 504 U. S. 555, 560–561.

indicated that the State of Massachusetts had standing based on legislation that provided it with the capacity to enforce rights. In such a case, the court stated that one ‘can assert that right without meeting all the normal standards for redressability and immediacy’.⁴² The courts also reached the conclusion that the EPA had a statutory duty to regulate carbon dioxide and other related greenhouse gases in terms of the Clean Air Act and that by the Agency declining to regulate these gases from motor vehicles, it failed to meet its statutory obligations.⁴³

This case presents lessons on the importance of climate litigation for Zimbabwe, with notable differences that need to be taken into account. In the USA, an individual would have difficulties in establishing standing in climate litigation, because they would need to meet the criteria of injury, causation and redressability.⁴⁴ Previously, in terms of Zimbabwe’s common law, one had to show real, direct and sustainable interest for the courts to establish standing in the same way as is required in the USA.⁴⁵ However, this issue is no longer a challenge in Zimbabwe, as will be shown below, given the broad standing provisions provided in the Constitution.⁴⁶

It is also important to consider an area that forms part and parcel of the American standing question, namely causation. The court in the case of Massachusetts followed the chain of causation relating to emitting pollutants from motor vehicles. This is correct, and various reports from the IPCC can be utilised to support this assertion.⁴⁷ However, as Chief Justice Roberts indicated in his dissenting opinion, climate change causation is, at times, ‘far too speculative to establish’.⁴⁸ This matter has also been presented before the courts in the case *Comer v Murphy Oil*.⁴⁹ In this case, the court rejected the defendant’s contention that their greenhouse gas emissions contribution towards the harm at play was weak given the greater scheme in global emissions.⁵⁰ The case raised more questions than answers, especially in delictual matters. It is important

42 Ibid.

43 Op. cit., *Massachusetts*, p. 6.

44 *Allen v Wright* 468 U.S. 737, 751 (1984).

45 *Zimbabwe Teachers Association & Ors v Minister of Education and Culture* 1990 (2) ZLR 48 (HC).

46 Constitution of Zimbabwe [Amendment (No 20) Act, 2013], Section 85.

47 Sims et al. (2014).

48 *Massachusetts*, 127 S. Ct. at 1469 (Roberts, C.J., dissenting).

49 *Comer v Murphy Oil* 585F.3d 855 (5th Cir 2009) 863 (SD Miss 18 April 2006).

50 Ibid.

that when one is thinking of bringing a climate change *aquilian action*, in terms of the Zimbabwean law of delict one is sure that all elements of wrongfulness, fault, causation and harm are established.⁵¹ One element that will be a major challenge is establishing causation. As indicated above, though a relationship may exist between the defendant's conduct and the consequent action, it may be that the defendant is only one of many contributory actors.⁵²

Currently, nations around the globe are moving towards formulating specific climate change law, and the case of Massachusetts indicates how existing legalisation can in the interim be utilised to steer climate action.⁵³ The Clean Air Act,⁵⁴ in as far as it defines air pollution, is akin to the Zimbabwe Environmental Management Act read in conjunction with the Atmospheric Pollution Control Regulations.⁵⁵ The Environmental Management Act prohibits the operation of transport conveyances that cause air pollution in contravention of set emission standards; these include carbon dioxide amongst other listed six gases. This legal framework has hardly been utilised, although the government agency never been taken to task even through mandatory interdicts as has been the case in other jurisdictions.⁵⁶ A climate legal framework can be developed, but if the existing framework that has the potential to steer climate action is not being utilised, the climate framework will not yield the much-needed results.

4.2 *Earthlife Africa Johannesburg v Minister of Environmental Affairs and Others*

The first climate change-related case in the region was *Earthlife Africa Johannesburg v Minister of Environmental Affairs and Others*.⁵⁷ The case interrogated the consideration of climate change impacts within the

51 Feltoe (2014), p. 9.

52 See Rumble and Summers (2016) for detailed insights on the problems of delictual action in climate change litigation.

53 Massachusetts, 127 S. Ct. at 1469 (Roberts, C.J., dissenting).

54 Clean Air Act 42 U.S.C. § 7401.

55 Environment Management (Atmospheric Pollution Control) Regulations, SI 72 of 2009.

56 See Dhlakama and Zamasiya (2017). *Wildlife Society of Southern Africa and others v Minister of Environmental Affairs and Tourism* [1996] 3 All SA 462 (Tk).

57 *Earthlife Africa Johannesburg v Minister of Environmental Affairs and Others* 2017 (5) SA 227 (WCC)

overall Environmental Impact Assessment (EIA) process in South Africa. It raised questions about the need to broaden impact assessments beyond 'environmental' considerations.⁵⁸

The applicant in this case, the NGO Earthlife Africa, questioned the government's decision to allow the construction of a 1,200MW coal-fired station in an ecologically sensitive area in Limpopo province.⁵⁹ The project had been given permission to go ahead because of the social and economic needs without having taken into account its climate change impacts, which the applicant deemed imperative.⁶⁰ The respondent's defence was that South Africa was not mandated to take climate considerations into account in the absence of domestic legislation, regulations or policies.⁶¹

The respondents' arguments were dismissed after the court took into account the international obligations to which South Africa had aligned itself; climate impacts were relevant considerations that could not be ignored.⁶² Utilizing a purposive interpretation of the existing legislative and policy framework, the court concluded that the absence of mandatory legal instruments was not a barrier for the consideration of climate change impacts. The court took into account the 'text, purpose, ethos and intra- and extra-statutory context'⁶³ of section 42(0)(1) of the National Environmental Management Act⁶⁴ as indicative of the fact that climate change impacts are relevant factors that could not be ignored. The *Earthlife* case has been heralded as '...a landmark ruling that actually holds the environmental affairs department to account'⁶⁵ whilst indicating the effectiveness of utilizing judicial review in climate litigation.⁶⁶

The issue of mainstreaming climate change considerations within the general framework of environmental impact assessments, as raised in the *Earthlife* case, is globally gaining momentum.⁶⁷ It ensures that other sectors of the economy implement climate-friendly practices and have

58 Leonard and Shepherd (1995).

59 *Earthlife Africa Johannesburg v Minister of Environmental Affairs and Others 2017 (5) SA 227 (WCC)*, para 1.

60 *Ibid.*, p. 19.

61 *Ibid.*, para 16.

62 *Ibid.*, para 35.

63 *Ibid.*, p. 91.

64 Act 107 of 1998.

65 'Earthlife Africa wins South Africa's first climate change case', *Mail and Guardian*, 8 March 2017.

66 Ashukem (2017), p. 35. See also Humby (2018), pp. 145-155.

67 Gao (2018); Matemilola et al. (2019).

due regard to developing climate-safe areas.⁶⁸ The European Union has gone to the extent of developing guidelines aimed at ensuring that climate change is integrated within EIAs.⁶⁹ Whilst this is a commendable step, it is not a necessary path in the context of Zimbabwe. The decision in *Earthlife* shows how a purposive interpretation of existing law suffices to mandate decision-makers to consider climate change impacts as relevant considerations within the decision-making framework. Section 99 of the Environmental Management Act clearly indicates that the EIA should identify both ‘short-term and long-term effects of the project’ on the environment and suggest mitigation measures.⁷⁰ Greenhouse gas emissions have short- and long-term effects which the majority of projects listed in the first schedule of the Environmental Management Act such as mining, power generation and industry cannot ignore.⁷¹ Therefore, an EIA that does not adequately take these considerations into account can be taken on review, as will be discussed in the following section.

5. Horizontal Application of the Declaration of Rights and Corporate Civil Liability for Rights Violations

Apart from the judicial challenges stipulated in the preceding section, there are difficult constitutional issues relating to corporate liability for climate change-induced rights violations. One of these is the question of whether juristic persons engaging in business activities that substantially contribute to climate change are directly bound by the rights entrenched in the Declaration of Rights.⁷² To this end, the Constitution provides that ‘the state and every person, including juristic persons, must respect, protect, promote and fulfil the rights and freedoms set out in this Chapter’.⁷³ Furthermore, it provides that the Declaration of Rights ‘binds natural and juristic persons to the extent that it is applicable to them, taking into account the nature of the right or freedom concerned and any duty imposed by it’.⁷⁴ On the face of it, these provisions suggest that companies are directly bound, to the fullest extent possible, by the rights protected in the Constitution. Accordingly, victims of violations of

68 Kok and Coninck (2007).

69 European Commission (2013).

70 Chapter 20:27.

71 *Ibid.*, First Schedule.

72 Moyo (2019).

73 Section 44 of the Constitution.

74 Section 45(2) of the Constitution.

rights can make claims directly based on any provision in the Declaration of Rights against non-state actors whose activities cause environmental degradation, pollution and climate change. However, before holding private companies directly responsible for rights violations, a number of factors should be considered. These include the nature of the right, the nature of the duty, the extent of the violation, the nature of the non-state actor and the relationship between the non-state actor and the victim.⁷⁵

Ideally, direct corporate responsibility of non-state actors becomes compellingly important if there is no private law or claim to remedy the alleged violation of rights.⁷⁶ Under normal circumstances, it is convenient for claimants to base their claims on private law, especially given the rich literature on the subject and the well-developed nature of common law remedies. This is in line with the principle of avoidance, which revolves around the notion that it is important for courts to avoid raising or dealing with constitutional issues in cases that are extensively regulated by the common law, customary law or legislation.⁷⁷

Generally speaking, it would appear from the literature that constitutional rights-based claims can only be instituted against non-state actors where either no private law remedy exists to respond to the infringement or where the remedy that exists is patently ineffective.⁷⁸ However, Zimbabwean courts have an explicit duty to take into account the spirit and object of the Declaration of Rights and to develop the common law or legislation in light of these.⁷⁹ This provision seems to suggest that individuals or groups of people, usually through climate litigation, can make direct claims of rights against companies that exceed their share of carbon emissions or degrade the environment.

From a practical point of view, inspiration can be drawn from the rise of private power in modern society, which reveals that it is no longer the case that the state still enjoys a monopoly over social, political and economic power.⁸⁰ To a large extent, this argument hinges on the

75 See Chirwa (2008).

76 Ibid.

77 *Hanrahan v Merck Sharp & Dohme (Ireland) Ltd* [1988] I LRM 629.

78 Klare (1998), pp. 146, 150.

79 Section 46(2) of the Constitution provides that '[w]hen interpreting an enactment, and when developing the common law and customary law, every court, tribunal, forum or body must promote and be guided by the spirit and objectives of this Chapter'.

80 In *South African National Defence Union v Minister of Defence* 2003 SA 239(T) 218, Van der Westhuizen had the following to say: 'The assumption

privatisation of public power, i.e. the performance of public functions by private companies or individuals. The classical liberal postulates that the major threat to human rights and civil liberties is the power of the state not only fails to explain the relative weaknesses of some states, but also overlooks the growing power of large national and supranational private institutions such as conglomerates.⁸¹ In an age characterised by the outsourcing of public services to private companies and the privatisation of public functions, the formalistic application of the private/public distinction would extend immunity from human rights norms and values to many private persons performing public functions and largely responsible for climate change.⁸² Many private law norms, values and principles would be concealed from the public eye and would be insulated from a critical examination of their consistency with the normative public value-system entrenched in the Constitution, particularly the Declaration of Rights.⁸³

The modern world has also registered an unprecedented rise in

*new fragmented centres of power such as voluntary associations, trade unions, corporations, multinational companies, universities, churches, and the like. The emergence of large private institutions, wielding massive power over the lives of citizens, is an integral component of modern life. In principle, this power might be as oppressive – and potentially as illegitimate – as the power wielded by the state.*⁸⁴

Some private corporations have become so powerful that they not only control or influence the decisions made by the national government but are also responsible for gross violations of human rights.⁸⁵ Today, many

that the state is always more powerful than so-called private concerns is not necessarily tenable or generally accepted in either modern constitutional jurisprudence or political and economic philosophy; hence the recognition that constitutional rights could be horizontally binding on private entities under certain circumstances as envisaged in section 8 of the Constitution.’

81 See generally Fraser (2005); De Feyter and Gomez (2005); Scott (2001).

82 Ibid.

83 For similar arguments, see Van der Walt (1995), pp. 169, 184, arguing that private law rights have been conventionally ‘valued and protected as trumps which insulate the individual from all, but the most limited unavailable state actions’; Cockrell (1993), pp 227, 228.

84 See Cockrell (2013).

85 See Business & Human Rights Resource Centre Climate Litigation against Companies: An Overview of Legal Argument 2019 < https://www.business-humanrights.org/sites/default/files/documents/Legal%20Briefing_Climate%20Litigation_Final_2.pdf >

public services including the provision of water, electricity, sanitation, food and health care have been fully or partly privatised, and functions historically performed by public bodies now lie in the hands of juristic persons. Against this background, there is no sound reason why juristic persons that perform quasi-public roles and provide public goods and services should not be held to the same standards of transparency and accountability as their public sector counterparts. The growing trend toward the privatisation of public power and the challenges that emerge as a result, provide a background against which the horizontal application of the Declaration of Rights must be understood and justify an imaginative reading of the relevant provisions of the Constitution.⁸⁶

In the context of climate litigation, the ideal model of the horizontal application of the Declaration of Rights should entail both the indirect approach which permits consideration of rights when interpreting and applying private law,⁸⁷ and the direct approach which allows victims of rights to bring constitutional claims against non-state actors where private law remedies are unavailable or insufficient to respond to the claim.⁸⁸ In terms of this model, an individual seeking to vindicate constitutional rights against a juristic person for violations arising from climate change must bear the burden of proving that particular human rights cannot be sufficiently dealt with through private law and the indirect application of the Declaration of Rights to the common law.⁸⁹ The benefit of this approach emanates from the fact that it does not deny that rights apply to non-state actors, and promotes the principle of avoidance in matters that are sufficiently governed by the common law, customary law or legislation.

Finally, some environmental law principles such as the 'polluter-pays' principle can assist individuals and groups to directly challenge the business policies and practices of (multinational) companies in courts of law. The polluter-pays principle means that when a company or person embarks on business or acts that emit excess harmful products like carbon dioxide or other harmful substances such as chemical waste they must pay to remediate the effects of such pollution.⁹⁰ The more one pollutes the

86 *AAA Investments (Pty) Ltd v. Micro Finance Regulatory Council and Another* 2007 (1) SA 343 (CC).

87 Averill (2009).

88 *Ibid.*, p. 142.

89 Friedman (2014).

90 This and other principles of environmental management are enshrined in s4 of the EMA.

environment the more one should pay. This helps reduce the amount of pollution emitted to the environment and forces corporates to look into possibilities for increased reliance on renewables instead of fossil fuels.⁹¹

As demonstrated above, every human being has a right to an environment not harmful to health and well-being.⁹² In light of the polluter-pays principle, the government has ensured that anyone who discharges any poison or toxic matter into the aquatic environment shall be found guilty of an offence. Section 57(1) of the Environmental Management Act provides that ‘any person who discharges or applies any poison or toxic, noxious or obstructing matter, radioactive waste or other pollutants or permits any person to dump or discharge such matter into the aquatic environment in contravention of water pollution control standards shall be guilty of an offence. This offence is punishable by either imprisonment for a period not exceeding five years, or a fine not exceeding five million dollars, or to both’.⁹³

Apart from the sentences stipulated above, the offending person is liable to pay the cost of the removal of any poison, toxin, or other hazardous pollutants, including the cost of restoration of the damaged environment, which may be incurred by a government agency and to pay third parties such reparation, cost of restoration, restitution or compensation as may be determined by the court on application by such third parties.⁹⁴ These provisions explicitly bind corporates to pay for the damage they cause to the environment and thereby help victims of climate change to prove violations of the right to an environment that is not harmful to human well-being or health.⁹⁵

There is no doubt that the government can promote environmental conservation by incorporating remedies such as the polluter-pays principle into its policies. The principle improves the enforcement of environmental rights, especially in clear-cut cases where environmental damage can be linked to the activities of specific companies. However, the usefulness of this mechanism is remote in cases of greenhouse gas emissions and consequent damages as it becomes difficult to determine which company is responsible for releasing emissions.

91 *Massachusetts*, see footnote 36.

92 See s 73(1)(a) of the Constitution.

93 *Ibid.*

94 Environmental Management Act [Chapter 20:27].

95 Challenges in establishing quantum of damages will however need to be addressed.

6. Hurdles for Climate Change Litigation in Zimbabwe

Litigation of harm resulting from climate change raises serious challenges for courts in almost all countries.⁹⁶ Litigation has been an important tool used to steer policymakers and the business community to take more responsible action in Zimbabwe, and in the same way it can be used to steer climate action. Whilst climate change litigation has the potential to bring to the test the (in)adequacy of government and business actors in Zimbabwe, there are various legal hurdles that cannot be taken lightly.

Foremost, the parties to climate change litigation should have *locus standi in judicio* to institute proceedings before a competent court.⁹⁷ The court must also be situated in a position within which relevant laws exist, have subject matter jurisdiction over the case, and be complemented with sufficient enforcement mechanisms, especially when it comes to interstate litigation.⁹⁸

Generally, rights litigation addresses specific injuries generated by specific perpetrators and experienced by specific victims. In Zimbabwe, there has been a significant paradigm shift, especially in light of the broad provisions of s 85(1)-(3) of the Constitution, towards the liberalisation of rules governing standing,⁹⁹ which allows a wide range of persons who can demonstrate an infringement of their environmental, health or other rights or those of others, or in the public interest, to approach the courts for relief. It is intended to enhance access to justice by individuals and groups without the knowledge and resources to vindicate their rights against government institutions or agencies and private persons who cause climate change through pollution, deforestation and many other activities. To this end, the drafters of the Declaration of Rights acknowledged

96 See generally Hilson (2019); Faure and Peeters (2011).

97 Feltoe (2014).

98 Sands (2016); see also Strauss (2009).

99 Section 85 provides that ‘Any of the following persons, namely--

1. any person acting in their own interests;
2. any person acting on behalf of another person who cannot act for themselves;
3. any person acting as a member, or in the interests, of a group or class of persons;
4. any person acting in the public interest;
5. any association acting in the interests of its members;

is entitled to approach a court, alleging that a fundamental right or freedom enshrined in this Chapter has been, is being or is likely to be infringed, and the court may grant appropriate relief, including a declaration of rights and an award of compensation.

that restrictive standing provisions defeated the idea behind conferring entitlements upon the poor and the marginalised. In the context of climate change, the majority of the people intended to benefit from the constitutionalizing of the right to a clean environment often do not have the resources, the knowledge and the legal space to drag powerful states, transnational corporations or rich individuals to court in the event that a violation of their rights occurs as a result of climate change. Most climate change litigation is aimed at promoting the public interest rather than that of any specific group, as was evident in the *Urgenda Foundation v Kingdom of the Netherlands* case.¹⁰⁰ The court found that Urgenda, an NGO representing the collective interests of other litigants, had standing, although in some cases public interest litigants still face challenges.¹⁰¹

It is beyond question that climate change has specific victims, individuals who either undergo suffering by contracting tropical diseases and respiratory infections or lose a season's (or a decade's) crop due to drought.¹⁰² However, the activities that cause climate change result from fragmented and unrelated acts by countless individuals or actors in multiple sectors and locations.¹⁰³ It remains difficult to establish the chain of causation between the exact physical or psychological harms that are experienced by climate change victims and all factors causing climate change. The challenge is to identify the perpetrator(s) and apportion responsibility for environmental harm in a manner that mirrors their contribution to climate change.¹⁰⁴ For instance, if there is an outbreak of respiratory infections and lung diseases in a residential area located adjacent to a busy industrial area where dozens of petrochemical and other companies carry out manufacturing operations, it may not be clear what level of responsibility should be imputed to each of the companies.¹⁰⁵ While specific actors, particularly those who overuse carbon fuels, are responsible for climate change, there are variations on the levels of responsibility.

The courts are likely to face enduring difficulties in identifying the extent to which individuals or entities are responsible for either climate

100 *Urgenda Foundation v. The Netherlands* [2015] HAZA C/09/00456689.

101 *Ibid.*, para 4.42.

102 Popovski and Mundy (2012).

103 See Peel (2011).

104 *Anvil Hill Project Watch Association v Minister for the Environment and Water Resources* (2007)b159 LGERA 8.

105 Paterson and Kotze (2009), p. 376.

change or climate change-driven health and environmental problems.¹⁰⁶ In the absence of technologies that measure the volume of emissions, it may be difficult to identify which companies are releasing emissions into the environment more than others.¹⁰⁷ Besides, the companies may argue that fossil fuel-powered passenger trains and cars passing by the area should also take a measure of responsibility. Where some or all of the companies concerned have technologies to capture and store carbon, and therefore prevent climate change, further complications on the allocation of responsibility for climate change would arise.¹⁰⁸

Another problem relates to the level of responsibility extended to relevant organs of the state, especially given that the state is the primary duty bearer for the enjoyment of human rights and that most of the human-induced causes of climate change occur either with the permission of the state or on the state's watch.¹⁰⁹ Traditionally, the state had the obligation to respect human rights in the sense of not interfering with people's enjoyment of environmental and other related rights and freedoms. However, the doctrine of state responsibility acknowledges that non-interference alone does not ensure the enjoyment of human rights, especially in the context of non-state actors being engaged in businesses that have implications for the environment.¹¹⁰

Over the years, the duty to protect has evolved to mean that the state is duty-bound to take positive steps to protect its citizens (and other persons within its territorial boundaries) from violations of rights perpetrated by natural and juristic persons.¹¹¹ The doctrine of state responsibility binds the state and all agencies of government to prevent human rights violations emanating from climate change; to regulate the conduct and business operations of corporations and to investigate violations when they occur, and prosecute the perpetrators and provide remedies to victims.¹¹² The duty to protect the general public from climate change-

106 Peel (2011), p. 957.

107 Ibid.

108 See Cockerill (2012).

109 According to the United Nations Guiding Principles on Business and Human Rights, the first pillar clearly indicates the States' obligation to 'respect, protect and fulfil human rights and fundamental freedoms' < https://www.ohchr.org/documents/publications/GuidingprinciplesBusinesshr_eN.pdf>

110 Ibid, p. 5.

111 See Shue (1980), p. 55; Eide (1995).

112 Chirwa (2004).

induced harm to their health or well-being is not illimitable, because organs of the state cannot be found liable for all human rights violations that take place in the private sphere. Nonetheless, the state is answerable and liable for such violations if it fails to exercise due diligence to prevent the violation or to react to it timeously.¹¹³ Besides, the bulk of human rights violations emanating from climate change can also be imputed to the state, particularly if it is complicit to such violations.

Direct state responsibility for human rights violations, especially through litigation against the government, poses numerous practical challenges. To ensure effective enforcement of environmental rights, the plaintiff must have been harmed on the territory of the defendant state or the state in which the perpetrator is ordinarily resident. Generally, it is cumbersome to successfully sue foreign governments or state officials for acts or omissions that have resulted in harms to individuals in other territories. In the absence of concrete and compelling evidence of direct causation and blatant harm, few national courts are prepared to accept petitions from victims located abroad against their own or other foreign governments.¹¹⁴

Apart from minimal chances of successfully litigating environmental rights against foreign governments, litigation destroys the marginal gains currently attained through global political negotiations. Measures that are intended to target governments are likely to have a limited overall impact on global emissions or other causes of climate change, especially because the major polluters worldwide are domestic or multinational companies carrying out businesses that have negative implications for the enjoyment of environmental rights.¹¹⁵ Furthermore, the majority of climate change victims are not citizens or residents of the wealthy polluting countries, but people living in poor countries responsible for negligible emissions. These considerations do not necessarily weaken the significance of litigating environmental rights-based claims but they do demonstrate the limits of the legal machinery in combating climate change.

More importantly, victims rarely have standing to sue states before regional and international courts, and even where they do, there are challenges relating to costs and exhaustion of domestic remedies associated with transnational litigation. In addition, victims of violations of rights

113 Chirwa (2008).

114 International Council on Human Rights Policy (2008), p. 66.

115 See McAusland (2008).

usually need to have been injured on the territory of the state in question in order to litigate against that state. Individuals and groups experience challenges in suing these foreign governments for transnational climate change impacts arising from such developments.¹¹⁶ For the Zimbabwean government to be accountable for the operations of foreign governments with extra-territorial environmental impacts, it has to be shown that Zimbabwe, 'through the effective control of the relevant territory and its inhabitants as a consequence of military occupation, or through the consent, invitation or acquiescence of the authorities of that territory, exercises all or some of the public powers normally exercised by the latter'.¹¹⁷ It is highly unlikely that many climate change harms will meet this narrow threshold and many transnational violations of environmental rights are likely to continue unpunished.

7. Conclusion

The environment as we know it is changing on a day-to-day basis and climate change has scientifically been established to be contributing significantly to this. Citizens world over are awakening to the harsh reality that urgent climate action is needed to confine human action from causing greater harm to planet earth for future generations to inherit it is a good condition. Litigation is one such tool that can steer climate action and can curb the existing deficit. Globally, citizens are turning to the courts in the anticipation that duty bearers (government and private entities) are held to the standard that is expected of them. The courts though cautious to prescribe the manner that the duty bearers should undertake, they are entering into this scientifically uncertain realm, acknowledging standing even to non-governmental organisations and apportioning liability where harm has emanated. The door to climate litigation has hence been opened to which important lessons can be taken by the Zimbabwe legal fraternity through both administrative and delictual action.

Indeed, litigation is filled with its on challenges as has been identified above, but the progress that it has achieved in steering greater climate action should also be celebrated. The Government of Zimbabwe through crafting policy documents and the private sector actions of embracing greener technology should also be commended. These actions are in line with other nations that all seek to ensure that the global carbon footprint

116 Ganguly et al. (2018).

117 Van Dijk et al. (2006), p. 21.

are in line with the objectives of the Paris Agreement. It is the hope that whilst policy making inroads are being done, people hold government and private power to account least citizens lose faith in the climate negotiations and national policy making processes.

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Human Rights in the Age of Climate Change

Admark Moyo

1. Introduction

From heavy storms, floods, landslides, fires, tornadoes, cyclones and hurricanes to gradual developments such as desertification, habitat destruction, drought, heat waves, falling water table causing wells and boreholes to dry up, deforestation, species extinction, ice melting, receding coastlines, rise in sea level and ocean acidification, the consequences of climate change exacerbate human suffering and affect the enjoyment of fundamental human rights and freedoms. The age of climate change denialism and massive disinformation campaigns challenging climate change science appear to be over but pressing questions about better ways of curbing or preventing climate change while promoting sustainable development remain largely unanswered, especially in third world countries.

Climate change indirectly affects the enjoyment of almost all the rights provided for in the Constitution and international law. However, the link between climate change and the enjoyment of most rights is remote and, in some cases, the chain of causation appears very weak. The key human rights that are directly impacted by climate change include the right to an environment that is not harmful to health and well-being; the right to water and the right to food.¹ Given space constraints, it is imperative to briefly explain how climate change is affecting the right to water and food. However, my main focus is on environmental rights. The Constitution of

1 See s 73 and 77 of the Constitution.

Zimbabwe confers on every person the right to safe, clean and potable water, even in the context of climate change. Water is a scarce resource but also a fundamental right in that it sustains life and health. The right to water is indispensable for purposes of leading a dignified life. It is also a prerequisite for the realisation of other rights such as food, especially in countries such as Zimbabwe where farmers rely on rain-fed agriculture for food production.

Different aspects of the globe's hydrological cycle are regulated by the natural functions of ecosystems and associated geophysical processes such as evaporation and the functioning of the climate system.² Climate change has a direct impact on access to water by humans and the ecosystem. As it is, climate change is already affecting people and their rights since there is significant reduction in surface water and groundwater resources in most dry subtropical regions.³ This intensifies competition for water between agriculture, ecosystems, settlements, industry and energy production and affects regional water, energy and food security. Human interventions in watersheds, lakes and river systems take many forms, both negative and positive, including deforestation, extraction from subterranean aquifers, farming, irrigation and damming rivers.

Water scarcity endangers food production, human health, economic development and geopolitical stability. Globally, the availability of water per person has declined markedly in recent decades.⁴ The threat that water shortages pose to food production and economic development are predominantly felt in countries, such as Zimbabwe, that rely heavily on rain-fed agriculture. Substantial parts of the country often experience moderate to high water stress, especially in agro-ecological Regions IV and V which are dry due to decreased rainfall.⁵ The fraction of people affected

2 WHO (2005), p. 26.

3 IPCC (2014), p. 13 (hereinafter IPCC, AR 5)

4 WHO (2005), p. 8.

5 Natural Region I lies in the east of the country. It is characterised by rainfall of more than 1 000 mm/year (most of which falls throughout the year), low temperatures, high altitude and steep slopes. The country's timber production is located in this region. Natural Region II is located in the middle of the north of the country. The rainfall ranges from 750 to 1 000 mm/year. It is fairly reliable, falling from November to March/April. Because of the reliable rainfall and generally good soils, Region II is suitable for intensive cropping and livestock production. It accounts for 75-80 per cent of the area planted to crops in Zimbabwe. This region is suitable for intensive livestock production based on pastures and pen-fattening utilizing crop residues and grain. Region III is located mainly in the mid-altitude areas of the country. It

by climate change, especially changing water patterns, is likely to increase due to population size and per capita water demand growth reflecting the escalating use of fresh water for irrigation purposes, livestock production, industry and the luxuries of wealthier urban residents.⁶

The fact that climate change affects the availability of water resources for agricultural and other economic developments, negatively affects food production and the capacity of communities to meet their basic needs. In poor countries, especially in rural areas, the health of communities often is directly dependent on locally productive ecosystems providing sources of basic nutrition. Apart from these brief remarks on climate change, water supply and food production, this chapter discusses, in great detail, the relationship between climate change and the right to a clean environment, including each of the key elements of this right. It begins with a section on the politics of climate change and human rights which explains the difficulties of addressing climate change liability. It also discusses the several components of the right to an environment that is not harmful to health and well-being, and the obligations this imposes on state and non-state actors engaging in activities that cause climate change. Finally, the chapter discusses

is characterised by annual rainfall of 500-750 mm, mid-season dry spells and high temperatures. Production systems are based on drought-tolerant crops and semi-intensive livestock farming based on fodder crops. The predominant farming system is smallholder agriculture. This region is suitable for the production of groundnuts and sunflowers as cash crops. Natural Region IV is located in the low-lying areas in the north and south of the country. The characteristics of the region are annual rainfall of 450-650 mm, severe dry spells during the rainy season, and frequent seasonal droughts. Although this region is considered unsuitable for dry land cropping, smallholder farmers grow drought-tolerant varieties of maize, sorghum, pearl millet and finger millet. Region IV is ideally suitable for cattle production under extensive production systems and for wildlife production. Natural Region V covers the lowland areas below 900 metres above sea level in both the north and south of the country. The rainfall is less than 650 mm/year and highly erratic. Although Region V receives reasonable rainfall in the northern part of Zimbabwe along the Zambezi River, its uneven topography and poor soils make it unsuitable for crop production. Generally, this region is suitable for extensive cattle production and game-ranching. Although both Region IV and V are too dry for crop production, households on the communal lands in these regions grow drought resistant grain crops (maize and millet) for their food security and some cash crops such as cotton. Crop yields are extremely low and the risk of crop failure is high in one out of three years. Cattle and goat production are major sources of cash income.

6 WHO (2005), p. 8.

several mechanisms for combating climate-change-driven violations of environmental rights.

2. The Politics of Climate Change and Human Rights

To present a full picture of the climate change and human rights debate, it is imperative for state and non-state actors to focus on the unequal distribution of resources and power in society. Within this context, there are immense disparities between the interests of those who are meant to benefit from the regulation of climate change and those who stand (in the short term at least) to lose from such regulation. The latter are those that profit from the extraction and combustion of fossil fuels, deforestation and overgrazing that, generally speaking, are among some of the wealthiest and most powerful business corporations in the world: for instance, in 2005 alone, Exxon-Mobil made over \$328 billion in revenues, more than any other corporation in the world.⁷ In addition, due to access to reliable internet services and other methods of communication, this powerful lobby can influence political decisions with relative ease. As Sinden states, the persons who stand to lose from climate change regulation ‘are small in number, and each one stands to suffer substantial, concrete, economic losses in the short run if climate change regulation is enacted’.⁸

On the other side, those who are meant to benefit from climate change regulation are predominantly individuals or communities – urbanites who live in areas adjacent to industrial areas, coastal communities settled alongside rising seas; farmers in the third world whose crops are endangered by drought and climate change; and the masses, especially children, in the tropical and sub-tropical developing world who are at risk from the spread of malaria and other insect-borne diseases. Unfortunately, these multitudes who could gain ‘from climate change regulation are widely dispersed around the globe, and have interests that are often hard to measure in precise economic terms and in many cases are not likely to be felt until well into the future’.⁹ This multifarious group faces huge challenges in trying to organise politically and confront the influence of organised capital or state actors.¹⁰ What is more? Given that they are mainly from the developing world, the gainers have no political voice

7 ‘The World’s Largest Public Companies’, *Forbes Magazine*, 31 March 2006.

8 Sinden (2007), p. 10.

9 *Ibid.*, p. 11.

10 See generally, Engel and Saleska (2005), p. 183.

in developed countries, where most climate change problems originate and where a well-oiled public disinformation campaign influences law and policy-making.¹¹

The alternative energy sector patently stands to benefit from the reduction of greenhouse gas (GHG) emissions. However, at least until recently, the power of the alternative energy sector to influence public opinion and political outcomes has been dwarfed by the wealth and power that the fossil fuel industry has put behind their fight for immediate economic prosperity and survival. Corporate interests that stand to lose from climate change regulation, especially the coal, oil, and car manufacturers' industries, have orchestrated a disinformation campaign about climate change science. From the late 1980s, oil companies, car manufacturers and other similar industries have formed a broad front mandated to create public doubt about the science behind global warming.¹² In 1989, Exxon, General Motors, Ford, Shell, Texaco, Chevron, Chrysler, Amoco, the American Forest and Paper Association and many other huge corporations and industry groups formed the Global Climate Coalition (GCC).¹³ Over the next decade, the GCC spent millions of dollars on a campaign that included extensive funding of scientists willing to express scepticism about global warming; and efforts to publicly discredit scientists on the Intergovernmental Panel on Climate Change, as well as extensive advertising and lobbying.¹⁴ Whilst this coalition disbanded in 2002,¹⁵ it raised serious questions about the reality of climate change, ran a strong disinformation campaign for more than a decade and demonstrated the disparities in wealth and power between the losers and the gainers of climate change regulation.

Reducing fossil fuel energy use constitutes a win-win solution for business and the environment, and as public awareness of the dangers of global warming improves, companies are gradually realising that improving energy efficiency has a public relations dividend.¹⁶ As the political inevitability of mandatory carbon limits 'knocks' at the doors of

11 See IPCC (2001).

12 See generally, Union of Concerned Scientists (2007).

13 See Burton and Rampton (1997).

14 Ibid.

15 Anderson (2002), pp. 235-51.

16 'B of A has a Payoff for the Ecosystem: The Nation's Largest Retail Bank is Unveiling a \$20-billion Project to Shrink Energy Use and Address Global Warming', *L.A. Times*, 6 March 2007.

capital, an increasing number of corporations are recognising that cutting GHG emissions may ultimately be good for the bottom line.¹⁷ Much of the research on climate change has been driven by the atmospheric sciences community, including greater interaction with biophysical scientists in recent years.¹⁸ However, there is much to be gained from an approach that includes those working in the social sciences and public policy. Moreover, the growing interest in partnerships, both public and private, as well as the inclusion of large corporations, formal and informal business, and wider civic society, requires more inclusive processes and activities.¹⁹ More creative interactions will be required: for example, greater interaction between users and producers of science, as well as policy-makers and development agencies.²⁰ Corporations that step up quickly to support the general idea of emissions regulation are likely to benefit from the transition to a low carbon economy. In other countries, companies have concluded well-publicised deals with environmental groups to scrap plans for future extensive use of fossil fuels and thereby reduce GHG emissions and improve their public images.²¹

Despite the developments above, the rise of voluntary ‘corporate greening’ programmes should not blind states and environmental groups from recognising the power imbalances that characterise the discourse on human rights and climate change. The gradual development of a large political narrative about corporations going green or becoming redeemed sinners tends to mask many violations of human rights committed by corporations in communities where they operate. The growing belief that the new green corporation has heard (and internalised) the environmental gospel and its heart has suddenly been converted may well serve to disincentivise public authorities from monitoring business operations and, in the process, open a new chapter of gross human rights violations. In other words, it is wrong for authorities to think that those who pollute the environment by burning fossil fuels and therefore contribute to global warming have suddenly been truly converted to represent and advance

17 ‘When Being Green Puts You in the Black’, *Washington Post*, 4 March 2007; ‘Global Warming May Cloud Directors’ Liability Coverage’, *Wall Street Journal*, 7 May 2003.

18 GoZ (2012), p. 35.

19 *Ibid.*

20 *Ibid.*

21 ‘A Coal Executive with a Clean-up Mission’, *New York Times*, 7 March 2007.

the best environmental interests of the general public.

Corporations are still largely, if not solely, driven by the motive to make profits for shareholders and even as they now fully recognise the reality of climate change and the need for legal regulation to curb it, their primary purpose remains the same, although it is now clothed with a new economic or political strategy. If economic and power relations were equal, the solution to fixing climate change would have been to let major players realise the devastating effects of their joint exploitation of the common resources and take collective action to prevent the over-exploitation of such resources.²² Accordingly, while climate change is a serious environmental problem, three decades of political paralysis, despite overwhelming evidence that continued GHG emissions will inevitably cause catastrophic global harm, has deepened the crisis. Thus, the power disparities between the fossil fuel industry and those states whose economies have entrenched fossil fuel interests, and the general public remains one of the major problems. This is despite both the emerging images of the corporate as redeemed sinner and corporate attempts to design and sell environmentally friendly commodities.²³

3.1 Climate Change and Environmental Rights

In constitutional terms, climate change and mitigation are closely related to the right, contained in s 73(1)-(2) of the Constitution, to an environment that is not harmful to health or well-being. This right can be subdivided into several parts. The first part confers on every person two interrelated rights which include (a) the right to an environment that is not harmful to their health or well-being and (b) the right to have the environment protected for the benefit of present and future generations. Secondly, paragraph (b) indirectly imposes on state and non-state actors the duty to adopt measures that (i) prevent pollution and ecological degradation; (ii) promote conservation and (iii) secure ecologically sustainable development and use of natural resources while promoting economic and social development. Finally, s 73(2) imposes on the state the duty to ‘take reasonable legislative and other measures, within the limits of the resources available to it, to achieve the progressive realisation of the above-mentioned environmental rights.’ These provisions are explored in detail below.

22 Ostrom (1992), p. 2.

23 ‘Attention Shoppers: Carbon Offsets in Aisle 6’, *New York Times*, 7 March 2007.

3.1.1 The right to an environment not harmful to health or well-being

Section 73(1)(a) of the Constitution provides for every person's right to an environment that is not harmful to their health or well-being. This provision entrenches two interrelated rights: First, the right to an environment that is not harmful to human health and, second, the right to an environment that is not harmful to people's well-being. These rights revolve around the term 'environment' which is not defined in the Constitution. However, the Environmental Management Act (EMA) in s 1 defines the term 'environment' as follows:

- (a) the natural and man-made resources, physical resources, both biotic and abiotic, occurring in the lithosphere and atmosphere, water, soil, minerals and living organisms whether indigenous or exotic, and the interaction between them;
- (b) ecosystems, habitats, spatial surroundings and their constituent parts whether natural or modified or constructed by people and communities, including urbanised areas, agricultural areas, rural landscapes, and places of cultural significance;
- (c) the economic, social, cultural or aesthetic conditions and qualities that contribute to the value of the matters set out in paragraphs (a) and (b).

This definition is not as wide as the dictionary definition which refers to the environment as the 'totality of a being's surroundings'.²⁴ In addition, the EMA definition fails to place human beings at the centre of the environment.²⁵ Whilst it includes the physical environment and the interactions between its constituent parts, it does not emphasise the

²⁴ Compare also with the definition of the word 'environment' in section 1 of the South African National Environmental Management Act 107 of 1998. The South African National Environmental Management Act 107 of 1998 (NEMA) defines the environment as the surroundings in which humans exist and includes the land, water and atmosphere. In addition, it includes the interrelationships, combinations, properties and conditions of all organisms that exist within the surroundings. It is therefore submitted that NEMA is a progressive environmental management legislation in South Africa and globally.

²⁵ However, this maybe a good 'failing' because most environmental clauses are criticised for being human-centred to the exclusion of purely aesthetic protection of the environment.

interaction between these components and human beings. Nonetheless, the environmental rights enshrined in the Constitution should not be narrowly confined to the EMA definition, but should be interpreted to ensure that the rights are not unreasonably limited at the interpretation stage.

A broader conception of the environment and environmental rights would include the place of human beings in the urban environment; this would include both the built and the work environment.²⁶ Ferris observes that a generous approach to environmental rights would include the socio-economic and cultural dimensions of the interrelationships that exist, not only between humans and the natural environment, but also between humans (the latter can be conceptualised as the social environment).²⁷ She also argues that a wider definition of environmental rights can be ‘invoked to prevent displacement and relocation of indigenous groups on the basis that the loss of culturally or historically significant sites violates’ such rights.²⁸

The right to an environment that is not harmful to health or well-being speaks to the underlying determinants of health such as food, water, clothing, bedding, housing and general living conditions of the human person. It is beyond doubt that the term ‘health’ relates to human health and incorporates both psychological and physical integrity. To this end, the World Health Organisation (WHO) widely defines ‘health’ as a ‘state of complete physical, mental and social well-being’.²⁹ The protection of a right to a ‘healthy’ environment is particularly important for groups that are socio-economically marginalised and rely on the natural environment for basic necessities of life.³⁰

Climate change affects precipitation patterns and less rainfall substantially reduces agricultural productivity. This exposes millions of people, especially in developing countries, to drought and a lack of water for domestic and other uses. In the end, lack of access to adequate food and water due to climate change undermines not only the general standard of living, but the constitutional promise of an environment that is not harmful to health or well-being. Air and water pollution constitute

26 Du Plessis (2011).

27 Ferris (2000), p. 199.

28 Ferris (2013), p. 525.

29 See Preamble to the Constitution of the WHO.

30 Kidd (1997), p. 36.

environmental harms that threaten the right to health, and detrimental impacts on ecosystems can also cause multiple negative health impacts. The WHO notes that:

Ecosystems are the planet's life-support systems - for the human species and all other forms of life. Human biology has a fundamental need for food, water, clean air, shelter and relative climatic constancy. Other health benefits include those derived from having a full complement of species, intact watersheds, climate regulation and genetic diversity. Stresses on freshwater sources, food-producing systems and climate regulation could cause major adverse health impacts... The causal links between environmental change and human health are complex because often they are indirect, displaced in space and time, and dependent on a number of modifying forces. For example, climate changes can place stresses on agricultural production or the integrity of coral reefs and coastal fisheries. This can lead to malnutrition, stunted childhood growth, susceptibility to infectious diseases and other ailments.³¹

The idea of 'well-being' is undoubtedly broad and difficult to pin down to a specific meaning, especially in the context of environmental and climate change law. In *HTF Developers (Pty) Ltd v Minister of Environmental Affairs and Tourism*,³² Murphy observed that the term 'well-being' is 'open-ended and manifestly ... incapable of precise definition. Nevertheless, it is critically important in that it defines for the environmental authorities the constitutional objectives of their task'.³³ In other cases, the courts have not directly defined the concept, but have regarded exposure to stench as being detrimental to human health and well-being.³⁴ Glazewski contends that:

[i]n the environmental context, the potential ambit of a right to 'well-being' is exciting but potentially limitless. The words nevertheless encompass the essence of environmental concern, namely a sense of environmental integrity, a sense that we ought to utilise the environment in a morally responsible and ethical manner.³⁵

Accordingly, any conduct that endangers human welfare or negatively

31 WHO (2005), pp. 1-2.

32 2006 (5) SA 512 (T).

33 Para 18.

34 *Hichange Investments (Pty) Ltd v Cape Produce Co (Pty) Ltd t/a Pelts Products* 2004 (2) SA 393 (E), 415.

35 Glazewski (2000), p. 86.

affects human security violates every person's right to an environment that is not harmful to their well-being.

Lawyers can draw lessons from the conceptualisation of the term 'well-being' by social scientists. McGregor, for instance, defines the phrase as 'a state of being with others, where human needs are met, where one can act meaningfully to pursue one's goals, and where one enjoys a satisfactory quality of life'.³⁶ This approach portrays 'well-being' as involving the idea of physical, economic, social, emotional and cultural aspects of human life. Doyal and Gough posit that harm or ill-being (the antithesis of well-being) is a result of the failure to meet basic needs.³⁷ According to McGregor, they conceptualise that:

*health and autonomy as the two basic dimensions of human needs that are required to permit effective participation in society and through that avoid harm... These basic needs are seen as foundations of any notion of well-being... [but] we are immediately encouraged to think of well-being beyond its material dimensions. The recognition of the importance of mental health for participation invites us to consider cognitive processes as an important area for consideration. The concept of autonomy encourages us to consider both relational and cognitive dimensions of well-being. It draws our attention not only to the relationships that people have, but also, in cognitive terms, to take account of how people perceive their ability to participate in society.*³⁸

Health needs are predominantly physical in nature and constitute the core requirements for individuals not only to stay alive, but to possess physical health or well-being.³⁹ Human beings cannot survive without food and water, two key needs that are substantially negatively affected by climate change. Similarly, every person should avoid situations that may expose them to physical harm (injury or death), including contracting diseases. Climate change negatively impacts food security and may lead to the rise of nutrition-related diseases, thereby affecting the well-being of hundreds of millions across the globe. Autonomous needs revolve around the individual's ability to make informed choices to achieve the goals they have set for themselves. For humans to achieve this, they should possess cognitive skills, mental health and opportunities to engage in social

36 McGregor (2008).

37 See also Doyal and Gough (1991).

38 McGregor (2004), pp. 337, 344.

39 Doyal and Gough (1991), pp. 56-59.

participation.⁴⁰ For humans to lead healthy and rationally autonomous and fulfilling lives, the following universal satisfier characteristics must be met:

- Adequate nutritional food and water;
- Adequate protective housing;
- Non-hazardous work environment;
- Non-hazardous physical environment;
- Appropriate health care;
- Security in childhood;
- Significant primary relationships with others;
- Physical security;
- Economic security;
- Safe birth control and child rearing; and
- Appropriate basic and cross-cultural education.⁴¹

Climate change directly and indirectly affects all the universal satisfier characteristics stipulated above and, therefore, has implications for the enjoyment of human well-being in its broad sense. Climate change impoverishes communities and poverty is essentially the absence of well-being. Eradicating poverty entails satisfying the requirements of what McGregor and Sumner term '3-D well-being'. This notion entails the interaction between three dimensions of human well-being: the material, the relational and the subjective or perceptual.⁴² Whereas traditional conceptualisations of poverty and well-being focus on material deprivation, there is a strong movement towards an emphasis on the role of relationships and subjective experiences in shaping an individual's immediate environment, health and well-being. To generate or give meaning to legal or policy interventions, which combat climate change and support individual or collective welfare, the state must take measures to promote all three dimensions of well-being. These several dimensions of well-being will be addressed by the realisation of other rights in the Constitution, which include the rights to freedom from slavery, servitude⁴³

40 Ibid., 59-69.

41 Ibid., Chapter 10.

42 McGregor and Sumner (2010), p. 104.

43 Section 54 of the Constitution.

and forced labour;⁴⁴ housing; health care;⁴⁵ food and water;⁴⁶ children's rights;⁴⁷ education;⁴⁸ equality⁴⁹ and human dignity.⁵⁰

3.1.2 The right to have the environment protected for the benefit of present and future generations

Section 73(1)(b) of the Constitution protects every person's right to have the environment protected for the benefit of present and future generations. This provision acknowledges that as a developing country, Zimbabwe needs to meet the demands of social transformation and economic growth whilst simultaneously expediting its ability to compete in regional and global markets. As such, the Constitution recognises that the country will inevitably embark on developmental programmes to improve its capacity to meet the needs of present and future generations. The individual right to a satisfactory environment cannot be severed from the collective or individual right to economic development.⁵¹ To this end, the Constitution requires the state to create an environment of harmony between the current generation's right of access to economic opportunities and the competing interests of future generations to earn a living from natural resources. From the perspective of Sustainable Development Goals (SDGs), the country should strive to create an environment that eradicates poverty and hunger whilst at the same time ensuring environmental sustainability.⁵² Accordingly, programmes targeted at promoting social, economic and human development ought to take place in an environmentally sustainable fashion.

More importantly, the concept of sustainable development has both substantive and procedural dimensions. From a substantive point of view, sustainability implies that developmental projects should not lightly disregard environmental concerns and the legislature may provide for

44 Section 55 of the Constitution.

45 Section 76 of the Constitution.

46 Section 77 of the Constitution.

47 Section 81 of the Constitution.

48 Section 75 of the Constitution.

49 Section 56 of the Constitution.

50 Section 51 of the Constitution..

51 Ksentini (1995), p. 97.

52 See generally the SDGs goals on poverty, hunger, good health and well-being; clean water and sanitation; affordable and clean energy; decent work and economic growth; reduced inequalities, and sustainable cities and communities.

Environmental Impact Assessments (EIAs) for all such projects. This will not only improve the operational effectiveness of the Environmental Management Agency (EMA), but also contribute towards the prevention and mitigation of climate-change-driven violations of human rights. The centrality of EIAs in preventing damage to the environment or loss of livelihoods is discussed in detail below. The procedural dimension of sustainable development is linked to participation in environmental decision-making and to the right of access to information.⁵³

The inclusion of the general public in development-related and environmental-justice issues will ensure that they understand the benefits and risks of various economic activities; empower communities to meaningfully contribute to the formulation and implementation of climate change and human rights policies; and ensure that everyone owns the process and outcomes of the climate change and human rights debate. With an informed public, it is relatively easy to implement climate change risk management and adaptation strategies for the benefit of present and future generations. In the context of the right to have the environment protected, the main challenge arises from the need to ensure economic development with concurrent ecological conservation. This is because activities that promote the former often cause environmental degradation and, therefore, contribute to climate change.

3.2 Nature and Scope of States Parties' Obligations

3.2.1 The duty to respect the right to a clean environment

Most of the rights in the Constitution, including environmental rights, generate duties to respect, protect and promote such rights.⁵⁴ The environmental right imposes on state and non-state actors the duty to respect (not to disturb) citizens' enjoyment of this right. The duty to respect is implied by the fact that the Constitution couches the right as a negative right to have an environment that is *not* harmful to their health or well-being.

3.2.2 The duty to adopt measures that prevent pollution and ecological degradation

To ensure that every person's right to have the environment protected for the benefit of present and future generations, the Constitution requires

53 Ksentini (1995), p. 98.

54 See s 44 of the Constitution.

the state, and private persons, to adopt reasonable legislative and other measures that prevent pollution and ecological degradation.⁵⁵

A. Measures that prevent pollution

In the context of pollution, the primary solution to climate change is to require state and non-state actors to ensure a sharp decrease of GHG emissions at national and international levels. Given that the path to economic growth and prosperity has, until now, primarily been based on carbon intensive industrialisation, a global freeze on technologies that produce these emissions perpetuates vast wealth disparities between groups in different regions. Nonetheless, air, water and land pollution remain one of the enduring threats to human health and life. To limit the climate change impacts of pollution in all its forms, the Constitution binds the state to adopt measures that prevent pollution and foster environmentally friendly economic development.

In Zimbabwe, extensive reliance on fossil fuels, particularly coal, poses threats to public health and is a massive contributor to climate change. Recently, the government announced the expansion of the Hwange thermal power station to an over 1500 megawatt (MW) energy generation facility.⁵⁶ This coal-powered expansion project is expected to feed an additional 600MW into the national grid, thereby raising the Power Station's installed capacity to 1520MW from the current 920MW.⁵⁷ Zimbabwe's coal reserves are estimated at about 10.6 to 26 billion tonnes in situ in 21 deposits, of which 2 billion tonnes are considered mineable by open cast methods.⁵⁸ To date, only 3 million tonnes per year are used to generate power at Hwange Power Station and the small power plants in Bulawayo, Harare, and Munyati. Hwange Power Station is the main producer of thermal power, and consumes about 2.5 million tonnes of coal per year.⁵⁹

From a climate change and human rights perspective, it is encouraging to note that Hwange power station is expected to use 12,000 tonnes of limestone per month in its operations. On the positive side, the use of limestone captures SO₂, reduces GHG emissions by the plant and

55 Section 73(1)(b) of the Constitution.

56 'Hwange power station expansion contractor on site', *The Chronicle*, 1 May 2018.

57 'ED commissions \$1,5bn project: Expansion to feed 600MW into national grid', *The Herald*, 28 June 2018.

58 AfDB (2011).

59 GoZ (2012), p. 124.

mitigates the outbreak of diseases among people living in the surrounding communities. Yet, large-scale mining and use of limestone also causes environmental hazards such as alteration of streams and rivers when mines pump excess water from limestone quarries into downstream natural channels. This severely raises the stakes of flooding and of any pollutants or changes in water quality affecting surface water. Whilst some of the health-related challenges arising from coal-powered electricity generation can be partly addressed by the use of flue gas clearing facilities, the country's plans to expand its reliance on coal may negatively affect the achievement of its nationally determined contribution of 33 per cent per capita below the projected 'business as usual' scenario by 2030. Whilst Zimbabwe's fleet of thermal power stations is relatively small⁶⁰ within the region, the question we should ask is whether we should continue following an environmentally unfriendly path to economic development when other less harmful alternatives such as renewable energy are available.

Places where different manufacturing and petro-chemical processing industries are located often constitute the toxic hub of carbon reliant economies and have serious implications as the noxious pollution generated by emissions causes devastating impacts on human health and the environment, especially when communities live alongside industries that generate significant portions of carbon and sulphur dioxide. Even in areas that are further away from heavy industries, 'prevailing winds carry soot and occasional spray from [oil] refineries' and other industries.⁶¹

In South Africa, the prevalence of asthma and respiratory infection symptoms have been strongly linked to high concentrations of air pollution. In the year 2000, empirical research demonstrated that eleven

*stationary point sources (i.e. factories) were responsible for approximately 90 per cent of the total sulphur dioxide emissions for the South Durban Basin per year, with Sapref and Engen (the two major oil refineries) alone contributing more than 65 per cent. These measures were based on the amount of reported daily fuel consumption reported by each company.*⁶²

Toxic emissions into the air and water are a daily cumulative threat to

60 Zimbabwe has four thermal power stations which are located in Hwange, Bulawayo, Harare and Munyati with an operational capacity of 1,190 40,000 megawatts. Comparatively, South Africa has about 18 thermal power stations with an operational capacity of just over 40,000 megawatts.

61 Dugard and Alcaro (2013), pp. 191, 197.

62 Cairncross (2000).

the health, lives and livelihoods of people who work or live in affected areas, with pollution creating the most pervasive harm.⁶³ This leads to high rates of respiratory illnesses and cancers affecting individuals and entire communities.

International research findings have established that childhood asthma disproportionately affects children born into poverty-stricken families and residing in urban centres, many of whom often belong to non-white racial groups.⁶⁴ This challenge is attributable to the residential areas for African ethnic groups, which are often located close to high traffic densities and industry, thus increasing the potential for respiratory infections, such as asthma, emanating from vehicle fumes.⁶⁵ The links that exist between air pollution and breathing problems suggests that human exposure to air pollutants emitted from vehicles, refineries, mills and factories endangers public health. In response to this tragedy, the state should adopt measures that substantially limit air pollution and effectively prevent the rise or spread of respiratory and other related infections.

Section 36E of the Income Tax Act [Chapter 23:06] provides for payment of carbon tax by a visitor to Zimbabwe who uses a motor vehicle registered outside the country on the basis of engine capacity. Section 36H of the Act also requires an oil company or other person or entity engaged in oil procurement or wishing to use the petroleum product for their own consumption or import any petroleum product to pay carbon tax. The petroleum importers' levy is levied upon every petroleum importer who transports petroleum products by road and is paid at any designated port of entry into Zimbabwe. The Customs and Excise Act [Chapter 23:02] provides for the imposition, collection and management of customs, excise and other duties. The Act provides for customs duty charged on imported fuel (diesel and unleaded petrol). It also provides for special excise duty to be charged on the value of second-hand motor vehicles sold, transferred or otherwise disposed of to any person in Zimbabwe. It also provides for surtax on second-hand light passenger motor vehicles. Surtax is charged on imported second-hand light vehicles that are more than five years old.

It is submitted that major standards in existence in Zimbabwe relate to vehicle emission standards, and fuel quality standards. The former are

63 Robins et al. (2005).

64 Van Bever et al. (2002); see also WHO (1993).

65 Lewis et al. (2005).

established in the form of maximum permissible discharge for a particular compound and mainly designed to curb localised pollution from mobile sources including motor vehicles. They are not necessarily intended to measure and regulate GHG emissions from such vehicles. The fuel quality standards that exist are intended to ensure fuel safety for the benefit of consumers (efficacy). There are wide-ranging fiscal measures that are established under different laws and regulations across all the sectors, that is the environment, energy, tax, and transport. These include carbon tax (environment), fuel price stabilisation levy (energy), the National Oil Company of Zimbabwe's debt redemption levy, strategic reserve levy, petroleum importers levy, customs duty, surtax on imported second-hand vehicles and road levy.

There are a few legislative provisions that support new technologies. These include a mandatory use of ethanol in blending unleaded petrol and the adoption of diesel 50 down from diesel 500. There is, however, no equivalent regulation on diesel. The EMA makes provision for the adoption of best practical technology to control pollutants during emission processes. However, there is need for such measures to be taken or implemented in order for the country to utilise new technologies for purposes of addressing vehicle fuel economy and GHG emissions matters. On the whole, the legislative provisions governing air pollution are fragmented and sector specific, with no clear focus on reducing GHG emissions.

To prevent pollution, there is dire need for Zimbabwe to design and implement energy policies that promote the use of alternative renewable energy sources ahead of non-renewable fossil fuels. Taking the path of the former is not only good for the health of the global poor, but also helps states to achieve their GHG reductions commitments. Zimbabwe's Nationally Determined Contribution (NDC) provides for reducing carbon emissions by 33 per cent per capita below the projected business as usual scenario by 2030. For this commitment to be achieved, it is imperative for the state to adopt policies that promote the use of alternative renewable energy.

B. Measures that prevent ecological degradation

Environmental degradation occurs when past and present generations use up or damage natural resources faster than nature can restore them, such that few, if any, of those resources remain for the next generation.

There is, therefore, an inherent link between the duty to prevent ecological degradation and the right to have an environment that benefits current and future generations. Environmental degradation impacts include:

- deforestation, causing soil degradation and threatening agricultural livelihoods,
- building of dams or diverting rivers upstream causing water shortages and increased workloads to collect water,
- destruction of coastal protection such as mangroves, leading to exposure to storm damage, water logging of soils, and relocation of communities,
- the depletion of ground water resources through the use of ever-deepening boreholes and the absence of restrictions on their use.
- smoke and air pollution from factories using chemicals causing increased ill health, and
- increased poverty and vulnerability as a result of all of the above.⁶⁶
- Natural disasters such as floods, droughts, storm surges, and others are affecting more people than before and are generating increased environmental damage globally, even though reported fatalities appear to be on the decline.⁶⁷ This can be explained by improved recording of natural disasters and their impact; increased disaster preparedness due to technological advancement; increased exposure of the population to hazards, and environmental degradation processes such as climate change. This leads to the degradation or unsustainable use of ecosystems, thereby negatively affecting poor resource-dependent communities. In 2005, the Millennium Ecosystem Assessment observed that two billion people living in arid, semi-arid and sub-humid regions are extremely vulnerable to the loss of ecosystem services, such as water supply. It specifically noted that:
 - Ten to twenty per cent of drylands are already degraded (there is, however, uncertainty in the measurement of the extent of desertification).

⁶⁶ Wiggins and Wiggins (2009), p. 4.

⁶⁷ CRED (2008).

- Pressure is increasing on dry land ecosystems for providing services such as food, and water for humans, livestock, irrigation, and sanitation.
- Climate change is likely to increase water scarcity in regions that are already under water stress as they accommodate close to a third of the world population but harbour only 8 per cent of global renewable freshwater resources.
- Droughts are becoming more frequent and their continuous reoccurrence can overcome the coping mechanisms of communities.⁶⁸

Regarding the last point above, a major problem arises when coping mechanisms are exhausted by the extended duration of resource scarcity. When adaptation strategies of communities are overwhelmed by the loss of ecosystem services, droughts and loss of land productivity can become important factors triggering the movement of people from drylands to other areas. Afforestation, reforestation, environmental impact and human rights assessments, climate smart agriculture, monitoring business activities by large companies, the use of renewable energy sources are just some of the ways in which the state can prevent ecological degradation. The success of these mechanisms largely turns on political will and the fiscal resources committed towards achieving their implementation.

3.2.3 The duty to adopt measures that promote conservation

Environmental conservation is an umbrella term that refers to anything done for the protection of the planet, in order to conserve its natural resources so that every living thing can have an improved quality of life. In Zimbabwe, the law recognises the promotion of conservation in s 73(1)(a)(ii) of the Constitution which states that every person has the right to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that promote conservation i.e. environmental conservation is a human right which the government is bound to promote.

There are multiple ways by which the state can promote the conservation of natural resources. First, promoting afforestation and reforestation can replenish what has been destroyed by giving back to the earth. Countless acres of valuable trees have been lost to deforestation. This contributes to

68 Millennium Ecosystem Assessment (2005).

climate change by removing sinks and reservoirs. Planting trees enables the restoration of natural habitats for wildlife, food resources and medicinal properties that only trees can provide. There is also protection of soil from erosion through reforestation as trees hold the soil together. Trees are also a source of oxygen, an essential ingredient of human life, and they must be planted in abundance even where there were no forests at all, as they also protect humans from the negative impact of carbon dioxide emissions. Thus, the government can embark on more afforestation and reforestation programmes as a way of promoting conservation.

Conservation can also be achieved by embracing alternative energy sources. Across the entire country, Zimbabweans use firewood for domestic energy needs, thereby causing alarming levels of deforestation and the gradual collapse of ecosystems. In order to manage the situation, the government can promote the use of solar energy and wind power (see Chapter 10) that are better renewable energy options as they can be easily replenished. Promoting the use of renewable energy sources which do not pollute the environment is a better strategy for ensuring environmental conservation.

The government can also help conserve the environment by implementing land zoning policies. This entails having specific land use zones for, for example, mining, settlement, industry, and forestry. This prevents struggles over land use and limits the overuse of specific land portions. Land zoning ensures that, for example, mining activities, which produce hazardous wastes and substances harmful to people's health and life, are not located adjacent to residential areas. In *Zimbabwe Environmental Law Association & Others v Anjin Investments (Private) Limited & Others*,⁶⁹ the court underlined that inter-mixing mining and settlement areas can cause problems as the former produces chemical residues, iron and raw sewage, waste products that are harmful to human health.

The key land-use categories in Zimbabwe are agricultural, rangelands, conservancies and various forms of settlement – rural, mining, and urban. Land-use change is a driver of environmental and climate change in Zimbabwe especially through the expansion of agriculture; and economic and technological development.⁷⁰ The increase in population in the communal areas has led to the destruction and degradation of forests as a

69 *Zimbabwe Environmental Law Association & Others v Anjin Investments (Private) Limited & Others* (HC 9451/12) [2015] ZWHHC 523.

70 GoZ (2014), p. 23.

result of their clearance for agriculture and firewood. These changes expose such areas to different effects of climate change. In 2000, the government introduced a new policy, the Rural Land (Farm Sizes) Regulations Statutory Instrument 288. This set the parameters for subdividing rural land for distribution under the land reform programme. The regulations set maximum farm sizes for each of the country's agro-ecological regions across A1 and A2 farms. This led to the division of farms into small-medium- and large-scale commercial farms and had implications on the type of land-use that such plots could support; in consequence, however, more land was cleared for agriculture, thus increasing the pollution of the environment.

There are also concerns arising from the accelerated clearance of woodlands for purposes of making timber. In fact, it has been noted that Zimbabwe will most likely be importing timber by 2030 and timber has been added to a list of commodities that are in short supply in the country.⁷¹ In May 2019, the Forestry Commission's spokesperson was quoted as saying this country loses about 330,000 hectares of forests annually and that forest and woodland resources now cover a paltry 45% of the country's land area, down from 53% in the year 2014.⁷² As observed by the spokesperson, '[a]lready this points to major deforestation⁷³ and significantly contributes to climate change through the release of carbon dioxide.

3.2.4 The duty to adopt measures that secure ecologically sustainable development and use of natural resources

A state's duty to adopt measures to secure ecologically sustainable development grounds every citizen's right, not only in a fair share of the natural resources, but also to demand that the state ensure that present generations do not use the resources to the detriment of future generations. In developing countries, most debates relating to climate change mitigation and human rights arise in the context of the state's duty to adopt measures that 'secure ecologically sustainable development and use of natural resources while promoting economic and social development'. Developing countries have sought to invoke the principle of Common but

71 'As Zimbabwe's forests fall, timber shortage tightens screws on carpenters', *The Zimbabwean*, 21 May 2019.

72 Ibid.

73 Ibid.

Differentiated Responsibilities and Respective Capabilities by contending that, historically, the main contributors to climate change were developed countries and that if, for instance, they were to be required to comply with mandatory emissions reduction targets, their economic growth would be undermined.⁷⁴

During negotiations leading to the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, developing countries negotiated for a treaty that would take account of three fundamental distinctions between wealthier and poorer countries. These included historical (and current) responsibility for climate change; differing likely impacts of climate change, (estimated to be far greater in poorer than richer countries); and differing capacities to deal with the problems resulting from climate change and develop non-carbon- intensive energy technologies.⁷⁵ These equity-based claims were inserted into the UNFCCC acknowledging, in principle, the validity of different justice claims made by the developing countries, which were only peripherally responsible for global warming and climate change in the past.

At a domestic level, the Constitution provides for substantive equality and sustainable development in that it recognises that it is important for the state to promote economic development for the benefit of especially poor citizens, but that this noble aim has to be counterbalanced with the need to avoid environmental degradation, climate change and related violations of human rights. The duty to adopt measures that secure ecologically sustainable development and use of natural resources requires the state to limit the human rights impacts of climate change and to mitigate the harm emanating therefrom. This is because if the equilibrium between economic development and ecological conservation is well maintained across the entire globe, there will be fewer significant climate harms and the populace will have an environment that is not detrimental to their health and well-being.

4 Combating Climate Change Driven Violations of Human Rights

This section explains the role of different mechanisms and institutions in ensuring climate change adaptation and mitigation as well as protecting and promoting fundamental human rights and freedoms. Some of the

⁷⁴ Bodansky (2010), p. 230.

⁷⁵ ICHR (2008), p. 59.

institutions and mechanisms include EMA, independent commissions, civil society organisations, constitutional litigation for human rights violations and the horizontal application of human rights obligations to non-state actors that emit substantial greenhouse gases into the atmosphere.

4.1 Independent Commissions

Generally, National Human Rights Institutions such as the Zimbabwe Human Rights Commission (ZHRC) are mandated to protect and promote human rights, including environmental rights. In terms of s 243(1)(b) of the Constitution, the ZHRC is mandated ‘to promote the protection, development and attainment of human rights and freedoms’. The protection and realisation of environmental rights falls under this mandate, although National Human Rights Institutions (NHRIs) usually continue to be inundated with cases involving classical rights such as civil, political, social, economic and cultural rights. In light of the constitutional provisions governing the ZHRC’s mandate, it is argued that the ZHRC should be more open to emerging human rights issues such as business and human rights, sustainable development goals and climate change.

Given their broad mandate, NHRIs can perform a pivotal role in the implementation of the Paris Agreement and 2030 Agenda for sustainable development. After the adoption of sustainable development goals (SDGs) in September 2015, NHRIs met in Mexico to discuss how they can contribute to the international commitment ‘to leave no one behind’. This meeting culminated in the adoption of the Merida Declaration, which outlines the multiple roles that NHRIs can play in monitoring the implementation of SDGs, while discharging their protective and promotional mandate. For purposes of this chapter, it is important to note that Agenda 2030 introduces a strong convergence between SDGs and human rights and includes the fight against climate change, by urging states to ‘take immediate action against climate change and its impact’.⁷⁶ In its 2015 resolution on National Human Rights Institutions, the General Assembly of the United Nations acknowledged the role of NHRIs to contribute towards the goals of the 2030 Agenda for Sustainable Development, including the high-level political forum on sustainable development.⁷⁷

In terms of reporting on climate change violations, NHRIs can use the

⁷⁶ See Goal 13 of Agenda 2030.

⁷⁷ UN Secretary-General (2017), para. 16.

various different reports they are mandated to develop to influence legal reforms related to climate change.⁷⁸ In its annual or issue-specific reports which assess the national human rights situation, the ZHRC can report on the human rights impacts of climate change. These reports are sometimes submitted to Parliament and therefore can influence bills and even existing laws. NHRI's can also lead advocacy efforts with the parliamentary groups or issue recommendations to change laws that are harmful to the environment.⁷⁹ In addition, there are other reporting avenues that the ZHRC can explore to lobby changes in environment-related laws or public policies. These avenues include parallel reports that the ZHRC submits to treaty bodies or the other mechanisms of the Human Rights Council, such as the Universal Periodic Review or the special procedures mandate holders. Recommendations given by the Working Group to States to protect environmental rights can be reflected in the outcome of these mechanisms and influence law or policy reform.

With regards to complaints handling, the ZHRC is authorised 'to receive and consider complaints from the public and to take such action... as the Commission considers appropriate'.⁸⁰ This means that the ZHRC can handle complaints about climate change leading to violations of various fundamental rights and freedoms, including the right to an environment that is not harmful to human health and well-being. In the Philippines, typhoon survivors submitted in 2015 a complaint to the NHRI-Philippines on the responsibility of fossil fuel companies for climate change leading to human rights violations. They were seeking redress from an NHRI with a quasi-judicial mandate. By the same token, the ZHRC and other independent Chapter 12 institutions can entertain and handle complaints alleging that certain actions of state and non-state actors infringe upon any of the fundamental rights and freedoms protected in the Constitution.

There is an overlap between the ZHRC's mandate to handle and investigate complaints by members of the general public. The ZHRC has an obligation 'to investigate the conduct of any authority or person, where it is alleged that any of the human rights and freedoms set out in the Declaration of Rights has been violated by that authority or person'.⁸¹ More importantly, it is encouraging to note the ZHRC has done well on the

78 Ramli (2016).

79 Ibid.

80 Section 243(1)(d) of the Constitution.

81 Section 243(1)(f) of the Constitution.

investigations front as it had produced ten reports at the time of writing. These include, Investigative Report on Headlands Evictions (Manicaland, 2018)⁸²; Investigative Report on Maganga Estate Evictions (Mashonaland East Province, 2018);⁸³ Investigative Report on Arbitrary Evictions (Mashonaland Central, 2017)⁸⁴ and Investigative Report on Violations of Environmental and Health Rights (Midlands, 2017).⁸⁵ These reports have implications for the enjoyment of the right to an environment that is not harmful to the health or well-being of the human person.

The Report on Violations of Environmental and Health Rights arose from allegations that the respondent's business activities in the Mazvihwa community violated a number of human rights. In *Mazvihwa Community v Murowa Diamonds (Pvt) Ltd*,⁸⁶ the complainants were community members residing near Murowa Diamond Mine under Chief Mazvihwa in Zvishavane. They alleged that as a result of mining activities, Murowa Diamond Mine had been polluting the environment in the community and violating the residents' right to health due to mine blasts that produce excessive dust that adversely affects the health and well-being of the general public. In its report, the ZHRC observed that Murowa Diamond mine was impacting on the environmental rights of residents of Mazvihwa community in a manner that contravened the United Nations Guiding Principles on Business and Human Rights (UNGPs). Given that they were negatively affected by the mining activities of Murowa Diamonds, all residents of Mazvihwa had the right of access to a remedy in terms of the UNGPs. Further, the ZHRC emphasised that the right to a remedy and many other rights such as environmental and health related rights are inalienable and cannot be taken away by either the state or business corporates.⁸⁷ The ZHRC observed that

[t]he UNGPs on Businesses and Human Rights make it clear that all companies everywhere have a responsibility to respect human rights, which

82 Available at <http://www.zhrc.org.zw/download/investigative-report-on-headlands-evictions-manicaland-2018/>

83 Available at <http://www.zhrc.org.zw/download/investigative-report-on-maganga-estate-evictions-mashonaland-east-province-2018/>.

84 Available at <http://www.zhrc.org.zw/download/2017-mazowe-arnold-farm-report/>.

85 Available at <http://www.zhrc.org.zw/download/mazvihwa-community-v-murowa-diamonds/>

86 FILE REF ZHRC/CI/0149/16.

87 See para 6.3.5 of the Report.

entails avoiding having negative impacts on human rights and to address such impacts where they do occur. In this case, Murowa has a responsibility to mitigate the impacts of blasting and excessive dust emissions which negatively affect the health and wellbeing of the complainants. More so, as a way of ensuring effective remedy, the mine has a responsibility of rehabilitating the damaged houses or consider relocating the victims to safe locations.⁸⁸

In addition, ZHRC found that the dust produced by the blasting results in temporary clouding of the surrounding area and pollution of surrounding water bodies.⁸⁹ The dust was found to be smelly and to cause coughing if one continuously inhales it.⁹⁰ In its recommendations, ZHRC encouraged the Murowa Diamonds Mining to facilitate the relocation of affected community members to areas that are fit for human habitation far away from the mine blasts.⁹¹ The relocated people should be provided with safe accommodation. This was an important step because blasting and dust levels had an impact on the well-being of the community members who were constantly exposed to the dust and noise pollution.⁹²

Finally, ZHRC can partner other commissions, CSOs, independent research centres and other agencies of government in delivering human rights and climate change education, as one of its obligations is ‘to promote awareness of and respect for human rights and freedoms at all levels of society’.⁹³ By working with different actors, ZHRC can learn from their experiences and reinforce their capacities to generate knowledge about the impact of climate change on human rights. In addition, working closely with non-state actors enables ZHRC to monitor the implementation of measures that mitigate climate change and its impacts.

4.2 The Environmental Management Agency

If equipped with the necessary functional autonomy and adequate fiscal resources for the implementation of its institutional mandate, the Environmental Management Agency (the Agency) can perform a pivotal function in combating climate change and its impact on the enjoyment of human rights, as it has a broad legislative mandate to protect the

88 See para 6.3.6 of the Report.

89 Para 7.4 of the Report.

90 Para 7.5 of the Report.

91 Para 8.4 of the Report.

92 Ibid.

93 Section 243(1)(a) of the Constitution.

environment from excessive exploitation by states and corporations. In terms of the Environmental Management Act (EMA), the Agency is bound to ‘assist and participate in *any matter* pertaining to the management of the environment’.⁹⁴ This entails the duty to ensure public awareness of environmental issues and climate change through educational programmes.⁹⁵ The Agency’s duty to inform the public should be read together with every person’s constitutional right to information held by the state and, if the information is needed for the exercise of other rights, any private person. In 2016, for example, the Agency commemorated seven environmental observance days: World Wetlands Day, Africa Environment Day, National Fire week, World Day to Combat Desertification, World Environment Day, Clean-Up Zimbabwe Campaign, and the National Tree Planting Day. A total of 156 events were held countrywide, reaching out to 107,465 people, with information about sustainable wetland management, fire management, waste management and water pollution to various stakeholders.⁹⁶ These activities form an inherent part of the Agency’s annual calendar and result in a well-informed society with sound environmental management practices.

The Agency’s duty to participate in any matter pertaining to the management of the environments includes a variety of sub-duties i.e. it is legally required to regulate and monitor the collection, disposal, treatment and recycling of waste; to regulate and monitor the discharge or emission of any pollutant or hazardous substance; and to regulate and monitor the management and utilisation of ecologically fragile ecosystems.⁹⁷ These duties enable the Agency to perform an important role in monitoring the impact of business activities on the environment and to limit the human rights impacts of the discharge of hazardous pollutants. In practice, the Agency has also encouraged the implementation of climate change mitigation, adaptation and development strategies such as the Small Grains Projects introduced in areas that are hard hit by drought.⁹⁸ However, there is a growing need for accurate and useful climate data to inform adaptation

94 Section 10 (1) (b) of the EMA.

95 GoZ (2014), p. ix.

96 See The Agency Annual Report (2016), p. 21.

97 See s 10(1)(b) of the Act.

98 The Agency has been implementing several Small Grain Projects across the country in areas such as Tsholotsho, Uzumba Maramba Pfungwe and Shurungwi. The aim of the Small Grain Project is to build drought resilient communities which are food secure.

strategies that can anticipate future climate.

Another of the Agency's functions is to regulate, monitor, review, and approve EIAs.⁹⁹ In terms of the Act, certain projects may not be implemented unless (a) the Director-General has issued a certificate in respect of the project; (b) an environmental impact assessment report has been produced; (c) the certificate issued by the Director-General remains valid; and (d) any conditions imposed by the Director-General with regards to the issue of the certificate are complied with.¹⁰⁰ The EMA clearly stipulates that it is an offence, punishable by the imposition of a fine or a prison term not exceeding five years or both, for any person to knowingly implement any project without carrying out an EIA.¹⁰¹ The Agency has the power to serve an order on any person who knowingly implements a project without carrying an EIA ordering that person (a) to mitigate the effects of any adverse environmental impact in the manner specified in the order; or (b) where it is not possible to mitigate any adverse environmental impact, to destroy any works undertaken in connection with the project.¹⁰² The EMA also bars any other authority from issuing licences to persons or entities intending to implement projects that require an EIA unless the person or entity has done such an EIA.¹⁰³

For purposes of this chapter, it is important to note that major business initiatives that require EIAs have far-reaching climate change and human rights impacts. The construction of large dams for purposes of irrigation or power generation; massive mining projects; the generation of energy from fossil fuels (especially coal and petroleum products) and many other initiatives fall into the category of projects that require EIAs before implementation. In fact, the EMA explicitly provides for an extensive list of projects for which EIAs are required.¹⁰⁴ It remains uncertain if the EIA requirements include

99 See s 10(1)(vi) of the EMA.

100 Section 97(1)(a)-(c) of the EMA.

101 Section 97(2) of the EMA.

102 Section 97(3) of the EMA.

103 Section 97(5) of the EMA.

104 Section 97 read with the First Schedule to the EMA lists several activities including the following relevant to this chapter: conversion of natural woodland to other use within the catchment area of reservoirs used for water supply, irrigation or hydropower generation; iron and steel smelters and plants; smelters other than iron and steel; petrochemical plants; cement plants; lime plants; agro-industries; pulp and paper mills; ... mining and quarrying activities such as mineral prospecting; mineral mining; ore processing and concentrating; quarrying; petroleum production, storage

a climate change impact assessment for the listed activities that concern use of fossil fuels. Courts in South Africa have held that a climate change assessment is a prerequisite for a coal-fired power plant.¹⁰⁵

The majority of the economic activities mentioned above significantly contribute to climate change and have serious negative implications for human rights. It is evident, from the long list referred to in the preceding paragraph, that almost every meaningful economic activity requires an EIA before implementation. This underlines the importance of an environment that is not harmful to human health and well-being. The contents of EIAs enable the Agency to analyse the likely impact of proposed projects on the environment; thereby protecting people living in affected communities from the adverse impact of business projects. This claim has support from the legislative provisions stipulating the contents of EIAs.

In terms of the EMA, EIAs should

- (a) give a detailed description of the project and the activities to be undertaken in implementing it;
- (b) state the reasons for selecting the proposed site of the project;
- (c) give a detailed description of the likely impact the project may have on the environment or any segment thereof, covering the direct, indirect, cumulative, short-term and long-term effects of the project;
- (d) specify the measures proposed for eliminating, reducing or mitigating any anticipated adverse effects the project may have on the environment, identifying ways of monitoring and managing the environmental effects of the project;
- (e) indicate whether the environment of any other country is likely to be affected by the project and any measures to be taken to minimise any damage to that environment;

and distribution such as oil and gas exploration and development, pipelines, oil and gas separation, processing, handling and storage facilities, oil refineries, power generation and transmission, thermal power stations, hydropower schemes, high-voltage transmission lines; ...waste treatment and disposal projects that include toxic and hazardous waste, incineration plants, recovery plants (offsite), wastewater treatment plants (off-site), landfill facilities, storage facilities (offsite).

105 *Earthlife Africa Johannesburg v Minister of Environmental Affairs and others* [2017] 2 All SA 519 (GP)

- (f) where applicable, indicate how the developer proposes to integrate biological diversity in the project;
- (g) describe concisely the methodology used by the developer to compile the environmental impact assessment report.¹⁰⁶

These requirements enable the Agency to make an informed cost-benefit analysis and, depending on the size of the project, its potential impact and proposed mitigatory measures, to bar persons or entities from implementing projects that are likely to negatively implicate both the environment and livelihoods. These requirements do not necessarily refer to human rights implications of business developments and EIAs are not necessarily designed to address the human rights impacts of projects that contribute to climate change. Nonetheless, the point remains that by protecting the environment from activities that contribute to climate change, the Agency also prevents possible climate-change driven violations of rights by business corporations.

Environmental Impact Assessments are a tool to implement the sustainable development duties that are imposed by the environmental rights clause entrenched in the Constitution. They are tools by which the state can prevent pollution and ecological degradation as well as promote conservation. By protecting the environment from activities that contribute to climate change, the Agency also prevents possible climate-change driven violations of rights by business corporations. In *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province and Others*,¹⁰⁷ the Constitutional Court of South Africa held that the environmental authorities' failure to comply with the requirement to consider, assess and evaluate the social and economic impact of the proposed construction of a filling station, including its cumulative effect on the environment, constituted a ground for the courts to invalidate the decision to approve of the proposed project.¹⁰⁸ In the view of the majority of the Court, the National Environmental Management Act (NEMA) required the environmental authorities to consider the impact of the proposed filling station on socio-economic conditions and thereafter to make a decision that

106 See s 99 of the EMA.

107 2007 (6) SA 4 (CC).

108 Para 90.

is appropriate in the light of such a consideration.¹⁰⁹ Given the authorities' failure to comply with a material and mandatory duty, the decision had to be reviewed in light of the applicable legislation.¹¹⁰ Ngcobo J, who penned the majority opinion, was at pains to emphasise that section 24(7)(b) of NEMA specifically requires environmental authorities to investigate the potential impact, including cumulative effects, of the proposed development on the environment and socio-economic conditions, and the assessment of the degree of that potential impact.¹¹¹

It is worth noting that the Court linked the regulatory duty to ensure the performance of satisfactory EIAs to the enjoyment of specific constitutional rights, particularly the promotion of sustainable development. To this end, they first insisted that the Constitution, NEMA and other pieces of environmental legislation do not protect existing developments at the expense of future developments. Accordingly, both section 24 of the South African Constitution and NEMA were designed to ensure that

*socio-economic development must be justifiable in light of the need to protect the environment. The Constitution and environmental legislation introduce a new criterion for considering future developments. Pure economic factors are no longer decisive. The need for development must now be determined by its impact on the environment, sustainable development and social and economic interests. The duty of environmental authorities is to integrate these factors into decision-making and make decisions that are informed by these considerations. This process requires a decision-maker to consider the impact of the proposed development on the environment and socio-economic conditions. Second, the objective of this exercise, as NEMA makes it plain, is both to identify and predict the actual or potential impact on socio-economic conditions and consider ways of minimising negative impact while maximising benefit. Were it to be otherwise, the earth would become a graveyard for commercially failed developments.*¹¹²

More importantly, however, the Constitutional Court observed that environmental legislation requires authorities to 'place people and their needs at the forefront of their concern so that environmental management

109 Para 89.

110 Paras 89-90.

111 Para 83.

112 Paras 79-80. See also para 77 of the same judgment.

can serve their developmental, cultural and social interests'.¹¹³ As such, the Constitution and NEMA elevated the concept of integrated environmental management which requires investors to balance, on the one hand, the actual and potential impact of proposed projects on the environment and socio-economic conditions in order to minimise negative impacts, on the other.¹¹⁴ As contemplated in the Environment Conservation Act,¹¹⁵ this meant that the environmental impact report would have to include "an estimation of the nature and extent of the effect of the activity... on [competing] social and economic interests".¹¹⁶ On the whole, EIAs can work, indirectly though, as tools for ensuring the protection and enjoyment of human rights in a manner that is socially, economically and environmentally sustainable.

4.3 A call for synergies between various state institutions, CSOs and IRCs

There is need for government departments and line ministries to ensure that the human rights impacts of climate change are adequately addressed for the benefit of victims, society and the state. To this end, it is important for the Ministries of Mines and Mining Development, Industry and Commerce, Energy and Power Development, Transport and Infrastructural Development, Lands, Agriculture, Water, Climate and Rural Resettlement, Justice, Legal and Parliamentary Affairs, and the Ministry of Finance establish multi-sectoral synergies targeted at combating both climate change and its potentially devastating effects on ecological degradation, agricultural productivity, and livelihoods.

It is beyond doubt that the mandate and activities of many of these ministries plus the areas monitored by these ministries disproportionately contribute to climate change.

It is thus essential for the ministries form of an inter-ministerial taskforce or any other equivalent body, to ensure the development of a comprehensive climate change strategy that addresses both human rights challenges and the need to ensure economic development in the country.

At the moment, government's approach to the climate change and human rights debate appears to be fragmented. For instance, the phrase

113 Para 75.

114 Para 77.

115 Act 73 of 1989.

116 See section 26(a) of ECA.

‘climate change’ was mentioned just twice in Zimbabwe’s National Report to the Human Rights Council during the second cycle of the Universal Periodic Review (UPR).¹¹⁷ Similarly, the phrase ‘human rights’ is mentioned just once in Zimbabwe’s Climate Change Response Strategy.¹¹⁸ This reveals not only capacity gaps among key government functionaries responsible for authoring the two documents, but also the lack of meaningful engagement and collaboration between the Ministry of Environment, Water and Climate and the Ministry of Justice, Legal and Parliamentary Affairs.

Whilst there is relative clarity of the mandates and roles of the different ministries, departments and entities responsible for climate change and human rights policy design and implementation, there appears to be insufficient co-ordination at the national, provincial and local levels. Government ministries and departments are often exclusively concerned with their own mandate and there is limited concern over the ‘global’ implications of certain activities on human rights. As such, there is need for state agencies to develop holistic national plans, policies and strategies on thematic areas linked to human rights and climate change. These policies and plans should strengthen co-ordination mechanisms and measures for protecting and promoting human rights generally and also the rights of marginalised groups.¹¹⁹ The government should design and implement an all-encompassing climate change policy that includes all aspects of human rights, and sets out a comprehensive and workable strategy for its application. The policy should then be supported by adequate human, technical and financial resources and should enhance the implementation and co-ordination of action plans relating to climate change and human rights. This approach will address the existing lack of an effective mechanism to ensure systematic implementation of international and domestic climate change and human rights instruments and commitments.¹²⁰

Finally, the creation of synergies and co-ordination should also take into account efforts by NGOs and Independent Research Centres (IRCs) doing work on climate change and human rights. Consistent interaction between government departments and IRCs enables the government

117 UN General Assembly (2016), paras 122 and 125.

118 GoZ (2014), p. 62.

119 CRC (2016), para. 10.

120 Ibid., para. 11.

to tap from the knowledge and resources of these organisations and to adopt evidence-based interventions on climate change and human rights. In addition, it enables NGOs and IRCs to identify research and skills gaps within the government; to commit resources towards capacity building or enhancement in key government ministries and to publish research materials that directly respond to the government's needs.

5. Conclusion

This chapter explored the way in which climate change affects the enjoyment of human rights, particularly the right to an environment that is not harmful to health or well-being. It has been argued that this right speaks to the underlying determinants of health such as food, water, clothing, bedding, housing and general living conditions of the human person. Against this background, the protection of the right to an environment that is not harmful to health or well-being is particularly important for groups that socio-economically marginalised and have to rely on the natural environment for basic necessities of life such as drinking water and food. The most vulnerable social groups are also the most sensitive to the effects of climate change. Among these groups are populations from developing countries; poor people living in any part of the world; indigenous people who depend on close contact with the earth to survive; children; women; persons with disabilities and the like. It is important for developing countries such as Zimbabwe to adopt climate change adaptation and mitigation strategies that directly respond to the needs of vulnerable groups.

The Constitution protects every person's right to have the environment protected for the benefit of present and future generations as part of the right to a clean environment. To this end, it acknowledges that Zimbabwe needs to meet the demands of social transformation and economic growth whilst simultaneously expediting its ability to compete in regional and global markets. The chapter argued that in the context of the right to have the environment protected for the benefit of present and future generations, the main challenge arises from the need to ensure economic development while at the same time ensuring ecological conservation. This is because activities that promote the former often have negative implications for the environment and gradually contribute to climate change.

This chapter also analysed the role of different mechanisms and

institutions in ensuring climate change adaptation and mitigation as well protecting or promoting fundamental human rights and freedoms. In terms of reporting on climate change violations, National Human Rights Institutions could use the different types of reports they are mandated to develop to influence legal reforms related to environmental issues. In its annual or issue-specific reports, the ZHRC can report on the human rights impacts of climate change. These reports are sometimes submitted to Parliament and can, therefore, influence bills or even existing laws. From a practical perspective, it is encouraging to note that the ZHRC has done well on the investigations front, even in the context of the right to an environment that is not harmful to health or well-being.

The Environmental Management Agency also plays an important role with regards to the issuance of EIAs for major business initiatives that have far-reaching climate change and human rights impacts. The construction of huge dams for purposes of irrigation or power generation; massive mining projects; the generation of energy from fossil fuels (especially coal and petroleum products) and many other initiatives fall into the category of projects that require EIAs before implementation. In fact, the Act explicitly provides for an extensive list of projects for which EIAs are required. Although human rights impact assessments can help the Agency to identify gaps that need to be filled before the commencement of works for major projects, EIAs can be used to achieve the same goals, especially if they are tailor made to include several legal issues.

This chapter also argued that there is need for government departments and line ministries to ensure that the human rights impacts of climate change are adequately addressed for the benefit of victims, society and the state. Such an approach establishes multi-sectoral synergies targeted at combating both climate change and its devastating effects on bio-ecological diversity, agricultural productivity, livelihoods and human rights. It has been shown that at the moment, government's approach to the climate change and human rights debate appears to be fragmented and lacking appropriate co-ordination. Inter-ministerial collaboration and the collaboration between the government, CSOs and NGOs specialising in climate change issues, ensures the development of comprehensive climate change response strategies that address both human rights challenges and the need to ensure economic development without causing climate change.

Regardless of the liberalisation of rules governing standing to allow

a wide range of climate change victims to approach the courts for relief, this chapter questioned the effectiveness rights-based claims in preventing climate change driven violations of rights and ensuring environmental justice. Litigation of harms resulting from climate change raises serious challenges for courts as man-made events that cause such harms emanate from numerous fragmented and unrelated acts that are performed by countless individuals or actors in multiple sectors and locations. Besides, it is difficult to establish a direct link or chain of causation between the exact physical or psychological harms that are experienced by climate change victims and all factors causing climate change. Similar challenges arise in attempts to hold large corporates accountable for human rights violations caused by pollution or the discharge of hazardous pollutants into rivers and other water sources.

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Climate Change, the Mining Industry and the Law in Zimbabwe

Darlington Chidarara

‘Only by mining with principles can the mining and metals industry contribute to sustainable development and protect the planet.’¹

1. Introduction

Following the disruption of the agricultural industry in Zimbabwe, the mining sector has emerged as a major axis for socio-economic development. Its rise and impact has been strongly felt since the year 2009.² Consequently, minerals are now not only deemed to be important, but they are also ‘critical’ to the economy as manifested by the upsurge in revenues from gold, platinum, palladium, diamonds, nickel, coal and chromite.³ However, the economic revival through mining has brought its own negative impacts, especially on the environment as broadly defined. This includes the contribution to climate change by enabling the extraction and consumption of resources that release greenhouse gas emissions.

There is little comprehensive research and debate on the links between climate change and mining especially in the Zimbabwean context. This chapter sheds light on these links and provides an overview of the

1 <https://www.icmm.com/>

complex challenges around the extractive industries in the context of climate change. The chapter proffers a Zimbabwean perspective on (1) the contribution of the mining sector to anthropogenic climate forcing; (2) the extent to which the Zimbabwean mining industry needs to develop strategies for climate change adaptation; and, (3) the extent to which Zimbabwe's legal, policy and institutional frameworks which exist, and have recently manifested as responses, attempt to solve the climate problem and meet the needs of the mining industry in dealing with climate change related issues. The climate challenge is a challenge that the mining industry and the nation must accept due to the implications it poses to economic growth not only in the mining industry but within other sectors of the Zimbabwean economy, hence the interrogation.

1.1. *The Politico-Economic Context*

Zimbabwe's new dispensation is popularly known for its 'Zimbabwe is open for business' mantra, crafted to attract foreign direct investment in the mining sector. To implement this objective, the government of Zimbabwe initiated the ease of doing business reforms in its first 100 days in office. Zimbabwe has also developed a draft policy for oil and gas extraction,⁴ with the aim of attracting investment in the extraction of coal and coal-bed methane in Hwange and Lupane districts. The Government of Zimbabwe (GoZ) also plans to further expand thermal power generation in addition to the recent expansions that have taken place at Hwange.⁵ This increase in coal extraction will incidentally increase greenhouse gas emissions (GHG). It is accepted that coal is among the major sources of such emissions.⁶ Under the United Nations Framework Convention on Climate Change (UNFCCC)⁷ and the Paris Agreement,⁸ Zimbabwe has committed to reducing its per capita GHG emissions by as much as 33% by 2030.⁹

Interestingly, Zimbabwe intends to expand coal production at a time when other countries and major investors and financial institutions are

4 The Zimbabwe Oil and Gas Industry Development Policy (2017).

5 'Hwange begins \$1bn draw-down', *Business Daily*, 1 June 2018.

6 Houghton (2009) p. 13; see also Hardy (2003), p. 20, and Grover (2004), pp. 12-13.

7 UNFCCC (2015).

8 *Ibid.*

9 GoZ (2015).

downscaling investments in coal.¹⁰ Despite the ‘grace’ period given to developing countries to continue with coal-driven investments, further coal extraction in Zimbabwe is going to lead to further loss of vegetation, acceleration of GHG emissions and negatively impact local communities. Furthermore, there is no guarantee that after such investment, Zimbabwe will be able to quickly move to cleaner sources of energy and facilitate a smooth and just transition into a low-carbon economy.

It is therefore important to emphasise that despite the contribution of the mining sector to national revenue, it is also responsible for massive environmental degradation. For instance, the extraction of mineral resources such as chrome in Zvishavane, coal in Hwange and granite rocks in Mutoko Districts has resulted in the destruction of large tracts of vegetation, and even of mountains, and the decimation of groundwater levels. In addition, the destruction of trees to pave way for mining reduces carbon sinks. Mining activities are also dependent on the use of heavy machinery. Most of the machinery used is diesel powered, yet diesel is a fuel that is known to produce high carbon emissions. Without any deliberate efforts by the mining industry and individual mining companies to address the effects of their activities on climate change, it is likely that host mining communities will bear the externalised costs of the industry.

The mining industry, particularly the operators, the investors and financiers must push for GHG reductions and adaptation plans in their countries of operation. Equally, host governments must encourage such action through legal, policy and institutional frameworks that regulate the mining industry. This may be difficult in developing countries like Zimbabwe, which are desperate for investment and trying to create an investor friendly environment. In addition, the national, provincial and/or local governments are aware that they will or may be reliant on the mining industry through collected revenues,¹¹ employment, up and downstream industries linkages, provision of infrastructure and social programmes.¹² Therefore, the state may be unwilling to impose radical measures aimed at moving towards a low-carbon economy.¹³ Developing countries are afraid that investors may move to regions with more lenient regulatory regimes.

10 ‘SA’s big banks pull out of funding new coal projects: Report’, *Business Tech*, 4 February 2019.

11 In the form of taxes and royalties.

12 Humby (2016), pp. 22-3.

13 Ibid.

Zimbabwe has legislated to balance different interests in order to regulate the mining industry over the past four decades. The important question thus becomes, how has, and how can the state regulate the mining industry in a manner that ensures maximum profits with minimum environmental impacts?

Given the heavy reliance on coal, the mining sector in Zimbabwe, like other developing countries, is intertwined with energy security. Zimbabwe is heavily reliant on coal for power generation, with most of it coming from the Hwange Thermal Power Station (920 MW) and other three other smaller coal-fired power stations whilst substantial power also comes from the Kariba Dam Hydroelectric Power Station (750 MW).¹⁴ As the need to go deeper in the earth to extract minerals increases, the mining industry will demand more and more water, produce more mine waste and consume more energy thereby increasing the industry's footprint. These need careful consideration and interrogation, particularly with regard to the environment and climate change. The law and regulation are key determinants of the industry's future trajectory.

2. Overview of Zimbabwe's Mining Industry

Mining in Zimbabwe makes the largest contribution to the economy and is the largest earner of foreign currency, contributing up to 50% of exports, although it employs only 5% of the country's workers.¹⁵ The Mines and Minerals Act (MMA)¹⁶ is the main legislation governing the mining industry in Zimbabwe. The MMA does not define the 'mining industry' in Zimbabwe. It does, however, recognise that Zimbabwe has a mining industry as it refers to it three times.¹⁷ The formal component of Zimbabwe's mining industry incorporates private, public and state-owned companies. Zimbabwe's Department of Mines and Mineral Resources simply states that Zimbabwe's mining industry is focussed on a diverse range of small- to medium-scale mining operations.¹⁸ It does not offer any further clarification.

14 See <https://www.africa-eu-renewables.org/market-information/zimbabwe/energy-sector/>.

15 Brazier (2015), p. 20.

16 The Mines and Minerals Act Chapter 21:05 was first adopted in 1961. It has been amended more than forty-five times since its entering into force. (herein after referred to as the MMA)

17 Sections 343 (c), 402 (1), 406 (1) of the MMA.

18 See <http://www.mines.gov.zw/>.

From 2000 to 2008, formal mining and its production declined rapidly due to the economic meltdown. By contrast, artisanal mining increased sharply during the same period as many people resorted to gold panning throughout the country and informal alluvial diamond mining in Marange to earn a living.¹⁹ Until now, artisanal mining has continued to grow despite its not being legally regulated. By October 2018, Zimbabwe had produced 30 tonnes of gold of which large-scale miners recorded 9,82 tonnes against 20,4 tonnes produced by artisanal miners.²⁰ The Mines and Minerals Amendment Bill (Mines Bill),²¹ a recent effort to amend the MMA, has at least attempted to outline the components of the mining industry in Zimbabwe. The Mines Bill defines ‘large-scale miner’ as

- (a) the lessee of a mining lease; or
- (b) the holder of a mining location whose output in any period of twelve months exceeds or is likely to exceed such amount as may be prescribed;²²

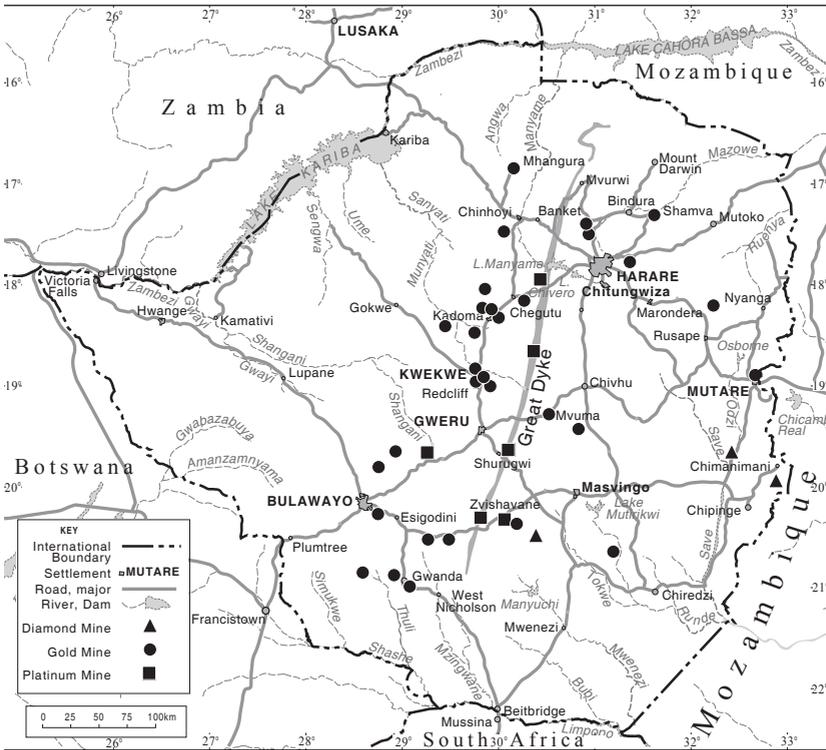
It further defines a ‘small-scale miner’ as a ‘holder of a mining location who is not a large-scale miner.’²³ These definitions attempt to define the main players in Zimbabwe’s mining industry, but they still fall short as they deny the current reality – that there are important players in the mining industry who are the artisanal small-scale miners.

In the context of climate change, the extraction of minerals whether by formally recognised or unrecognised players still emits GHGs, which contribute to the mining industry’s responsibility for climate change. It is, therefore, imperative that when we deliberate on the GHG emissions from the mining industry, we are cognisant of the GHGs produced by the artisanal small-scale miners. In essence, any reference to the ‘mining industry’ in Zimbabwe must be done with this important caveat in mind. In addition, we must look at the whole mineral production chain and actors involved at various points along the mineral beneficiation stage. It is against this background that for the sake of climate change in this chapter, we shall refer to the mining sector inclusive of the artisanal small-scale miner. Below is a map of the major mining sites in Zimbabwe.

22 257A of the MMAB.

23 Ibid.

Active Mining Sites in Zimbabwe²⁴



2.1 The Climate Footprint of Zimbabwe’s Mining Industry

Despite mining being a significant contributor to climate change, it is difficult to find disaggregated statistics covering the global mining sector as a whole i.e. both the formal and informal sectors.²⁵ The same goes for Zimbabwe’s mining sector. Mutasa, in Chapter 2, mentions that Zimbabwe’s overall GHG emissions are very small as they constitute about 0.062% of the global total with the major sources of Zimbabwe’s GHG emissions being energy (60.7%); agriculture (20.7%); waste (1.9%) and industry (16.6%).²⁶ According to Zimbabwe’s Third National Communication to the UNFCCC in 2006, the country was noted to be a net carbon sink.

However, the fact that Zimbabwe’s contribution is small does not

24 <https://worldview.stratfor.com/article/zimbabwes-mining-sector-moving-pro-business-direction>.

25 Humby (2016), pp. 22-4.

26 GoZ (2014), p. 42.

warrant complacency. Zimbabwe still needs to address the climate change problem. The impacts of global climate change will affect everyone despite their level of contribution hence, the need for every country to contribute to the reduction of GHG emissions. The National Climate Change Response Strategy clearly alludes to this in stating that, despite Zimbabwe contributing a mere 1.7 % to the total GHG emissions of the African continent, it is still important for future development planning to take cognisance of this low carbon footprint and to preserve it.²⁷

Most of the mining sector's GHGs are produced through energy consumption. Ironically, the mining industry produces fossil energy sources that further contributes to global CO₂ emissions.²⁸ Coal provides approximately 20% of the world's primary energy demand, contributing to global warming through direct emissions when burnt and through fugitive emissions released during the process of mining coal.²⁹ Zimbabwe's energy sector, following the global trend, is also heavily reliant on its coal resources at the Hwange Thermal Power Station.³⁰ This is also strongly emphasised by the Zimbabwe's National Climate Policy.³¹

Arguably, the mining sector consumes most of Zimbabwe's coal-based energy and shows the existence of a strong nexus between the mining sector and climate change. This justifies the need to regulate the mining sector as a way of tackling its significant contribution to greenhouse gas emissions, and consequently to global climate change.

2.2 Vulnerability of the Mining Industry to Climate Change: risks and opportunities

Mining activities, either underground or open cast, all contribute to climate change and are also vulnerable to its impacts.³² Relatively little knowledge exists on how climate change may impact mining operations and the extractives sector.³³ Although there are some efforts to recognise and address the mining industry's sensitivity to climatic changes, robust, evidence-based knowledge that explores the full range of causal

27 Ibid.

28 Rüttinger and Sharma (2016).

29 Ibid.

30 See <https://www.africa-eu-renewables.org/market-information/zimbabwe/energy-sector/>.

31 G.oZ (2016), p. 9.

32 Mtisi and Prowse (2012), p. 117.

33 Rüttinger and Sharma (2016), p.3.

relationships and links between the two remains limited.³⁴ However, it is a given that climate change will have both direct (operational and performance-based) and indirect (securing of supplies and rising energy costs) impacts on the mining sector.³⁵

The impacts of climate change on the mining sector may include, but are not limited to, water-related impacts (droughts, floods, cyclones and storms); heat-related impacts (bush fires and heat strokes) and, sea level rise.³⁶ A combination of these effects may jeopardise the sector's viability by denying the industry and its personnel a safe operating environment, both spatially (impacts felt across the immediate vicinity of the mining site and areas further downstream) as well as temporally (including, sporadic short-term and more permanent long-term changes).³⁷ This may also impact the communities in which mining is taking place. In Zimbabwe, most mining happens in marginalised rural areas hence, the need to understand the link so that the country can be better prepared to adapt to climate impacts on the mining industry especially to protect the most vulnerable groups of the society.

A number of incidents that link mining and climate change have already been reported. Rüttinger captures one Australian incident in the following description:

In the most recent flood event of 2010-11, several towns – both mining-intensive and larger service hubs – in and around Central Queensland were flooded, and it took a long time before normal services and mining operations could resume. In fact, the La Niña effect observed in 2010 was one of Australia's strongest since 1917 (Nicholls 2011), leading to 'flooding of historic proportions' (ABARES 2011). Almost 80 % of the entire state of Queensland – with more than 2.5 million people and several thousand kilometres of road and rail infrastructure – was declared flood-affected.

In February 2019, at Cricket Mine, Battlefields, Zimbabwe, it was reported that 23 artisanal miners died when interlinked shafts and tunnels at two mines were flooded after the collapse of a dam wall due to heavy rains in the area.³⁸ Arguments have been put forward blaming the artisanal miners for such disasters. Mtisi and others summarise the vicious cycle

34 Ibid.

35 Ibid. p. 2

36 Ibid.

37 Ibid.

38 '23 miners perish in shaft', *The Herald*, 14 February 2019.

linking poverty, droughts, climate change and informal mining as follows:

Small-scale miners pose a unique threat to the environment. They exploit mostly alluvial gold and have no capacity to mitigate environmental damage. In addition, small-scale miners lack the skills necessary for efficient mineral extraction and so achieve low yields. Small-scale miners are driven by limited opportunities elsewhere in the economy, such as limited jobs in agriculture due to droughts. The damage caused by small-scale mining methods threatens surface water resources and flooding is exacerbated by deforestation and the siltation of water courses.³⁹

It is submitted that, although some of the arguments advanced by Mtisi are correct, artisanal mining needs to be viewed with nuance as it has supported the economy when large mining operations were facing challenges. The risks mentioned by Mtisi may also be seen as opportunities: for example, addressing farmer–miner conflicts through exploring dewatering of mine shafts for irrigation purposes is but one suggestion.

The International Council on Mining and Metals (ICMM) also cites other reputational risks to the mining industry and its social licence to operate that may be permanent in nature.⁴⁰ Some examples of how climate change-induced (mis)management of mining impacts may exacerbate tensions with host communities include: tailings dam disintegration due to extreme flooding or sea level rise;⁴¹ competition (and in some cases, potential conflict) with host communities and local industries over access to limited reserves of water during or following a drought; heat and dust-related health stress among local residents,⁴² the decimation of forests, etc.

Also worthy of mention is that climate change can offer opportunities for the mining sector to reduce emissions and trade carbon credits on the international carbon market.⁴³ Such opportunities are recognised through Zimbabwe’s climate change legal and policy frameworks mainly through the Climate Change Response Strategy and the National Climate Policy. Mines that can install clean technology such as carbon capture and storage, and hold carbon credits issued by the government, can end up

39 Mtisi and Prowse (2012), p. 114.

40 ICMM Annual Report, 2013.

41 A tailings dam is typically an earth-fill embankment dam used to store byproducts of mining operations after separating the ore from the gangue. Tailings can be liquid, solid, or a slurry of fine particles, and are usually highly toxic and potentially radioactive.

42 Rüttinger and Sharma (2016), p. 4.

43 Mtisi and Prowse (2012), p. 118.

trading their surplus credits on the international market.⁴⁴ These are a few examples highlighting that climate vulnerabilities need to be understood if the mining industry is to harness opportunities that climate change may bring.

2.3 Efforts by the Zimbabwe's Mining Industry to Mitigate GHG Emissions

The Zimbabwean mining industry has not developed a collective response to climate change, leaving this task to the state. Few mining companies have taken steps towards addressing climate change related issues in their operations. Some major operators have identified climate change as a significant risk. For example, ZimPlats (Ltd) Holdings claims to have an environmental policy framework for responsible and environmentally friendly exploration, mining and processing operations.⁴⁵ In its annual report in 2012,⁴⁶ ZimPlats assessed its energy consumption and then stated that an external consultant will be engaged to do an energy audit and that report will be used to provide a basis for future comparison.⁴⁷ This suggests that this was the first time the company engaged in climate change reporting. In its 2017 report, ZimPlats has a section on climate change and energy management. The report claims that the company is conscious of the environmental and socio-economic risks associated with climate change and that it is progressively integrating climate change mitigation into its core business and aligning processes with climate change and greenhouse gas emission reduction policies and legislation.⁴⁸

The energy management section of the 2017 report states that ZimPlats used purchased electricity which contributed to 78% of their total energy consumption while the remaining contribution was from direct energy, the use of diesel, petrol and coal.⁴⁹ The company can be commended as one firm that has taken an initiative to publish their emissions and realising the need for sustainable mining initiatives in a climate change risked environment. Moreover, the company has raised some optimism on the support for energy efficient initiatives as they have since reported that they have purchased energy efficient electric motors which will

44 Ibid.

45 See <https://www.zimplats.com/environment/>.

46 Zimplats 2012 Annual Integrated Report, p. 57.

47 Ibid.

48 Zimplats 2017 Annual Integrated Report, p. 62.

49 Ibid.

be installed at the Ngwarati Mine, a smelter and a Selous Metallurgical Complex concentrator.⁵⁰ They claim that since the inception of the energy efficient lighting programme in February 2014, a total of 4,391 megawatt-hours (MWh) were saved hence, their 2017 annualised savings amounting to 1,507 MWh.⁵¹ Other mining companies in Zimbabwe need to be encouraged to take the initiative that ZimPlats have started as that can shape the Zimbabwean mining sector's collective efforts to mitigate GHG emissions.⁵²

3. The Legal Framework Governing Mining and Climate Change in Zimbabwe

Regulating the mining sector can help it reduce the contribution of mining to climate change while at the same time reducing its vulnerability to climate change.⁵³ Due to its direct physical environmental impacts, the mining sector has always been regulated in Zimbabwe through several legal instruments including legislation, policies and regulations. These are discussed below examining their potential to regulate the mining sector in light of the challenges presented by climate change.

3.1 The Constitution of Zimbabwe⁵⁴

Like any other good constitution, the Constitution of Zimbabwe attempts to deal with almost all the fundamental legal aspects such as human and environmental rights and state responsibility. It does not directly deal with mining and climate change issues, but it contains the environmental clause under section 73, which creates a framework for the protection of the environment for present and future generations.⁵⁵ Nevertheless, the Constitution can be interpreted to have serious implications on various actors in the mining sector. It may be interpreted to include the climate problem to the extent that climate change has impacts on people's well-being. Climate change is also caused primarily by air pollution which section 73 regulates. The section reads:

- (1) Every person has the right –

50 *Ibid.*, p. 63.

51 *Ibid.*

52 *Ibid.*

53 Mtisi and Prowse (2012), p. 115.

54 Constitution of Zimbabwe Amendment (No 20) Act, 2013.

55 Section 73 of the Zimbabwean Constitution (2013).

- (a) to an environment that is *not harmful to their health or well-being*; and
 - (b) to have the *environment protected for the benefit of present and future generations*, through reasonable legislative and other measures that –
 - (i) *prevent pollution* and ecological degradation;
 - (ii) promote conservation; and
 - (iii) secure ecologically sustainable development and use of natural resources while promoting economic and social development.
- (2) The State must take reasonable legislative and other measures, within the limits of the resources available to it, to achieve the progressive realisation of the rights set out in this section. (*italics are our own for emphasis*).

The long-term impacts of climate change fall within the purview of the environmental right vision to protect the environment ‘for the benefit of present and future generations...’ The challenge is that quite a number of companies (and individuals) wreaking havoc on the environment, are not Zimbabwean, and feel no responsibility toward future generations. The environmental clause in the Constitution thus, places a legal duty on the state, non-state actors and virtually everyone in the mining sector to ensure that they act in a way that seeks to protect the environment. Among the constitutional duties is a duty to ‘prevent pollution’ encompassing reducing GHGs emissions. The state is also duty bound to make available such legislation that directly deals with climate change.

3.2 The Mines and Minerals Act

The Mines and Minerals Act⁵⁶ (MMA) is the principal legal instrument governing mining in Zimbabwe. It was passed in 1961 well before climate change was an issue. Consequently, any interpretative references to climate change with regards to the MMA is implied rather than explicit. As a starting point, one may ask how the MMA regulates the mining sector in order to minimise negative environmental impacts.

The MMA regulates the mining sector mainly by mandating the state to grant mining licences subject to certain duties, and standards including environmental protection. This may be read to mean protection from climate change if climate change is well mainstreamed into this mining

56 Mines and Minerals Act (Chapter 21:05) herein after referred to as the MMA.

legislation in order to push for a climate change agenda. The MMA, despite being an old piece of law as mentioned above, through some of its amendments⁵⁷ does have some provisions that speak to environmental issues and prevention and treatment of pollution.⁵⁸

Tsabora in Chapter 9 notes that Zimbabwe's legislative framework also permits the government to enter into mining contracts with mining investors, and such contracts can exclusively regulate all aspects of the relationship, investment rights, obligations and duties of all parties and these also include environmental conditions as noted in the *Zimplats* case.⁵⁹ These mining contracts may also be used as a tool by the state when negotiating with investors to compel them to adhere to best environmental practices and standards that assist in pushing for the government's climate change objectives.

3.2.1 The Mines and Minerals Amendment Bill

The Government of Zimbabwe has done extensive work on attempting to amend the MMA to reflect current realities. In 2018, the President, Emmerson Mnangagwa, however, refused to sign the proposed amendments into law citing that it needed to be reformed so as to address contentions between land rights owners and mineral rights owners.⁶⁰ It was said that the law failed to offer a clear procedure for mineral rights owners to begin exploitation of mineral resources found on farming land. In other words, the law fell short of addressing potential farmer/miner conflicts. As a result, an extensive amended Mines and Minerals Amendment Bill (MMAB)⁶¹ is expected or, the old MMA be completely replaced with a new act which will extensively deal with climate change and the mining industry, among other issues. This view has also been echoed by other scholars who argue for a total overhaul of the mining code.⁶²

The MMAB carries with it a number of progressive environmental management issues which will be discussed here in light of the climate

57 The MMA has been amended a number of times since the rising into prominence of environmental issues in Zimbabwe.

58 See section 159 (3) (e) (2A) of the MMA.

59 *Zimbabwe Platinum Mines Pvt Ltd (ZIMPLATS) vs Zimbabwe Revenue Authority and 3 Ors* HH169/15.

60 'Mnangagwa rejects Mines Bill', *Newsweek*, 19 September 2018.

61 See note 22.

62 Dhliwayo (2016), p. 56.

change agenda. Noteworthy is Clause 40 of the Bill,⁶³ which was created to mainly provide for environmental protection.⁶⁴ The Mines Bill endeavours to ensure that a balance is struck between development and the environment. This aspect of the Bill draws on the Environmental Management Act and gives it new life in the mines legislation.

The Mines Bill also makes the Minister of Mines the manager of all mining activities⁶⁵ by empowering him with mining experts to determine best practice in any area inclusive of rivers, surface use and underground; determining the tools and machinery to be used, and deciding the level and extent of such mining activities.⁶⁶ It is commendable that the Mines Bill creates such provisions, which although purely environmental, can be used to advance the climate cause.

The Mines Bill provisions on conditions for the protection of the environment are also important.⁶⁷ The provisions establishes the Mines Cadastre Registrar and the Cadastre System. The former is given authority to weigh options with the objective to conserve the environment; and Environmental Impact Assessment (EIA) approval must be submitted to the Cadastre Registrar as part of the application process for mining rights or title. All these are positive environmental imperatives. The EIA being an important tool in the mining process from planning and implementation to mine closure, i.e. it safeguards the environment at all three stages of mining. The EIA will be discussed in-depth under the EMA Act. What is important is that the bill requires EIAs from both large-scale and small-scale miners hence, strengthening the EMA Act position.⁶⁸ As previously alluded to, this will be used in a number of ways which include, but are not limited to, prevention of pollution, limitation and treatment of pollution and minimising impacts of mining.

A further provision requires holders of any mining rights to manage all environmental impacts in accordance with their environmental management plan and the approved environmental management programme. The wording includes a mandatory language and obligations through the use of must. These provisions are important as already noted because they make environmental considerations clear, solid and mainstreamed within

63 Clause 40 of the MMAB.

64 Section 257A of the MMAB.

65 Section 257 B of the MMAB.

66 Section 257 (b) of the MMAB.

67 Section 257D of the MMAB.

68 Section 257A of the MMAB.

mining activities so that the industry can be regulated.

The question is whether these provisions can make an impact not just in the environmental sense, but in terms of climate change mitigation and adaptation imperatives. The Mines Bill has commendable provisions to achieve environmental protection, but it is lacking in regulating the mining industry in order for it to realise, achieve and promote tangible mitigation and adaptation actions.

3.3 The Environmental Management Act: Environmental Impact Assessments, Adaptation and Climate Change

The EMA Act⁶⁹ is the chief piece of law that regulates environmental issues in Zimbabwe. Its main purpose is to provide for the sustainable management of natural resources and protection of the environment, the prevention of pollution and environmental degradation.⁷⁰ Several provisions in the Act deal directly with the mining industry and its operations. Chief amongst the provisions is the need for an Environmental Impact Assessment (EIA).⁷¹ The objective of the EIA is to ensure that benefits from the intended project as well as socio-economic and environmental costs are identified and reckoned. It therefore follows that the EIA can deal with climate change in the mining sector, mitigating negative impacts and realising potential benefits. If the EIA report shows that a mining project or activity will produce a substantial amount of GHGs, then it can be regulated by the EIA conditions, and the miner can propose ways of mitigating the climate change impacts. Under these circumstances, the EIA becomes an important tool in the planning phase of a mining project, which will inform decisions in the mining sector, including the climate change component. This was the case in one of the groundbreaking case of *Earthlife Africa Johannesburg v Minister of Environmental Affairs* as discussed in Chapter 5. The EIA provisions of the EMA Act do not recognise climate change yet climate change requires adaptation. This calls for more than just an environmentally focused EIA but also a climate impact assessment to supplement our understanding of the overall environmental risks involved, and climate change related costs and impacts. Consequently, a transformation of our

69 Environmental Management Act, Chapter 20:27 (Hereinafter referred to as the EMA).

70 Preamble of EMA.

71 Section 97 of EMA.

EIA system to accommodate climate change related impacts, such as that offered in the *Earthlife* case needs to be adopted.⁷²

Also important is section 63⁷³ which deals with the management of air quality standards. The section empowers the Standards and Enforcement Committee to determine, regulate and set standards related to air quality and emissions. The EMA Act also regulates air pollution using various Statutory Instruments (SI). The Environmental Management (Atmospheric Pollution Control) Regulations⁷⁴ has provisions that apply to the mining sector to mitigate against climate change. The SI deals with air pollution and mining activities are known to cause air pollution, both directly and indirectly, in emissions of GHGs. Section 3 of SI 72 of 2009⁷⁵ sets objectives and emission standards for certain activities that emit pollutants into the atmosphere.⁷⁶ The regulations make it an offense for land occupiers to cause or allow fugitive dusts to be emitted into the atmosphere as a result of their activities, which include mining.

In 2016, the Zimbabwe government also enacted SI 131 of 2016,⁷⁷ which amends whilst strengthening the 2009 SI. SI 131, and bans and controls the import and production of several ozone depleting substances. The regulations apply to private and public, industrial and commercial importers, exporters, producers and consumers of ozone depleting substances and greenhouse gases.⁷⁸ The banning and controlling of prohibited substances is done through the Ozone Office and by issuing of import and export licenses.⁷⁹ This means that for the mining industries, the SI controls and bans some of their 'business as usual' substances towards opting for environmentally viable options.

The Zimbabwean mining industry is not immune to climate change and its effects. Zimbabwe is faced or will have to face adaptation challenges

72 See <https://cer.org.za/virtual-library/judgments/high-courts/earthlife-africa-johannesburg-v-minister-of-environmental-affairs-and-others>.

73 Section 63 of the EMA.

74 Section 3 of the Environmental Management (Atmospheric Pollution Control) Regulations, Statutory Instrument 72 of 2009.

75 Ibid.

76 See the section for the listed activities.

77 Environmental Management (Prohibition and Control of Ozone Depleting Substances, Greenhouse Gases, Ozone Depleting Substances and Greenhouse Gases Dependent Equipment) Regulations, Statutory Instrument 131 of 2016.

78 Section 3 of SI 131 of 2016.

79 Section 5 of SI 131 of 2016.

sooner or later. These call for careful, well-thought-out strategies. Alternatives and renewable energy sources, such as mining lithium for batteries to encourage a climate smart transportation system, need to be explored more thoroughly.

3.4 National Policy and Legal Response to Climate Change and the Mining Sector

In light of the impending climate change related problems, a national climate change legal and policy framework becomes crucial, so as to clearly direct and guide the state and other actors and, dictate the state's position and objectives within the climate agenda. Zimbabwe has not yet produced actual climate legislation.⁸⁰ In an attempt to address climate change mitigation and adaptation, Zimbabwe has thus far officially produced two documents which depict Zimbabwe's national policy responses to climate change. These are the Zimbabwe Climate Change Response Strategy of 2014 and the Zimbabwe National Climate Policy of 2016. To establish whether Zimbabwe has created a framework which encompasses or allows for mainstreaming of climate change mitigation and adaptation in the mining sector, these two documents will be interrogated in turn.

3.4.1 Zimbabwe's National Climate Change Response Strategy

The GoZ in 2014 created the National Climate Change Response Strategy⁸¹ (NCCRS) to begin co-ordinated efforts and responses to deal with climate change mitigation and adaptation efforts that did not previously exist in Zimbabwe. The NCCRS is clear when it comes to mining issues. Firstly, it acknowledges the rise of the mining sector as a powerhouse in the economic sector.⁸² As a matter of fact, it expressly states that mining has overtaken the agricultural and manufacturing industry.

As its goal, the NCCRS seeks to, '*... mainstream climate change adaptation and mitigation strategies in economic and social development at national and sectoral levels through multi-stakeholder engagement.*'⁸³ Arguably, this goal is plausible as it recognises that all economic sectors such as mining, which has also grown exponentially, are supposed to be involved in the fight against

80 At the time of writing this chapter, the Ministry of Agriculture, Water and Climate had announced its intentions of creating climate change legislation. See <https://www.herald.co.zw/agric-ministry-to-lobby-for-climate-change-law/>.

81 GoZ (2014), p. 8.

82 Ibid.

83 Ibid., p. 10.

climate change. This is also supported by the document's objectives. The first objective is to mainstream climate change in all the key sectors of the economy, mining included.⁸⁴

The NCCRS further indicates as strategies for the mining sectors response to climate change as including the need to:

- (a) Develop regulatory frameworks to encourage emissions reduction and invest in resource efficient technologies.
- (b) Enforce and monitor the implementation of mandatory and voluntary environmental management systems.
- (c) Adopt practices that reduce energy consumption in the mining sector.
- (d) Develop a framework for enhancing the capacity of small-scale miners to improve their environmental performance.⁸⁵

The first strategy, which is the need to develop regulatory frameworks that encourage emissions reduction, is imperative. This implies that legal frameworks are needed for the mining industry to contribute to Zimbabwe's emissions target and ensure a contribution to the global action against climate change. If the strategies outlined above are implemented and embedded within the mining legal frameworks, they will contribute towards Zimbabwe achieving its climatic goals. One of the NCCRS's guiding principles is to mainstream climate change into policy within a legal framework, incorporated into development planning.⁸⁶

NCCRS have set a relatively clear foundation for legal regulation of the mining sector in order to promote positive climate change outcomes. However, despite an acknowledgement that the mining sector is one major sectors that needs special attention if the NCCRS is to achieve its goals, it lacks clear, detailed guidelines about how the mining industry in Zimbabwe can practically contribute to the nation's climate change agenda. In my view, this was a missed opportunity. Nonetheless, as a policy document, it provides a foundation so that when robust legal frameworks are put in place, they will have a reasonable guide on which to build.

84 *Ibid.* p. iii.

85 *Ibid.* p. 40.

86 *Ibid.* p. 10.

3.4.2 The National Climate Policy

The Zimbabwe Climate Policy (NCP)⁸⁷ which was launched by the GoZ in 2016 clearly indicates the development pathway that should be followed in Zimbabwe which are ‘aligned to the guiding principles of the National Climate Change Response Strategy and Action’.⁸⁸ The vision for adoption of the document is:

*...to climate-proof all the socio-economic development sectors of Zimbabwe to address the national challenge of reducing Zimbabwe’s vulnerability to climate and climate related disasters, while **developing in a low carbon pathway**. The motivation for this policy is to reduce the socio-economic impacts of climate variability and change in Zimbabwe and contribute to global greenhouse gas emissions reduction.*⁸⁹ (my emphasis).

That vision may well feed into the mining industry. The main purpose for adopting the National Climate Policy is scribed as to guide climate change management in the country, enhance the national adaptation capacity, scale up mitigation actions, facilitate domestication of climate related global policies and ensure compliance to the global mechanisms⁹⁰ which speaks to Zimbabwe’s general climatic objectives.

The NCP acknowledges that Zimbabwe’s economy has been historically anchored on four pillars: agriculture, mining, manufacturing and tourism.⁹¹ The NCP further states that the industrial pillar adds value to the products from agriculture and the mining sector hence the significant contribution to GHG emissions.⁹² This resonates very well with the National Climate Change Response Strategy. One would have thought that identifying and handpicking mining at this juncture, the NCP would extensively have provisions that are intended for the sector. Unfortunately, the NCP misses that opportunity and instead sidelines the mining sector whilst dealing extensively with Agriculture, Land-use, Land-use-Change and Forestry (LULUCF), the Waste Sector and the Energy sector individually. Mining on the other hand is then incorporated under the industrial sector.

The NCP principles are critical for the mining sector in the context of

87 GoZ (2016).

88 NCP, p. (iii).

89 Ibid., p. 3.

90 Ibid., p. 4.

91 Ibid., p. 10.

92 Ibid.

climate change as decoded in line with the UNFCCC principles. Principle 3 states the necessity of adopting low carbon development pathways that incorporate national developmental aspirations, visions and national programmes. Principle 4 builds on principle 3 and highlights the need to build resilience to climate challenges through adaptation programmes that shall be pursued concurrently with climate change mitigation programmes. These are important for the mining sector as mitigation and adaptation efforts need to be realised and implemented to complement each other. Principle 7 also states that the climate policy must guide climate change adaptation and mitigation investment programmes in Zimbabwe's priority areas. Again, this resonates with principles 3 and 4 as well as the primary goals of the policy.

Another important principle under the NCP is principle 9 which also advocates for adoption of new and emerging technologies and innovations that are relevant and dynamic in offering adaptation and mitigation solutions. Principle 9 therefore, promotes and strengthens the goal of the NCP, which is to promote technology development and transfer, capacity building and information sharing. It has been said that for all the sectors to develop with a low carbon pathway, access to appropriate technology must be encouraged. This means that the mining sector will be required to move towards low emission technologies. For Zimbabwe to successfully meet the above discussed goals, it intends to promote technological transfers as per the country's needs in order to meet its set NDCs.

In summary, the NCP is generally a commendable document. Following the NCCRS, it declares the aspirations of the GoZ and its ambition to deal with climate change related challenges in key sectors of the economy as well as dealing with mitigatory and adaptation efforts. The NCCRS loudly acknowledges the mining sector as a growing sector but the NCP does not seem to do justice to this assertion. It does not single out or target the mining sector when it deals with climate change adaptation and mitigation to achieve low carbon development. As a result, the NCP may be applauded for identifying the other major sectors despite not doing justice to one of the most growing producers of GHGs, the mining sector. Legal and policy frameworks that adequately deal with the major sectors of the economy, such as mining, clearly need to be either amended or developed so as to advance the noble aspirations shown by the GoZ through developing a National Climate Policy.

3.5 Zimbabwe's Oil and Gas Industry Development Policy

The GoZ has also created the Oil and Gas Industry Development Policy (OGIDP)⁹³ after realising that there was mineral potential in oil, natural gas and coal bed methane. Coal bed methane (CBM) is believed to be a clean and renewable (still contentious) energy which has steadily grown as a clean alternative to traditional coal and oil exploration and production.⁹⁴ Coal bed methane is similar to natural gas, the only difference being in the way that they are formed and stored in the earth's crust.⁹⁵ CBM extraction and utilisation does retain some methane, which would otherwise be released during coal mining, hence, proving very advantageous because methane is considered as one of the most powerful GHGs.⁹⁶

The objectives of the policy are clear in that they seek to first offer guidance into the process of the exploration. One of the major objectives of the OGIDP is to provide for legal frameworks, guidelines and principles which allow for the economic benefit of Zimbabwe.⁹⁷ The other objective is to create a policy that guides both players and investors involved in the exploration, development and exploitation of oil and gas resources in the country.⁹⁸ The two outlined objectives are noble in that they speak towards greening the Zimbabwe energy sector. This will offer the government of Zimbabwe a chance to set certain standards and to determine the best methods of extracting oil and gas resources in a way that is environmental and climate friendly if the resources are actually found.

Secondly, the objectives make clear the need for provisions of a legal framework that will regulate the process of exploration. That commitment is strongly reiterated by the policy as it clearly states that 'the government shall ensure that all activities are authorised by relevant authorities and conducted in full compliance with applicable conventions, laws, regulations and requirements.'⁹⁹ The policy is thus, considerably clear and commendable in that it supports the need to develop actual laws that support its imperatives.

93 Oil and Gas Industry Development Policy, Government of Zimbabwe (2007).

94 'Good news for the energy industry: Coal bed methane offers a safe solution to energy problems', *The Washington Times*, 21 August 2016.

95 Anderson (2014).

96 *Ibid.*

97 Section 3.1 of the OGIDP.

98 *Ibid.*, Section 3.5.

99 *Ibid.*, Section 4.9.

The OGIDP has important provisions that deal with environmental management issues. One of the most notable spells out the need for oil and gas operations to ‘...avoid the pollution of water, soil and air... Conditions of sustainability, bio-diversity and ecology in guarding environmental impact shall be in accordance with the relevant laws.’¹⁰⁰ This means that the state has taken a step in the right direction as the policy pushes for mainstreaming of environmental considerations in the oil and gas extracting sector. The provision allows for the state to actually achieve positive environmental outcomes in a sector capable of producing immense atmospheric pollution.

In summary, the state must be commended for incorporating such a forward-looking provision. This is appreciable if one links it with the nation’s climate agenda, despite the policy not expressly talking about climate change, although it is clear that it seeks to create alternative sources of energy. The state when faced with creating actual legislation on oil and gas extraction will have to place emphasis on climate change mitigation and adaptation efforts and provide clear guidelines and be specific in terms of detail and how these can be achieved as the policy has shortcomings in this regard.

4. The Mining Industry and Zimbabwe’s Carbon Tax

In 2001, Zimbabwe introduced a price on carbon for fuel to curb greenhouse gas emissions on petrol and diesel.¹⁰¹ Carbon tax was said to be based on the application of the ‘*polluter pays*’ principle, hence, in its early stages of implementation, the tax was collected as a separate amount of money from motorists.¹⁰² However, with time, it was incorporated into the fuel price, and for that reason, the carbon tax lost its deterrence effect.¹⁰³ Statistics indicate that between 2009 and 2015, petrol and diesel use (major sources of climate warming gases) rose with nearly 150% to 1,38 million litres each year due to Zimbabweans buying more vehicles.¹⁰⁴ One should, however, note that during the same period, Zimbabwe was suffering an energy crisis hence many sectors opted for petroleum-related energy rather than traditional electricity, which was unreliable and in short supply.

100 Ibid.,Section 4.6.

101 ‘What role can carbon tax play to achieve Zim’s climate goals?’, *The Herald*, 13 November 2017.

102 Tonderayi (2012).

103 Ibid.

104 See note 102 above.

As previously stated, mining activities are dependent on the use of heavy machinery and most machines are diesel powered. Given that diesel is a fuel blamed for high carbon emissions, the mining sector opted for petroleum-related energy. What, however, one needs to observe is that currently the mining industry is taxed for carbon at the same rate as private individuals. The only difference lies in the quantity consumed; hence, the argument that carbon tax has lost its deterrence effect. Furthermore, carbon tax has, as a result of the one size fits all system, not proven to be about climate protection but is merely a tool for boosting the national treasury's coffers.¹⁰⁵ There has, for example, been no clear indication about whether revenues from carbon tax have been distributed in a manner that supports low-carbon initiatives and development.

Carbon Tax in Zimbabwe is also payable when importing petroleum and diesel products.¹⁰⁶ Both scenarios explained above could be effectively implemented in the mining industry, a high energy consuming sector. Zimbabwe, therefore, needs to align the taxes on carbon with its climate goals under the Paris Agreement, so that carbon tax is used as an imperative to achieve climate related goals.

Zimbabwe could draw lessons from other countries such as South Africa. The South African government recently promulgated and passed into law carbon tax legislation.¹⁰⁷ It is aimed at reducing pollution, which has been part of the country's landscape for more than a century, as the local economy ramped up industrialisation through the development of mines, cement and steel plants and fossil powered electricity plants through imposition of a tax on the carbon dioxide equivalent of greenhouse gas emissions.¹⁰⁸ The Act introduces the 'polluter-pays principle', which incorporates the costs of damage caused by GHG into the price of high-carbon-emitting goods and services.¹⁰⁹ This is aimed at changing consumer behaviour and also encourage investors to shift towards low-carbon options.¹¹⁰ Companies, individuals and public entities will be liable to pay the carbon tax if conducting an activity that results in the emission

105 Ibid. and note 103 above.

106 This is according to the Customs and Excise Act (Chapter 23:02).

107 Carbon Tax Act No 15 of 2019, South Africa (2019).

108 The Preamble of the South African Carbon Tax Act.

109 See the preamble of the South African Carbon Tax Act.

110 'The Carbon Tax Bill will cut emissions from SA in June', *BusinessDay*, 17 May 2019.

of GHGs above the prescribed emission thresholds.¹¹¹ One of the most heated issues with regards to the act, whilst it was still a bill, was on how to balance the introduction of another tax burden on ordinary citizens and how the collected revenue should not be used as *fiscus* but should be used as an instrument to achieve better results on GHG reduction strategies and be deployed for mitigating initiatives.¹¹²

This law targets major GHG emitters such as coal handlers. Even though most miners are not under any threshold, and are thus exempted from paying carbon tax, the tax imperatives in the Act are aimed at collecting a punitive revenue. This, the South African Government intends to use to achieve better results on GHG reduction strategies and mitigating initiatives.¹¹³ The Act targets industrial players with an installed thermal capacity of 10MW or more, who will need to start reporting their carbon emissions. Most mining operations, which typically go beyond this level, often reaching as much as 600MW, will be impacted. However, the South African National Treasury has advised that energy-intensive sectors will be ‘cushioned’ through measures introduced to ensure that the tax does not raise the price of electricity.¹¹⁴ The Act creates exemptions and allowances to certain sectors during the first phase of its implementation. The mining sector being one of them,¹¹⁵ it will pay very little in carbon tax. Thus, one could argue that the Act seems to defeat its own objectives reducing taxing carbon emissions through taxation. Despite the complexity of the South African carbon tax legislation’s suggested implementation, Zimbabwe should lean towards such an approach in the near future so as to achieve the noble goal of moving towards a low carbon economy.

5. Conclusion

This chapter attempted to create a *nexus* on the complex challenges around the extractive industries in the context of climate change. This was done in order to (a) establish the extent of Zimbabwe’s mining sector’s contribution to anthropogenic climate forcing; (b) find ways in which the sector needs to develop strategies for climate change mitigation and adaptation; and (c) to ascertain the extent to which policy and legal frameworks have recognised

111 Section 3 of the South African Carbon Tax Act.

112 ‘Debate around the Carbon Tax Bill getting hotter by the day’, *Business Report*, 7 January 2019.

113 Humby (2016), pp. 22-29.

114 Note 111 above.

115 See section 4 of the South African Carbon Tax Act.

the need to direct the players in the mining industry to respond to the climate problem and how they can assist with mitigation and adaptation actions in the communities in which they are operating.

The climate relevance of mining is high and particularly so in the Zimbabwean context where mining has grown into the backbone of the economy and the highest earner of foreign currency as well as the largest magnet for foreign direct investments. The mining industry, primarily through its use of electricity, is a significant emitter of GHGs contributing substantially to anthropogenic climate forcing. This is mainly through the coal mining industry which feeds the energy sector with the coal, which in turn feeds the mining sector with energy hence, the nexus. The mining industry will also play a key role in the provision of raw materials that will enable Zimbabwe to move towards a low carbon development pathway and reduce its GHG emissions. The mining industry is already feeling the need to adapt as stated in the National Climate Change Response Strategy.

The Zimbabwean mining industry is responding rather slowly to the need for climate change mitigation and adaptation. In this regard, there is also need for further policy, legal and institutional frameworks, development and co-ordination. This may have to be initiated by the mining industry and mining stakeholders since the government, as shown by the above discussed climate legal and policy analysis project, reflects an inconsistent pattern in the realisation of the role of the mining sector in achieving and promoting climate change mitigation and adaptation.

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Climate Change and Labour Law in Zimbabwe: A Critical Perspective¹

Lenin Tinashe Chisaira

1. Introduction

Climate change laws and policies will inevitably play a key role in human and societal relations, of which, for the foreseeable future, labour relations and rights will form a substantial part. The law plays a central role in any society, more so in a society undergoing the impacts of climate change. Indeed, the latter has undoubtedly become one of the fundamental, defining – if not highly debated – issues in contemporary society.² The nature of the relationship between climate change, labour law and rights is contingent, and depends on the way society will deal with the transition from fossil fuels, to cleaner energy alternatives, as well as the forms of mobilising climate finance.

Climate change will impact the law, rights and social justice, and this chapter will examine how this will occur around the world, but with an emphasis on Zimbabwe. In the workplace, traditional fossil-fuel-based industries will retrench workers, and occupational and environmental

1 The writer substantially developed the chapter while attending the United Nations Climate Change Conference (COP 24) in Katowice, Poland. Most helpfully the COP 24 theme was ‘Changing Together’ and related to issues of the Just Transition. COP 24 is of great significance to the question of climate change and labour justice, and it resulted in the Solidarity and Just Transition Silesia Declaration discussed in the chapter.

health problems are likely to follow, as well as environmental disasters.³ On the other hand, work will become available in the green economy sectors such as biofuel production, renewable energy plants, green housing construction, water management, and resilience-building sectors, etc. Such changes necessitate a careful study of the prevailing legal and policy framework regarding labour relations.

Zimbabwe's legal framework for labour and climate change as well as social justice in the workplace is already comprehensive. A Labour Act (Ch. 28:01) is in place as well as a large body of Labour Court decisions. Also, the State has developed policies on climate change and energy use especially emanating from the Climate Change Management Office. Against this background, the question that lingers for any academic and practitioner is whether the existing legal, policy and institutional framework is adequate to protect labour rights in Zimbabwe? Are the laws ready for a green economy and a world in transition?

The purpose of the law is a contested issue but what is not in doubt is the power of the law to facilitate or expropriate people's rights. Both expropriation and facilitation take place across a range of fields including labour right and relations, and attendant fields such as health, access to information, food security, water, environmental conservation, agriculture, access to education, social welfare and provision of public transport services.

The nexus between climate change and sustainable ways of transitioning from the current ways of working and managing society – including labour law and rights – are increasingly becoming a crucial part of global climate negotiations and policy formulation.⁴ That the issue recurs and rarely approaches a resolution reflects the (in)adequacy of the general global political and economic system Rosemburg commenting on the desire to place sustainability in the climate change discourse rightfully

3 The ILO has done some comprehensive research on the effect of climate change on social and economic relations as well as the health of workers. For instance, ILO (2017), p. 1: When it comes to occupational safety and health, climate change will have a direct effect through, for instance, temperature change. Excessive workplace heat is an example of a well-known occupational health hazard. High body temperature or dehydration causes heat exhaustion, heatstroke and, in extreme cases, death. Heat extremes also increase the risk of workplace accidents, and a body temperature above 40.6 degrees Celsius is life-threatening.

4 This link was, for instance, envisaged by the deliberate decision to concentrate on 'The Just Transition' during key Conference of the parties (COP) meetings, for instance, COPs 16, 21 and 24.

seeks to question the adequacy of the current economic system to deal effectively with climate change initiatives:

When, in 1992, governments met in Rio and agreed on the fundamental link between ensuring social justice, protecting the environment and promoting economic security, hopes emerged on the capacity of our societies to transform themselves towards sustainability. However, 20 years later, the limits of our economic system have been reached, inequalities have never been higher, and the planet's natural resources are already showing signs of exhaustion.⁵

This passage highlights the various interests in the global climate change discourse. The labour voice is playing an increasingly critical role and organisations such as the International Trade Union Confederation and the International Labour Organisation (ILO) at the forefront of climate change policy and treaty shaping. At the national levels, the Zimbabwe Congress of Trade Union (ZCTU) and the Labour and Economic Development Research Institute have also played significant roles in the inclusion of labour interests in climate change decision-making as they also participate in COP delegations.

2. Theoretical approaches to labour law

Understanding labour law in the current era requires an understanding of the general theoretical underpinnings governing law formulation. There are various legal theories and approaches to labour law, social justice and democracy in the workplace.⁶ Labour Rights and justice are affected by the way powerholders and legal minds adopt any of a number of the dominant theoretical and philosophical frameworks, such as the social contract, liberal, Marxist and feminist theories. These may seek to explain the class antagonisms that underlie labour relations, as do, for example, conflict and Marxist legal theories. They may also seek to highlight conservatisms and one-sided power hierarchies, as do, for example, the unitary and free-market theories. These philosophical frameworks may be helpful in academic and legal circles in trying to decipher the socio-economic effects of climate change on contemporary society.

In this chapter, I will apply the critical and marxist legal theoretical perspectives to understand the relationship between labour law, climate change and the state of the workplace. Marxist and closely related theories are persuasive as they provide a space for a robust criticism of society and

5 Rosemberg (2010) p. 127.

societal relations. Marxist legal theorists have pointed out that law 'is the active expression of men and women living within a social and material universe at a particular historical moment.'⁷

For counter-arguments, Madhuku starts by acknowledging that 'there is a great deal of substance in the Marxist conception of law.'⁸ He, however, goes on to say, 'however, the theory exaggerates the extent to which law is an instrument of ruling class interests. While the law is, in many respects, an instrument of class rule, it is also, in other respects, a phenomenon that has life outside the realm of class struggle.'⁹ This discussion by Madhuku, of course, is one side of the debate.

The historical development of labour law itself is undoubtedly built on the unequal relations between employers and employees.¹⁰ Legal history in any society, and especially labour law, is a direct result of the class conflict. Scholars have acknowledged the role of class conflicts in shaping the development of labour law in each State:

Labour laws have not developed as a series of evolutionary stages, or as a 'necessary' or 'natural' response to globalisation. The laws in each country have been the outcome of complex, protracted and sometimes bitterly contested struggles. The comparativist has to examine the specific features of historical change in each country in order to explain differences in the laws which have shaped labour markets.¹¹

As the impacts of climate change are expected to place a significant toll on the workplace, especially on the way the workplace and employer-employee relations are organised. There will be law reforms to accommodate the first world renewable energy businesses and possibly to ease retrenchments occasioned by fossil-fuel businesses that have to downsize. The legal framework has to cater to all these facets.

Hence, the rising importance of labour rights in climate change discussions can never be analysed in isolation. Labour rights will only be adequately catered for in a changing environment after recognition of the powers of the conflicting critical classes, namely the employers and employees.

8 Madhuku (2010) p. 10.

9 Ibid.

10 See, for instance, Gwisai (1998) p. 134.

11 Hepple (2005), p. 256.

3. Climate Change, the ‘Just Transition’ Principle and the Workplace

Global treaties have taken into consideration the need for a just transition as the world begins to deal with climate change. The Paris Agreement¹² in its preamble calls for State Parties to take into consideration ‘the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities.’¹³ The aspiration for a just transition is hence dependant on domestic climate policy as outlined in each State’s nationally defined priorities. For instance, the Zimbabwe NDC report¹⁴ outlines several clean energy initiatives under consideration. These include an increase in large and mini-hydropower plants, construction of institutional biogas digesters, solar energy, ethanol blending, and electrification of the rail system, as well as the long-delayed search for sustainable energy alternatives to the curing of tobacco.¹⁵ Some initiatives highlighted in the NDCs do not seem helpful, for instance, the promotion of the use of liquified petroleum gas. However, most of these cleaner energy initiatives pose opportunities for Zimbabwe’s energy workforce, especially if workers are re-trained. The whole narrative of ambitious cleaner energy projects will require climate financing, but this must be done in ways that empower the governments and tax revenue systems of developing States and in ways that do not leave them tied to indebtedness.

The Paris Agreement has been bolstered by the United Nations Climate Change Conference (COP 24) held in Katowice, Poland. The COP 24 was instrumental in the just transition and decent jobs discourse. Despite being held in a traditional Polish coal heartland of Silesia Province, the conference focused on the just transition. A key output of COP 24 is the Solidarity and Just Transition Silesia Declaration.¹⁶ This is an essential document on the relation between climate change and labour justice that builds on the Paris Agreement desire to achieve a just transition. The Silesia Declaration stresses that ‘just transition of the workforce and the creation of decent work and quality jobs are crucial to ensure an effective and inclusive transition to low greenhouse gas emissions and climate resilient

12 UNFCCC (2015).

13 *Idid.*, Preamble.

14 GoZ (2015).

15 *Ibid.* p. 10.

16 UNFCCC (2018).

development.¹⁷ The global climate change discourse has therefore moved towards a greener world but without leaving traditional workers and their labour rights and social justice expectations in at the deep end.

The key determinant for relations of work and the impacts of climate change are going to be derived from the broader societal arrangement of modern neo-liberal capitalism. It is therefore expected that most international discussions will centre on the preservation of the dominant capitalist economic and global system and its attendant problems and challenges, such as the lukewarm desire to deal with the causes of climate change or with changing the consumption and production levels in the industrialised world.

Scholars around the world have since observed that the transition to cleaner forms of energy or climate mitigation measures will not necessarily mean an improvement in worker welfare and rights. Van den Berge, for instance, points out that:

*Green jobs are not necessarily decent jobs. So the creation of new, green jobs does not guarantee that workers will get new, decent employment from mitigation policies. For unions, it is important to seize the opportunities for new employment, while at the same time they must protect working conditions.*¹⁸

Such a just transition will need to see an overhaul of labour relations and labour laws so that workers remain in secure workplaces, that are characterised by social justice and social democracy. Workers would then have a say on the ways the workplace is run, and their safety and insurance policies are discussed and formulated.

4. Labour and environmental rights in Zimbabwe

The link between labour and environmental rights has been a factor globally at least since the advent of the Industrial Revolution and the rise of capitalism around 250 years ago. In Zimbabwe and most of the developing world, capitalism induced the age of imperialism and colonialism by industrialised States. The main essence of this period is that the nature of work, especially fossil-fuel dependant industrial and mining works, involves ruthless exploitation of the environment for the sake of profit, either through the search for raw materials or as a result of emissions (be it of poisonous substances, by-products or greenhouse

17 Ibid., Point 1.

18 Van den Berge (2010), p. 219.

gasses). The modern workplace also poses a threat to the health of the worker herself or himself. Scholars like Collin make an accurate observation of the Industrial Revolution:

The Industrial Revolution belched noxious substances on an ominous scale. By the nineteenth century, everyone living in the choking grey hubs of industrial civilization was threatened by the deadly by-products of burning fossil fuels, manufacturing chemicals and cement, and smelting metal. Massive quantities of sulphuric acid, alkali, sodium carbonate and lead were essential for industrialization, but they poisoned land, air, water and people in the process.¹⁹

The law, mainly environmental and labour law, ostensibly seek to minimise the adverse impacts of such industries on human and societal health through legislation.

In Zimbabwe, the labour and environmental laws are located from several sources. These include State obligations in international law, international customary law, legislation and common law. The principal legalisation at the State level on the impacts of climate change on labour rights and social justice include the Constitution of Zimbabwe,²⁰ the Labour Act,²¹ and the Environmental Management Act.²² In addition to this principal legislation, there is some subsidiary legislation emanating from the ministries responsible for either labour or climate change.

This chapter mainly discusses statutory and constitutional provisions. The main reason for the limitation is that statutes are the primary sources of law. There is a need for more space to tackle the effects of the sources of law on labour and climate change within the Zimbabwe context.

4.1 The Constitution

The Constitution of Zimbabwe²³ came into effect through a referendum in 2013 after being amended nineteen times since independence in 1980. The National Objectives embedded in the Constitution outline that the State and government agencies and institutions have an obligation to 'adopt reasonable policies and measures, within the limits of the resources available to them, to provide everyone with an opportunity to work in a freely chosen activity, in order to secure a decent living for themselves

19 Collins (2010), p. 84.

20 Constitution of Zimbabwe [Amendment (No 20) Act, 2013].

21 [Chapter 28:01].

22 [Chapter 20:27].

23 Constitution of Zimbabwe [Amendment (No 20) Act, 2013].

and their families.²⁴ This proviso, outlined within the section relating to the availability of resources, is problematic throughout the sections dealing with social and economic rights within the Constitution. Such constitutional provisions, however, will need to be revisited in the era of climate change to guarantee that the transition to greener economies caters for the rights of people to find work opportunities in a changing environment.

In addition to the national objectives, the 2013 Constitution contains a progressive Declaration of Rights. The Declaration of Rights in Chapter 4 contains a range of labour and environmental rights that are relevant in an anthropogenic era. Hence every person is deemed to have the rights to fair and safe labour practices and standards,²⁵ to be paid a fair and reasonable wage,²⁶ to form and join trade unions,²⁷ to participate in collective job action, including the right to strike, sit in, withdraw their labour and to take other similar concerted action²⁸ and the right to just, equitable and satisfactory conditions of work.²⁹ The right to safe labour practices and satisfactory conditions of work may become increasingly critical as the world begins to deal with the adverse impacts of climate change on the workplace, for instance increasing temperatures, the prevalence of disease and natural and human-made disasters.

The Labour Act also contains special provisions on the rights of female workers in Zimbabwe. Women have the right to equal remuneration for similar work done with men.³⁰ They also have a right to fully paid maternity leave for at least three months.³¹ These provisions are crucial in societies which have hardly passed the throes of patriarchy and traditionalism.

In addition to the constitutional labour rights outlined in the preceding passages, the Constitution also provides for environmental rights. Section 73 of the Constitution is very comprehensive and provides that:

24 See s 24 (1).

25 See s 65 (1).

26 See s 65 (1).

27 See s 65 (2). This right applies to every person except for members of the security services.

28 See s 65 (3). This right applies to every person except for members of the security services. Furthermore, the Constitution gives space for a law that may restrict the exercise of the right to participate in collective job actions by workers in essential services.

29 See s 65 (4).

30 See s 65 (6).

31 See s 65 (7).

*Every person has the right to an environment that is not harmful to their health or well-being; and to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting economic and social development.*³²

These rights are crucial in the era of climate change where whole societies or States can be subjected to adaptation measures that may not be ecologically sustainable, for instance, dam construction and biofuel plantations that result in widescale deforestation and ecological distortions.

A few specific laws deal with labour and environmental or climate-change-related matters and buttress the constitutional provisions. These laws include the Labour Act and the Environmental Management Act. Below is a discussion on the Acts.

4.2 The Labour Act

The Labour Act³³ provides for several fundamental rights for workers and gives effect to Zimbabwe's international obligations since the State is a member of the ILO. The Act provides for workers' rights to trade unionism, prohibits forced labour and protects workers' rights to fair labour standards, allows for workplace democracy and disallows discrimination. The labour law was greatly influenced by the socialist leaning of the Zimbabwe State in the immediate post-colonial period, and later at the turn of the century with the entry into Parliament of former trade unionists who became part of the law-making system in the Zimbabwe State. These factors had great influence on the current shape of labour law and especially on the desire to defend the right to social democracy in the workplace which is a principle embedded into the Preamble to the Labour Act. The right to democracy in the workplace is especially important since the workplace under capitalism is systematically skewed against workers regarding power relations. The Act protects this right by stating that:

No person shall hinder, obstruct or prevent any employee from forming or conducting any workers committee for the purpose of airing any grievance, negotiating any matter or advancing or protecting the rights or

32 See s 73 (1).

33 [Chapter 28:01].

*interests of employees; threaten any employee with any reprisal for any lawful action taken by him in advancing or protecting his rights or interests.*³⁴

These right to democracy is critical in workplaces that may be transitioning to the green economy since the voices of workers aware of the importance of climate justice will need to be incorporated in organisational decision-making. Furthermore, workers' voices are necessary within the changing face of the workplace during climate change as there may be a need for additional bargaining concerning, for example, working hours within a climate more vulnerable to harsher weather elements.

4.3 The Environmental Management Act

The Environmental Management Act³⁵ is the primary environmental legislation in Zimbabwe. The Act replaced the Natural Resources Act and created the Environmental Management Agency (EMA).³⁶ The Act provides some opportunities for the identification and protection of labour rights. For instance, in sync with the 2013 Constitution, the Act provides for substantive environmental rights for all persons, which necessarily includes the workforce. The Act provides for the right to an environment that is not harmful to health,³⁷ access to environmental information³⁸ as well as environmental protection.³⁹ Furthermore, the Act specifies that 'environmental management must place people and their needs at the forefront of its concerns'⁴⁰ as well as ensuring 'the participation of all interested and affected parties in environmental governance ... and all people must be given an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation'.⁴¹ These are vital provisions in environmental law, but would require a State that is capable of implementing such provisions. At the moment, the political will in Zimbabwe is lacking.

In addition to this principal legislation, there are a host of statutory instruments which are related to labour rights and general human health and safety in the times of climate change and harmful emissions.

34 See s 7 (1).

35 [Chapter 20:27].

36 See s 9.

37 See s 4 (1) (a). Also see s 73 (1) of the Constitution of Zimbabwe.

38 See s 4 (1) (b).

39 See s 4 (1) (c).

40 See s 4 (2) (b).

41 See s 4 (2) (c).

These provisions present an opportunity for workers to access information related to environmental and climate change issues and therefore to be better informed in negotiations in transitional workplaces.

4.4 Climate policy and labour rights

In addition to laws, the major decisions and planning by government are contained in policy documents, or in simple terms, government plans and aspirations. Following the international climate and related environmental treaties, for instance, the UNFCCC, COP decisions, the Kyoto Protocol and Paris Agreement among others, individual States also domesticated some of these decisions into either domestic law or State policy. The critical policies relating to climate change in Zimbabwe are the Zimbabwe Climate Policy, the National Energy Policy and the National Climate Change Response Strategy.

The latter acknowledges that some of the critical pillars of the Zimbabwean economy, for instance, mining, are detrimental to the environment. These industries are not only massive and strategic, but they also pose challenges to efforts to combat climate change as well as progressive in preserving human health, labour rights and societal welfare. The following passage from the strategy is clear enough in highlighting these aspects:

These mining activities, conducted in over 1,000 mines, have, however, inherent destructive elements to the environment and to the climate in particular. For instance, open cast mining leads to the clearing of forests and woodlands which are carbon sinks, whilst blasting leads to the emission of dust and gases which pollute the atmosphere. The health effects of emissions from mining activities on workers and local residents are often underplayed to the detriment of the communities, thus the reduction of emissions will have co-benefits.⁴²

Hence the impacts of specific industries on climate and labour rights are known to the State, but there seems to be no downscaling on harmful mining methods or extraction and use of fossil fuels in the primary transport and energy sectors, at least at the time of this writing. This lack of action is consistent with Marxist legal theory views of the purpose of the State, which is to maintain the interests of the monied classes at the detriment of workers, people and the planet.

The National Climate Policy,⁴³ however, is the critical policy on

42 GoZ (2014), p. 40.

43 GoZ (2017).

climate change from a Zimbabwean perspective. It calls for inclusivity and collaboration in dealing with the socio-economic impacts of climate change. The policy's concluding passage is very important as it reiterates 'calls for multi-stakeholder collaboration, interagency co-operation, governance systems and a means to integrate and mainstream climate change into different socio-economic sectors.'⁴⁴ This multi-stakeholder approach remains weak at the moment.

The National Energy Policy is also critical in the discussion on the impact of climate change on labour rights in Zimbabwe. The policy highlights the inevitable approach of green and renewable energy economies:

Consistent with regional and international strategies, protocols and conventions on climate change, a complementary energy policy objective is to ensure that Zimbabwe promotes research and development and the use of renewable sources of energy to support regional and international goals for increasing access to socially and environmentally sustainable energy services.⁴⁵

The Energy Policy recognises the need for the State to shift towards renewable energy, which is a vital component of the just transition focus. How it is rolled out will be critical to workers, trade unions as well as labour and environmental lawyers.

5. Challenges and Opportunities for Labour Law in the Era of Climate Change

The phenomenon of climate change undoubtedly affects all facets of human life as well as societal development. However, there are a few contemporary scientists and even politicians who continue to deny the human impacts of climate change. The field of labour law and labour rights are also vulnerable to the influence of climate change denials since the views of policy makers lead to the nature and content of laws. Beyond these challenges, there are also opportunities for labour justice in the times of climate change stemming from the implementation of domestic laws and international treaty obligations.

5.1 The Just Transition Principle and Space for Labour Justice in the Drive for Decent Work

Labour activists and practitioners amplify the climate change discourse at the local level. At international level, multilateral institutions such as

44 *Ibid.*, p. 23.

45 GoZ (2012). p, ix.

the International Labour Organisation has begun to include the need to cushion people from the effects of the transition to a greener world. The Solidarity and Just Transition, Silesia Declaration outlines the need for social democracy in the workplace, as indicated above. The declaration states that political leaders should:

Note the importance of a participatory and representative process of social dialogue involving all social partners to promote high employment rates, adequate social protection, labour standards and well-being of workers and their communities, when developing nationally determined contributions, long-term low greenhouse gas emission development strategies and adaptation planning processes.⁴⁶

The Just Transition principle is fast becoming an accepted part of international climate change law and policy. At the domestic level, there are already moves in important policies such as the National Climate Change Response Strategy and the National Climate Policy to discuss the implications of the transition to renewable energy and the green economy on the socio-economic rights as well as on human needs.

5.2 Co-ordination between Environmental and Labour Rights Groups

The need for joint efforts in tackling the problems of climate change cannot be understated. At the international level, there have already been instances of collaboration between international trade union groups with environmental groups. In the Zimbabwean context, the ZCTU, the Solidarity Centre and other trade unions will also be expected to upscale their collaborations with environmental and climate organisations and institutions, for instance the Climate Management office under the ministries dealing with climate change, as well as environmental groups such as the People and Earth Solidarity Law Network, and Environment Africa.

5.3 Advocacy and Law Amendments

Since the Paris Agreement, climate change is no longer the sole responsibility of the industrialised world. Therefore, there is need to push developing States to amend laws and cater for mitigating the emission of greenhouse gasses. This initiative has a direct effect on the preservation of human lives and health in the workplace, especially in traditional fossil-fuel driven

⁴⁶ UNFCCC (2018), Point 5.

industries. However, such amendments must also introduce provisos on preserving the labour expectations and job security for workers.

6. Conclusion

Labour rights and social justice in the workplace will be significantly strained if the transition to greener economies by developing States is not adequately managed. The effort to manage such a transition depends on a more significant part in the theoretical approach to labour law by the government of the day. At the international level, this will depend on the nature of climate financing. This will have an impact on the capacity of developing States to transition to cleaner energies and to carry out other mitigatory measures. The effort is also dependant on the domestic ratification or adoption of international environmental, climate change and labour decisions and treaties. In the case of Zimbabwe, it is apparent that there are almost adequate labour and climate-related legislation or policies; however, there is going to be the need for extensive collaborations between trade unions, workers' committees and social justice institutions with public interest environmental, climate change and labour law organisations. What is not in doubt however is that the world and the State are awakening up to the importance of preserving human and labour rights in the face of the changing face of the workplace due to anthropogenic effects.

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Climate Change and Property Rights Allocation in Zimbabwe's Energy Sector

James Tsabora

1. Introduction

The emergence of Zimbabwe's energy sector as a significant industry since the turn of the millennia must not only be understood in relation to economic development, but also in the context of emerging environmental phenomena such as climate change impacts. The rationale for this is that whilst the energy sector has huge potential to drive industrialization, society has ignored the attendant climate change and environmental impacts associated with investments in it. Consequently, insights can be made in relation to strategies and methodologies that must be embraced by the sector to confront environmental and climate change impacts. The fundamental contentions revolve around climate change and energy law, in particular the manner and extent that the regulatory framework for the energy sector can contribute in the achievement of positive environmental and climate change outcomes.

Throughout the past three decades, the government has crafted property rights and investment laws and policies with various interests in mind, including the need to attract foreign and domestic investment.¹

1 The most recent of policies include the 2018 Investment Guidelines and Opportunities for Zimbabwe. Other laws include the Indigenisation and Economic Empowerment Act [Chapter 14:33], Joint Ventures Act [Chapter 22:22], Zimbabwe Investment Authority Act [Chapter 14:30], and Special

The major influences responsible for shaping the content of investment laws have included economic, environmental, social and political factors, operating at the national, regional and international levels.² As with most developing nations, Zimbabwe has not held back from using its property rights law to regulate and manage economic investment in order to achieve socio-economic and political objectives.³ How can the state regulate the award and distribution of energy sector investment rights in a manner that ensures that it confronts climate change impacts?⁴ To date, Zimbabwe's energy sector continues to reflect tensions and compromises between these factors and interests. Climate change can be identified as a fairly new challenge that the energy sector has had to accept owing to the inherently cross-cutting developmental implications it poses to all economic sectors.⁵

1.2 Climate Change and Economic Investment

Climate change cannot be ignored without serious developmental consequences. Apart from the complex interplay of factors that have determined energy sector investment in the past three decades, the sector must adapt in view of additional considerations of climate change. It is now beyond dispute that climate change is a cross-sectoral issue that can seriously affect economic growth and development. To avoid this, strategies must be pursued to enhance the mitigation of, and adaptation to, climate change impacts. This, it is argued, is critical for a sector widely characterised by its 'minerals-energy complex'.⁶

Serious analysis of the connection between climate change and economic investment is necessitated by the relationship between economic development and human rights. Accelerated economic development can translate to improved standards of life, enhanced social and economic well-being and consequently, full enjoyment of basic human rights. It is now conceded that climate change issues are inexplicably tied to the

Economic Zones Act [Chapter 14:34].

2 Magaisa (2015).

3 Constitution of Zimbabwe [Amendment (No 20) Act, 2013]. Section 56 accepts unfair discrimination for purposes of redressing social-economic circumstances. Section 72 also accepts unfair discrimination in the distribution of land rights in order to address disparities in land distribution.

4 Matyszak (2011) p. 14.

5 This reality is reflected throughout policy frameworks designed by the Government of Zimbabwe. See GoZ (2017); GoZ (2015).

6 Murombo (2016).

enjoyment of human rights.⁷ Climate change impacts pose serious questions to human rights frameworks and response mechanisms particularly in countries commonly affected by droughts. The connection between climate change and socio-economic rights such as the right to health, food, water, shelter, culture, livelihood and property is clear.⁸ (See Chapter 6 for detailed discussion.) As a developing nation, Zimbabwe is bound to feel the depredations of climate change the most, as it already experiences hunger, droughts, poverty and diseases.⁹

Can the allocation and redistribution of property rights in the energy sector be used to promote and achieve positive climate change outcomes? These outcomes have to include achieving and promoting climate change mitigation and adaptation. This chapter thus interrogates the climate change and energy law and policy framework, examining whether climate change considerations are, or can be made to be, a basis for the granting of licences, permits, authorisations, certificates and other forms of property rights in the energy sector.

Other countries have moved, with relative success, towards mainstreaming climate change in the legal framework for the allocation and protection of investment rights and licences in various sectors, including the energy sector. In this light, one must question the extent to which Zimbabwe has predicated its energy sector licensing framework on climate change considerations. Further, are there opportunities in existing investment and energy law and policy for the mainstreaming of climate change? In exploring these questions, this chapter provides insights into whether the legal regulation and management of the energy sector property rights regime can be used to pursue climate change imperatives in Zimbabwe.

7 GoZ (2014), para 5:1, states that ‘At the heart of climate change governance are also issues of equity, human rights, gender and poverty reduction.’ The discussion on human rights is made in other parts of this book.

8 Greiber et al. (2009) p. 12.

9 GoZ (2017). The opening statement notes that ‘Zimbabwe lies in a semi-arid belt of Southern Africa with 80 percent of farming relying on rain-fed agriculture. This increases the vulnerability status of the country as agricultural productivity trends and other economic indicators such as gross domestic product has been observed to follow annual rainfall variability patterns. It is clear that urgent action is needed from Government as climate change is increasing this variability and subsequent impacts such as poverty, declining water quality and quantity, damaging of infrastructure and degradation of the natural resources which people’s livelihoods and the national economy depend on.’

1.3 Zimbabwe's Energy Sector in Perspective

The energy sector is gaining momentum in Zimbabwe owing to its centrality in the country's industrial development. The Energy Regulatory Act defines the 'energy industry' as 'persons in Zimbabwe who, in the private or public sphere are concerned with the generation, procurement, distribution, transportation, transmission and production of energy to consumers thereof'.¹⁰ To some extent, this covers the energy sector value chain. The sector's significance in the emission of greenhouse gases (GHGs) is well captured in Zimbabwe's National Climate Policy:

the country is an emitter of greenhouse gases with the major contributors being fuel combustion or energy (68.5%), agriculture (22.35%), waste handling (3.93%) and industrial processes (5.21%) in CO₂ equivalent. The primary energy sector is dominated by conventional fuels: coal, with total reserves of 10.6 billion tonnes of which half a billion are proven, petroleum of which about 1.5 billion litres of finished distillates are imported every year, and hydroelectric power with a total potential of 4,200 MW mainly on the Zambezi River, which is a shared basin. The liquid petroleum and gaseous fuels, which are all imported, are augmented by locally produced ethanol blended at a ratio 15:85. Electricity generation is about 49% hydro and 51% coal whilst the contribution of other abundant renewable energy resources such as solar and waste energy is negligible.¹¹

Arguably, the energy sector is the biggest emitter of GHGs.¹² This illustrates the inevitable connection that exists between the energy sector and climate change. Most importantly, the statistics alone justify the need to regulate the energy sector in a manner that seeks to tackle its significant contribution to GHG emissions, and consequently to climate change.¹³

1.4 Climate Change and Property Rights Regulation

In what way can property rights regulation have an impact in the quest for climate change mitigation and adaptation in the energy sector? The 2013 Constitution contains a constitutional property cause, section 71, which creates a framework for the protection of property rights in Zimbabwe. From an investment perspective, investors are granted

10 Energy Regulatory Act [Chapter 13:23] s1.

11 GoZ (2017) p. 12.

12 International Energy Agency, 'Key stats for Zimbabwe, 1990-2016' <<https://www.iea.org/countries/Zimbabwe/>>.

13 GoZ (2014) p. 42.

various authorisations in form of statutory licences, permits, certificates and special grants. The constitutional provisions on property rights in general have important implications for the security of these investment rights. Inescapably, the question is whether investment rights commonly prevalent in the energy sector fit within the definition of property given and envisaged by the Constitution of Zimbabwe.

An analysis of the constitutional property clause (section 71) is apposite. This provision describes property as ‘property of any description and any right or interest in property’. Clearly, this definition is abstract, and can encompass virtually everything. Notably, it envisages property as encompassing both ‘rights’ and ‘interests.’ Licences and all other statutory authorisations qualify as rights and interests. Accordingly, they grant to the holder all entitlements of property, which include the rights:

to acquire, hold, occupy, use, transfer, hypothecate, lease or dispose of all forms of property, either individually or in association with others.¹⁴

From this, it is clear that investment rights that are granted and allocated by the state in the energy sector are definite property rights. They are thus constitutionally protected and guaranteed. Can the state subject these rights to any form of restrictions, limitations or expropriation for reasons connected to climate change?

1.5 Compensation for Deprivations and Acquisitions by the State

Apart from guaranteeing the security of property rights, the Constitution permits what is known as compulsory deprivation and acquisition of rights, generally in the public interest.¹⁵ Compulsory deprivation is defined as the attenuation or negative restriction of property rights that comes with private ownership, at the behest of state authorities. It is thus a limitation to the enjoyment of property rights, which are not absolute in themselves. Compulsory deprivation is usually uncompensated.¹⁶ Under section 71 of the Constitution, compulsory deprivation can only proceed in terms of a law of general application, and such deprivation must be necessary

¹⁴ Constitution of Zimbabwe, s71 (2).

¹⁵ *Ibid.*, s71(3). The public interest envisaged in the constitutional property clause includes the interests of defence, public safety, public order, public morality, public health or town and country planning.

¹⁶ *Hewlett v Minister of Finance and Another* 1982 (1) SA 490 (ZS) (1981 ZLR 571); *Davies v Minister of Lands, Agriculture and Water Development* 1994 (2) ZLR 294 (H) and 1997 (1) SA 228 (ZS).

in the public interest, that is 'in the interests of defence, public safety, public order, public morality, public health, town and country planning or in the development or use of that property or another for a purpose that benefits the community'.¹⁷

Another important limitation, is compulsory acquisition of property. As with deprivation, this is also recognised by the Constitution, and it can proceed upon certain procedural conditions being met by the state.¹⁸ Compulsory acquisition is the transfer of rights to state authorities, often with compensation being paid.¹⁹ In practice, the state acquires the property, stripping the previous owners of all rights vested in them.

The fact that property rights are subject to deprivation and compulsory acquisition by the state means that corollary issues of compensation take effect. Generally, in the context of investment per se, there is no doubting the fact that whilst a strong government that can enforce and protect property rights is necessary, the danger exists that the same government can also abrogate such rights without due and adequate compensation. The security of investment is critical, and where such security is threatened, investors expect compensation.

Under the Zimbabwean Constitution, the acquisition or deprivation of property is subject to fair and adequate compensation.²⁰ In terms of section 71 (3), the acquiring authority is required to pay fair and adequate compensation for acquisition of property rights before the acquisition is done, or within a reasonable time thereafter.²¹

It is important to note that the 2013 Constitution seems to depart

17 Constitution of Zimbabwe, s3.

18 *Ibid.*, s71 (3) (c-e).

19 *Davies v Minister of Lands, Agriculture and Water Development*, 1997 (1) SA 228 (ZS).

20 Constitution of Zimbabwe, s71 (3) (c). Compare with acquisitions under s72 where compensation is limited to improvements done on the land, but is not payable on the loss of the land itself.

21 *Ibid.* s71 (3) uses the terms compulsory deprivation and acquisition interchangeably, and this does not aid any clarity. Tsabora (2017) notes the fact that the section adopts compulsory deprivation in the primary sentence directly, suggesting that it is wholly and exclusively concerned with compulsory *deprivation*, not compulsory *acquisition*. However, according to Tsabora, the section proceeds to interchangeably uses both compulsory acquisition and compulsory deprivation, suggesting that these two concepts bear the same meaning. Hence, s71 (3) (a) broadly refers to compulsory deprivation, s71 (3) (c) and (d) make reference to compulsory acquisition, and finally s71 (3) (e) reverts to compulsory deprivation.

from its predecessor in relation to compensation regimes. Under the 1980 Lancaster House Constitution, only compulsory acquisition of property required compensation;²² deprivations, understood to refer to restrictions on the use of property, were uncompensated. The 2013 Constitution changes this position, and interchangeably uses the terms ‘acquisitions’ and ‘deprivations’ in section 71, leading to an arguable conclusion that both acquisitions and deprivations are now subject to compensation.²³ Can deprivations of rights in the energy sector expect compensation in practical terms? What is likely to be the attitude of the state regarding compensation for all forms of deprivations, large or small?

It is contended that despite the Constitution seemingly calling for compensation for both deprivations and outright acquisitions, the state is likely to compensate for acquisitions only. Deprivations in the sector are likely to be those that restrict the use of certain technologies, methods and strategies in energy production.²⁴ They may also include deprivations generally meant to achieve environmental conservation, public health imperatives or other related public purposes. For example, the state can adopt regulations that compel private investors to use and adopt cleaner and more efficient technologies for purposes of meeting climate change objectives and the Nationally Determined Contribution targets. The consequence of such restrictions is not the extinguishing or transfer of property rights, but the achievement of a public good, namely climate change imperatives. For that reason, government is not likely to compensate.²⁵ This is a global trend;²⁶ governments rarely compensate for restrictions on the use of property that do not lead to the acquisition or transfer of property rights.²⁷

22 *Hewlett v Minister of Finance and Another* (n 16 above); *Davies v Minister of Lands, Agriculture and Water Development* (n 16 above).

23 Magaisa (2012).

24 GoZ (2014) p. 58.

25 The Zimbabwean Supreme Court has supported this approach in the *Davies* case supra. Therein, the court declared that, ‘... there are numerous enactments in our statute books that provide for control, but do not provide for compensation for any loss or restriction arising from those measures of control. This, to some extent, gives a clear indication that by and large measures of control can be enacted without provision for compensation.’

26 See Alexander (2006); Dagan (2007).

27 *First National Bank of SA Pvt Ltd t/a Wesbank v Commissioner of the South African Revenue Service & Anor; First National Bank Pvt Ltd t/a Wesbank v Minister of Finance* CCT19/01. The Court stated that ‘... it is permissible for legislation, in the broader public interest, to deprive persons of property

In the case of *Hewlett v Minister of Finance*, the Supreme Court laid the foundation for uncompensated deprivations. The court declared that 'government could be made virtually impossible if every deprivation of property required compensation'.²⁸ Apart from the similar approach in the South African jurisdiction, this approach has also characterised American jurisprudence,²⁹ and is likely to characterise the Zimbabwean legal system under the 2013 Constitution.

The above rendition of the property rights position illustrates three major points. Firstly, it has been proved that energy sector investment rights are property rights recognised as such in terms of the constitutional property rights clause. These rights are guaranteed, but are also subject to limitations. Secondly, it has been demonstrated that the limitations to property rights can constitute either deprivation or acquisition of rights. Where there is compulsory deprivation, property rights are restricted, but are not transferred or taken away, unlike in cases of compulsory acquisition where rights are extinguished altogether. Thirdly, it has been shown that despite the Constitution seemingly destroying the traditional distinction between acquisitions and deprivations, the state is likely to compensate acquisitions only. This means that the state can impose restrictions on the exercise of energy sector investment rights; such restrictions are constitutional and lawful, and, in ordinary circumstances, are justified as being in the public interest.

The mining sector provides a perfect analogy for scrutinizing the use of the rights allocation system. The state has applied the property rights restrictions in the regulation of the mining sector to achieve various objectives, including environmental objectives. How has the state achieved this feat?

without payment of compensation. The second is that for the validity of such deprivation, there must be an appropriate relationship between means and ends, between the sacrifice the individual is asked to make and the public purpose this is intended to serve.'

28 *Hewlett v Minister of Finance and Another*. Fn. 17 above.

29 Compare with the case of *Pennsylvania Coal Co v Mahon* 260 US 393 (1922) 413. The court reasoned that: '[g]overnment hardly could go on if to some extent values incident to property could not be diminished without paying for every such change in the general law. As long recognized some values are enjoyed under an implied limitation and must yield to the police power. But obviously the implied limitation must have its limits or the contract and due process clauses are gone.'

1.6 Mining Sector Regulation and Environmental Imperatives

The mining sector has always been a regulated sector in Zimbabwe, chiefly owing to its significant contribution to economic growth and social development. Another critical factor is the environmental impacts associated with mining. The regulation of the sector has therefore always sought to influence positive behavior from an environmental perspective. How has the state approached regulation in this sector, particularly in relation to ensuring the mitigation of environmental degradation associated with mining?

The state has regulated the mining sector by distributing licences and related authorizations which impose certain duties and standards on the miner in the public interest. In granting such mining rights, the state applies certain conditions, which create the basis for the regulation, management and even termination of the holder's rights.

Under the Mines and Minerals Act,³⁰ for instance, a miner can be granted a 'special mining lease',³¹ a 'special grant'³² or a 'prospecting licence'. The Mines and Minerals Amendment Bill³³ also recognises several mining rights. It defines mining title to mean an exclusive prospecting licence, or an exclusive exploration licence, or a special grant for exploration.³⁴ It further defines 'mining right' to mean:

- (a) a certificate of registration of a block of precious metal claims;
- (b) a certificate of registration of a block of precious stones claims;
- (c) a certificate of registration of a block of base mineral claims;
- (d) a certificate of registration of a site mentioned in section 47;
- (e) a special mining lease;
- (f) a mining lease; or
- (g) special grants for mining.

These rights, licences and grants are the main forms of property

30 Chapter 21:05.

31 *Ibid.*, Part VIII.

32 *Ibid.*, s291.

33 H.B.14 (2007).

34 *Ibid.* s14 recognises and confirms the nature of these rights as property rights. A newly inserted s2A provides that; 'A prospecting, exploration or mining right granted in terms of this Act is a limited right which is subject to the provisions of this Act.'

rights found in the mining sector. They are aimed not only at awarding mining rights, but also to ensure that the state controls the nature and methodology of resource extraction. By such regulation, the state ensures that there is least environmental damage and that the resource extraction is sustainable in the short, medium and long term.

The Zimbabwean government has awarded mining rights in terms of mining legislation. However, the legislative framework permits the government to enter into contracts with mining investors, and such contracts can exclusively regulate all aspects of the relationship, investment rights, obligations and duties of all parties.³⁵ In some instances, the contracts take precedence over legislation, and can elbow out the application of legislative provisions.³⁶ A case in point is *Zimbabwe Platinum Mines Pvt Ltd (ZIMPLATS) v Zimbabwe Revenue Authority*,³⁷ which permitted the mining investor to pay a lower tax rate than that imposed by legislation, and on dates agreed in the contract, rather than those set down in the Mines and Minerals Act.

Mining contracts are particularly technical, and seek to capture almost everything within the confines of the law. They can regulate tax provisions, local procurement requirements, the right for the company to process, market and sell the minerals it extracts, a company's community development obligations, and provisions for state participation and/or control. They can also regulate other technical, legal, customs, economic, administrative, land, employment and environmental conditions with a view to ensuring that the mining investor and the government contracting party meet their obligations. However, while governments may find it easier to incorporate obligations in mining contracts, the asymmetrical nature of the negotiations means that they can easily miss the opportunities to impose best practices and standards.³⁸

If they are well negotiated, though, the government can exploit the opportunities to impose best climate sensitive practices and standards in contracts with investors. As Cotula has noted:

35 *Zimbabwe Platinum Mines Pvt Ltd (ZIMPLATS) vs Zimbabwe Revenue Authority* and 3 Ors HH169/15.

36 *Ibid.*

37 *Ibid.*

38 'Zim's shady mining contracts: A case for African Mining Vision', *Zimbabwe Independent*, 27 July 2012.

*Contracts ... shape the balance between these economic considerations and the other pillars of sustainable development, namely social and environmental aspects. If well designed and implemented, contracts can maximize the contribution of natural resources investment to sustainable development but badly drafted or executed contracts may impose unfavourable terms on the host country often for long periods of time, sow the seeds of disputes and undermine the pursuit of policy goals like poverty reduction and environmental sustainability.*³⁹

The most common approach in awarding mining rights and concessions in Zimbabwe is through legislation. The mines law itself is a colonial piece of legislation,⁴⁰ and was adopted prior to the prominence of environmental issues.⁴¹ However, through several amendments, this law now recognises the importance of environmental considerations, to some extent, in the application processes for mining rights.⁴² A good example is the application for a special mining lease under the Mines and Minerals Act. As part of the application documentation, the applicant is required to submit, inter alia:

a report on the anticipated impact of mining operations on the environment and any measures to be taken to assess, prevent or minimize such impact, including proposals for

- A. the prevention or treatment of pollution;*
- B. the treatment and disposal of waste;*
- C. the protection of rivers and other sources of water;*
- D. the reclamation and rehabilitation of land disturbed by mining operations;*
- E. monitoring the effect of mining operations on the environment.*⁴³

The government is currently expected to replace the mining law with a new Act or introduce comprehensive amendments to the Mines and Minerals Act.⁴⁴ This would enable it to ensure that constitutional and

39 Cotula (2010) p. 3.

40 The Mines and Minerals Act [Chapter 21:05] was first adopted in 1961. It has been amended more than forty-five times.

41 Environmental Management Act [Chapter 20:27]. The legislation was passed in 2002.

42 Mines and Minerals Amendment Bill. The bill has extensive provisions on the environmental regulatory controls in the mining sector.

43 Mines and Minerals Act, s159.

44 'President rejects Bill', *The Herald*, 6 October 2018.

other modern standards are incorporated. The provisions of the Mines and Minerals Amendment Bill are interesting in relation to environmental management and must be discussed here.

1.7 The Mines Bill and Environmental Imperatives

An important part (Part XVA) of the Mines and Minerals Amendment Bill is its need to strike a balance between mining development and environmental management imperatives. Under this, the Minister and a team of experts are given the responsibility for determining the best method of mining to be used in any area, whether in rivers, on the surface or underground, the tools and machinery to be used and the level and extent of such mining activities.⁴⁵ It is arguable that the best mining method is one that incorporates environmental considerations and seeks to mitigate environmental impacts.

This approach means that mining activities that are carried out should not result in irreversible damage to the environment. Related provisions include the manner in which the protection of natural resources is balanced against the imperatives of environmental protection.⁴⁶ In terms of this, the Cadastre Registrar is obligated to consider the need to conserve the natural resources on the land over which the right is sought or in neighbouring land prior to the granting of a mineral right or title. Additionally, an Environmental Impact Assessment (EIA) is required and this must be submitted to the Cadastre Registrar as part of the application process for mining rights or title.

An EIA is a very important planning and decision-making tool, particularly in those sectors whose activities lead to great impacts on environmental integrity.⁴⁷ Generally, the objective of an EIA is to ensure that the environmental and socio-economic costs and benefits of development projects are properly accounted for, that unwarranted negative impacts are avoided or mitigated and that potential benefits are realised.⁴⁸ The fact that EIAs now characterise most developmental sectors such a mining where environmental impacts are massive means that there is an environmental mainstreaming approach in economic sectors that

45 Mines and Minerals Amendment Bill, s257 B (2).

46 *Ibid.*, s257(C).

47 Energy Regulatory Act, s4(1)(q). The provision gives the energy regulatory authority power to assess, promote studies of and advise the Minister and licensees on the environmental impact of energy projects before licensing.

48 SARDC (2000).

have a significant impact on the environment.

The Mines and Minerals Amendment Bill calls for EIAs in relation to both large- and small-scale miners, and this is well in line with the provisions of the Environmental Management Act.⁴⁹ The implications of this are significant. Clearly, it implies that the prevention, limitation or treatment of pollution and the minimization of the impacts of mining are part of the conditions for the allocation of mining titles or rights by the state to mining investors.⁵⁰ Finally, a significant position in the Bill requires every holder of a prospecting, exploration or mining title or right to manage environmental impacts associated with their mining activities in accordance with environmental management plans or programmes.⁵¹ Without doubt, these provisions have significant meaning: the state has mainstreamed environmental considerations in the legal regime for the acquisition, allocation and re-distribution of mining rights and title. By so doing, the state can achieve and promote positive environmental outcomes such as environmental protection in a sector where environmental degradation is a massive problem.

The argument is therefore that the state can adopt and implement a similar philosophy in regulating the acquisition, allocation and redistribution of rights in the energy sector. But in this sector, the focus must be to achieve and promote climate change mitigation and adaptation. To what extent does the climate change policy framework accommodate such thinking?

1.8 The Climate Change Policy Framework

A policy framework is critical in guiding state practice and legislative objectives. Any climate change policy framework provides insights into the state's agenda in relation to climate change mitigation and adaptation. Indeed, a climate change policy document must give backing to the actual laws that are set to promote and achieve objectives in the policy framework. This position applies to Zimbabwe; the climate change policy framework must be interrogated to determine whether it has opportunities for the mainstreaming of climate change mitigation and adaptation imperatives in the energy sector.⁵² Currently, two official documents characterise

49 Mines and Minerals Amendment Bill, s257 (A).

50 Mines and Minerals Amendment Bill, s257 (D) (1) (a) and (b).

51 *Ibid.*, s257 D (2) (c).

52 The Energy Regulatory Act, s24, states that the Minister responsible for energy may give the energy regulatory body *such general directions in writing*

the climate change policy framework: the Zimbabwe Climate Change Response Strategy and the Zimbabwe National Climate Policy.

1.8.1 The National Climate Change Response Strategy

The Zimbabwe government crafted the National Climate Change Response Strategy in 2014, and it creates a sound and comprehensive platform to confront climate change. Prior to this, climate change issues were covered in sectorial policies in an uncoordinated manner. The policies that covered, often marginally, climate change issues include the National Policy and Programme on Drought Mitigation; the Draft Disaster Risk Management Policy and Strategy; the Second Science, Technology and Innovation Policy; the Water Policy; the Agriculture Marketing and Pricing Policy; and the Small, Micro and Medium Enterprises Policy.⁵³

The Strategy is clear on its goal, which is 'to mainstream climate change adaptation and mitigation strategies in economic and social development at national and sectoral levels through multi-stakeholder engagement.'⁵⁴ Other objectives of the Strategy are plausible, and these include to mainstream climate change in all the key sectors of the economy; to promote resource use efficiency and less carbon intense pathways in all economic activities and develop a climate change resilient energy infrastructure that is not carbon intense. A general theme of the strategic objectives, main pillars and vision of the Strategy is mitigation and adaptation for purposes of creating 'a climate change resilient nation while its mission is to ensure sustainable development and a climate proofed economy.'⁵⁵

Apart from these positions, the Strategy acknowledges the importance of a clear and comprehensive legal and policy framework for climate change. In this vein, one of the guiding principles of the policy is to mainstream climate change into 'policy and legal framework as well as development planning'.⁵⁶ Other complementary policy thrusts include the mainstreaming of both sustainable development

relating to the policy the Authority is to observe in the exercise of its functions as the Minister considers to be necessary in the national interest, and the body is obliged to take all necessary steps to comply with any direction given to it in terms of the subsection.

53 GoZ (2014) p. 64.

54 Ibid.

55 Ibid.

56 Ibid.

and human rights-based approaches in law and policy.⁵⁷

In relation to energy, several points can be made about the Strategy. Firstly, it acknowledges the importance of the energy sector and its critical connection to climate change. It connects climate change based approaches with approaches called for in the National Energy Policy,⁵⁸ and these include promotion of renewable energy and other action plans to ‘green’ the energy sector.⁵⁹ Strategies for confronting the climate change phenomenon in the energy sector are identified in the document, as the introduction of policies and regulatory frameworks for renewable energy, energy conservation and energy efficiency; strengthening energy planning, research and development; and promoting low carbon energy provision and use.⁶⁰

The Strategy defers to the energy policy framework in as far as implementing strategies are concerned. Specifically, it pins its hopes on the strategies in the energy policy framework, stating that if these strategies are implemented within stipulated timeframes, they ‘should’ be able to complement the strategies identified in this strategy document.

Whilst this can be lauded as an integrated approach to policy making, its dangers must not be overlooked. The lack of technical detail and specificity of the energy policy framework means that the Strategy missed an opportunity to establish a comprehensive framework of action to guide the energy sector and ensure that it makes a practical contribution to climate change imperatives. What must be applauded however is the clear foundation for legal regulation of the energy sector in a manner that promotes positive climate change related outcomes. Thus, a law that applies conditions and restrictions to the awarding of licences, permits and rights for the purposes of contributing to imperatives of climate adaptation and climate change mitigation has adequate policy backing.

1.8.2 The National Climate Policy

In 2016, the government of Zimbabwe drafted the National Climate Policy (NCP). Complementing the Climate Change Response Strategy discussed above, the NCP is adopted for purposes of galvanizing

57 Ibid.

58 GoZ (2012).

59 GoZ (2014) p. 46.

60 Ibid.

*action towards specific targets, timelines, mandates, and allocation of resources and responsibility amongst relevant Ministries and sectors for concrete and implementable steps, guiding the National Climate Response Strategy among other plans developed.*⁶¹

Indeed, the NCP is regarded as necessary to 'guide the implementation of the National Climate Change Response Strategy and other subsequent strategies, and action plans that will be developed.'⁶²

To start with, the NCP endorses the need for the 'mainstreaming'⁶³ of climate issues in all sectors of the economy, including energy, agriculture, industrial processes, waste, land use, land cover and forestry.⁶⁴ This aligns with the general theme of the Response Strategy. Of the principles supporting the policy, three are critical in relation to the energy sector. The first is Principle 3, which recognises the need to adopt a low carbon development pathway that incorporates national developmental aspirations, vision and programmes. Principle 4 is also critical; it requires the building of resilience to climate challenges through adaptation programmes, and these must be pursued concurrently with climate change mitigation programmes. The third is Principle 7, which requires the policy to guide climate adaptation and climate change mitigation in investment programmes in Zimbabwe's priority area.

Apart from the principles that are the bedrock to the NCP, the policy seeks to achieve certain important goals to promote climate adaptation and climate change mitigation. One important goal is the promotion and strengthening of technology transfer and information sharing. This is seen as vital in order to 'reduce vulnerability to the diverse and complex impacts of climate change, while developing in a low carbon pathway in the country.'⁶⁵ The NCP correctly identifies the importance of technology transfer, pointing out that:

The challenge of climate change requires Zimbabwe to access and develop technologies relevant for implementing appropriate mitigation and adaptation projects and actions. Across the global landscape, countries are increasingly drawing from Low Emissions Development (LED) technologies particularly

61 GoZ (2017), Foreword.

62 Ibid., Preface.

63 GoZ (2014) also recognises the need for mainstreaming, and calls for the mainstreaming of climate change through a sectoral approach to ensure that each sector implements adaptation and mitigation actions.

64 GoZ (2017), Preface.

65 Ibid., p. 7.

in the energy sector. LED pathways, for example in the energy sector, have given several opportunities including energy security, energy access, employment generation, cost-savings, resource efficiency and health benefits to countries adopting such technologies. As such, there are numerous benefits in developing or upscaling LED programmes in Zimbabwe.⁶⁶

To achieve this, government has set out on a particular trajectory. Specifically, the government intends to, inter alia, ‘identify the country’s technology needs and priorities and promote its development, uptake and diffusion’; promote the removal of barriers of technology transfer; and promote technology transfer in support of Zimbabwe’s Nationally Determined Contributions (NDCs) and other climate related policies and actions.⁶⁷

Finally, the government is targeting the acceleration of mitigation measures by adopting and developing low carbon development pathways in the industrial, energy, waste, agriculture, land use, and forestry sectors, among others.⁶⁸ Notably, the government seeks to proceed implementing a number of measures, and these include establishing and regularly updating a national inventory of anthropogenic emissions by sources and removal by sinks of greenhouse gases; and preparing, communicating and maintaining set emission targets for each sector that are in line with the NDCs in a transparent manner and to update them every five years. In addition, the government intends to formulate and implement programmes containing measures to mitigate climate change, whilst also mainstreaming climate change in the energy and other sectors. The government shall also cooperate in the development, application and diffusion of climate friendly technologies.

Some of the measures to be implemented in the energy sector include the promotion of cleaner fossil fuel technologies and access to clean and affordable energy, and enhancing the monitoring, reporting and verification systems based on appropriate methodologies to account for GHG emissions in the energy sector.

The government has clearly accepted the challenge posed by climate change to various sectors of the economy, not least the energy sector. The policy thrusts are quite noble, despite lacking in implementation detail and institutional mechanisms. Despite the lack of specific discussions on the

66 Ibid.

67 Ibid.

68 Ibid., p. 15.

legal framework impacting on the energy sector, it is very clear that laws must be developed and improved to incorporate these policy imperatives. In some instances, the law needs constant amendment to encapsulate the imperatives of policy frameworks. In what manner are initiatives in the climate change policy framework complemented by strategies in the national investment policy framework?

1.8.3 The National Investment Policy framework

The existing investment policy⁶⁹ is a reformist document, seeking to introduce changes in the investment sector for the purpose of attracting investment. The major objectives for the document are to provide an efficient, effective and transparent system for attracting and carrying out investment; to enhance, modernise and streamline the legal framework for investment; and to promote the development and application of good international standards and practices regarding investment. These objectives are outlined on the back of investor flight from Zimbabwe since 2000 owing to property rights insecurity and other challenges associated with the economic crises.

A significant observation about the policy document is that it gives little, if any, recognition to the energy sector as an investment sector worthy of mention. The energy sector is bunched with infrastructure and mentioned only in part. It is therefore not surprising that the document does not seem to regard sustainable development as a critical objective. There is no connection made between climate change and the national investment policy thrust. In summary, the investment policy is based on attracting foreign investment without emphasizing the need to pursue investment policies that are guided by cross-sectoral developmental programmes such as those advocated under the climate change policy.

1.9 The Zimbabwe Energy Policy Framework

The national policy for energy in Zimbabwe is contained in the National Energy Policy,⁷⁰ a careful reading of which suggests that the main policy goals and objectives are guided by the five 'A's: Applicability, Acceptability, Affordability, Accountability and Availability.⁷¹ The document does not mention climate change, opting to perhaps cover it under environmental

69 GoZ (2018).

70 GoZ (2012).

71 *Ibid.*, p. 6.

considerations or factors.⁷² Climate change considerations are covered only under the Acceptability principle, which is described as follows:

*The technical quality and the social and environmental sustainability of energy products and services determine their acceptability to local and international stakeholders. There is global consensus on the need to protect the physical environment, and therefore international best practice is used to benchmark standards of safety, reliability, security, efficiency and the acceptable environmental and social impacts of energy production, transportation, distribution, supply and use. Sustainability requires energy efficiency and demand-side management to be embedded in all energy sector strategies.*⁷³

There is no escaping the fact that the energy policy relegates environmental considerations to the margins. Indeed, no single principle is more prominent than any other. For instance, in relation to environmental imperatives, the policy calls for the need to ensure environmentally friendly power exploitation methods,⁷⁴ promotion of renewable sources of energy which are environmentally friendly, institutional collaboration between environment authorities and energy and power departments,⁷⁵ and the need for an integrated energy plan that takes into account environmental considerations,⁷⁶ whilst incorporating environmental considerations in the supply, transformation and end use of energy. Finally, the policy calls for the ministry responsible for energy and power to 'develop and review integrated electricity energy resource master plans so as to increase the proportion of electricity generated from renewable energy resources for environmental sustainability'.⁷⁷

There is a very important provision in the energy policy in relation to the use of the licensing system to achieve certain outcomes. As part of the strategies to enhance institutional governance, the policy makes recommendations for the Zimbabwe Energy Regulatory Authority (ZERA). One important strategy to be implemented by ZERA is to:

72 Energy Regulatory Act [Chapter 13:23]. The Act may be read as preferring to cover climate change under 'environment'. There is no single mention of the term climate change. It mentions environment three times in the licensing requirements, and functions of the regulatory authority.

73 National Energy Policy, pp. 5-6.

74 *Ibid.*, p. 21.

75 *Ibid.*, p. 28.

76 *Ibid.*, p. 41.

77 *Ibid.*

*incorporate in licences and regulations explicit principles and measures for embedding energy efficiency and demand-side management, environmental protection and gender, and other energy cross-cutting issues related to the quality and sustainability of energy services.*⁷⁸

This statement is critical. It means that ZERA can use its licensing system to promote certain objectives good for society, and these include environmental protection objectives. Thus, ZERA can effectively require investors in the energy sector to adopt clean technologies, or other strategies and methods of energy production in a manner that promotes climate adaptation and climate change mitigation. This clearly means the energy policy is not hostile to the use of its rights distribution and allocation system to achieve environmental objectives, possibly through the law. It becomes critical to interrogate how Zimbabwe's energy law responded to this challenge.

1.10 The Energy Regulatory Act

The energy industry is regulated by the Zimbabwe Energy Regulatory Act,⁷⁹ which is administered by the minister responsible for energy, working through the Energy Regulatory Board and ZERA. These main institutional mechanisms are central to the licensing regime created by the Act. The Act is not oblivious to environmental sustainability but does not mention climate change. It could be argued that the Act envisages climate change issues as covered in the provisions on environment.

It is important to note that the Act can accommodate a robust climate change-based approach in the licensing regime. ZERA has wide powers in relation to this; it has the power to 'regulate the procurement, production, transportation, transmission, distribution, importation and exportation of energy derived from any energy source'.⁸⁰ It can also regulate 'the environmental, occupational and consumer safety standards to be observed in relation to the extraction, production, refining and distribution of the energy source in question.'⁸¹ Apart from

⁷⁸ See Energy Regulatory Act, s7(3) (b). This approach gives the regulatory authority power to make licensing regulations providing for the environmental, occupational and consumer safety standards to be observed in relation to the extraction, production, refining and distribution of the energy source in question.

⁷⁹ Zimbabwe Energy Regulatory Act [Chapter 13:23].

⁸⁰ Ibid., s4(1) (a).

⁸¹ Ibid., s7(3) (b).

this, the Authority can make regulations to govern licence terms and conditions applicable to the sector of the energy industry concerned with the exploitation of the energy source in question.⁸²

Despite this, there is no doubting the fact that the Act is based on the need to achieve energy efficiency and energy security. With Zimbabwe in a permanent state of energy crisis,⁸³ it would not be surprising for the government to ignore climate change considerations and seek to promote imperatives for energy sector expansion and increased production. Accordingly, it can be asserted that whilst in theory this piece of legislation may accommodate licencing terms and conditions that can promote climate adaptation and mitigation, the reality on the ground might militate against an overly stringent licensing regime that may hinder increased production.

Finally, the relationship between the energy sector and environmental management legal regime must be tightened. Without doubt, an integrated approach between the two can bear fruit. Currently, energy sector activities require environmental impact assessments under the Environmental Management Act, which states that activities requiring an EIA in the energy sector are petroleum production, storage and distribution; oil and gas exploration and development; pipelines; oil and gas separation, processing, handling and storage facilities; and oil refineries.⁸⁴

Further, in relation to power generation and transmission, an EIA is required for the construction of thermal power stations, hydropower schemes and high-voltage transmission lines.⁸⁵ The boundaries of licensing and regulatory powers between the energy regulatory authorities and the environmental management authority are not clearly spelt out. These weaknesses are sources of potential trouble, militating against the effective regulation of investment licences in the energy sector.

1.11 Overview

Several points stand out from this analysis of the policy frameworks.

The fact that climate change must be approached from a cross-sectoral perspective means that it must be mainstreamed in all relevant laws and

82 *Ibid.*, s7(3) (h).

83 'Zimbabwe energy crisis to ease in 2019', *NewsDay*, 18 June 2013; Panapress (2003); 'Energy crisis worsens in Zimbabwe' < <https://allafrica.com/view/group/main/main/id/00038972.html> >.

84 Environmental Management Act, s97.

85 *Ibid.*

policies. This mainstreaming establishes the moral, political and legal basis for using rights allocation laws to promote particular behavioral practices in the energy sector. However, whilst several relevant policy documents map the mainstreaming of climate change as a critical way forward, others are either non-committal or uninterested.

Secondly, national climate change and energy policy frameworks are not averse to the establishment of a licensing system that is based on the need to achieve climate adaptation and climate change mitigation.

Thirdly, Zimbabwe has a very clear and sound climate change response strategy that can inform the provisions of legislation adopted to support various climate change policy objectives. Importantly, existing policy thrusts must necessarily inform the interpretation, enforcement and application of laws meant to achieve climate change objectives.

The fourth point is that there is a lot of room for institutional mechanisms to establish various rights allocation systems that are predicated on the need to achieve and promote climate change imperatives. An integrated institutional system that functions under a cooperative governance framework can achieve climate change related outcomes through investment rights allocation in the energy sector.

Finally, there is nothing in the policy framework that contradicts, directly or indirectly, provisions of the constitutional property clause that guarantees property. All strategies and initiatives envisaged by policy frameworks can easily be justified as necessary instruments to achieve particular socio-economic objectives. In any case, where such strategies and initiatives restrict the enjoyment of property rights, such restrictions can be explained on the basis of the constitutional limitation clause, which calls for limitations of rights 'to the extent that the limitation is fair, reasonable, necessary and justifiable in a democratic society based on openness, justice, human dignity, equality and freedom'.⁸⁶

1.12 Conclusion

From the outset, this contribution sought to examine whether climate change considerations are, or alternatively can be made, deterministic in any way in the granting of licences, permits, authorizations, certificates and other forms of property rights awarded in the energy sector. This inquiry is motivated by the quest to modify the contours of the energy sector for the purpose of promoting climate adaptation and climate

⁸⁶ Constitution of Zimbabwe, s86.

change mitigation. Throughout the discussions, one conclusion has been inescapable, if not inevitable, and it is that climate change considerations can be mainstreamed in the licensing processes of the energy sector to achieve climate adaptation and climate change mitigation.

The face and nature of investment in the energy sector must change to incorporate, promote and achieve environmental objectives such as climate change imperatives. The best way to achieve this is not to reinvent the wheel, but to revisit the licensing or rights allocation system in the energy sector. Rights allocation and redistribution, as developments in the mining sector illustrate, can shape corporate behavior and provide governance frameworks with a legitimate instrument to achieve certain social, political and environmental objectives without harming economic investment.

This approach does not jeopardise the security or exercise of investment rights in the energy sector. The 2013 Constitution goes a long way in the recognition, protection and promotion of the right to property. Indeed, it has been illustrated that the manner in which the constitutional property clause is phrased extends recognition and protection to property rights such as those commonly found in the energy sector. This provides an important value system that should guide and determine the content of legislation promulgated not only to give effect to the right to property, but also to impose socially beneficial restrictions to such rights. This approach has been commonly followed in other comparable jurisdictions, and it should be harnessed in Zimbabwe in the interests of climate adaptation and climate change mitigation.

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Climate Change in Zimbabwe: Towards a Low Carbon Energy Industry

Tumai Murombo

1. Introduction: Climate Change, Energy and Low Carbon Economy

Zimbabwe is currently struggling with a persistent energy crisis that has been exacerbated by a drawn out economic meltdown. Unplanned electricity outages and scarcity of petroleum products are now the order of the day.¹ Electricity shortages have been a perennial challenge for the whole region of Southern Africa since 2008.² As far as petroleum products are concerned, the country has been battling for the past several years to fend off a virtual drying up of fuel stations and reserves. Bottlenecks in procurement, growing vehicular population, and state control of procurement have largely contributed to the shortages. With increasing pressure to take steps towards developing climate change mitigation and adaptation policies and plans, the country has to be strategic. Zimbabwe needs its forests to provide the sinks for greenhouse gases, while the

1 The 'energy crisis' is used here to refer to the erratic supplies, and occasional absence, of energy, especially electricity and liquid fuels. In May 2019 the Zimbabwe Electricity Transmission & Distribution Company attributed these shortages to 'demand and supply mismatch, due to low water levels at Kariba Power Station, generation constraints at Hwange Power Station and limited imports.' Available at <https://zetdc.co.zw/2019-load-shedding-programmes/>

2 The Southern Africa Power Pool estimates that peak demand in Zimbabwe will rise to 2 287 MW.

majority of rural people rely on the forests for 94% of their energy needs. Most of its electricity is generated from coal and hydropower. This is a challenging context within which to reconcile climate change imperatives while guaranteeing energy security and expanding access. Any commitments to legally mandate domestic climate action should be considered against the backdrop of this social, economic, and cultural context³ – and not international trends per se. Law must be developed and function in context.

The major sources of electricity in Zimbabwe are coal-fired thermal and hydropower plants all owned directly or indirectly by a state-owned enterprise, ZESA Holdings through the Zimbabwe Power Company. Due to constrained supplies driven by economic challenges and failure to invest into new capital projects, Zimbabwe also imports electricity from South Africa, Namibia and Mozambique. Most of its petroleum products are imported from within Southern Africa and sometimes from as far as the Middle East. An emerging biofuels industry contributes a small percentage of liquid fuels. This status quo creates a trilemma for the country – it needs energy in order to steer the economy on a recovery path, yet energy development is hamstrung by economic slowdown, and there is international pressure to act on climate change. The economic costs of the current energy crisis are exponential.⁴

This makes it urgent to research the causes of the current energy crisis, and attempt to unravel the role that the legal regulatory framework is playing and could play in ameliorating or exacerbating the situation. However, more critical for this chapter are the implications of this current energy crisis on Zimbabwe's policies and strategies to implement climate change mitigation and adaptation actions. Given the persistent shortages, what possibilities are there for the country to even consider shifting from fossil fuels to low carbon renewable sources? Can the economy sustain growth of a renewable energy sector, and at what cost to the economic recovery

3 This is often understated, but a study has demonstrated that even rural electrification has had limited impact because of patriarchal roles and gender dynamics that see women still using fuelwood for cooking despite electrification; see Chipango (2018), p. 210.

4 Kaseke and Hosking (2012); Kaseke (2013), p. 10.

and stabilisation programme?⁵ What can Zimbabwe possibly do to move towards Sustainable Development Goal 7 (affordable and clean energy) without compromising Goal 3 (good health and well-being) and Goal 13 (climate action)? Sourcing energy from affordable and clean sources that do not threaten health and well-being⁶ while promoting climate action is a complex task that requires extensive funding, institutional strength and an enabling legal environment. Over-ambitious climate change policy and action plans can inadvertently constrain further use of fossil fuels and increase the cost of capital energy projects.⁷

Zimbabwe, like many African countries, has unlimited access to several renewable sources of energy but these have largely remained untapped.⁸ The central thesis of this chapter is that the Zimbabwean energy crisis can be ameliorated if the government, instead of pinning hopes on traditional unsustainable forms of producing energy, turns to renewable energy sources like solar, wind and distributed small hydropower plants. In addition, the country recently discovered that it is endowed with considerable reserves of natural gas, which is less polluting than coal, but no sustained efforts have been made yet to exploit these other energy

5 Several studies have highlighted the need for renewable electrification programmes to be economically sustainable and affordable for the targeted rural communities, see Karekezi and Kithyoma (2002), p. 1082, (noting that, 'In the near to medium term future, greater emphasis on electrification of rural households is unlikely to succeed and would not address the needs of the rural poor in sub-Saharan Africa. What are urgently needed are technologies that can quickly increase incomes to the rural poor in sub-Saharan Africa. Energy technologies that are primarily designed to generate electricity are unlikely to be best candidates primarily for reasons of cost.')

6 Constitutionally protected as a human right by s73 of the Constitution of Zimbabwe.

7 South Africa is currently experiencing this phenomenon where its ambitious climate change policies and strategies are being used to block any further development of coal-fired power plants, see *Earthlife Africa Johannesburg v Minister of Environmental Affairs* [2017] 2 All SA 519 (GP); *Earthlife Africa Johannesburg v Minister of Environmental Affairs* Case No 21559/18 (ZAGP) (pending second appeal against the first decision when the Minister had considered a climate change impact assessment report.); *Groundwork Trust v Minister of Environmental Affairs* Case No 54087/18 (ZAGP) (challenge to Ki-Power coal baseload IPP project); *Groundwork Trust v Minister of Environmental Affairs* Case No 61561/18 (ZAGP) (court challenge to ACWA Khanyisa Power IPP coal baseload project.) For further litigation against new coal build projects and the 'Life After Coal Campaign' in South Africa, see Centre for Environmental Rights, Pollution and Climate Change at <https://cer.org.za/programmes/pollution-climate-change/litigation>

8 GoZ (2012), p. 24.

resources.⁹ Gas has been touted (not without controversy) as the bridging fuel that will enable that transition from fossil fuels to low-carbon climate friendly energy sources.¹⁰ Despite the equivocation of this ‘bridging’ potential of gas, it is argued that Zimbabwe has failed to harness its gas resources to meet its energy needs.

The legal framework for the energy industry has not been facilitative. On the contrary, the current energy laws may be entrenching fossil fuels and large hydropower by stifling investments in the energy market.¹¹ While investment in low carbon renewable energy is growing globally, the inflows into Zimbabwe are still low. The political-economic and actual costs of providing infrastructure for a modern energy mix remains far from ideal.¹² Yet there is hope in the new political dispensation’s call to open the country for business. However, such political calls should manifest in economic reforms that demonstrate a commitment not only to attracting, but also to protecting, the security of investments into the country.¹³ The Transitional Stabilisation Plan provides for ambitious short-term activities in the energy industry to ensure that energy drives the economy. It provides that:

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- 9 The discovery of about 600m³ of coalbed methane gas in Lupane, Hwange, Chiredzi and Beitbridge;; although encouraging, it is doubtful if the country currently has the necessary financial resources to exploit these resources.
- 10 Several studies argue, based on empirical studies, that while natural and shale gas have less carbon, their methane emissions are higher than coal and oil and therefore should not be preferred; see Howarth (2014); Stephenson et al.,(2012); Zhang et al., (2016); Mittal, et al., (2016); McGlade et al., (2018).
- 11 A core claim of this chapter is that the legal frameworks for the energy sector in Zimbabwe are still narrowly focused on a centralised energy system run by a public utility that does not provide incentives for private sector participation. As Bazilian and others write, ‘While there are no fundamental technical obstacles preventing universal energy access, there is, however, a lack of effective institutions, good business models, transparent governance, and *appropriate legal and regulatory frameworks.*’ Bazilian et al., (2012), p. 1. (*emphasis added*)
- 12 Zimbabwe’s investment climate and policy uncertainty remain a concern in 2019. This is compounded by an unpredictable financial system that prevents any long-term financial planning.
- 13 In October 2018 the government developed the *Transitional Stabilisation Programme, Reforms Agenda October 2018-December 2020*, which ‘outlines policies, strategies and projects that guide Zimbabwe’s social and economic development interventions up to December 2020, simultaneously targeting immediate quick-wins and laying a robust base for economic growth for the period 2021-2030.’

Investments to maximise domestic generation capacity at the lowest social, environmental and economic cost from all sources will be pursued. This includes upgrading the transmission infrastructure to ensure that electricity generated is delivered to consumers with minimal losses.

The Rural Electrification Fund will be strengthened to ensure empowerment of rural communities through extension of the electricity grid to rural service centres, business centres, growth points, households, schools and clinics.¹⁴

What remains conspicuous in this programme is the focus on fossil-based¹⁵ and hydropower sources,¹⁶ especially for the electricity sector, which is the main focus of this chapter. Huge investments are planned in new thermal power or upgrading of existing thermal power plants. Hydropower¹⁷ remains part of these short- to medium-term plans, but there is unambitious talk of new renewables such as solar, wind,¹⁸ biomass and biogas.¹⁹ To complement the Transitional Stabilisation Programme's energy agenda, the government also recently launched a Renewable Energy Policy,²⁰ and efforts are underway to develop a climate change statute to promote a low-carbon energy mix supported economy.

This chapter begins by putting the energy crisis into its social, economic and political contexts, then proceeds to outline the policy environment and analyse the legal framework. Finally, it seeks to present emerging renewable sustainable energy technology as a possible solution to the crisis and also a pathway to implement Zimbabwe's climate change agenda. The chapter demonstrates the regulatory causes of this apparent failure to exploit renewable energy sources and advance climate change objectives.

14 Goz (2018), p. 35.

15 Hwange Unit 7 and 8; 3 Small Thermals (Harare, Munyati, Bulawayo).

16 Itself likely to face serious challenges from climate change;; see Berga (2016), p. 316.

17 Batoka Hydro-Electric Scheme; Kariba South expansion; Tugwi Mukosi; Manako (Osborne) Mini Hydro Electric Power; and the Odzani Mini Hydro Electric Power.

18 Rufaro and Harava Solar projects; and Rooftop Solar Energy (Bulawayo, Harare and Kwekwe); There are plans to use US\$50 million from the Rural Electrification Fund, to support of rural based community solar mini grid systems. See GoZ (2018), p. 39, this latter is a positive strategy given the potential of decentralised rural energy to promote rural development, subject to variable conditions; see Deichmann et al., (2011), p. 225-226.

19 Despite its potential, biogas remains underexploited to produce electricity in Sub-Saharan Africa;; see Dasappa (2011), pp. 210-211; Parawira (2009), p.191.

20 GoZ (2019).

It concludes that while there has been noticeable policy incubation on the climate change and energy front, Zimbabwe has not developed a mature enabling legal environment for promoting renewable energy as a pathway to a low-carbon, climate-friendly energy mix.

2. Problem Context: Climate Change and Energy in Zimbabwe

Chapters 2 and 3 have provided an extensive context of Zimbabwe's climate change situation from the vulnerabilities, risks, expected impacts and the required governance frameworks to propel an effective mitigation and adaptation programme.²¹ In the energy industry, with a focus on the electricity supply sector, reliance on imports and a failure to expand the generating capacity over the years coupled with poor maintenance of existing plants have proved very costly to Zimbabwe. Somewhat comforting is data that shows that Zimbabwe's carbon emissions have gone down from 16.25Mt in 1990 to 10.33Mt in 2016.²² This is mostly attributable to the economic slowdown. Any economic growth will see an increase in the carbon footprint.

Outdated coal technology has meant that the major electricity generating plant at Hwange has become an inefficient major source of greenhouse gas emissions.²³ The Kariba hydropower plant has also been operating below installed capacity for several years. Coal contributes 55.4%, hydro 42.3%, and biofuels 1.7% to the country's electricity generating capacity.²⁴ The government has pinned its hopes on expanding these existing primary sources to increase capacity whilst kick-starting a renewables sector. From a climate change adaptation angle this strategy is futile. There is double jeopardy in that coal must be phased out in the transition to low-carbon sources, while hydropower will be impacted badly by climate change.²⁵ This is exemplified by the decreasing output from

21 The literature on climate change in Zimbabwe and adaptation pathways is also growing, see for example Chikodzi, et al., (2013), p. 36, detailing the potential of small-hydro in South-Eastern Zimbabwe and an empirical survey of adaptation strategies; Chanza (2018); Rurinda et al. (2014); Duvénage, et al., (2013); Mtisi and Prowse (2012); and Brown, et al., (2012), p. 1-40.

22 International Energy Agency, Zimbabwe 1990-2016 , available at <https://www.iea.org/countries/Zimbabwe/>

23 GoZ (2014), p. 43.

24 International Energy Agency, 'Share of electricity generation by fuel Zimbabwe 2016'; GoZ (2017), p. 29, puts this at 49% hydro and 51% coal.

25 Hamududu and Killingtveit (2012), p. 315,318.

Kariba hydropower plant due to low water levels impacting electricity availability for both Zambia and Zimbabwe. The IPCC aptly cautions that:

*Hydropower holds a double relationship with climate change. On the one hand, it contributes to the avoidance of greenhouse gas emissions from the burning of fossil fuels. On the other, water availability and hydropower generation are likely to be affected by changing rainfall patterns, which can reduce the flow of rivers.*²⁶

This paradox is complicated further by the social and environmental impacts of dam construction for large hydropower. Therefore a strategy that focusses beyond coal and hydro is necessary for Zimbabwe's electricity supply sector. This is particularly the case given the failure to harness gas for cooking and heating and the continued reliance on biomass for cooking and heating by the majority of households in most of Southern Africa.

Be that as it may, security of supply and reliability of electricity has always been a problem, especially during peak demand periods in winter and during plant maintenance. Supply pressure has also been building up due to expanded grid access under access to energy and electrification programmes implemented by many countries in Southern Africa without a relative increase on the supply side²⁷ – by increasing the generation capacity. The availability factor of existing generating capacity has shrunk while concurrently becoming aged and an inefficient greenhouse gas emitter. However, the Zimbabwean energy crisis is not merely a repercussion of expansion of grid access²⁸ with suppressed supply capacity. Quite to the contrary, there are other variables that have fuelled the energy crisis, chief of which is the failure to mobilise enough investment into energy infrastructure, and sub-economic tariffs. Otherwise, before the economic crises – prior to 2000 – the country was able to meet its energy needs.

Africa, and indeed, Zimbabwe, is not energy poor – what we suffer from is the inability to mobilise financial resources to convert rich primary resources into usable capital. It is the paradox of poverty in the midst of plenty. The construction of additional power plants and deployment of

26 IPCC *How Hydropower Can Help Climate Action*, UN Climate Change News, 22 November 2018, available at <https://unfccc.int/news/how-hydropower-can-help-climate-action>

27 Onyeji, et al., (2012), p. 526; Kaygusuz (2012), p. 1119.

28 Zimbabwe electrification stood at 44% in 2019; see GoZ (2017), p. 9.

alternative sustainable energy sources have been very slow.²⁹ This is despite investment inflows and revenues generated from economic activities and resource extraction. This is the historical and developmental context within which the Zimbabwean energy crisis and its climate change ambitions must be understood.

2.1 The Electricity Energy Sector in Zimbabwe

As at March 2019 Zimbabwe needed a peak of 1 700MW (down from 2 200MW in 2016), and an installed capacity of 2 300MW, 95% of which is owned by the Zimbabwe Power Company, a state-owned utility.³⁰ In 2016 installed capacity was 1 940MW which in operated at 40% capacity to produce 845MW. In August 2019 production fell to 528MW.³¹ The shortfall had to be met through imports from South Africa, Mozambique, and Namibia.³² The current electricity shortages therefore sets in when the country is struggling under a debilitating historical and current foreign debt.³³ In this regard, the problem is not only shortage of generation capacity, but more importantly shortage of foreign currency with which to pay for the imports. The foreign currency shortage is attributable to reduced exports and lack of foreign investment flowing into the country. Of late, the country has also not been able to access balance of payment support from the Breton Woods institutions, due to its perceived economic delinquency.³⁴ The government disputes the allegation of mismanaging the economy and blames all problems on the unofficial economic sanctions allegedly imposed by the United States and Britain, after the controversial land reform programme. Key challenges with the electricity sector are

29 South African Power Pool (SAPP) commented in 2015 that the region ‘ran out of generation surplus capacity in 2007/8 due to inadequate investments in both generation and transmission infrastructure over the last 30-years.’ Available at <https://www.esi-africa.com/wp-content/uploads/2015/05/Lawrence-Musaba.pdf> ; see also Wright et al., (2018), p. 49.

30 GoZ (2019), p. 7.

31 This is as at 22 August 2019, a far cry from the peak demand of 1 700 MW, see ZESA Holdings, Power Generation Statistics, available at <http://www.zesa.co.zw/>

32 Get Invest, ‘Zimbabwe Energy Sector’ available at <https://www.get-invest.eu/market-information/zimbabwe/energy-sector/>; These statistics have recently (August 2019) worsened due to the country’s inability to service its import debt and further constrains on Kariba hydropower plants.

33 Jenkins (1998), p. 57.

34 Zimbabwe has a huge foreign debt and recently had to print money to raise money to settle IMF debts.

however historical and predate the geopolitical sparring.³⁵

These issues require detailed research that is beyond the scope of this book; suffice it to state that these political and economic problems have partly driven the energy crisis and the current structure of the energy market. Furthermore, without a resolution of these governance issues, it will be difficult to push for the transposition of good energy and climate change policies into effective hard laws. Energy projects are by nature long term and require long term political and financial commitment by a consistent government supported by enthusiastic private sector investors. With this we explore the adequacy of the current policy environment on climate change and energy, not only to empower the government, but also to charm investors into the industry.

3. The Policy Environment

3.1 Policies on Climate Change and the Environment

The key policy on climate change is the National Climate Policy of 2017. A detailed discussion of this policy is presented in Chapter 3, therefore in this Chapter the policy is analysed in relation to the extent to which it provides a framework to promote renewable energy and a transition from an electricity industry that relies heavily on fossil fuels and hydroelectric power.

Among its underpinning principles the National Climate Policy contains some that can inform the design of legislation on low-carbon and renewable energy.³⁶ For example,³⁷ the principle of building resilience through adaptation and mitigation programmes points towards energy systems and a market that can nurture resilience and enable energy users to adapt to the impacts of climate change. There is also the principle that calls for the adoption of a low carbon development pathway which is aligned to the transition to low carbon energy sources. Lastly, there is a principle that calls for the adoption of new and emerging technologies and innovations that can support mitigation and adaptation, providing a context within which to design a renewable energy legal framework that promotes certain viable renewable energy and carbon capturing technologies.

35 See Kayo (2002), p. 963, highlighting the challenges that has bedevilled Zimbabwe's power supply sector since the 1990s.

36 GoZ (2017), p. 3.

37 Ibid.

The National Climate Policy appropriately demonstrates awareness of the linkages between climate change and economic development – both in terms of positive linkages and negative causal effects.³⁸ An acknowledgement of these linkages is important and will guide the rate at which carbon intensive energy sources will be phased out. Economic development is premised on the supply of affordable and reliable energy and for now fossil fuels in Zimbabwe provide that affordable energy. Climate action in the energy industry should not therefore unduly constrain the supply of energy for economic development. This requires the government to ensure synergy, especially among environmental, energy, and climate change policies.

Chapter 2 of the National Climate Policy provides for policy positions on climate change adaptation. Six specific sectors are identified: water, agriculture,³⁹ health, forestry and biodiversity, infrastructure and human settlements.⁴⁰ The energy sector is quite understated in the adaptation section of the policy. Does this imply that the country has no plans to take measures to adapt to climate change in, or by using, the energy sector? This is a grave omission when it is remembered that Zimbabwe obtains 49% of its electricity from hydropower, and the policy is completely silent about the role of water in the provision of energy and potential impacts of climate change on water as a primary source of energy.⁴¹

The health sector is also discussed without reference to the effects of reliance on fossil fuels and to how the sector could provide the impetus to energy sources that are not detrimental to health. It is only under the infrastructure section where the policy states that the country will ‘develop a climate resilient hydro-energy infrastructure that incorporates anticipated reductions in river runoff, higher evaporation, and increases in climate variability.’⁴² The policy provides further that the country will ‘promote research in the climate-energy-economic nexus, including assessment of the impacts of climate variability and change on the production of energy from climate-sensitive sources (such as hydropower and solar).’⁴³ While this is encouraging, it is argued that energy issues should have

38 Davidson et al., (2003), p. S97-S113.

39 GoZ (2017), p. 5.

40 Ibid., p. 7.

41 Hamududu and Killingtveit (2012), Mukheibir (2007), p. 6-7.

42 GoZ (2017), p. 7.

43 Ibid.

been included and aligned to health sector and water concerns as energy is not an infrastructure issue only. Adaptation policy objectives should demonstrate the need to deal with the social justice and equity of measures to be adopted. Achieving a socially just adaptation plan has been noted to be a challenge.⁴⁴

Chapter 3 of the policy is dedicated to climate change mitigation and low carbon development, almost wholly focused on the energy industry.⁴⁵ An impression is immediately created that mitigation will happen largely in the energy sector, yet there are many such opportunities in all sectors of the economy. However, the focus on mitigation within the energy sector by the climate policy reiterates the sentiments in the Nationally Determined Contributors (NDCs) was a missed opportunity within which the climate policy could have guided the second NDC communication in 2020. The underlying policy objective as far as mitigation is concerned is to ‘mainstream climate change in the energy, industrial processes, waste, agriculture and land-use, land-use-change and forestry sectors.’⁴⁶ The policy provides in detail the objectives for the energy sector. These include promoting ‘renewable energy and adoption of energy efficient technologies and practices across all socio-economic sectors of the economy and the built environment’; promoting ‘research and development, innovation and deployment, and adoption of robust, gender-sensitive, green technologies,’ and promoting ‘cleaner fossil fuel technologies and access to clean and affordable energy.’⁴⁷

Thankfully, Zimbabwe’s Intended Nationally Determined Contribution (INDC) of 2015 categorically makes the commitment undertaken therein subject to article 4 of the United Nations Framework Convention on Climate Change (UNFCCC).⁴⁸ It is encouraging though that the National Climate Policy emphasises the need for technology transfer and information sharing, two key preconditions under the UNFCCC for developing countries to implement mitigation measures. However, the policy does not go far enough in highlighting the importance of

44 Shackleton, et al., (2015).

45 GoZ(2017), p. 9. This is understandable given that the energy industry is the biggest single source of greenhouse gas emissions and in Zimbabwe the source of 60.7% of emissions.

46 Ibid.

47 Ibid., p. 10.

48 GoZ (2015), p. 10, Zimbabwe targets 33% reduction in Green House Gas emissions by 2030.

transfer of renewable energy and clean coal technologies without which a transition to a low carbon energy systems is virtually impossible. It is important for any climate change policy to reiterate the need to promote access to clean coal and renewable technologies which are mostly owned by the developed countries and remain expensive, inaccessible⁴⁹ and costly to import and localise.

Surprisingly, before the development of the climate policy, Zimbabwe developed a National Climate Change Response Strategy.⁵⁰ In terms of the strategy focus was going to be on seven pillars: Adaptation and Disaster Risk Management; Mitigation and Low Carbon Development Strategies (LCDS); Capacity; Governance framework; Finance and Investment; Technology development and transfer, including infrastructure; Communication and advocacy; and Information management and dissemination.⁵¹ One may also add energy policy development – with a focus on the electricity sector. In an ideal world a policy should precede the formulation of a strategy. The relevant component of the strategy is sectoral strategies on physical and social infrastructure dealing with ‘energy’, where the strategic commitment is to:

- (a) Introduce policies and regulatory frameworks for renewable energy, energy conservation and energy efficiency.
- (b) Strengthen energy planning, research and development.
- (c) Promote low carbon energy provision and use.⁵²

Some of these strategic objectives have been taken further in the policy and current efforts to develop principles for a climate change act and the development of a model bill. If the National Climate Policy is not explicit on the need to promote renewable energy, it is expected that the policies on energy will address these issue head-on.

3.2 Policies on Energy

The National Energy Policy was published in 2012 and is a key instrument in promoting the use of renewable energy for climate change mitigation. A fundamental policy statement states that:

The country is endowed with a variety of renewable and fossil energy resources

49 Amankwah-Amoah (2015), p. 26.

50 GoZ (2014).

51 Ibid., p. iii.

52 Ibid., p. 46.

*which need to be exploited in a sustainable manner. Regional cooperation is essential for the development of large-scale hydropower resources. Small-scale hydropower projects may not make a significant impact on national requirements but they help to develop skills and to speed up access for remote communities that are not likely to be connected to the national grid in the foreseeable future.*⁵³

The national energy policy acknowledges at the outset the availability of renewable sources of energy and the need to exploit non-renewable sources in a sustainable manner. The policy has five broad objectives:

- (1) Increase the access of all sectors of the economy to affordable energy services through the optimal use of available energy resources and the diversification of supply options (applicability, availability, acceptability and affordability principles).
- (2) Stimulate sustainable economic growth by promoting competition, efficiency and investment in the sector (applicability and accountability principles).
- (3) Improve the institutional framework and governance in the energy sector to enhance efficiency and the delivery of energy services (accountability principle).
- (4) Promote research and development in the energy sector (applicability principle).
- (5) Develop the use of other renewable sources of energy to complement conventional sources of energy (applicability and acceptability principles).⁵⁴

It is clear that Zimbabwe has a policy aimed at promoting renewable energy and the diversification of sources that could propel a gradual shift from fossil fuels and heavy reliance on big centralised hydropower. The policy is informed and grounded in fundamental principles of sustainable energy and development. These include the principles of access to affordable, reliable and sustainable energy. With specific reference to renewable energy, the policy objectives are to 'Increase usage of and investment in renewable energy; Promote renewable energy as an environmentally friendly form of energy; Diversify supply options; and

53 GoZ (2012), p. ii.

54 Ibid., p. 7.

Increase access to modern energy in rural areas.⁵⁵ Appropriate strategies which include developing a framework for Independent Power Producers (IPPs), and Public-Private-Partnerships (PPPs) are laid out in the policy.⁵⁶ Importantly, the policy also includes tapping into the Clean Development Mechanism (CDM), and creating incentives to attract investment. The CDM is an underutilised opportunity⁵⁷ within the international climate change regime for developing countries to enable technology transfer and secure the assistance of developed parties to the UNFCCC.

Mitigating greenhouse gas emissions from the energy industry is key to achieving any climate change mitigation objectives, therefore Zimbabwe's policy should be closely aligned to this reality. The policy notes that the majority of rural Zimbabweans rely on biomass (traditionally used) for cooking and heating energy needs.⁵⁸ This is well-known to be an environmental and health risk.⁵⁹ Therefore rural electrification to promote access whilst concomitantly ensuring the cleaner energy forms are affordable is the greatest challenge. There are areas where the learning curve for Zimbabwe can be faster. For example, efforts to promote cleaner methods of biomass burning can be prioritised. Bagasse and sugar cane ethanol provide a low-hanging fruit that can be expanded; Hippo Valley and Triangle Estate have already generated 75.5MW for their own use and an excess of 10MW is sold to the grid.⁶⁰

A national energy policy that anchors sustainable energy and dovetails into the global climate change regime is what Zimbabwe needs to properly target its climate change objectives without compromising access to energy and economic growth. While policy pronouncements and documents are good, it is only when such policies are translated into legal mandates on the basis of which the state can be held accountable that the transition to low carbon energy can be expedited. Initiatives and actions driven by policy per se may never be sufficient. It is in this context that in addition to the climate change and energy policies Zimbabwe must have a robust legal framework that speaks to its policy to promote diversification of energy

55 *Ibid.*, p. 27.

56 *Ibid.*

57 Kaygusuz (2012), p. 1123.

58 Rural people meet 94% of their heating needs by using fuelwood. GoZ (2012), p. 1, Six million tonnes of fuelwood are burnt annually when the country's forest can sustainably only provide 4.6 million tonnes. *Ibid.*, p. 22.

59 Parawira (2009), p. 189.

60 GoZ (2012), p. 23.

sources and deployment of energy sources that are aligned to its climate change mitigation objectives.

4. The Legal Regulatory Environment

4.1 Energy Legislation

Zimbabwe has legislation on the energy industry that enables both policy development and technical regulation.⁶¹ The typical regime is one which empowers the ministry responsible for energy to direct and develop policy while technical legislation provides enough power, independence and authority to regulatory agencies to implement the policy as embodied in law. Zimbabwe, like other countries, has moved towards an integrated energy regulatory structure where there is a single apex regulator that works in consultation with the government. The regulator is responsible for all three sectors – electricity, gas and liquid fuels – with specific technical legislation for each.

The central regulator, the Zimbabwe Energy Regulatory Authority (ZERA), was established by the Energy Regulatory Authority Act.⁶² The ideal energy regulator should be preoccupied with technical regulation while the government executive remains responsible for policy-making. This ensures autonomy and independence which section 4(4) provides for.⁶³

4.1.1 Mandate, functions and authority of ZERA

The Energy Regulatory Authority Act does not have a specific ‘objects’ clause. As far as the electricity sector is concerned, the Electricity Act, which was amended by the Energy Regulatory Authority Act, remains the statute that provides for some of the regulatory objectives of ZERA.⁶⁴ The Electricity Act⁶⁵ provides that the objectives of ZERA (as the ‘Authority’)

61 Energy Regulatory Authority Act [Chapter 13:23]; The Electricity Act [Chapter 13:19]; The Rural Electrification Fund Act [Chapter 13:20].

62 Energy Regulatory Authority Act [Chapter 13:23] of 2011 effective 22 September 2011 (see *Statutory Instrument* 111A of 2011).

63 Section 4 (4) ‘Subject to this Act, the Authority shall not, in the lawful exercise of its functions under this Act, be subject to the direction or control of any person or authority.’

64 Section 31 (a) and (b) of the Energy Regulatory Authority Act substituted ‘Commission’ by ‘Authority’ and then repealed s5 to s16 of the Electricity Act. Section 4 which sets out the objects of Electricity Act remains intact.

65 Electricity Act [Chapter 13:19].

Act are:

- (a) to create, promote, and preserve efficient industry and market structures, and to ensure the optimal utilisation of resources for the provision of such services;
- (b) to maximise access to electricity services, by promoting and facilitating consumer connections to distribution systems in both rural and urban areas;
- (c) to ensure that an adequate supply of electricity is available to consumers;
- (d) to ensure that the prices charged by licensees are fairly sufficient to allow the licensees to finance their activities and obtain reasonable earnings for their efficient operation;
- (e) to ensure safety, security, reliability, and quality of service in the production and delivery of electricity to consumers;
- (f) to ensure that regulation is fair and balanced for licensees, consumers, investors, and other stakeholders in the electricity sector.⁶⁶

Section 4(1) (a) to (c) and partly (e) carry some policy components, in addition to enabling technical regulation. Parts (d) and (f) are explicitly technical regulatory objects. It is submitted that blurring the policy-making and regulatory functions can be bad for ZERA's independence and autonomy as a regulator.⁶⁷ Ministerial consultation provisions are sufficient to create synergy but giving the authority some policy-making powers defeats the separation of functions between the executive and the regulator.

The generic functions of ZERA are provided for in section 4(1) of the Energy Regulatory Authority Act, most of which repeat the functions in the sectoral energy legislation.⁶⁸ It is interesting to note that the Energy Regulatory Authority Act goes beyond the Electricity Act in empowering ZERA to promote renewable energy. Renewable energy is thereby put at the convergence of climate change and energy discourse. Section 4(1) (i)

⁶⁶ Electricity Act., s4 (1) 2002. Apparently most of the emphasised aspirations have not been achieved mainly due to reasons beyond the control of ZERA.

⁶⁷ Contrast with s4 (1) of the Petroleum Products Act [Chapter 13:22].

⁶⁸ Electricity Act, s4 and s4 Petroleum Act.

expressly provides that ZERA shall ‘promote, identify and encourage the employment and development of sources of renewable energy’.. The Act also mandates ZERA ‘to ensure the maximisation of access to energy by all consumers that is affordable and environmentally sustainable’.⁶⁹ Broadening the environmental mandate, ZERA is empowered ‘to assess, promote studies of and advise the Minister and licensees on the environmental impact of energy projects before licensing’.⁷⁰

The functions of ZERA both under the constitutive Act and sectoral legislation do not expressly refer to the need to promote or collaborate with government departments responsible for climate change. This is not a major flaw given that the functions have adequate provisions that task the regulator to consider the environmental implications of its decisions as well as their environmental soundness. Climate change is an integral appendage of environmental considerations in view of the broad definition of ‘environment’ in the Environmental Management Act.⁷¹

4. 1.2. Licencing regime for energy sources and electricity market liberalisation

In order for the energy industry to be a space to undertake effective climate change mitigation and adaptation measures, it is necessary for the regulatory authority to have enough flexibility in exercising this ultimate function. Licencing decisions are the hallmark of an energy regulator and they provide it with the opportunity to promote or to make it cost-ineffective to deploy certain types of energy sources. Through the process of licencing, the regulator can insist on impact assessments that may include climate change assessment and evaluation of the carbon footprint

69 Energy Regulatory Authority Act, s4(1)(m).

70 Ibid., s4(1)(q); although this could possibly conflict with the environmental impact assessment provision in the Environmental Management Act [Chapter 20:27], s97 - s108.

71 Section 1 of the Environmental Management Act defines ‘environment’ as (a) the natural and manmade resources physical resources, both biotic and abiotic, occurring in the lithosphere and atmosphere, water, soil, minerals and living organisms whether indigenous or exotic and the interaction between them; (b) ecosystems, habitats, spatial surroundings or other constituent parts whether natural or modified or constructed by people and communities, including urbanised areas, agricultural areas, rural landscapes, and places of cultural significance; (c) the economic, social, cultural or aesthetic conditions and qualities that contribute to the value of the matters set out in paragraphs (a) and (b).’ This certainly includes climate change and global warming, these being the consequences of air pollution.

on each proposed energy project provided the legislation empowers it to do so.

ZERA is charged with authorising the ‘generation, procurement, distribution, transportation, transmission and production of the energy source for gain or reward’ of declared sources of energy.⁷² ZERA has the authority to make regulations prescribing ‘the environmental, ... standards to be observed in relation to the extraction, production, refining and distribution of the energy source [being licenced].’⁷³ Similar regulations have been made in relation to the blending of liquid fuels.⁷⁴

Similarly, ZERA can promulgate regulations to ensure that low carbon energy sources are given preference when granting generation licences. Thus the regulator can design a quota system geared towards a gradual transition to an energy mix that recognises climate change as a problem and incentivises renewable sources. When a licence application is received in terms of section 10, section 11 authorises the regulator to grant such a license subject to terms and conditions that are prescribed, or that the authority ‘may reasonably determine in the circumstances’. These should be read with sections 47, 53 to 54 of the Electricity Act which provides for the technical considerations of licences and the setting of tariffs.

These are provisions that the regulator should use to insist on clean coal technologies, to give an upper hand to renewable sources, and generally to align energy development projects to the country’s climate change objectives as provided in the Climate Change Policy, the Strategy and the INDCs. Arguably, however, the regulator should not get involved too much in promoting one technology over the other – this being a policy decision that the ministry should take.

Although the legislative framework for ZERA is recent, it lacks specific incentives to promote entry into the electricity industry by the private sector, and incentives for the adoption of clean energy technologies.⁷⁵ One is left with the impression that this body cannot adequately promote emerging technologies given its limited regulatory role or without comprising its regulatory neutrality in relation to various energy technologies. Indeed, the Ministry of Energy and Power Development should lead any government

⁷² Energy Regulatory Authority Act., s7.

⁷³ Energy Regulatory Authority Act., s7 (3)(b).

⁷⁴ Petroleum (Mandatory Blending of Anhydrous Ethanol with Unleaded Petrol) Regulations, 2013 as amended by *Statutory Instrument* 125 of 2015.

⁷⁵ There are no clear tariff-setting principles that ZERA could use to implement incentives for renewable energy, for example a feed-in tariff.

efforts to develop emerging sustainable energy resources.⁷⁶ Ultimately, in making its decision the regulator is guided by government policy and should consider energy security and reliability concerns.

In addition to the Energy Regulatory Authority Act, the Electricity Act provides detailed guidelines for the licensing and regulation of the generation, transmission, distribution and supply of electricity to the whole of Zimbabwe.⁷⁷ It is noteworthy that before this new framework was created in 2002, there existed the Zimbabwe Electricity Supply Authority (ZESA), which was a traditional parastatal that fulfilled all the four functional areas of electricity supply, from generation to distribution (vertically integrated monopoly).

The current regulatory framework coincided with the unbundling of the old parastatal into separate business units, namely, the Zimbabwe Power Company (ZPC) focusing solely on generation, the Zimbabwe Electricity Transmission and Distribution Company (ZETDC) responsible for transmission and distribution, and PowerTel (Pvt) Ltd., the public data service provider.⁷⁸ It was argued by some, including the Reserve Bank of Zimbabwe, that the hasty unbundling of the power utility led to unnecessary duplication of activities and costly overheads that have crippled the profitability of the whole electricity holding company.⁷⁹ It can be argued that some restructuring exercises which developing countries rush into may be detrimental to the efficiency of public utilities.⁸⁰

76 Electricity Act., s35. The Minister can give policy directions to the ZERA 'relating to the policy the Authority has to observe in the exercise of its functions including, in particular, directions relating to tariffs chargeable by licensees.'

77 Electricity Act., Parts VIII, IX and X.

78 The company's focus is on providing support communication services, not only to electricity companies but also to the general public and government departments.

79 RBZ (2006), p. 38.

80 This includes the economic structural adjustments programmes often required by the IMF and World Bank. Most of these models do not work in African economies. See generally *Gender and Economic Adjustment in Sub-Saharan Africa*, Findings, African Region Number 19 (1994), available at <http://www.worldbank.org/afr/findings/english/find19.htm> ; see also Shah (2013); and Colgan (2002) who rightly notes that, '...World Bank and IMF structural adjustment in Africa have led to greater social and economic deprivation, and an increased dependence of African countries on external loans. The failure of structural adjustment has been so dramatic that some critics of the World Bank and IMF argue that the policies imposed on African countries were never intended to promote development. On the contrary, they claim that their intention was to keep these countries economically weak and dependent.'

While fairly coherent and easy to understand, some of the substantive provisions of the Electricity Act show that the legislation is inadequate as a tool to promote emerging climate friendly renewable energy technologies. The Act does not clearly articulate the regulatory objectives in relation to low carbon energy or the justifications for the continued restrictive regulation of the electricity industry in Zimbabwe. There is no express determination to promote renewable energy sources or to open the electricity sector to private enterprise. Indeed, provisions for promoting competition⁸¹ are included, but without guidance on how such competition is to be promoted. Market entry and price regulation remain serious obstacles to private sector penetration of the electricity energy sector in developing countries.⁸²

Often, certain industries are regulated because of the perceived ‘public interest’⁸³ or ‘essential’⁸⁴ nature of the services they provide to society. Coupled to this is the non-competitive nature of some services rendered by these industries, for instance the provision of electricity to a small country that can be done more profitably by a single utility than a dozen. This traditional design of the electricity industry has led to legal instruments that entrench fossil based energy and are ill-suited to promoting distributed and small-scale low carbon renewable energy. The result is a single government-controlled utility like ZESA Holdings whose dominance is a ‘natural monopoly.’⁸⁵

The viability and cost-competitiveness of renewables like solar, wind, and biofuels mean that the private sector can play a meaningful role in

81 Electricity Act, s(4)(2)(a) – ‘(a) promote and implement competition and private sector participation, when and where feasible’ read with the Energy Regulatory Authority Act, s4(1) (g) and (h) – ‘(g) to maintain and promote effective competition within the energy industry; (h) to promote encourage the expansion of the energy industry and the advancement of technology relating thereto.’

82 Murombo (2015), p. 163.

83 Phillips and Brown (1993), p. 51 and 89, for a history of the origins of the public interest doctrine; see also Bosselman et al. (2006), p. 5.

84 The provision of water, electricity and health services are among those treated as essential service in Zimbabwe. Thus employees in most of these sectors are prohibited by law from engaging in industrial action.

85 Bosselman et al.,(2006), p. 6 define this term as ‘conditions...where a single firm can provide a good or service at a lower average cost than two or more firms. To capture these economies of scale, a single firm is often awarded a monopoly franchise to provide service, but then regulators must prevent the franchised monopoly from earning excess profits at the expense of the consumer.’

making the industry competitive in the near future. In the Zimbabwean context, where these sources still contribute less than 1% of electricity generation, the economic competitiveness remain suppressed. Climate change imperatives and the need to promote security of supply provides an opportunity for Zimbabwe to open the electricity sector to private sector investors.

One of the major causes of the predicament of the Zimbabwe power utility, is the failure to operate profitably even with the insufficient power that it is able to generate locally. This can be attributed to the rate regulation provisions of the Electricity Act and the efficiency of operation and maintenance as stated above. The Act provides that at the time a utility is applying for a license, it must provide information on the proposed tariff and the method of establishing the tariff. The most restrictive provision, however, is section 53 (1) which provides that:

[n]o prices or tariffs in connection with the provision of an electricity service or operation of an electric power system by a licensee or proposed licensee shall have effect unless such prices or tariffs have been approved or, in the case of any service determined by the Commission after consultation with the Minister, fixed by the Commission in terms of this section.

In a highly inflationary economic environment, this requirement for consultations and approvals from political appointees can be, and has been, very damaging to the operations of Zimbabwe's power utility. The discretion of ZERA is unfortunately limited, and the Minister has de facto power to regulate tariffs.⁸⁶ The uneconomic rates historically charged by Zimbabwe's power utility have since seen it operating at a loss for many years, and failing to make any capital investments into new generation capacity or upgrades.⁸⁷ Most of the proposed capital build projects are largely off schedule due to the failure to mobilise funds for them.

This creates an opportunity for foreign and private sector investment

86 This is done through guidelines to be used by the regulator in determining tariffs. Under s53 (3) (a) to (e), the authority is bound to have regard to, among other factors, the licensee's ability to recover the full costs of its business activities, including a reasonable return; the need to provide 'incentives for the continued improvement of the technical and economic efficiency with which the services are provided; ...protecting consumers while keeping them informed about the cost their consumption imposes on the licensee's business;...avoiding undue discrimination between customers and customer categories; phasing out or substantially reduce cross subsidies'.

87 Ibid.

into low carbon electricity sources. It is submitted that one good solution is for energy development to focus more on emerging low carbon renewable energy sources, especially solar and wind power. This is especially compelling in the case of Zimbabwe given the current drive towards rural electrification.⁸⁸ It is necessary to discuss these sources of energy in detail to properly defend the argument that Zimbabwe must consider focusing more on emerging sustainable energy sources and cut down on coal-fired thermal plants.

4.2 Environmental and Climate Change Legislation

Zimbabwe does not have legislation specific to climate change. The National Climate Policy, Climate Change Strategy and the INDC are the explicit climate change instruments. An urgent question, therefore, is whether the country needs climate specific legislation or whether existing environmental and other cognate legislation is sufficient to mandate actions on climate change mitigation and adaptation. Some argue that a climate change act is necessary, while others argue that such an act will just add to legislation that is ineffectively implemented and enforced. What is the existing legislation that could serve the purposes of a specific climate change statute?

If it is acknowledged that climate change is a result of global warming which is caused by the emission of certain greenhouse gases into the atmosphere, then it follows that legislation to control the emission of such gases could be sufficient. In Zimbabwe, air pollution and the emission of harmful gases is regulated under the Environmental Management Act,⁸⁹ which provides an overarching framework for environmental

88 In 2002 the government enacted a new statute called the Rural Electrification Act whose objective is to facilitate the provision of grid electricity, and to a limited extent solar, to rural and outlying areas. The statute established a fund funded partly from an electricity levy and government allocations. In order to get connected the rural communities also pay about 60% of the transmission cost and bear the total cost of actual supply (paying electricians and cabling of buildings, metering, etc.). The initial costs of the projects often prove very expensive and the delivery of service by the Rural Electrification Agency (REA) is hampered by lack of transport, and shortages of fuel and human resources.

89 Environmental Management Act [Chapter 20:27]. With effect from 7 April 2006, this Act repealed the Atmospheric Pollution Prevention Act [Chapter 20:03], the Hazardous Substances and Articles Act [Chapter 15:05] and the Noxious Weeds Act [Chapter 19:07] all of which would be relevant to addressing the impacts of climate change.

regulation and management. Section 4(2) provides internationally accepted principles of environmental management that are key to addressing environmental problems, including climate change. Relevant principles include participatory decision-making, integrated environmental management, the precautionary principle, the principle of prevention and sustainable development, the polluter-pays principle, and special treatment of sensitive environments. Could it be argued that, for example, the polluter-pays principle can be used to address the question of loss and damage in climate change law?

Among other duties of the minister responsible for environmental affairs, is ‘to regulate the management of the environment and to promote, co-ordinate and monitor the protection of the environment and the control of pollution’.⁹⁰ Furthermore, the minister has a duty ‘to ensure that persons or institutions that are responsible for causing environmental harm will meet the cost of remedying that harm’.⁹¹ Apart from imposing duties on the minister, the Act also establishes the Environmental Management Agency, tasked, among other things, with the duty ‘to formulate quality standards on air, water, soil, noise, vibration, radiation and waste management’,⁹² and ‘to regulate and monitor the discharge or emission of any pollutant or hazardous substance into the environment’.⁹³ The Agency may also ‘recommend to the Government the conventions which the country may join, and incorporate their provisions into national law’, including such conventions and treaties as the UNFCCC, the Kyoto Protocol and the Paris Agreement.

More specifically, the Environmental Management Act provides for the regulation of air pollution and a licencing system.⁹⁴ The Standards and Enforcement Committee shall recommend to the Environmental Management Board the adoption of ‘ambient’, ‘occupational’ air quality standards and ‘emission standards for various sources’ as well as ‘criteria and guidelines for air pollution control for both mobile and stationary sources’ or ‘any other air quality standards.’⁹⁵ Any person who causes

90 Environmental Management Act., s5 (1) (a).

91 Ibid., s5 (1) (g).

92 Ibid., s10 (1) (a).

93 Ibid., s10 (1) (b) (iii).

94 Ibid., s63 to s68.

95 Ibid., s63 (1) (b); Example include the Environmental and Natural Resources Management (Prohibition and Control of Ozone- Depleting Substances and Ozone-Depleting-Substance-Dependent Equipment) Regulations, *Statutory*

pollution exceeding prescribed standards is guilty of a criminal offence and liable to a fine,⁹⁶ and an obligation to compensate for loss suffered or costs incurred in remedying and restoring the environment.⁹⁷ Emitting a prescribed substances without a licence issued by the Board is an offence.

Similarly, the Water Act⁹⁸ provides for the regulation of water use and the control of water pollution, including the construction and management of dams. There is legislation on disaster management and civil protection as well as on agricultural practices and forest management⁹⁹ that could be deemed relevant to climate change.

What is clear is that environmental legislation provides a foundation for the regulation of one of the underlying causes of climate change, namely the emission of greenhouse gases. What is equally clear is that existing environmental legislation is very specific to controlling air pollution as a discreet environmental problem. Climate change is much broader than air pollution. The mitigation of, and adaptation to, the impacts of climate change requires a multi-sectoral approach and multi-disciplinary regulation for which existing legislation is insufficient. The handling of Cyclone Idai in March 2019 demonstrates how environmental law is necessary, but inadequate, to deal with the impacts of climate change.

Similarly, environmental legislation in Zimbabwe does not sufficiently regulate the production of energy, particularly electricity. The choice of primary energy stock and the licencing of generators by ZERA, as well as policies on renewable energy, are not subject to environmental scrutiny. Environmental Impact Assessments (EIAs) are indeed required for licensable activities, but that is not the only control mechanism necessary to implement an effective climate change mitigation regime. Arguably, environmental laws could very well be an obstacle to the adoption of certain climate change mitigation measures.¹⁰⁰ Indeed, as Tomain argues:

When we speak of energy, we are also speaking about the natural resources

Instrument 7 of 2011, and the Environmental Management (Atmospheric Pollution Control) Regulations, Statutory Instrument 72 of 2009.

96 *Ibid.*, s63 (2).

97 *Ibid.*, s63 (3).

98 Water Act [Chapter 20:24].

99 Forest Act [Chapter 19:05] and the Forests (Control of Firewood, Timber and Forest Produce) Regulations, 2012, *Statutory Instrument* 116 of 2012.

100 For a detailed analysis of the integration necessary between environmental (and therefore climate change) law with energy laws, see Murombo (2015), p. 323 *et seq.*

*used in its production – energy and natural resources are inextricably linked throughout the fuel cycle from exploration to extraction to end use and disposal. ...Energy laws, policies and regulations, then, should not ignore the environmental effects that occur throughout the fuel cycle.*¹⁰¹

It is important, therefore, for the Renewable Energy Policy and the National Climate Policy to lead to legislation that creates effective regulatory synergy between the environment, climate change and energy. Synergy is necessary at the institutional level, in terms of standards setting and in terms of implementation of impact assessment and licencing procedures. Disaster management legislation should be aligned to land use planning and a climate liability regime.

We should conceive of a low carbon energy industry (a sustainable energy system)¹⁰² as one that promotes sustainable and renewable sources without compromising the energy security needs of the most vulnerable, whose resilience needs to be strengthened.¹⁰³ A sustainable energy system in Zimbabwe therefore requires more specific environmental and energy legislation than already exists.

5. Potential for low carbon renewable energy in Zimbabwe

Zimbabwe has access to renewables ranging from solar and wind to biomass and biofuels.¹⁰⁴ Various capital build electricity projects are proposed to increase generation capacity.¹⁰⁵ While noble, the projected costs for these plants are beyond the financial capacity of the power utility, unless it enters into joint ventures, or private international capital is allowed to play a role. This assumes economic feasibility and acceptable business risk.¹⁰⁶ From a climate change perspective, the proposed larger generation capacity projects¹⁰⁷ are all coal thermal or hydropower plants. This puts

101 Tomain (2011), p. 12--13.

102 Mitchell and Woodman, p. 572.

103 Murombo (2015), p. 336, further explores sustainable energy systems building on the theories of Mitchell C (above).

104 For a detailed study of the potential of these sources, see Makonese (2016).

105 According to the SAPP, several new capacity projects were supposed to have been completed by 2014 (Batoka, Gokwe North, Lupane, Western Power Station, Hwange Station No 7 and 8). All these projects are still behind schedule in 2019.

106 Recently the Minister of Energy and Development threatened that over 30 IPPs who had failed to consummate their projects risk losing their licenses; see Groenendaal (2019).

107 Western Power Station, Gokwe North and Hwange No 7 & 8.

the country's environment at the risk of increasing its greenhouse gas emissions and makes it difficult to meet its INDCs.

Hydropower, while cleaner than coal, is not necessarily environmentally neutral. It involves dam construction that displaces many communities¹⁰⁸ and disrupts riverine ecosystems. In the case of shared watercourses, a number of issues arise regarding transboundary environmental harm and co-management issues.¹⁰⁹ The use of hydropower may also compromise the duty of public utilities to ensure reliability of supply, in times of droughts as well as floods. However, hydropower remains the major preferred energy resource in Africa along with coal and gas.

African countries face a plethora of challenges and constraints in ensuring energy for sustainable development, not only in terms of the regulatory frameworks, but also of other factors – especially infrastructure – that impact delivery of energy. This is not only the task of developing countries like Zimbabwe; the global community has a role to play in capacity building, as well as technology transfer and financial support in line with the UNFCCC.

Zimbabwe has substantial solar radiation sources given its geographic position.¹¹⁰ However, there is a continuing aversion to solar projects by the power utility, as well as the private sector, which has been explained in the following terms:

ordinary solar home system energy outputs are low: they cannot provide power for cooking, heating or productive purposes such as welding, grinding maize or charging batteries commercially. They can provide limited power for lighting, radio, TV, communication, and relatively small-scale pumping and

108 An example is the Three Gorges Dam in China which displaced over 1.2 million people (Tullos, 2009) For the controversy around the Belo Monte hydropower scheme in Brazil, see Bratman (2014,) Carvalho (2006); World Commission on Dams (2000), p. 310, where it is curtly asserted that, 'dams have made an important and significant contribution to human development, and the benefits derived from them have been considerable. In too many cases an unacceptable, and often unnecessary and high price has been paid to secure those benefits, especially in social and environmental terms, by people displaced, by communities downstream, by taxpayers and by the natural environment.'

109 For instance, the Zambezi and Kariba Dam are managed by the Zambezi River Authority, an intergovernmental institution with Zimbabwean and Zambian officials.

110 GoZ (2019), p.16 states that 'Solar potential of sixteen (16) to twenty (20) MJ/m²/day in Zimbabwe is vastly unexploited.'; see also Ziuku et al., (2014), p. 226, demonstrating Zimbabwe's potential for CSP.

*refrigeration, as well as other small-scale end uses.*¹¹¹

These constraints on solar have seen it play only a limited role in developing countries where, unfortunately, the bulk of solar energy is abundantly available throughout the year.¹¹² It is submitted that the reasons given in by Krause and Nordstrom can easily be overcome through effective awareness campaigns in the development and implementation of rural electrification projects as well as urban renewable energy projects. This should be accompanied by appropriate financial incentives to reduce the initial costs of solar installations.

Other potential alternative energy sources in Zimbabwe include wind, methane gas, nuclear and biofuels. These are not touted as solutions to the current energy crisis, but they could be used to complement and supplement thermal and hydropower. Instead of continuing to pour investments into thermal stations, the government could redirect its efforts towards facilitating the deployment of emerging clean energy technologies like solar and wind.¹¹³ But the issue of cost¹¹⁴ and the scale of application are most important; these technologies generally remain more expensive than existing technologies, and only a few developing countries have managed to deploy renewable energy in their energy mixes.

In developing countries, the shift to new forms of energy must be done carefully, and with the full participation of intended beneficiaries. All too often renewable energy projects are developed by governments and donor agencies and offered to communities as packages with little post-project technical support.¹¹⁵ One critic appropriately summed up the whole paradox as being born of disorganisation and inadequate planning by implementing agencies.¹¹⁶ One may add that, while the law

111 Krause and Nordstrom (2004).

112 Ziuku et al., (2014), p. 225.

113 Wind energy development has been proved not to be very suitable because of the slow wind speeds in most parts of Zimbabwe, hence the assertion that these other forms of energy could be used to supplement reliable sources. See African Windpower and Powervision web <http://homepages.enterprise.net/hugh0piggott/african36/index.htm> (for information on research and wind technology development in Zimbabwe; the technology is there but other factors militate against large scale use of wind energy).

114 Kaygusuz (2012), pp. 1120, 1124.

115 Karekezi and Kithyoma (2002), p. 1084.

116 Makapo (1997) notes that, '[p]rojects conceived without carefully consulting the intended recipients and beneficiaries face serious acceptance problems and fail prematurely due to abandonment. The priority needs of

can be used to force technology and expedite the shift towards use of sustainable energy resources, the law itself must be embraced by the intended beneficiaries.

Absence of an appropriate enabling legal regulatory framework per se cannot be blamed for the failure of Zimbabwe to fully harness renewable energy sources. Most of the constraints are well-documented.¹¹⁷ Cost and affordability are serious limitations, but these could be ameliorated by the removal of government subsidies on traditional conventional sources and their redirection to new sustainable sources within a bounded timeframe.¹¹⁸ However, such steps could impact the climate resilience of communities who have hitherto afforded access to energy through government subsidies, for example under the rural electrification programme. Internalisation of the external environmental cost of fossil energy sources would be necessary, with the government absorbing the true cost of such accounting. All such strategies towards low carbon renewable energy require legal reforms. Thus Ottinger rightly submits,

*to effectuate these alternatives, legal structures to promote them are indispensable. Much attention has been given to new energy technologies and the means of technology transfer and capacity building. Very little attention has been given to the legal frameworks essential to their implementation.*¹¹⁹

Developing appropriate policies is a precursor to designing effective renewable energy and climate change laws. It is thus encouraging that Zimbabwe recently launched a targeted policy on renewable energy, in addition to the climate change policy and strategy.

5.1 Renewable Energy Policy.

The Ministry of Energy and Power Development published a National Renewable Energy Policy in March 2019. Its broad vision is to ‘provide

rural communities for whom RETs are being developed or adapted must be known clearly, and appropriate solutions devised. Too often, bureaucrats conceive projects, or donors offer ready-made projects, intended to demonstrate specific technologies or approaches.’

117 GoZ (2019), p.17-18; See generally Murombo (2016a); Reddy and Painuly (2004); Verbruggen et al., (2010); and Mulugetta et al., (2000)

118 However, caution should be taken to find replacement policies for communities cushioned by such subsidies during the transition.

119 Ottinger (2005), p. 103; for model legislation to promote energy efficiency and renewable energy in selected, see Murombo(2016b), p. 330.

energy access to all in a sustainable manner by increasing the mix of [renewable energy] sources.¹²⁰ In summary, the new policy,

aims to promote investment in the renewable energy sector by providing specific incentives. It recommends providing National Project Status to all the renewable energy projects. It encourages the Ministry responsible for Energy to recommend renewable energy projects on case-to-case basis to the Ministry responsible for Finance for according Prescribed Asset Status so as to unlock Insurance and Pension funding. It also recommends specific incentives for promoting third party sale of power. Further, it recommends reduction in licensing fees and relaxations in licensing requirements for renewable energy projects. Favourable tax incentives and rebates are also recommended in the NREP in addition to the existing Statutory Instruments.¹²¹

The policy sets out a plan to deploy renewable energy and also provides that the ministry shall use feed-in-tariffs and competitive bidding¹²² procurement methods depending on the need and amount of energy to be procured.

Specific renewable energy targets are provided in the policy. By 2025 the policy targets 16.5% of total generating capacity or 1 100MW from renewable sources. This goes up to 2 100MW by year 2030.¹²³ The policy correctly identifies, as the first objective, the development of ‘a strong institutional and regulatory framework for promoting up-take of [renewable energy].’ This acknowledges the role that a clear and effective legal framework can play in promoting renewable energy sources.

Further strategies include a policy direction to the regulator to ‘come up with the mandatory Renewable Purchase Obligations (RPOs) in the form of regulations/orders within a period of six months from the date of notification of the policy’.¹²⁴ This is to be complemented by transmission company created ‘green corridors’ on the grid to enable interconnection.

The renewable energy targets are set taking into consideration Zimbabwe’s INDCs and the ability of utilities to despatch and pay for the power. In terms of incentives the policy provides that renewable energy

120 GoZ (2019), p. 19.

121 Ibid., p.7-8.

122 Ibid., p. 26-28.

123 Ibid., p. 20; of the 2 100MW sources will contribute as follows: Small Hydro 150MW, Grid Solar 1 575MW, Wind 100MW, Bagasse and other sources, 275MW. Over 250,000 solar water heaters are targeted and 8 000 biodigesters.

124 Ibid., p. 23.

projects shall be awarded a National Project Status (NPS) to facilitate exemption from customs and general excise duties for the importation of renewable energy technologies. Legislation that shall provide a framework of incentives include the Finance Act, Income Tax Act, Value Added Tax Act and Value Added Tax Regulations, Customs and Excise Duty Act and Customs and Excise General Regulations.¹²⁵ There are no specific policy provisions on how these statutes will be used to create incentives – possibly this being a task to be co-created with the Ministry of Finance and the Zimbabwe Revenue Authority. In addition, the policy proposes reduced licencing fees for renewable energy sources.

The policy highlights the importance of off-grid systems, especially for rural and remote areas.¹²⁶ Off-grid systems can provide a faster way to expand access to electricity for inaccessible areas where it is not cost-effective to extend the grid. This is the case with many mountainous and remote rural areas in Zimbabwe. These systems include mini- and micro-grid systems. The policy provides for a framework under which the government will provide financial support through grants or loans¹²⁷ for the development of these off-grid systems. The Rural Electrification Fund (REF), which is currently responsible for rural electrification, is expected to play a key role in championing off-grid systems in rural areas.

A Green Energy Fund of Zimbabwe is proposed which will be managed by the REF during the first year, after which the Infrastructure Development Bank (IDBZ) will take over. The regulator is tasked to assess the maturity and commercial viability of the various renewable energy sources every five years. Institutionally, the policy proposes the setting up of a Nodal Agency, within the Ministry of Energy and Power Development, to manage the renewable energy procurement programme.¹²⁸

Implementing the renewable energy policy is one way by which Zimbabwe can make progress towards its climate change objectives. It is apt that the renewable energy policy was framed within the context of existing INDCs and the climate change policy objectives. Policy alignment and integration are key to ensuring that steps taken to mitigate greenhouse emission do not adversely affect economic development. Promoting social, environmental and economic sustainability is key in the process of

125 GoZ (2019), p. 24.

126 Ibid., p. 36-37.

127 Ibid., p. 37.

128 Ibid., pp. 34-35.

developing integrated energy and climate change policies.

The real challenges will be seen when it comes to implementing this policy. This particularly relates to the detailed design of the fee-in-tariff and the competitive bidding process and the potential effects of such regulations on the viability of existing utilities and the long-term sustainability of the cost of procuring renewable energy. By comparison, South Africa has implemented one of the most successful renewable energy procurement programme that has seen growth of independent power producers (IPPs) between 2012 to 2018.¹²⁹ Zimbabwe can learn from the pitfalls and successes of the South African programme.¹³⁰ Extensive studies exist that can provide lessons as Zimbabwe proceeds to design regulations and implementing mechanisms for its renewable energy programme.¹³¹ It will also be critical to understand the mechanisms of the renewable energy fund at a time when the IDBZ is also crafting a climate finance facility. Integration of all these areas aimed at climate adaptation and mitigation will be crucial.

6. Conclusion.

It clear that any efforts to introduce renewable energy technologies to developing countries like Zimbabwe come with challenges. Promoting low-carbon energy while trying to meet the sustainable development goal of providing access to affordable energy and dealing with poverty and development is complex. Energy is indispensable for the attainment of the Sustainable Development Goals of eradication of poverty, access to affordable energy, and climate change action. Model solutions and projects have to be contextualised and modified to suit the social, economic and political environment of each country. This requires enhanced efforts

129 The South Africa Renewable Energy Independent Power Producers Procurement Programme has to date procured 6 400MW of electricity from 102 IPPs, of which 4 065 MW is online. From the first procurement Window 1 to Window 4, prices have fallen with wind decreasing from an average bid price of 151c/kWh to 68c/kWh and solar PV from 329c/kWh to 82c/kWh.(see Department of Energy, South Africa, IPP Office, available at <https://www.ipp-renewables.co.za>)

130 These include the pushback from the entrenched fossil fuel interests, see for example *Coal Transporters Forum v Eskom Holdings Limited* (42887/2017) [2019] ZAGPPHC 76 (26 March 2019).

131 See generally Eberhard (2014); Eberhard et al. (2016).

at the international level to support the movement towards sustainable energy with technology transfer and funding. Climate change is a push factor that can expedite the adoption of low carbon energy sources.

Governments have an important role to play in creating incentives for private investment in sustainable energy projects. This can be done through the formulation of dynamic and flexible legal and regulatory frameworks, the removal of subsidies and allowing energy utilities to charge commercial rates, while cushioning the poor. Zimbabwe's energy laws and institutions are not yet fully enabled to promote renewable, sustainable energy technologies. The regulatory framework is heavily state-centred and leaves little room for private investment. However, the Renewable Energy Policy, together with the National Climate Policy, provides a good foundation for the amendment of energy laws or the development of specific renewable energy and climate change legislation that can promote the twin objectives of access to clean energy and low carbon development.

The international climate change regime under the UNFCCC and the Paris Agreement provide a good context within which Zimbabwe can harness global technology to implement its renewable energy programme. Advantage should be taken of the Clean Development Mechanism and the global climate change funds. Without progressive legal and regulatory frameworks, little progress will be made, but the frameworks need to be complemented by many other economic and policy interventions. Above everything else such laws and policies must resonate with the country's social and economic realities.

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Climate Change Financing: Reflections from a Zimbabwe Context

Veronica Nonhlanhla Gundu-Jakarasi

1. Introduction

The impacts of climate change have become more intense, frequent and huge. The world is experiencing an unprecedented climate change phenomenon which is likely to lead into crisis of human survival and national development unless urgent steps are taken to curtail human behaviours and actions impelling climate change.¹ The shift from brown to green actions (that is the move from a polluting and high fossil-fuel-driven economy to clean, low carbon and renewable energy and sustainable management of natural resources) is essential. Deichmann and Zhang, call for additional resources , following the need to address the impacts of climate change, including enhancing resilience of communities.² Enabling the transition to a low-emission, climate-resilient development pathway requires addressing both sides of the same coin: scaling up climate finance and scaling down brown finance or developing policies that disrupt brown investment.

Whilst climate finance has its history under the United Nations Framework Convention on Climate Change (UNFCCC), Article 2.1(c) of the Paris Agreement also captures the notion that we should focus on

1 GoZ (2016).

2 Deichmann and Zhang (2013).

all finance flows, not simply green financing, but brown financing, and think of policies to disrupt such financing, as it may not be justifiable to scale up climate financing if larger sums are being spent on brown investments. UNFCCC may not effectively address fossil fuel subsidies, for example; but greater attention does need to be placed on the brown/dirty flows. However, the reality is that it is hard to get appropriators of public climate finance to agree to scaling up additional support for developing countries if they are also accepting large amounts of high-emission, maladaptive investment from other countries.

The current climate finance flows fall short of the estimated US\$5-\$7 trillion per annum for the global infrastructure to address climate change and remain below the 2°Celsius temperature goal between 2016 and 2030.^{3,4,5} These figures indicate that developing countries account for about US\$4 trillion per year of the estimated required resources, representing approximately two-thirds of global infrastructure investment.⁶ Hence, it is important to further understand how countries can scale up climate finance to meet low-carbon, climate-resilient investment needs, enhance existing investment levels and future needs in line with the increasing global average temperatures. This scenario justifies the call for developed countries to honour their commitment and enhance ambition to mobilise US\$100 billion per year for climate action for developing countries by 2020 and beyond, based on their needs and priorities.

This chapter provides a historical background to climate finance and how over time it has transformed into the post Paris Agreement epoch. The chapter also highlights the possible good practices and lessons that can inform the establishment of a National Climate Fund. Good practices can also influence how public financing can leverage private sector financing to support climate change action in Zimbabwe, where the fiscus is already overwhelmed with other priority needs. Lastly, this chapter provides information to non-climate finance experts, climate negotiators, legal experts and those keen to understand the history of climate financing and inform innovative future structuring of climate financing including the role of blended finance.

3 OECD (2017).

4 Bloomberg (2016).

5 WEF (2013).

6 Pombo (2018).

2. Global Financial Architecture

2.1 *The Climate Finance Landscape*

Article 4.3 of the UNFCCC states that deep cuts in global emissions are required to prevent dangerous interference with the climate system and achievement of the ultimate objective of the convention. Early and urgent action to this end is necessary. A delay in reducing greenhouse gas (GHG) emissions will significantly constrain opportunities to achieve lower stabilisation levels of GHGs and increase the risk of more severe climate change impacts. This is further expounded by the United Nations Paris Agreement of 2015,⁷ that further indicates the urgent need for climate action. However, the additional costs attributed to climate change require increased and scaled up financial resources. In this regard, several mechanisms were designed in order to achieve this goal. The roots of climate change financing date back to 1992, where developed countries made a commitment to provide funding to assist developing country efforts to reduce GHG emissions and assist in their adaptation efforts.⁸ Financial support to developing countries is crucial to enable their transition to low-carbon development pathways as well as to allow them to adapt to a changing climate, and deal with the unavoidable impacts of climate change. While there is no agreed definition of climate finance, it is generally understood that ‘Climate finance refers to the financial resources mobilised to help developing countries mitigate and adapt to the impacts of climate change, including public climate finance commitments by developed countries under the UNFCCC’.⁹

The Global Environment Facility (GEF) was established in October 1991 as a US\$1 billion pilot programme in the World Bank to assist in the protection of the global environment and to promote environmental management and sustainable development. As part of its restructuring, the GEF was entrusted to become the financial mechanism for the UN Convention on Biological Diversity, the UNFCCC and the Convention to Combat Desertification, hence the GEF was the first operating entity of the financial mechanism for UNFCCC. Apart from providing climate change support, the GEF resources are also available for projects and other activities that address designated focal areas of biodiversity, international waters, ozone depletion, land degradation, primary desertification, deforestation

7 UNFCCC (2015).

8 Article 11 of the UNFCCC.

9 Nakhooda et al. (2014).

and persistent organic pollutants. The initial Global Implementing Entities to the GEF were the World Bank, United Nations Development Program (UNDP) and United Nations Environment Program (UNEP) but currently there are more than fifteen, including Food and Agriculture Organisation (FAO), Africa Development Bank (AfDB) and International Fund for Agricultural Development (IFAD).

To keep the momentum of the UNFCCC, in 1997 Parties came together and developed the Kyoto Protocol which came into force in 2005. This was also due to the realisation that developed countries were mainly responsible for the current high levels of GHG emissions in the atmosphere as a result of industrialisation. Hence, the Protocol sought to place a heavier burden on developed nations under the principle of ‘common but differentiated responsibilities and respective capacities’ (CBDR-RC) and help in the global mobilisation of financial resources for developing countries to enhance their climate adaptation capacity. Several market mechanisms were put in place to support the Kyoto Protocol such as the Clean Development Mechanism (CDM), Joint Implementation (JI) and Emissions Trading. The Adaptation Fund was established in line with Article 9.3. of the Kyoto Protocol which provides that:

As part of the global effort, developed country Parties should continue to take the lead in mobilising climate finance from a wide variety of sources, instruments and channels, noting the significant role of public funds, through a variety of actions, including supporting country-driven strategies, and taking into account the needs and priorities of developing country Parties.

The CDM defined in Article 12 of the Kyoto Protocol, allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol (Annex I Party) to implement an emission-reduction project in developing countries.¹⁰ Such projects can earn saleable Certified Emission Reduction (CER) credits, each equivalent to one tonne of CO₂, which can be counted towards meeting Kyoto targets. Joint Implementation is another mechanism used in financing efforts to reduce greenhouse gases emissions. The term ‘Joint Implementation’ is used generically in the negotiations to refer to the concept where a developed country Party could claim credit for emission reductions achieved through projects implemented in the territory of another developed country Party. International Emissions

¹⁰ For a detailed analyses of the CDM and other mechanisms, see Werksman (2002), and Freestone and Streck (2005).

Carbon Trading is an approach used to control carbon dioxide pollution by providing economic incentives for achieving emissions reductions. It is sometimes called cap and trade or carbon emissions trading.

While the CDM was meant to benefit the developing countries, in the main, only emerging countries such as Brazil and China have benefited from the mechanism.¹¹ Obstacles such as lack of initial financing, lack of experience and technical skill, land titling and monitoring challenges, and the complexity of CDM rules have limited the opportunities of developing countries participating in this initiative. These hurdles have to date resulted in low numbers of African carbon projects with only 2% of CDM projects registered by the UNFCCC being in Africa.¹² Although the UNFCCC Secretariat has identified different organisations such as the German Development Bank (KfW), to provide technical assistance through offering a variety of services such as

- (i) Advisory, structuring and assessment services for programme proposals;
- (ii) Financing and grants to cover the preparation of programme concepts, project design documents and monitoring plans;
- (iii) Support for programme implementation, and
- (iv) Assistance with marketing expected carbon credits;

the implementation of CDM projects remains low. However, the CDM Programme of Activities (PoAs) gained mileage in their implementation as they also addressed issues such as increased environmental integrity, social development contribution and targeting of sectors and countries 'neglected' by the traditional CDM.¹³

The CDM is the main source of income for the UNFCCC Adaptation Fund, which was established in 2001, and officially launched in 2007, to finance adaptation projects and programmes in developing country i.e. Parties that are particularly vulnerable to the adverse effects of climate change. The Adaptation Fund is financed by a 2% levy on CERs issued by the CDM. However, due to the poor performance of the carbon markets, the Adaptation Fund has also been supported by voluntary

11 Ganapati and Liu (2008).

12 Hagbrink (2010).

13 <http://www.energy.gov.za/files/esources/kyoto/Web%20info/Capetown%20workshop/Case%20study;%20Wonderbag;%20CDM%20Heat%20Retention%20cooker%20project.pdf>

means of finance, where European Union member states such as Germany have been one of the major financiers. The Adaptation Fund brought a new dimension from the GEF as it sought to strengthen direct access by countries and provided high level of ownership. States' nominated institutions are only eligible for direct access when they have met the high accreditation standards required to handle the funds. These national bodies are known as National Implementing Entities (NIEs).

In Zimbabwe, the Environmental Management Agency (EMA) is the nominated entity to the Adaptation Fund, and it is in the process of going through the rigorous process of accreditation.¹⁴ This is taking time as they must demonstrate a good track record of their fiduciary systems and their environmental and social safeguards systems respectively. The fund has very strict standards which they use in order to safeguard their resources, but these tend to be stringent for developing countries. Some of the strict Fiduciary standards include:

Financial integrity

- the ability to accurately and regularly record transactions and balances to an appropriate standard as attested by a competent entity
- the ability to safeguard, manage and disburse funds effectively to recipients on a timely basis
- the competence to produce forward-looking plans and budgets
- legal status to contract with the AF and third parties

Institutional capacity

- procurement procedures which provide for transparent practices, including those concerning competition
- capacity to undertake monitoring and evaluation
- ability to identify, develop and appraise projects
- competency to manage or oversee project execution
- Transparency and self-investigative powers
- freedom to blow the whistle on issues of fraud and gross mismanagement
- objective policy for self-regulation.¹⁵

14 'EMA to gain accreditation to the climate adaptation fund', *Sunday Mail*, 26 March 2017.

15 UNFCCC (2012).

Recognising the growing need to address climate change adaptation and mitigation, the fifteenth Conference of Parties to UNFCCC (COP15) held in December 2009 in Copenhagen saw developed country Parties pledge to lead in mobilising climate finance to reach a goal of US\$100 billion per year by the year 2020. This was to come from a wide variety of sources, instruments and channels, noting the significant role of public funds, through a variety of actions, including supporting country-driven strategies, and taking into account the needs and priorities of developing country Parties with balanced allocation between mitigation and adaptation. Some Parties advocated that a significant portion of this amount should come from private finance, which could be leveraged via public sources.¹⁶

In 2010 at COP 16 held in Cancun, Parties subsequently established the Green Climate Fund (GCF) as another operating entity of the Financial Mechanism of the UNFCCC under Article 11. The establishment of the Fund marked increased growth and momentum in climate financing. The Fund became operational in 2014 and the initial round of capitalisation was US\$9.7 billion which was increased to US\$10.5 billion at COP20 in Lima.¹⁷ The Fund is governed by the GCF Board and it is accountable to, and functions under, the guidance of the COP. It supports projects, programmes, policies and other activities in developing country Parties using thematic funding windows.

Given the urgent need to bolster climate action and to ensure that everyone did their fair share to address climate change, COP21 adopted the momentous Paris Agreement in France in 2015. The agreement ushered in a new era where countries committed to reduce their greenhouse gas emissions through their nationally determined contributions (NDCs) which they initially communicated as intended to the UNFCCC in 2015. Zimbabwe committed to reduce by 33% the energy emissions per capita by 2030 based on unconditional (domestic) and conditional (international) financing and including technology transfer and markets.¹⁸

According to Decision 1/CP.21, paragraph 58 of COP21, the Parties decided that the GCF may serve the Paris Agreement.¹⁹ Since then, the

¹⁶ Fry (2013).

¹⁷ The Climate Reality Project (2014). 'COP20 in brief'. Washington, DC: The Climate Reality Project.

¹⁸ GoZ (2015).

¹⁹ Report of the Conference of the Parties on its 21st session, held in Paris from 30 November to 13 December 2015, 9. ('Decides that the Green Climate

fund has continued to play a significant role in supporting the mobilisation of resources to respond to climate change by investing in low-emission and climate-resilient development. The Fund seeks to support limit or reduce GHG emissions in developing countries, and to help vulnerable societies adapt to the unavoidable impacts of climate change. Given the urgency and seriousness of this challenge, the Fund is mandated to make an ambitious contribution to the united global response to climate change. It has been structured to mobilise different sources of funding including public, private sector financing and markets.

Since the adoption of the Paris Agreement in 2015, the carbon markets (co-operatives under Article 6 of the Paris Agreement) has a potential for growth following lessons learnt from the implementation of the CDM. Saha states that approximately 70% of GHG emissions come from infrastructure (such as electricity generation, transportation, industry, and buildings) and that the resulting climate change will have a disproportionate impact on the poorest and most vulnerable communities.²⁰ Hence, the New Climate Economy (NCE) proposes that if carbon is priced into infrastructure projects, it has the potential, not only to help protect the environment, but also to attract more private money towards filling the world's one trillion dollar-a year infrastructure gap for Africa.²¹ This will be critical financing to complement the GCF resources. What is saddening is that whilst US\$10,2 billion was pledged in 2014, not all the resources have been made available for use by the Fund. This has been attributed to: i) USA communicating its intentions to pull out of the Paris Agreement, hence not fulfilling their pledge of US\$2 billion after the President of USA, Mr Trump, came into office in 2017, ii) Loss of over US\$300 million in exchange rates, and iii) loss in risk insurances.

The 2030 Sustainable Development Goals and Paris Agreement reconfirm that growth and development cannot continue without all countries tackling climate change and advancing environmental sustainability. The provision of private finance to low-emissions and climate-

Fund and the Global Environment Facility, the entities entrusted with the operation of the Financial Mechanism of the Convention, as well as the Least Developed Countries Fund and the Special Climate Change Fund, administered by the Global Environment Facility, shall serve the Agreement.')

<<https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf#page=9>>

20 Saha (2018), Low-carbon infrastructure: an essential solution to climate change? World bank.

21 The New Climate Economy (2018).

resilient projects in each country is typically the result of a combination of climate-related public finance and policy interventions, in the context of broader policy environments and enabling conditions.²² Hence, the success of Zimbabwe in mobilising climate finance will be contingent on the policy direction and availability of public finance to support climate action. Climate Policy Initiative (CPI) also state that well-designed financial instruments and appropriate public support that reduce private investors' risks and improve their financial returns could play a central role in global efforts to address the adaptation and mitigation needs of developing countries.²³

2.2 Sources of Climate Finance

The global community faces significant challenges in mobilising the climate investments required to meet the Paris Agreement shared goal of limiting global warming and to adapt to climate impacts. The global climate finance architecture is frequently evolving and becoming more complex. Funds flow through different channels, including the UNFCCC financial mechanism. However, monitoring the flows of climate finance is difficult, as there is no clear definition of what it constitutes. As governments focus on ways to most effectively finance the implementation of their Nationally Determined Contributions (NDCs), a wide range of public and private finance actors aim to take advantage of the strong political signal delivered by the Paris Agreement, and the numerous investment opportunities that the NDCs afford. Zimbabwe should, therefore, balance its political support with action required to strengthen the institutions and policies responsible for providing an enabling platform for resource mobilisation. Zimbabwe can leverage different sources of climate financing. These will include:

2.2. 1 Public money

For example, public money includes government-allocated funding often derived from carbon taxes and the revenues of carbon markets. Carbon taxes offer a market-based approach where a limited number of permits are sold: companies and other economic actors are required to hold permits in an amount equal to their CO₂ emissions.²⁴ This mechanism

²² Hascic et al. (2015).

²³ Oliver et al. (2018).

²⁴ Zimbabwe has a carbon tax established by an Act of Parliament but we do not yet have an Official Carbon Market Trading Scheme. However, Zimbabwe

favours investments in low-emission technologies, in order to reduce spending on permits. It also includes money channelled to the UNFCCC financial mechanisms, Climate Investment Funds (CIFs) and it may also include 'money owed' from damage caused by rich countries whose wealth is derived from burning fossil fuels. An example of a carbon market is the Canada-Quebec Cap and Trade System which has a three year compliance period and each tonne of carbon equivalent is USD14,91. The system covers all the GHGs and the initial sectors for implementation were electricity and industry. Enabling the transition to a low-emission, climate-resilient development pathway requires addressing both sides of the coin: scaling up climate finance and scaling down dirty/brown finance. Article 2.1(c) of the Paris Agreement captures the notion that we should focus on *all* finance flows, not simply green but also brown financing. In other words, it may not be justifiable simple to scale up climate financing if much larger sums are being spent on dirty investments. UNFCCC may not, for example, be eligible to address fossil fuel subsidies, but greater attention must be placed on the brown/dirty flows. However, as noted earlier, the reality is that it is quite hard to get appropriators of public climate finance to agree to scaling up additional support for developing countries while they continue to accept high-emission, maladaptive investment from other countries.

2.2.2. Private money

This money derives from individuals or private organisations. Private investment has increasingly become important to climate finance to address the gap required to take the world to a low carbon and resilient pathway. Private sector climate-related activities encompass a wide variety of sectors and project types and most are concentrated on mitigation such as renewable energy, energy efficiency and transport. In May 2017, the World Bank announced a commitment to increase climate finance to 28% of its portfolio by 2020 and at COP24 in Poland it committed US\$200million to support climate action. Another example is the European Bank for Reconstruction and Development, a multilateral development bank, with a 2020 target of 40%, up from 25% over the last 5 years. Multilateral development banks work with Climate Investment Funds to support 72 developing countries working towards low-carbon and climate-resilient development. Private money can be in the form of green bonds, private

has a Kariba REDD+ project that is trading carbon in the global carbon voluntary market.

equity, debt, guarantees and concessional loans.

The Paris Agreement also opened possibilities for new actors to provide climate finance. On the sidelines of the official negotiations, private providers emerged: private banks, insurers, institutional investors or other private initiatives also pledged funds. This is significant, as it shows that the expected mobilisation of private financial flows has already begun, and has also supported the formulation of green banks. The Infrastructure Development Bank of Zimbabwe seeks to be the first green bank in Zimbabwe. Other green banks in Africa include the Development Bank of Southern Africa and Morocco and Green Bank. They are dedicated to green investment and provide a market-based solution to addressing the climate investment gap. They are also designed to maximise total climate investment by leveraging limited public funds with far greater local or foreign private investment. Green Banks typically utilise innovative finance to address barriers to investment such as small ticket sizes, high transaction costs, real and perceived risks, regulatory uncertainty, currency and political risk, weak enabling environment, insufficient bankable project pipelines and shortage of project developer expertise.²⁵

The key elements of a Green Bank model include:

- An **in-country dedicated climate finance entity** that uses public and private investment to catalyse and crowd in private investment;
- Designed to **demonstrate bankability and market viability** of affordable low-carbon technology to **attract private investment and commercial bank funding** for rapid deployment;
- Is **market responsive** and develops **innovative finance instruments** to mitigate risks and enable first-of-a-kind investments;
- Uses **debt and credit enhancing instruments** such as first loss reserves, subordinated debt, aggregation, and extended tenor instruments;
- Designed to **earn a return** on capital from project cash flows and to be a **self-sustaining operation**;
- Designed to develop market capacity and as markets mature, to step away and **move to the next leading-edge opportunity**.

25 DBSA (2018a).

According to the Climate Policy Initiative, private sources provided the bulk of renewable energy investment globally – over 90% in 2016.²⁶ Conventional debt and equity are the most prominent financing instruments. Private investment continues to account for the major share of climate investments. At 54% annually for 2015/2016, private finance actors, such as project developers, corporations and commercial banks accounted for most climate finance flows.

Other sources of climate financing include public financial intermediaries, private financial intermediaries, finance for investors and lenders as well as philanthropic financing.²⁷ The most important multilateral sources of climate financing at the international level are the World Bank's carbon funds, the GEF, the AfDB, African Sustainable Forestry Fund, the UNFCCC's Adaptation Fund, and the Kyoto Protocol's CDM. Unfortunately, Zimbabwe has not been able to take full advantage of these funds in the past for several reasons including lack of capacity and lack of accredited financial institutions. However, most of the climate-related finance has come from the government treasury through the public sector investment programme.

2.3 Instruments of Channelling Climate Finance

Zimbabwe can leverage different instruments used to channel climate finance. Grant financing is a common practise for addressing adaptation-related actions, with Zimbabwe receiving US\$1.5 million and US\$4.5 million in 2007 and 2013 respectively under the GEF Special Climate Change Fund. Other grants also include the US\$300,000 GCF readiness to strengthen Zimbabwean GCF National Designated Authority's (NDA) fiduciary standards and project review capacity and the US\$3 million that was approved for the formulation of the Zimbabwe's National Adaptation Plan. Whilst Zimbabwe has political support for climate related issues, it is fundamental for the Climate Change Management Department (CCMD) to start raising capacity among different players such as the Ministry of Finance and Economic Development (MoFED) so that they do not view climate finance as an environmental and natural resources management issue but as a macro-economic one that can affect the country at national level. If the MoFED is on board, it will be able to support the scaling up of climate finance through leveraging DFIs and private sector finance

26 IRENA and CPI (2018).

27 OECD (2018).

in the form of concessional loans, low-cost project debt, project level, market-rate debt, project level equity, balance sheet financing (equity/debt) and/or guarantees through providing primary risk finance, securities and ring-fencing carbon finance to support low-carbon, resilient, and inclusive infrastructure development

In Zimbabwe, Carbon Tax is payable at the rate of US\$0.03 (3 cents) per litre of petroleum and diesel products or 5% of cost, insurance and freight value as defined in the Customs and Excise Act [Chapter 23:02], whichever is greater. Without increasing the rate of carbon tax, there is a need to ring fence some resources for low-carbon development, although the tax bracket can be expanded to also target the polluting industries and those that are unsustainably producing. South Africa seeks to also implement a carbon tax from 1 June 2019 and the Minister of Finance indicated that, ‘[t]he carbon budgeting system and the carbon tax will be aligned. This is done by imposing a higher tax rate as a penalty for emissions exceeding the carbon budget. The original date of implementation was 1 January 2019, but this will be postponed to 1 June 2019.’ The postponement is to allow for the new transition.²⁸ The Carbon Tax seeks to enable South Africa to meet its nationally-determined contribution (NDC) commitments in terms of the 2015 Paris Agreement on Climate Change, and to reduce the country’s GHG emissions in line with the National Climate Change Response Policy and National Development Plan.

2.4 The Role of the Private Sector

According to Climate Policy Initiative (CPI), climate finance flows reached a record high of US\$437 billion dollars in 2015. There was a 12% drop in 2016 to US\$383 billion, although still higher than flows in 2012 and 2013.²⁹ However, taking into account annual fluctuations, the average flows across 2015/2016 were 12% higher than during 2013/2014. It is said the record in 2015 was driven by a surge in private renewable investments, particularly in China, and in rooftop solar power in the U.S. and Japan, whilst the decrease in 2016 was due to a combination of both falling technology costs and lower capacity additions in some countries. Technology costs decreased an average of 10% between 2015 and 2016, with particular decreases from solar. Most of the resources were leveraged

28 ‘Tito Mboweni introduces Carbon Tax Bill’, *Business Day*, 20 November 2018

29 <<http://www.climatefinancelandscape.org>>

from the private sector.

Globally, the private sector is regarded as a key partner, particularly for moving investments away from high-emitting technologies towards mitigation and low-carbon development. A ‘fossil fuel divestment’ movement is starting among NGOs and institutional investors. The discourse claims that such initiatives need to be discussed in the negotiations, both in terms of their opportunities for accelerating mitigation and the challenges they imply for those economies highly dependent on fossil fuels.³⁰

The cost of transforming to greener actions and enhancing adaptation capacities requires US\$5-7 trillion per annum, but the current climate flows fall short of the required amount to address climate change. In one critical respect, however, there is need to progressively make the private sector a partner in helping nations build resilience and adapt to climate change. Engaging this sector is essential for mobilising financial resources and technical capabilities, leveraging the efforts of governments, engaging civil society and community efforts, and developing innovative climate services and adaptation technologies.³¹ Broad engagement of all parties will also enhance collective action, assessment of progress and identification of further action needed to meet the goal, recognising that there is no single pathway towards achieving climate resilience. Public private sector partnerships are encouraged, as a means for building financial and technical capacity.

The business community needs to be recognised as an indispensable partner as the world builds resilience against and adapts to climate change. Private entities dominate many investments that are critical to adaptation, such as the location and design of buildings and other infrastructure investments. The required trillion dollars cannot all come from public sources. There is need for contributions or investments from the private sector and for innovative sources of financing and necessary incentives. The private sector can play a key role in advancing blended finance for sustainable and climate-related development. ‘Blended finance’ is the strategic use of public or philanthropic development capital for the mobilisation of additional external private commercial finance for SDG-related investments. It can leverage diverse sources of capital to enhance

30 Betzold and Castro (2016).

31 Fayolle et al. (2019).

returns for private capital and positive impact.³² Blended Finance can be deployed at different stages across a project lifecycle, since each stage has a different risk profile which can be mitigated by a combination of blended finance instruments such as grants, debt swaps, syndicated bank loans, green bonds, government or private equity and debt, or risk mitigation instruments such as guarantees, insurance and export credits.³³

Given the diversity of the private sector and of the adaptation challenges facing developing countries, it cannot be taken for granted that the private sector will succeed in tackling all kinds of adaptation challenges.³⁴ But for the private sector, internalising the cost of action will be a major mechanism for a successful climate action. Zimbabwe and its philanthropic or development partners such as UNDP-Zimbabwe have the capacity to leverage private sector financing, but it is key to enhance evidence generation and data access to enable the banks and other private players to structure products that are relevant and also engage from an informed perspective.

3. Climate Financing Needs in Zimbabwe

Sterk, Luhmann and Mersmann, indicate that ‘International Climate finance needs to be underpinned by an understanding of the financing requirements of developing countries in order to be able to assess whether international climate finance is commensurate to their needs.’³⁵ There has been a discussion on whether the climate finance needs are premised on gross or net flows, incremental investment and or incremental cost due to climate change.³⁶ However, climate finance is clearly predicated on incremental investment and cost, not total investment. Zimbabwe developed a National Climate Change Response Strategy in 2014 which costed climate actions at US\$9.887 billion for a period of five to ten years across all the sectors of the economy. In 2015, the country further developed its Intended Nationally Determined Contribution (INDC) which specifically looked at the Agriculture sector from an adaptation perspective and energy from a mitigation perspective, respectively. The cost of implementing the country’s low carbon and resilient actions from

32 Thirdway Africa, Zimbabwe Resilience Building Fund Business Breakfast: ‘Inclusive Business, Impact Investing and Blended Finance’, Harare, 2018.

33 Ibid.

34 FAO (2017).

35 Sterk et al. (2011).

36 Ibid.

2020 to 2030 stated in the INDC were estimated at US\$90 billion.³⁷

As actions to combat dangerous climate change advance, concerns have lingered over the country's ability to mobilise funds for its US\$10 billion-worth adaptation and mitigation plan. According to the NCCRS, significant financial resources need to be allocated by the treasury and contributed by the private sector as well as be mobilised from international climate funds; bilateral donor and international agencies; carbon markets; foreign direct investment and loans from international, regional and local banks to implement the Action Plans proposed. While the NCCRS seeks to mainstream climate change adaptation and mitigation actions into the country's economic and social development across different tiers through multi-stakeholder engagement, Dhlakama indicates that this goal is not effectively addressed as the NCCRS fails to effectively identify the opportunity costs that each sector is potentially losing due to climate change effects.³⁸

Zimbabwe has a diversified economy based on agriculture, mining, manufacturing, commerce, forestry, and tourism, among others.³⁹ Agriculture provides about 60% of the total employment and raw materials for the industry. However, the national agricultural production largely relies on rain-fed agriculture, which is one of the most vulnerable sectors to climate change and variability. The climate sensitivity of the agriculture sector has increased the climate finance requirements for the sector due to increased frequency of droughts, mid-season dry spells, late onset of rains and hailstorms.⁴⁰ The climate change induced weather extremes have continued to increase the incremental investment and cost of doing business. To decouple agriculture from climate, there is need for the Government to leverage additional funding available in the global and domestic climate space to invest in irrigation, renewable energy and water harvesting technologies among others.⁴¹

The Constitution of Zimbabwe guarantees every citizen the right to 'an environment that is not harmful to their health and to their well-being' as well as protecting the natural environment for posterity. To

37 GoZ (2015).

38 Dhlakama (2015).

39 GoZ (2014).

40 Zhakata et al. (2017)

41 'Zim-Asset: Conducive platform for greening the economy', *The Herald*, 30 June 2014.

achieve this, the State is instructed to undertake ‘reasonable legislative and other measures’ that among other things ‘secure ecologically sustainable development and use of natural resources while promoting economic and social development.’⁴² Although the Constitution guarantees these environmental rights, the state is under no obligation to fulfil them if it does not have the resources to do so. This resource gap creates wider gaps in the wholesale implementation of green strategies. On the other hand, when the Green Climate Fund became fully operational in 2015, it was hoped the world’s largest international climate fund would be a reliable source of grants for adaptation. However, that does not seem to be the case.⁴³ Apparently, the African Group of Negotiators raised concern on the reduced opportunities for developing countries to access grants but more loans under the GCF.⁴⁴ They further highlighted that Africa should be careful not to leave the future generations a climate finance debt that they will not be able to service.

3.1 Zimbabwe’s Climate Finance Enabling Framework

Zimbabwe has considered the seriousness of the threats imposed by climate change to its people and the potential to undermine the country’s efforts to meet its developmental goals. As a result, in 2013, former President Mugabe called for the full establishment of the CCMD. According to the NCCRS, climate change has created urgency in the promotion of good governance at national level especially in the context of adaptation and development. Zimbabwe further showed its commitment by ratifying the Paris Agreement in 2017⁴⁵ in order to be in line with the global efforts to address climate change, and to benefit from financial resources meant to address global climate change.

However, climate change interventions have largely remained uncoordinated and differentiated across sectoral interests, mobilisation of funds has remained uncoordinated. The country has failed to fully benefit from several opportunities to tap into adaptation and mitigation funding, such as the reduced emissions from deforestation and forestry degradation (REDD+), CDM, CIFs, GCF and the Adaptation Fund. However, following the full operationalisation of the CCMD in 2015,

42 Section 73 of the Constitution of Zimbabwe (2013)

43 Arkin (2016).

44 Wyns (2018).

45 ‘New hope as Zimbabwe ratifies key climate treaty’, *The Herald*, 11 September 2017.

there has been increased momentum to co-ordinate climate action in Zimbabwe. This saw the development of a National Climate Policy (NCP) in 2017, which was informed by principles embedded in the Zimbabwe Constitution, the UNFCCC, the Paris Agreement, and Agenda 2030. The NCP increased oversight by the Office of the President and Cabinet to support the implementation of the Zimbabwe's NDC. This has also led to institutionalisation and mainstreaming of climate change into national economic blueprints, strategies, actions and budgets of climate sensitive sectors such as agriculture, forestry, water, environmental management, infrastructure, health and food security.

The NCP recognises the cruciality of climate funding to implement the Policy and related strategies. It therefore calls for the establishment of a National Climate Fund that is supported by a 10% budgetary allocation from the national budget which will finance the implementation of proposed climate strategies.⁴⁶ It further calls for the establishment of the 0.005% levy of net profit for industries towards capitalising the fund to support national green growth. According to the Constitution, outside the Consolidated Revue Fund, the National Climate Fund may be established either through:

- dedicated statute that then constitute the founding framework (Statutory Funds); or
- in terms of section 18 of the Public Finance Management Act, in which case they are administered under a Fund Constitution specifically drawn up for that purpose.

It is imperative that in establishing the National Climate Fund, the necessary legislation should provide for the fund establishment, purpose of the fund; fund governance arrangements, fund's income sources and purposes to which such income may be applied and requirements with respect to accounting for and audit of fund resources and assets.⁴⁷

To facilitate for climate finance mobilisation, the NCP also seeks to provide an enabling framework to support the accreditation of national institutions as NIEs for direct access to GCF and Adaptation Fund. The then Ministry of Environment, Water and Climate, through the CCMD as the NDA to the GCF and focal point to UNFCCC, nominated the EMA

46 GoZ (2017)

47 Public Finance Management Act 22 s 19. (2018). <https://www.parlzim.gov.zw/acts-list/public-finance-management-act-22-19>

as the NIE for the Adaptation Fund and IDBZ and Steward Bank as the national entities for direct access from the GCF. To support green growth in the country, the MoFED also plays a critical role in authorising the importation duty free for solar batteries, tax waivers, and rebate on green equipment among other initiatives.

Whilst Zimbabwe has recently become active in mobilising international resources, there are different funds, financial levies and taxes that were established domestically to support environmental and natural resources management, including addressing climate change impacts. These include the establishment of the carbon tax, environment fund, water fund and rural electrification fund. However, there has been great concern among the general public on the clear indication that the funds have been used in a manner that does not reflect their intended purpose. In the case of the carbon tax, which is supposed to be used in climate related activities such as supporting low-carbon development, it is uncertain how the income will be used. The limitation comes from the Customs and Excise Act [Chapter 23:02], the law that establishes the carbon tax, which is not absolute about its climate or carbon related functions. In this regard, there is need to review the laws in order to provide clarity on the use and disbursement of carbon tax.

The Environment Fund was established under the Environmental Management Act [Chapter 20:27] that is supposed to be capitalised through budgetary allocations, environmental levies, carbon tax and donations. The fund is expected to provide support through grants and loans to local authorities; climate change adaptation and mitigation activities; environmental extension; research, training and technology transfer; rehabilitation of degraded areas and environmental awareness programmes. Although the fund is not yet fully operational, it provides a legal institutional framework for mobilising climate finance for the country, hence there is need align it with the ongoing work of establishing the National Climate Fund.

The establishment of the CCMD in 2013, provides for the enabling institutional arrangements to address climate change and mobilise climate finance. However, it is fundamental that the Department does not view climate change as an environmental issue but a macro-economic issue. This will ensure that all the stakeholders are on board to do their fair share in addressing climate change, including the MoFED, Ministry of Energy, civil society, academia, private sector and development partners among others.

3.2 Case Studies that can inform the Establishment of the National Climate Fund

Mobilising additional climate finance is a strategic and well-presented opportunity to address the US\$2 billion climate finance requirement. This comes on a backdrop where the fiscus was generating less than US\$4 billion per annum with recurrent expenditure consuming over 80%. Hence, socio-economic investments including climate finance were crowded out from the onset.⁴⁸ It is, therefore, crucial for the government to think of more innovative ways of mobilising climate finance. As Zimbabwe is moving towards establishing the National Climate Fund, it can borrow some lessons from Rwanda and South Africa.

3.2.1 Rwanda Green Fund

The Rwanda Environment and Climate Change Fund, also known as the Rwanda Green Fund, was established in 2012. It aims to be a dynamic, independent resource facility providing targeted financial and technical support to catalyse climate resilient development at scale, contributing to Rwanda's vision of becoming a low-carbon and climate resilient economy by 2050. The Rwanda Green Fund is investing in public and private projects that drive transformative change. It is one of the first national environment and climate change investment funds in Africa. The Fund invests in sustainable wealth creation and poverty reduction by providing strategic financing that accelerates Rwanda's commitment to building a strong climate resilient and green economy. Due to the Fund's success over the last five years, many governments have sent delegations to Rwanda to learn from the Fund, including Benin, Kenya, Malawi and Zimbabwe.

Rwanda is highly vulnerable to climate change, as is the case in Zimbabwe, and relies heavily on rain-fed agriculture and hydro-power. Rwanda has experienced a temperature increase of 1.4°C since 1970, higher than the global average, and can expect an increase in temperature of up to 2.5°C by the 2050s. This affects not only Rwanda's environment, but also impacts its population as rain-fed agriculture remains the main source of livelihood for the majority of people and contributes to a third of the country's GDP.

The Rwanda Green Fund has committed investments of just under US\$40 million to 35 projects. The Fund has created more than 137,500

48 Monyau and Bandara (2015).

green jobs, provided more than 57,500 households with improved access to off-grid clean energy and protected 19,500 hectares of land against soil erosion. Investments have supported 104,000 people to cope with the effects of climate change and planted 39,500 hectares of forest. Investments have reduced the equivalent of 18,500 tonnes of carbon dioxide emissions. In total, the Fund has raised approximately US\$130 million for strategic climate resilience investments in Rwanda.⁴⁹

What has made the Rwanda Green Fund a success, is the way it was structured. The legislation that supported the formulation of the Fund ensured that all the other environment and climate related climate change funds were consolidated into one big fund. This has also been supported by the Fund's ability to facilitate direct access to international climate finance and streamlines and rationalises external aid and domestic finance. Further, financing from the Fund can be accessed by Rwanda's government ministries and agencies, districts, and civil society organisations, including academic institutions and the private sector.

The Fund's capacity to support different thematic areas such as waste management, energy, biodiversity, sustainable transport and the ability to provide several investment products, including grants, innovation investments, and credit lines has made the Fund more relevant and effective. The Fund's innovation investments are performance-based investments for research and development, proof-of-concept and demonstration. Private sector companies can apply for up to US\$300,000 and must provide 25% match funding, hence leveraging private sector financing for climate action. The Fund provides Rwanda's cheapest money with a credit line that provides financing at 11.45%, well below market rates of approximately 18%. Developed with Rwanda's Development Bank, private sector companies must provide 30% match funding. The minimum loan amount is US\$70,000.

Investments that have clearly demonstrated climate mitigation include the E-waste Management Project and the Integrated Land, Water Resources and Clean Energy Management for Poverty Reduction Project. In total, the Fund investments have reduced the equivalent of more than 18,500 tons of CO² emissions.

49 CIDT) (2016).

3.2.2 Development Bank of South Africa Climate Finance Facility

The Development Bank of Southern Africa (DBSA) is an infrastructure development finance institution (DFI) that supports financing of infrastructure in the energy, water, transport and ICT sectors in sub-Saharan Africa. It is an Accredited Agency (AE) of the Green Climate Fund (GCF) and South Africa's NIE of the GCF. As such DBSA's approach to project development and programming is no longer business as usual. Projects are now carefully designed to benefit local communities, with a particular focus on women and vulnerable groups, and the environment in their focal areas, with no anticipated adverse social or environmental impacts. To enhance DBSA's capacity to mobilise climate finance, DBSA established a new Climate Finance Facility (CFF) in 2017 to address market constraints, playing a catalytic role with a blended finance approach, to increase climate related investment in the Southern African region. CFF is a debt facility that aims to address market constraints in the private sector and play a catalytic role with a blended finance approach in increasing climate-related investments in Southern Africa.

The CFF will co-fund projects and businesses that mitigate or adapt to climate change and it is the first green bank concept adapted for developing countries. It offers globally significant proof-of-concept value to middle- and lower-income nations seeking to address market barriers and quickly scale up the high levels of private investment required by Paris climate commitments. The CFF will use its capital to fill market gaps and crowd-in private investment, targeting commercially viable technologies that cannot currently attract market-rate capital at scale and focus on adaptation and mitigation infrastructure projects through issuing subordinated debt/first-loss and credit enhancements instruments such as tenor extension to projects that are commercially viable but not currently being financed by the private sector banks. CFF was capitalised by GCF with US\$56.6 million barriers. The focus of the CFF (using GCF funding) will be to demonstrate the commercial viability of climate mitigation/adaptation technologies and solutions, resulting in full commercial viability.⁵⁰

According to a study by Maumbe and Jakarasi, in implementing the green strategies, there are challengers, followers and laggards. Whilst DBSA has been a challenger in developing new innovative ways of climate

50 DBSA (2018b).

finance, IDBZ has identified itself as one of the immediate followers.⁵¹ The IDBZ, which is also an infrastructure DFI, is in the process of getting GCF accreditation and equally establishing a Climate Finance Facility so as to attract financing/capital from climate funds and other providers of climate finance and crowd in private investment.

4. Recommendations and Conclusion

Some of the recommendations that can advance climate financing in Zimbabwe include the following:

- 4.1 In establishing the Zimbabwe National Climate Fund, it is important for the Government of Zimbabwe to ensure that the Fund is structured to address climate change from a macro-economic viewpoint. This will ensure that the fund covers different sectors and themes and it is significantly relevant. Relevance can also be built by ensuring that the fund can leverage climate financing from different sources including the private sector and ensure that different stakeholders equally benefit from the fund at national, sub-national and local levels.
- 4.2 Zimbabwe needs to develop the appropriate institutional framework to be able to take advantage of the private sector carbon financing mechanism to support low-carbon projects. There is need for the government to put in place policies and incentive mechanisms for attracting private sector participation in carbon financing.
- 4.3 In order to tap into many funding opportunities, Zimbabwe is required to foster public-private synergies that will continuously work together in efforts to access climate funding.
- 4.4 The government needs to mobilise technical assistance and capacity building to facilitate the accreditation of various national institutions as national implementing entities for direct access to GCF and other climate funds.
- 4.5 Ensure that the establishment of the National Climate Fund should be inclusive, transparent and accommodates the private sector requirements.
- 4.6 Support the public financial institutions, such as the Reserve

51 Maumbe and Jakarasi (forthcoming).

Bank, IDBZ, EMA and ensure that they are well-positioned to act as a key leverage point for governments' efforts to mobilise private investment for low-carbon projects, infrastructure and natural resources management.

- 4.7 The government should strengthen the fiduciary management, structuring climate finance and integration of environmental and social safeguards capacity for climate finance more broadly at national, sub national and local levels and ensure establishment of monitoring, reporting and verification systems.
- 4.8 There is need for capacity building and establishment of sector-by-sector guidance to enable them to develop viable projects that can attract finance from a diversity of sources. There will also be needed to build capacity to consider Zimbabwe's options for raising the climate finance necessary for realising proposed actions to respond to climate change and to turn ideas into actions on the ground.

In conclusion, Zimbabwe is an inextricable part of the response equation because they must provide a transparent framework and platform for local actions for both the government and the private sector. With the help of finance and legal experts, Zimbabwe must review current laws and policies so that they offer a conducive playground for the private sector and harness enough skills to develop quality and bankable projects for funding. The government has to offer specific monitoring and evaluating programmes for the private sector because there are also key challenges to engaging the private sector. Unlike governments, the private sector is not responsible for improving the lives of people and the extent to which private sector support climate action is not a strait jacket. Zimbabwe's continued political commitment, capacity building and institutional coordination and co-operation has the potential to harness climate finance at scale.

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Climate Change and Insurance in Zimbabwe

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1. Introduction

One of the most notable impacts of climate change, as observed in Chapter 2, are natural events such as droughts and floods. These tend to counteract developmental gains as the loss and damage from floods, storms, droughts and earthquakes usually impoverishes already poor regions and exacerbates the many demands on their economies.¹ Much of Africa, including Zimbabwe, is dominated by rain-fed subsistence agriculture, which is significantly affected by climate variability. Moreover, climate change is already threatening food security through higher incidences of protracted droughts, high temperatures and erratic rainfall. The existing structure of the international system for responding to natural disasters is neither timely or reliable and funding is usually secured largely on an ad-hoc basis *after* the occurrence of a natural disaster.² Thus, existing assets are depleted and setbacks suffered on developmental gains force those affected into chronic destitution in the world's least developed countries.

Climate adaptation is argued not to be about how countries should respond to weather extremes and disasters but *ex ante* preparation for the occurrence of such.³ However, this observation overlooks an important aspect: this is that although *ex ante* resilience-building lies at the centre of

1 Syroka and Wilcox (2006), p. 197.

2 Nyirenda and Goodman (2013), p. 1.

3 Hulme et al. (2011).

adaptation, it is not necessarily limited to that. The Intergovernmental Panel on Climate Change (IPCC) report on managing risks of extreme events clearly states that *ex post* response and *ex ante* preparation are not mutually exclusive.⁴ Therefore, their conclusion is that adaptation should involve both in response to the impacts of climate change in a manner that is mutually complementary.⁵ In other words, acknowledgement of the possibility of a natural disaster well before it occurs, means putting in place structures to respond effectively to the aftermath.

Most developing countries, including Zimbabwe, currently finance loss and damage after a natural event through the absorption of the costs by government and victims. There is also an over-reliance on donor aid as a major source of finance for most disaster-prone countries, which has its limitations. There is only a marginal use of financial risk transfer mechanisms such as insurance in responding to the effects of an extreme weather event or disaster.⁶

Insurance, however, is being used as a risk transfer mechanism in response to natural disasters in some developing countries today. The main benefit is that the country which suffers a disaster does not have to absorb the quantifiable cost of damage and loss, as this is covered by the insurance. This chapter will unpack what climate risk insurance is and how developing countries such as Zimbabwe could benefit in joining a risk-pool for such insurance. The next section elaborates the concept of 'loss and damage' tracing its development through the climate change international regime evolution. The third section discusses the generally applicable principles of insurance that are relevant to climate change insurance. Part four narrows down the analysis to the Zimbabwean insurance context, before providing a justification of climate insurance in part five. The last two sections consider the recommendations and possible pathways to climate risk insurance in Zimbabwe.

2. Loss and Damage associated with Climate Change

The increase in climate volatility counteracts efforts being made by African countries to mitigate and adapt to current and expected weather risks.⁷ Climate change is threatening the growth of agriculture in Africa

4 Field et al. (2012).

5 Boran and Heath (2016), p. 244.

6 Bals et al. (2006), p. 639.

7 ARC (n.d.).

and this impacts on food security and affects the economic livelihood of millions.⁸ Thus, there is an increasing awareness of the projected impacts of climate change, which lies at the core of evolving mitigation and adaptation efforts. In initial adaptation literature, reference was constantly made to the residual impacts even after such measures had been put in place.⁹ It was in this context that the damage associated with climate change after extreme weather events emerged as a pertinent issue. Efforts to formally address such loss and damage incurred by developing states can be traced as far back as 1991, when the Alliance of Small Island States (AOSIS) proposed, among other measures, compensation arrangements and insurance during the third session of the Intergovernmental Negotiation Committee for a Framework Convention.¹⁰

Loss and damage refer to the actual and/or potential manifestation of impacts which are associated with climate change that negatively affect human and natural systems.¹¹ They do not only affect human beings but also disrupt the well-being of ecological systems. There is however a differentiation between the concept of 'loss' and 'damage'. The former speaks to the negative impacts of climate change after an extreme weather event for which reparation or restoration is an impossibility.¹² Here, 'loss' cannot be remedied or recovered: for example, the loss of freshwater resources. On the other hand, 'damage' denotes the negative impacts in which restoration or reparation is still possible such as windstorm damage to buildings.¹³ The latter can be reconstructed and the impact of the damage can subsequently be compensated. Therefore, the concept of 'loss and damage' includes both what is lost entirely and what can be recovered and restored.

The technical dimension of loss and damage is based on general risk management methodology applied widely in disaster risk reduction (DRR) and more recently in Climate Change Adaptation (CCA). Where damage is concerned, the focus is on assessing, categorising and projecting impacts of events and implications for slow-onset impacts over a range of time-scales.¹⁴ In this context, these would include direct or indirect economic

8 Ibid.

9 Surminski and Lopez (2014), p. 2.

10 Ibid.

11 UNFCCC (2012a).

12 Ibid.

13 Ibid.

14 UNFCCC (2012b).

losses, damage to and loss of ecosystem services and in the worst-case scenario, loss of lives. In the broader context, loss and damage is often described as the third cost element of climate change that is: mitigation costs, adaptation costs and residual damage costs.¹⁵ In this description, loss and damage becomes a stand-alone cost of climate change, addressing those losses that occur regardless of mitigation and adaptation efforts.¹⁶

Furthermore, there are two different dimensions in the framing of loss and damage in climate change, namely the technical concept and the political dimension. The technical concept considers tools and processes to assess and manage risks and the political dimension looks at climate adaptation, compensation and equity.¹⁷ In appreciating the political dimension, it is imperative to understand the legal nature of loss and damage because this is relevant to the agreement of funding and compensation across the international community.¹⁸ Compensation arrangements for climate change have a long history, triggered by early assessments of the potential damage that could be caused by both the direct and indirect consequences.¹⁹ However, the discourse has evolved from compensation in the legal context, financial arrangements such as insurance, to a purely humanitarian perspective based on aid which can either be in economic or non-economic terms.²⁰

The concept of loss and damage has also evolved in international negotiation platforms. From the Bali Action Plan through to the Paris Agreement, where loss and damage is officially a stand-alone element of climate change just like mitigation or adaptation. This evolution has highlighted the importance of addressing loss and damage associated with climate change. Below I trace this developments from the Bali Action Plan through to the Warsaw International Mechanism for Loss and Damage.

2.1 Bali Action Plan

In the Bali Action Plan, the parties identified additional elements for adaptation that had not previously been given much attention.²¹ The Plan called for ‘risk management and risk reduction strategies, including risk

15 van Vuuren et al. (2011), p. 576.

16 Surminski and Lopez (2014), p. 3.

17 Ibid.

18 Ibid.

19 Brown and Seck (2013), p. 544.

20 Ibid.

21 UNFCCC (2008).

sharing and transfer mechanisms such as insurance' and 'disaster reduction strategies intended to address loss and damage associated with climate change impacts in developing countries, particularly vulnerable to the adverse effects of climate change'.²² This solidified the use of insurance as an adaptive measure in confronting loss and damage resultant from climate change.

Disaster risk is reduced through methodical efforts to analyse and manage causal factors of disasters, reduction of exposure to hazards, minimizing vulnerabilities, sustainable management of land use and environmental protection.²³ Chief among the factors for disaster risk reduction is an improved preparedness for extreme weather events. Therefore, disaster risk reduction strategies are needed to aid in counteracting added risks which arise from climate change. The Hyogo Framework for Action 2005-2010 titled 'Building the Resilience of Nations and Communities to Disasters' provides a comprehensive approach in reducing disaster risks and its main objective is the substantial reduction of disaster losses in the social, economic and environmental assets of communities and countries.²⁴

As already stated, the Bali Action Plan calls for the consideration of risk sharing and transfer mechanisms like insurance as a means to address loss and damage in developing countries, more especially those most vulnerable to the impacts of climate change. The Plan builds on and strengthens the mandate to use insurance instruments set out in the UNFCCC²⁵ and the Kyoto Protocol.²⁶ This clearly shows that the use of insurance in addressing loss and damage has been a considered option since 1992. However, every time insurance has been proposed in any negotiation platform, international adaptation finance is considered central to comprehensive risk reduction measures, specifically in the context of developing countries.²⁷ For countries like Zimbabwe, therefore, the availability of international adaptation finance is essential if the country is to decide to join a risk-pool to insure against loss and damage brought about by climate change.

22 Ibid.

23 Warner et.al. (2009), p. 2.

24 UNDRR (2010).

25 Article 4 (8) of the UNFCCC.

26 Article 3 (14) of the Kyoto Protocol.

27 Warner et al. (2009), p. 13.

2.2 Warsaw International Mechanism for Loss and Damage

The Warsaw International Mechanism for Loss and Damage (WIM) 2013 was established under the Cancun Adaptation Framework, even though there was immense pressure to acknowledge that loss and damage could not be effectively limited to adaptation. The WIM was formulated to address the impact of climate change in developing countries where populations are most vulnerable to its adverse impacts. An initial two-year workplan was approved in 2014 to carry out WIM's mandate: it had nine action areas which ranged from education and awareness, the promotion of risk management, to building resilience, building capacity and co-ordination in addressing loss and damage.

The WIM differentiates between reduction, transfer, and retention to build long-term resilience which guards against loss and damage from climate change. According to Durand and Huq, risk reduction measures are physical efforts that reduce the likelihood of loss; 'risk transfer' is a mechanism that shifts risk from an individual to the insurer; and 'risk retention' focuses on resilience building and cushioning communities against the loss and damage as a result of climate change.²⁸ These are acknowledged, by WIM, as necessary if developing countries are to confront the loss and damage resultant from climate change.

WIM also encourages comprehensive risk assessments by using financial instruments and measures that address the risk of loss and damage to facilitate finance where loss and damage has occurred.²⁹ However, this must take into account the policies of the country and region including the national efforts which capacitate such assessments. The financial instruments and tools listed include risk pooling and transfer, catastrophe risk insurance, catastrophe bonds, climate-themed bonds and other innovative financial tools.³⁰ It has been observed that there must be a mix of financial instruments tailored to suit a specific country or region. This means that even if risk pooling and transfer may be a viable option in one region, it may not be in another. Therefore, each country and region should select the financial tools feasible within their context. For example, a risk-layering approach and cost-effective risk reduction would be a priority for frequent, but low impact events, while insurance

28 Durand and Huq (2014), p 15; see also Roberts and Huq (2015), and Roberts and Pelling (2018).

29 Action Area 7 of WIM.

30 Ibid.

and other risk transfer products would be appropriate for high-risk but low-frequency events.³¹

Under Action Area 9 of the two-year initial workplan of the WIM, there was a call to develop a further five-year rolling workplan.³² This was approved during COP 22 in 2016 in Marrakech, Morocco. It builds on the lessons drawn from the implementation of the two-year workplan effective from 2014-16 by ensuring that developing countries are capacitated to address the loss and damage which results from climate change.

2.3 Paris Agreement

Article 8 of the Paris Agreement builds on the mandate set from the WIM and its main objective is to develop and scale up risk management and sharing facilities. These include risk insurance facilities, climate risk pooling and other insurance solutions. As a stand-alone component, different from adaptation, which can be perceived as a long-term process; loss and damage is largely viewed as a disaster response. Due to the worsening impacts of climate change, disasters from extreme weather events are no longer far-fetched but a reality, as floods, droughts, wildfires and earthquakes are occurring more frequently and with intensity across the globe.

This section of the Paris Agreement is an acknowledgement of the necessity to scale up disaster responsiveness especially in developing and Least Developed Countries (LDCs). Insurance as an option to respond to loss and damage is an initiative to establish co-operative mechanisms against disasters by offering affordable coverage across borders.³³ The practicality of this lies in the fact that many countries which benefit from having climate risk insurance would not ordinarily afford it, without membership of a risk-pool. This improves its affordability for developing countries.

An important question relating to loss and damage which the Paris Agreement attempts to answer is the compensation for that already caused and the consequent displacement resulting from climate change.³⁴ Where the latter is concerned, the Paris Agreement entrusts the WIM to set up a task force to develop 'recommendations for integrated approaches to

31 Warner et al. (2012).

32 Action Area 9 of WIM.

33 Boran and Heath (2016), p. 249.

34 Viñuales (2016).

avert, minimize and address displacement related to the adverse impacts of climate change'.³⁵ This points to the need to prepare and address the question of impending loss and damage and the need to address the loss and damage that has and is already being endured in many developing countries.

The Paris Agreement *Rule Book Modalities, Procedures and Guidelines* (MPGs) provides guidance on a variety of issues, including a financial mechanism notable for enabling developing countries to access finance, which could potentially subsidise premiums for climate risk insurance. The guidelines confirm that in addition to already existing climate finance institutions, discussed in Chapter 11 of this book, the LDCs Fund and the Special Climate Change Fund will serve the implementation of the Agreement. Therefore, where it can be argued that premiums on climate risk insurance are prohibitively expensive for developing countries; this commitment ensures that options for addressing loss and damage suffered in developing countries, such as insurance, are not abandoned for lack of finance.

3. General Principles of Insurance in Relation to Climate Change

Insurance is a transaction based on a contract that guarantees financial protection against loss in return for a premium.³⁶ When the insured suffers a loss or damage, then the insurer pays out the previously agreed upon amount. Insurance is not a new phenomenon and is common in many developed and developing countries. Furthermore, it covers a wide variety of perils. For example, a homeowner or shop owner may purchase fire and theft insurance as a means of protecting their property against these risks. In the event of a fire or theft, these property owners would receive a pay-out which covers the extent of the damage insured against the fire or the loss due to theft.

Insurance does not prevent or reduce the risk of damage or loss. It is not a tool to prevent, in the case of a home, a fire from breaking out and destroying property. However, the financial liquidity which is provided by insurance, in the event of damage or loss, has the capacity to reduce the direct effect of the damage or loss such as loss of assets, human suffering

35 UNFCCC (2015), para 50.

36 Warner et al. (2009), p. 3.

and set-backs to development.³⁷ On a larger scale, insurance can minimise the pressure on the public purse by restoring infrastructure and services after a national disaster has occurred.³⁸ This is because prompt pay-outs would facilitate rapid reconstruction of key infrastructure upon which most economies depend and restore the services most needed by the communities such as medical services and education; thereby avoiding indirect consequences of a disaster such as illness and increasing poverty.³⁹

In the context of climate change, insurance can help reduce the residual risk of damage and loss which cannot be reduced by mitigation efforts.⁴⁰ However, the insurance product must be skilfully designed to ensure that it responds adequately after the damage or loss has been suffered. If an insurance product is poorly designed and neither covers a reasonable amount of loss or damage nor provides attractive incentives for risk reduction practices; it may increase the risk of the insured regressing back to and staying in poverty after a foreseeable disaster strike.⁴¹

Although insurance clearly plays a pertinent role in the transfer of risks, it has been observed to have limitations as an option to loss and damage arising from climate change. Some scholars have noted that insurance is an appropriate option for computable losses, that is, losses that can be quantified into an estimated amount, but is inadequate for loss and damage caused to ecosystems, cultures and traditions which tend to be impossible to quantify.⁴² While this may be the case, it is important to formulate insurance products that have the capacity to respond to the damage and loss that is quantifiable, while affording adaptation strategies pathways to build resilience to impacts of climate change which cannot be compensated. There is ongoing research to establish methods and approaches to valuing the loss of ecosystem services, biodiversity, and unique environments.⁴³

Insurance necessitates the necessary move away from purely *ex post* responses after a loss or damage occurs and requires actors to manage risk proactively before a disaster. Reactive strategies in the event of

37 Ibid.

38 Ibid., p. 4.

39 Ibid.

40 Linnerooth-Bayer (2010), p. 342.

41 Kreft et al. (2017).

42 Ma et al. (2015), p. 58.

43 See generally Pearce and Moran (1994) and Toll (1995).

extreme weather events are detrimental to developing countries and set them back in meeting their development goals. Insurance sets incentives to manage risk proactively and *ex ante*. Where designed correctly, insurance incentivises risk reduction practices, thereby complimenting climate mitigation and adaptation efforts. Furthermore, such incentives could include reduction on premiums if certain practices are encouraged or avoided.⁴⁴ Unfortunately, only a few operational insurance schemes show an operational link between risk transfer and risk reduction.⁴⁵

4. The Insurance Landscape in Zimbabwe

The insurance industry is regulated by the Insurance Act [Chapter 24:07]. This Act lays down provisions on every aspect of insurance from the prerequisites for the registration of an insurance company, to the relationship between the insurer and the insured; and the insurer and the regulator of the industry. The Insurance Act was promulgated in 1988 does not specifically regulate some modern fields of insurance such as climate insurance. However, it does have specific provisions for life and other types of policies.⁴⁶

The Statutory Instrument 95 of 2017: Insurance (Amendment) Regulations, 2017 (No. 19), which repeals the Insurance (Amendment) Regulations, 2013 (No. 16), provides for current provisions on all matters related to and incidental to the insurance industry. Most provisions are monetary provisions that set out the minimum capital requirements for insurers.⁴⁷ Furthermore, the Regulations make provision for the use of acceptable actuarial methods for the assessment of claims and premiums. However, it is doubtful if these methods would be usable in assessment and computation of climate related losses and damages.

Most litigated cases in the insurance industry are for traditional types of liability and indemnity insurance like business or vehicle insurance. There is a paucity of litigated cases on innovative and rather new kinds of insurance like agricultural insurance. This is largely attributed to the slow uptake for this kind of insurance compared to other sectors of the economy. The perception of agricultural insurance by farmers is one of needless expenditure rather than a risk transfer mechanism. If such

44 Kreft et al. (2017).

45 Surminski and Oramas-Dorta (2013).

46 Sections 39 to 53 of the Insurance Act.

47 Section 3 of the Statutory Instrument 95 of 2017: Insurance (Amendment) Regulations, 2017.

a perception merely emanates from the economic costs associated with securing agricultural insurance or on uninformed opinions remains a subject of debate.⁴⁸

What is clear is that the regulatory framework for insurance in Zimbabwe lags behind the fast developing area of climate and other forms of insurance. There is a serious risk that this legal vacuum created by outdated legislation can disable the country from cushioning or enabling citizens to protect themselves from the impacts of droughts and extreme weather conditions such as cyclones and other related natural disasters. In addition, the absence of an enabling climate insurance legal framework, makes the state the primary responder when climate induced natural disasters strike. This could be alleviated where risk transfer can carry some of the loss and damage resulting from such events. It is necessary for the insurance legislation to be reformed to align with global developments on climate loss and damage liability insurance.

Currently, the insurance sector is made up of 27 non-life insurance companies, two reinsurance companies and 20 insurance brokers.⁴⁹ This is a significant improvement from the time of enactment of the Insurance Act which seemed to regulate life insurance more than any other kind of insurance. Of all insurance sectors, the biggest contributor is the motor insurance which makes up 48% of the insurance products in the market. As of 2009, the agricultural insurance sector only constituted of 5% of the insurance products in the market.⁵⁰ If anything, this is a clear display of the reluctance of the farmers to purchase such an insurance product, which is usually a form of property insurance and commonly referred to as 'named peril' or 'hail' insurance. This property insurance also extends to farm equipment, buildings and machinery.⁵¹ With increasing climatic variations that adversely affect the agricultural sector, it is important to raise awareness among farmers of the value of agriculture insurance which could indirectly address some of the impacts of climate change on food production and security.

There are limitations to the adaptation of agricultural insurance by farmers in Zimbabwe and one of the major challenges is that it remains

48 Tsikirayi et al. (2013).

49 Mujeyi (2009).

50 Ibid.

51 Tsikirayi et al. (2013), p. 3.

a low priority for a majority of small-scale farmers.⁵² It is relegated to a 'want' instead of a 'need' as farmers balance competing interests like production costs versus risk management for future climatic events. Furthermore, an increase in the uptake of this type of insurance would significantly improve if basic agricultural services like timely availability of funds for inputs, credit and viable markets for outputs, were provided for.⁵³ In the absence or delays in these services, benefits of purchasing agricultural insurance are minimal and this seems to be the case for farmers in Zimbabwe.

However, there are some products that are already in the market and that farmers seem to be slowly adapting to. These are EcoFarmer and the Nyaradzo Group Agricultural Insurance.

4.1 EcoFarmer

EcoFarmer is the brainchild of Econet and it is designed to protect smallholder farmers against crop failure due to weather events like droughts and floods.⁵⁴ This is a direct form of insurance where the farmer pays a premium to EcoFarmer in return for a transfer of risk in the event of crop failure.⁵⁵ This product seeks to ensure that there is increased productivity by farmers thereby promoting food security in the country.

Under EcoFarmer, farmers are registered into three categories which are the general farmer, the registered farmer and the insured farmer.⁵⁶ The general farmer only receives general farming messages i.e. agricultural developments alerts. The registered farmer receives farming messages such as weather information and reminders about vaccinations at a charge of \$1.50 per month. Failure to meet the payment relegates the registered farmer to a general farmer. The insured farmer pays insurance premiums of \$0.08 per day for 125 days or \$10 to cover the full farming season.⁵⁷ He or she is compensated \$100, in the event where the metrological department considers the level of rainfall either too low or too excessive for agriculture, upon payment of \$10 and/or received \$25 in the event of the

52 Ibid.

53 Ibid., p. 7.

54 Ibid.

55 Econet Wireless 'New product for Farmers' <https://www.econet.co.zw/media-centre/general-news/new-product-farmers> (Assessed 03 July 2019).

56 Ibid.

57 Econet Wireless 'About Us: EcoFarmer' <https://www.ecofarmer.co.zw/about> (Assessed 03 July 2019).

later upon payment of \$2.50 for the whole farming season. Furthermore, Econet is in partnership with Seed Co and in the event of drought, the farmer will be given as much as \$100 for every 10kg seed pack planted.⁵⁸ All of this in an effort to guard against food insecurity and to ensure that the farmer is timeously compensated in the event of crop failure.

4.2 Nyaradzo Group Agricultural Insurance

Although the company is associated with funeral policies, the Nyaradzo Group also offers Agricultural Insurance at micro-level. The first type of insurance it offers under agricultural insurance is crop insurance. This covers against any loss or damage to crops such as tobacco, potatoes, cotton, maize and sugar-cane from growing stage to the selling stage, against perils such as hail, windstorm and fire. The second type of product is the agricultural buildings and contents insurance. This is similar to home insurance. The policy pays out if, for example, a fire destroyed the outbuildings of the farm or a flood damaged some of the machinery. The third type of product is livestock insurance which covers against fire, lightning, impact and malicious damage to property. Furthermore, it also covers the risk of theft and straying animals.

5. Climate Risk Insurance (what, why and how)

Between 1980 and 2015, of all the loss and damage caused by weather-related natural disasters in developing and least developed countries, only 2% were covered by insurance.⁵⁹ This means that 98% of all loss and damage were borne either by governments, NGOs or the victims. Climate risk insurance is specifically designed to address the risk that climate change poses where loss and damage is concerned. The Sendai Framework for Disaster Risk Reduction observes the importance of mechanisms for disaster risk transfer and insurance at all levels including global, regional, national and local and stipulates a clear role for the private sector to contribute to disaster resilience.⁶⁰

Climate risk insurance is a risk transfer mechanism meant to provide financial support against loss of assets and income due to climate-related

58 Ibid.

59 Hoeppe, P. (2016) 'Weather-related loss events 1980–2015' MCII Side Event: Bonn Climate Talks <www.climateinsurance.org/fileadmin/mcii/pdf/Hoeppe.P_Climate_Risk_Insurance_for_the_Poor_and_Vulnerable.pdf>

60 UNDRR (2015).

disasters.⁶¹ This happens through effective and expeditious post-disaster support at an individual, community, national and regional level. Therefore, climate risk insurance can be understood as insurance products that cover loss and damage caused by extreme weather events whose intensity and frequency is a result of climate change. It replaces the uncertain prospect of loss and damage with the certainty of regular premium payments to aid in the event of such loss and damage.⁶²

Climate risk insurance schemes can either be direct or indirect in targeting poor and vulnerable communities. Direct insurance products provide benefits from transferring risk to the risk-bearing entity so that in the event of a loss or damage, the insured beneficiary receives the pay-out directly. Indirect insurance approaches are where the intended group benefits indirectly from payments channelled through an insured government or an institution that has insurance.⁶³

Climate risk insurance is available at three levels. The first is the microlevel and this is a direct form of insurance where the policyholders are farmers, fishermen or market vendors who receive direct pay-outs. Such policies are usually retailed through channels like microfinance institutions, farmer's co-operatives, NGOs, and local insurance companies and the policy holders either pay the premiums in full or have them subsidised.⁶⁴ The second is the meso level and this is an indirect form of insurance where policy holders are risk aggregators such as credit unions, co-operatives or NGOs and the insurer makes pay-outs to them then they provide services which compensate for the loss or damage to individuals.⁶⁵ The third is the macro level and this is a form of indirect insurance where policies are held by governments or other national agencies. In the macro level, pay-outs are made directly to the government and these can be used to manage liquidity gaps, restore the provision of services like transport, health and education post-disaster and provide relief services to the most affected groups.⁶⁶ At this level, insurance schemes are operationalised through regional risk pools. This level of climate risk insurance most appropriate for most developing countries, including Zimbabwe, as the

61 Schäfer et al. (2016), p. 17.

62 Ibid.

63 Ibid., p. 18.

64 Ibid.

65 Ibid.

66 Ibid.

premiums are paid from the national budget with the aid of climate finance available from international funds and it covers a wider spectrum of beneficiaries after a disaster in comparison to other levels.

At both micro and macro levels, insurance acts as a catalyst for risk assessment.⁶⁷ This is because risk assessment is a requirement for the calculation of premiums for policyholders. Therefore, insurance has the capacity to facilitate national, regional and international data analysis such as establishing data collection standards, methods and repositories to inform better policy formulation and implementation. Furthermore, risk assessments can help raise public awareness which encourages risk-reducing behaviour and increases the demand for insurance.⁶⁸

It is pertinent to emphasise that climate risk insurance, on its own, is not a determining factor in building resilience in vulnerable countries. It simply cannot be used as the only option to ensure that vulnerable communities adapt to the impacts of climate change. Furthermore, insurance is not a universal remedy for all types of loss and damage resulting from climate change. Although insurance options may offer a viable way of addressing the risk of extreme weather, insurance is not feasible for slowly developing, foreseeable events that will occur with a high degree of certainty e.g. rising sea-levels. Furthermore, it has been observed that even for weather-related events, insurance would be an ill-advised solution in regions where disastrous events occur frequently such as recurrent flooding.⁶⁹ Since science shows that climate change will increase the frequency and intensity levels of extreme weather events, there is a possibility that in the long-run, some risks will become too severe to be insurable. However, in the meantime, climate risk insurance is an option worth considering in concert with other adaptation measures in order to be able to recover from the effects of loss and damage without regressing in development gains.

6. Viability of Climate Risk Insurance in Zimbabwe

Zimbabwe is in a semi-arid region characterised by unreliable, limited rainfall patterns and variations in temperature. Due to climate change, rainfall is usually erratic with shifts in the onset of rains, an increase in the

67 Schäfer et al. (2016) p. 26.

68 Warner et al. (2009) p. 6

69 Hopeppe, P. 2016 'Trends in weather-related disasters: Consequences for insurers and society' *Weather and Climate Extremes* (11) 70.

intensity and frequency of heavy rainfall events, increase in low rainfall years and an increase in frequency of mid-season dry-spells.⁷⁰ There has also been a notable increase in the frequency and intensity of extreme weather events such as tropical cyclones and droughts.⁷¹ In a nutshell, the climate in Zimbabwe is based on the region within which it falls but it can be observed to be increasingly warmer with erratic rainfall patterns.

Chapter 2 drew our attention to the areas the most vulnerable to drought in Zimbabwe. These, as indicated, are most of the southern area of the country as well as a portion of the central and northern areas. If, for example, the country experiences a drought, almost 55% of the whole country would need assistance for food and water. With the prevailing economic hardships, it would be near impossible for the government, without any external aid, to avail the required amount of provisions to all the affected areas. Being part of a climate risk insurance pool could prove beneficial to Zimbabwe in the event of a drought.

Although the law governing the insurance industry in Zimbabwe does not offer many products which address the impact of climate change directly, the Zimbabwe National Climate Policy makes reference to the use of insurance under Goal 3.⁷² Here, the government seeks to strengthen capacity to:

- (a) generate new forms of knowledge, technologies and agricultural support services that meet emerging development challenges arising from increased climate change and variability,⁷³
- (b) strengthen the implementation of the drought management framework for livestock sector,⁷⁴ and,
- (c) to promote and regulate crop and livestock weather indexed insurance.⁷⁵

This is the only time that the policy refers to insurance and it would be insurance at a very low level, covering individual farmers who in most cases are unable to afford to pay premiums for such cover.

Zimbabwe is prone to extreme weather events due to its regional

70 Uganai (2009).

71 Mutasa (2008).

72 GoZ (2016).

73 Ibid., Goal 3 (14)

74 Ibid., Goal 3 (15)

75 Ibid., Goal 3 (16).

position and the impacts of climate change. That it is a developing country heightens its vulnerability to the loss and damage associated with climate change. Usually, when facing inevitable harm, three things must be done. Firstly, we can ensure that the harm never occurs by addressing what causes the harm.⁷⁶ This solution is out of the question because we know that with climate change, the frequency and intensity of extreme weather events is not likely to decrease in the foreseeable future. Secondly, we can adapt to the situation and institute measures to cushion us against the harm.⁷⁷ Thirdly, we can plan towards the compensation after the harm has occurred.⁷⁸ Although the last option is the least desirable, in the context of climate change it makes sense because in as much as we plan to adapt to the impacts, we already know what is coming and we can plan for it. Climate risk insurance is a tool by which Zimbabwe can plan ahead of extreme weather events before they actually happen and provide a cushion against the impact of loss and damage in the aftermath of such events.

The benefits associated with taking out climate risk insurance through risk pooling include:

- Paying a manageable sum instead of risking an unmanageable cost,
- By transferring risk, insurance can limit the need for individual countries to take costly individual action,
- Payment through premiums represents a predictable cost that can be planned for in a way that unexpected costs of risks cannot, and
- Incentives on premiums for countries to take preventative measures to lower risks.⁷⁹

As such, insurance presents a clear reason to be prudent and to plan for the inevitable. For Zimbabwe which already is vulnerable to the impacts of climate change and more likely to suffer loss and damage in the aftermath of extreme weather events, climate risk insurance provides an alternative to better handle an impending crisis. Furthermore, climate risk insurance will help in facilitating behaviours and measures that lower risk and encourage adaptation efforts.

Although there are notable benefits from joining a climate risk pool,

⁷⁶ Duus-Otterström and Jagers (2011) Ibid.

⁷⁷ Ibid.

⁷⁸ Ibid., p. 324.

⁷⁹ Ibid.

there are also pitfalls. One of the biggest challenges is that only the countries with the highest risk tend to join pools thereby quickly draining that common pool of resources.⁸⁰ This presents a danger that, for example, in a risk pool of four countries, funds may be able to cover loss for the first two countries but fail to cover the other two. Furthermore, experiences from the insurance industry would show that there is always a risk that the insurance cover will not be enough. In addition, countries most vulnerable are usually the poorer countries not able to afford the prohibitively expensive premiums.⁸¹

In the case of Zimbabwe, the benefits associated with joining a climate risk pool outweigh the challenges. Before the insurer arrives at the requisite premium, a risk assessment will be done. This will ensure that the country's risk profile is not such that it would drain the resources of the pool. In terms of a prohibitively high premium for countries with a high-risk profile, the Zimbabwe National Climate Policy makes provision for the establishment of a Climate Fund which will constitute 10% of the annual national budget. This amount could be channelled towards the payment of the premium. In addition, Zimbabwe has access to international climate funding which could potentially subsidise the payment of the premium. Affordability of the premium is not a factor, which can contribute to why the country fails to take out climate risk insurance.

Furthermore, in as much as most extreme weather events will eventually be uninsurable because of increased levels of frequency and intensity due to climate change, that time has not yet come. This is the time for Zimbabwe to be preparing and planning for its response to droughts and floods which Chapter 1 forecasts are increasing in frequency and severity. With a public purse that is already stretched, a reactive response in the aftermath of these extreme weather events will not suffice.

7. Conclusion: the future of climate insurance in Zimbabwe

This chapter discussed the role of insurance in combating the effects of climate change. It interrogated the notion of loss and damage and why it is important to ensure that the country has in place mechanisms to respond adequately. Climate risk insurance is one of such options and it addresses the effects of climate change that mitigation and adaptation efforts do

80 Persson et al. (2009), p. 138.

81 Duus-Otterström and Jagers (2011) Ibid. p. 325.

not cover. As such, where Zimbabwe had not yet considered climate risk insurance, at a macro-level, as a viable option in addressing the impact of climate change, this chapter proposes that it does so as it is a better response, in comparison to not having this option at all, after an extreme weather event. Insurance will not only provide comfort to the insured but can also potentially reduce reliance on the government and donor agency to respond to climate induced natural disasters and compensation for loss and damage resulting from such events.

This chapter also highlighted the inadequacies in the insurance legal framework which remains outdated and focused on orthodox liability and indemnity insurance. It is necessary for the insurance legislation to be reformed to incorporate global developments aimed at enabling climate risk insurance commensurate with our socio-economic context.

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Concluding Remarks

Mutuso Dhlwayo

The focus of this book, *Climate Change and Law in Zimbabwe: Towards a Climate Resilient and Low Carbon Developed Economy*, was based on a number of assumptions about climate change in Zimbabwe:

- That climate change is a reality and that its impacts will steadily become more severe.
- Law, governance and other regulatory constructs and social institutions that mediate the human/environment interface can play a central role in achieving climate mitigation, adaptation and the transition towards a low carbon economy.
- The nature of international climate change discussions, and scientific evidence of the impacts of such change, prompt one to question the extent to which Zimbabwean national laws are reflective of this focus.
- In order to sustainably meet its national development goals and increase its global competitiveness, Zimbabwe will have to embark on a range of regulatory initiatives towards a climate resilient and low carbon developed economy, taking into consideration the broader context of the climate change related laws in the country. As such, there is an urgent need to develop a comprehensive, systematic and (increasingly) multi- and trans-disciplinary understanding of the legal and extra-legal arrangements related to climate change planning, mitigation and adaptation.

The aim of this chapter is to consolidate and synthesise the findings, conclusions and main recommendations of the book. This will be done based on the different thematic issues, namely: climate change trends, climate change governance, agricultural impacts, climate litigation, human

rights, mining impacts, energy law, labour rights, climate financing and climate insurance.

With regard to future trends of climate change, these are measured in terms of temperature, precipitation and extreme weather events that include tropical cyclones, heat waves, droughts and floods. According to Mutasa, temperatures are expected to increase by 1.6°C on average in the 2020s, by 2.8°C on average in the 2050s and by 3.5°C on average in the 2080. These increases translate to a 0.1 to 0.5 °C increase per decade, meaning Zimbabwe's annual temperatures are predicted to increase more rapidly than the global average. Warming is projected to be greatest in the dry season and least in the wet season. It is estimated that Zimbabwe's precipitation will decrease in the future. This will occur throughout the wet season but will mainly be felt during the early and late rains now predicted to occur in December and February.

Extreme weather events are also evidence of climate change. Those that have already been experienced in Zimbabwe include tropical cyclones, heatwaves, droughts and floods. It is estimated that from 2071–2100 there will be an average of 20–80 annual heat-wave days over subtropical southern Africa

Droughts in southern African and Zimbabwe will also increase in both duration and intensity due to reduced precipitation and/or increased evapotranspiration. Currently, the region is experiencing a severe El Nino-induced drought and Zimbabwe is one of the countries most affected. This drought has also affected the generation of hydropower in Kariba Dam. Nonetheless, although Zimbabwe experienced the ravages of Cyclone Idai this year that left a trail of destruction in Chimanimani and Chipinge, it is predicted that there may be a reduction of these extreme weather events in the future as a result of increased droughts, reduced precipitation and increased evapotranspiration.

Zhakata on the other hand focused on the climate change governance framework. He acknowledges that regardless of Zimbabwe marginally contributing to climate change, it is highly vulnerable and cannot take a back seat. Zimbabwe is already taking steps to tackle climate change, as is evident through the National Climate Policy and National Climate Change Response Strategy and being a signatory to the Paris Agreement. The author addresses important questions such as the need, or not, for specific climate change legislation in Zimbabwe. Key pillars that should ground the legislation identified include the need to have long-term targets

complemented by interim targets, clear specific objectives and guiding principles and a monitoring and evaluation framework which can guide current consultation processes on the legislation.

The impacts of climate change will be felt in a number of economic sectors in Zimbabwe. Three of these that are dealt with in the book are agriculture, mining and insurance. According to Zamasiya and Nyikahadzoi, maize and soybean production will be hit hardest by climate change and the impacts are already being experienced. From 1961-2018, maize and soybean production has been falling. While this is due to a number of factors, climate change (declining rainfall) is one of them. Both maize and soybean production are very sensitive to rainfall variations.

Dhlakama and Moyo looked at the role and importance of litigation in promoting climate change adaptation and mitigation by both the government and the private sector and the challenges it faces. This was analysed from global, regional and national perspectives. Globally, the foundation for climate change litigation is laid by the UNFCCC, the Kyoto Protocol and the Paris Agreement. In the case of Zimbabwe, while the Constitution and framework legislation such as the Environmental Management Act make provisions that can be utilised for climate change litigation, the jurisprudence has not yet been developed, hence the reliance on international and regional cases. However, the provisions in the Zimbabwean Constitution on environmental rights as human rights, the expanded *locus standi* and the provisions of the Environmental Management Act, provide a good grounding for climate change litigation in the future.

Although climate change litigation is indeed a very good tool, it faces a number of hurdles, especially regarding *locus standi*. While this will not be an issue in a country like Zimbabwe because of the expanded *locus standi* provisions, there are problems when it comes to using regional and international mechanisms, especially when holding multinational corporations accountable. There are challenges associated with the exhaustion of domestic remedies and costs that may be beyond the reach of many of the victims, as well as with establishing the chain of causation to the harms that are experienced as a result of climate change..

Moyo reviewed how climate change affects the enjoyment of rights that are provided under international, regional and national law with a special focus on the right to an environment that is not harmful to health or wellbeing. It is mainly the poor and those who are marginalised socially

and economically whose rights are most vulnerable to the effects of climate change, as they are directly reliant on the environment for their livelihoods.

At the national level, the Constitution and the Environmental Management Act can be utilised for the protection of environmental rights and other rights that are interlinked to them. Institutions such as the Zimbabwe Human Rights Commission and the Environmental Management Agency protect and promote these rights. Such laws and institutions are critical in shaping and fostering the development of climate change mitigation and adaptation measures.

Chidarara considered how the mining sector can be regulated to reduce both its contribution and vulnerability to climate change, and reviews the Constitution, the Mines and Minerals Act, the Mines and Minerals Amendment Bill, the Mines and Minerals Amendment Act, the National Climate Policy, the Environmental Management Act, the National Climate Change Response Strategy and the Oil and Gas Industry Development Policy. However, the overall findings are that Zimbabwe's current legal and policy framework is not yet adequate in terms of regulating the negative contribution of the mining sector to climate change or to reducing its vulnerability.

Chisaira looked at the implications of climate change laws and policies on labour relations, labour rights and justice as we move towards a green economy. Climate change is expected to have a devastating impact on workers' rights especially in the traditional and coal or fossil fuel dominated industries. The issue of labour rights and climate change has gained traction as a result of COP 24, which focused on a just transition which builds on the Paris Agreement.

Zimbabwe has laws and policies that can be used to address – or at least lay a basis for addressing – the impacts of climate change on labour rights. These include the Constitution, Labour Act, Environmental Management Act, National Energy Policy, Climate Change Policy and Climate Change Response Strategy. However, while these laws lay a good foundation, they are not adequate to protect labour relations, labour rights and justice against the ravages of climate change. There is a need for extensive collaboration between trade unions, workers' committees and social justice institutions with public interest environmental, climate change and labour law organizations in order for these rights to be protected, respected and fulfilled.

Tsabora looked at the impacts of climate change and property rights with a special focus on the energy sector. How can the state regulate the award and distribution of the energy sector investment rights in a manner that ensures that it contributes towards climate change mitigation and adaptation?

His conclusion is that climate change considerations can be mainstreamed in the licensing processes of the energy sector to achieve climate adaptation and climate change mitigation. In other words, investments in the energy sector must change to incorporate, promote and achieve environmental objectives such as climate change imperatives. This can be done without jeopardising the security of property rights as provided for in the Constitution.

Murombo considered climate change and the prospects of a low carbon economy in the context of Zimbabwe's economic, social, political and environmental problems and the role that law and policies can play in addressing the problem as part of the broader debate on climate change adaptation. This analysis is very important in Zimbabwe's bid to achieve Sustainable Development Goals 3, 7 and 13. He advocates for the adoption of renewable energy sources like solar, wind, biomass, biofuels and to some extent hydropower which are less polluting than fossil fuels.

He concludes that although there has been a noticeable policy movement in the form of the National Renewable Energy Policy, there is still no mature enabling policy and legal environment for promoting renewable energy as a pathway to a low carbon economy. The reality of the current economic, political, social and environmental problems makes the possibility of a low carbon economy a distant dream despite its desirability. The government is currently seized with energy shortages and its main priority is energy provision. This leaves little room for focus on clean energy that is critical in the fight against climate change.

Climate finance is important for climate change adaptation and mitigation. Gundu-Jakarasi assesses climate finance and governance at the international, regional and national levels. Climate finance can be either public or private. At the international and regional level, the climate finance governance includes the Adaptation Fund established under the UNFCCC, the Clean Development Mechanism established under the Kyoto Protocol, the World Bank's Climate Investment Funds, Adaptation Fund and the Green Fund, GEF's Least Developed Fund and the Special Climate Change Fund. Various development agencies, including DFID,

SIDA, DANIDA and GIZ, also have climate change funds. The African Development Bank and the Development Bank of Southern Africa also have their own climate change funds.

However, from the assessment of the climate change governance framework, it is evident that Zimbabwe has not been very successful in accessing climate finance at the global and regional levels, hence the focus on the national level. Zimbabwe's climate change governance architecture at the national level includes the Environmental Fund, Water Fund, Carbon Tax, the Rural Electrification Fund, National Climate Fund, National Climate Change Response Strategy, National Environmental Policy, Renewable Energy Policy and National Climate Change Policy. In terms of institutions, these include the Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement, the Ministry of Environment, Tourism and Hospitality Industry, the Environmental Management Agency and the Ministry of Finance and Economic Development. While the local climate finance architecture is significant, the challenge is that it is not being used to address climate change related issues but government expenditures that are not related to climate change. There are concerns about transparency and accountability over the use of this money.

Moyo reviewed the role of insurance in absorbing the impacts of climate change. Insurance is important as a risk transfer mechanism in response to natural disasters, including those induced by climate change. Climate change results in loss and damage of life and property which can be covered by insurance. The concepts of loss and damage are discussed extensively, based on the Bali Plan of Action, the Warsaw International Mechanism for Loss and Damage and the Paris Agreement.

In Zimbabwe, insurance is regulated by the Insurance Act. However, the Act does not cover loss and damage resulting from climate change, and needs to be reformed to ensure that it does cover such losses. Currently, the government is the primary responder when loss and damage occur as a result of natural disasters caused by climate change and this is not sustainable in the long run.

Way Forward and Areas of Future Research

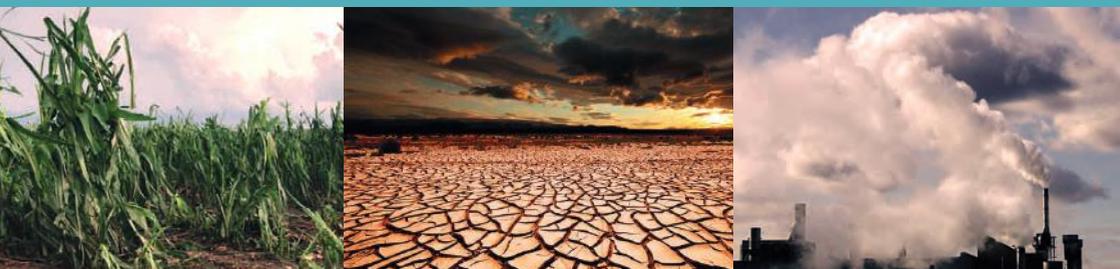
While this book is concerned with Climate Change Law in Zimbabwe, it does not provide detailed research into specific laws and policies as they relate to climate change and potential areas of conflict. To that end there is need for further research into the gaps within existing laws and policies.

The Law Society of Zimbabwe and the Government of Zimbabwe are in the process of developing a climate change bill that can benefit greatly from such a detailed research. Also, there are many other sectors that are critical within the climate change discourse such as forests, planning and infrastructure, transport and health. These are areas that future editions might include to set the context within which such sectors have to operate within a changing environment.

Climate Change Law in Zimbabwe: Concepts and Insights

Climate Change Law in Zimbabwe: Concepts and Insights is a timely book, following the devastating effects of Cyclone Idai. Climate change poses a threat to the realisation of the Sustainable Development Goals to which Zimbabwe has committed itself. This *must-read* book covers essential sectors vulnerable to the impact of climate change in Zimbabwe from both adaptation and mitigation perspectives, and comes at a time when Zimbabwe is in the process of reviewing its emission targets. Practical recommendations and policy suggestions are proffered, making the book a key reference text for policy makers, students and practitioners aspiring to tackle climate change challenges in Zimbabwe. The hard work of the editors and authors must be commended, as this is the first academic attempt to address climate change law in Zimbabwe from a multi-disciplinary and thematic perspective.

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