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LIVING WITH MULTIPLE, COMPLEX RISKS OF COMMERCIAL SUGARCANE FARMING IN KWAZULU-NATAL: THE ROLE OF CLIMATE CHANGE?

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0006505W

A dissertation submitted to the Faculty of Science, University of the Witwatersrand, Johannesburg, in fulfillment of the requirements for the degree of Master of Science

Johannesburg
2008

DECLARATION

I declare that this dissertation is my own, unaided work. It is being submitted for the degree of Master of Science in the University of the Witwatersrand, Johannesburg. It has not been submitted for any degree or examination in any other University.

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…….. day of ……. 20……..

ABSTRACT

The aim of this research is to examine the contextual environment in which farmers operate so as to improve our understanding of the factors shaping vulnerability to climate risk. A key focus is on the livelihoods of sugarcane farmers, using a case study of small-, medium-scale (emerging) and large-scale sugarcane farmers in the KwaZulu-Natal Midlands area of Eston and its surrounds. A social vulnerability assessment was undertaken under the Sustainable Livelihoods Framework (SLF) to test the hypothesis that climate risk is considered a major contributing factor to the vulnerability of commercial farmers in KwaZulu-Natal and needs to be effectively managed. This involved an investigation into the multiple stresses (both external and internal, on-farm and off-farm, climatic and non climatic) acting on the system. It is clear that climate change risk and variability is a major, but not the sole contributing factor to the vulnerability of commercial farmers in this part of KwaZulu-Natal. Climate change does need to be effectively managed but it will be best done in conjunction with the management of the other multiple and interacting threats and stresses identified in this study. Climate change and vulnerability, as well as the other multiple stresses, are acting on an already vulnerable system, exacerbating and compounding present risks.

This research also explored a number of coping and response strategies that commercial farmers have adopted in response to the threats and stresses and investigated particularly, what elements enhance or restrict these strategies (both on-farm and off-farm). These strategies posses potential as possible future adaptation options. It was found that the issues of access to livelihood assets (social, financial, natural/environmental, physical, human, knowledge assets and capital under the SLF) are key to the adaptive capacity and the adaptation strategies that farmers employ. Institutions (both formal and informal) play a pivotal role in this access to livelihood assets both enabling and restricting access.

In conclusion, this work determined that a focus on only one element, such as climate change, will not significantly reduce the vulnerability of commercial farmers. There is an interactive, dynamic and multifaceted network present with a number of factors acting within and from outside the system. Political, biophysical, social and economic factors interact and combine to compound vulnerability, requiring more integrative and multiple response strategies.

DEDICATION

This work is dedicated to the memory of my Grandfather Ken Fish. A true Geographer and enthusiastic teacher in the Natal midlands.

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I would like to thank all those who helped in the completion of this research and dissertation. I would like to thank my lecturers in the School of Geography Archaeology and Environmental Science at the University of the Witwatersrand for growing my knowledge and expanding my views. To my supervisor who spent much time encouraging me and giving me opportunities to learn more about this field. Thank you for your dedication to this field of study and your contribution to the understanding of the human dimensions of environmental change, vulnerability and adaptation.

Thank you to Trevor and Felicity Schwegmann for giving me contact details, making calls and introducing me to the farmers in the Eston District.

I am especially grateful to all the farmers in the KwaZulu-Natal Midlands South and Eston Mill District. Your friendliness and hospitality and your willingness to take time out of your busy schedules to speak to me has made this research what it is. I am truly grateful. To all those staff members at The South African Canegrowers Association (SASA) and South African Sugarcane Research Institute (SASRI), thank you for your input. Thank you to the extension officers who were willing to set up meetings and drive me around the district to meet various farmers and farming communities as well as give me background information on various aspect of sugarcane growing.

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PREFACE

This study formed part of a larger project funded by the Water Research Commission (WRC), managed by The School of Bioresources Engineering and Environmental Hydrology, University of KwaZulu-Natal Report 1430/1/05. (Reid. P., Massey, R., Vogel, C., 2005. Climate and development: experiences of Farmers in KwaZulu-Natal, South Africa in Schulze, R.E. (Ed) Climate Change and Water Resources in Southern Africa: Studies on Scenarios, Impacts, Vulnerabilities and Adaptations. Water Research Commission, Pretoria, RSA, (WRC) Report 1430/1/05).

The research has already generated a number of products. The research was presented in poster form at the 6th Open Meeting of the Human Dimensions of Global Environmental Change Research Community at Bonn University in Germany during October 2005. Poster title: The Vulnerability of Sugarcane Farmers in KwaZulu-Natal, South Africa, to Climate Change, Climate Variability and Non-Climate Related Stresses.

Preliminary findings of this work were also presented in 2004 as a paper at the Annual Geography Students Conference. Presentation Title: Climate Risk and its Impact on Commercial Farming in KwaZulu-Natal and at The 9th International Meeting On Statistical Climatology in Cape Town in 2004, presentation title: Coping with Climate Change, Related Risks and Non-climate Related Stresses: Perceptions and Responses of Subsistence and Commercial Farmers in KwaZulu-Natal (South Africa). Preliminary findings were also presented at the International Human Dimension Programme (IHDP) Regional Workshop on Human Dimensions of Global Environmental Change Research - Southern Africa in 2004 at Richards Bay. Presentation title: Climate Risk and its Impact on Commercial Farming in KwaZulu-Natal. Contributions on climate change and adaptation derived from this work have been published in the Wildlife and Environment Society's (WESSA) National Magazine: African Wildlife (2006) and the Department of Environmental Affairs and Development Planning (Provincial Government of the Western Cape) EnD Newsletters (2005). Contributions from this work were also made to the Energy and Climate Change section of the City of Cape Town's Environmental Resource Management Department.

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ACRONYMS

A – All farmers

AGM – Annual General Meeting

AIACC – Assessment of Impact and Adaptation to Climate Change

AOGCM – Atmosphere – ocean coupled general circulation model

CSAG – Climate Systems Analysis Group

DFID – Department for International Development

DoA – Department of Agriculture (National)

FANR – Food, Agriculture and Natural Resources Directorate

FAO – Food and Agriculture Organisation

FEWSNET – The Famine Early Systems Network

GCM – Global Circulation Model

GDP – Gross Domestic Product

GEF – Global Environment Fund

GIEWS – Global Information and Early Warning System

HIV/AIDS – Human Immune Deficiency Virus

IDS – Institute for Development Studies

IHDP – International Human Dimensions Programme

IPCC – The International Panel on Climate Change

IUCN - International Conservation Union

L – Large-scale farmers

M – Medium-scale (emerging) farmers

MAP – Mean Annual Precipitation

MRU – Migration Research Unit

ODI – Overseas Development Institute

PAETA – The Primary Agricultural Education Training Authority

PRA – Participatory Rural Appraisal

RRA – Rapid Rural Appraisal

RV – Recoverable Value

S – Small-scale farmers

SA – South Africa (Republic of)

SADC – Southern African Development Community

SACU – South African Customs Union

SASA – The South African Sugar Association

SASRI – The South African Sugar Research Institute

SAVI - Social Assets and Vulnerabilities Indicators

SEI – Stockholm Environmental Institute

SLF – The Sustainable Livelihoods Framework

SRES - Special Report on Emissions Scenarios

SWOT- Strengths, weaknesses, opportunities and threats

UK – United Kingdom

UNDP – United Nations Development Programme

UNEP - United Nation Environmental Programme

UNFCCC – The United National Framework Convention on Climate Change

US – United States (The United States of America)

VA – Vulnerability Assessment

VAM – Vulnerability Analysis and Mapping

WFP – World Food Programme

WRC – Water Research Commission

WTO – The World Trade Organization