LANDUSE PRACTICES INTERFACE: HUMAN-WILDLIFE CONFLICT IN LUPANDE GAME MANAGEMENT AREA

BY

PETER NGOMA

A DISSERTATION SUBMITTED TO THE UNIVERSITY OF ZAMBIA IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE DEGREE OF MASTER OF SCIENCE IN GEOGRAPHY.

THE UNIVERSITY OF ZAMBIA

LUSAKA

2011
DECLARATION

I, Peter Ngoma, declare that this dissertation represents my own work, and that it has not previously been submitted for a degree, diploma or other qualification at this or any other university. All published work or material from other sources which have been incorporated have been specifically acknowledged and adequate reference thereby given.

Signed……………………………

Date……………………..............

(i)
DEDICATION

To my wife, children, and niece.
ABSTRACT

Human-Wildlife Conflict (HWC) has become a serious threat to the survival of many endangered species in the world. The sighted examples from different countries such as Kenya, Zimbabwe, Zanzibar, Namibia, China and Peru demonstrate the severity of the conflict and suggest that greater in depth analysis of the conflict is needed in order to avoid overlooking the problem and undermining the conservation of threatened and potentially endangered species.

Lupande Game Management Area (LGMA) in Mambwe District has not been left out in this conflict which has come up as a result of competition for resources between humans and wild animals. The study objectives were to identify the current landuses in LGMA, to show the extent of landuse problems in LGMA, to assess the problems related to HWC and to develop management options for LGMA.

The study used a combination of primary and secondary data sources. Secondary data were obtained from archival sources such as maps and recorded Zambia Wildlife Authority (ZAWA) and Community Resource Board (CRB) documents. Primary data were obtained using interview schedule for collection of information on landuse activities. Key informants included Chiefs, Area Warden, Council Secretary, and CRB chairpersons. Descriptive Statistics comprising frequencies, percentages and means, were used to analyze responses from interview guides and interview schedule. Quantitative data were analyzed using inferential Statistics.

The study identified the current landuses in LGMA as, Safari hunting, agriculture, human settlement, and forestry. It also showed the extent of landuse problems as being deep rooted with crop damage standing at 60 percent and the number of reports received by ZAWA and Chiefs being on the increase. For example in 2006 and 2007, Chief Kakumbi received 207 and 1000 reports on crop damage respectively, whereas Chief Msoro received 474 and 780 reports in the same years. The study also revealed the problems related to HWC in LGMA as being crop damage, lack of land for cultivation, regulation by ZAWA, and lack of compensation schemes. The Study identified possible management options for LGMA. These were broken into preventive strategies which Included provisions of chilli fences, voluntary human
resettlement, and mitigation strategies which included wildlife translocation, Community Based Natural Resource Management Schemes (CBNRMS) and regulated harvest.

The study concluded by identifying cultivation as one of the major landuses which is mostly in conflict with wild animals. The study also revealed that more settlements have been established due to the increase in human population. Wildlife population was equally identified to have been on the increase both within and outside the park. The study brought out the issue of compensation scheme as being emotive as at the moment, there is no mechanism for resolving the issue of compensation. The study also provides practical recommendations for HWC interventions. These include among others, use of Chilli fences, voluntary human population resettlements, lethal PAC, conservation education for local communities, better definitions and prediction of hot spots, data collection and evaluation of their impact to mention but a few.
ACKNOWLEDGEMENTS

This dissertation owes its existence to the efforts of many individuals to whom I am greatly indebted. My sincere gratitudes go to my supervisor and co-supervisor, Dr. M. C. Mulenga and Dr. E. N. Sakala, respectively for their extremely valuable guidance. This work would have been far from being a reality without their patience and encouragement. I also wish to acknowledge, with gratitude, the assistance rendered by the staff and colleagues within and outside the Department of Geography.

I wish to commend my dear wife Janet, who has been a true companion. This work is what it is because of her support. My children Judith, Veronica, Memory and Daliso and my niece Chanda were a great source of inspiration for bearing my prolonged absence from home.

Lastly, my employer the Ministry of Education, and St. Lukes Secondary School Board deserve a word of thanks for facilitating my undertaking of this programme of study.

To you all, I say God Bless you abundantly.
TABLE OF CONTENTS

Declaration .................................................................................. (i)
Dedication ..................................................................................... (ii)
Abstract ...................................................................................... (iii)
Acknowledgements ...................................................................... (v)
Table of Contents ....................................................................... (vi)
List of Tables .............................................................................. (x)
List of Figures ............................................................................. (xi)
Abbreviations and Acronyms ..................................................... (xii)
Appendices .................................................................................. (xiii)

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study ..................................................... 1
1.2 Statement of the Problem .................................................. 4
1.3 Aim of the Study ............................................................... 5
1.4 Objectives of the Study ...................................................... 5
1.5 Research Questions ........................................................... 5
1.6 Rationale ............................................................................ 5
1.7 Organization of the Dissertation ...................................... 6

CHAPTER TWO: LITERATURE REVIEW

2.1 Importance of a Landuse History ...................................... 7
2.2 General Overview of Human-Wildlife Conflict ................. 7
  2.2.1 Causes of Human-Wildlife Conflict ............................ 8
    2.2.1.1 Human Population Growth ................................ 8
    2.2.1.2 Landuse Transformation .................................. 9
    2.3.1.3 Wildlife Population Increase .............................. 9
2.3 Physical and Social Conditions
  Intensifying HWC in Africa .................................................. 9
2.4 Human Wildlife Conflict, Lesson from Africa Wildlife Foundation Heartlands................................. 10
2.5 Origins of Wildlife Conservation in Zambia................................................................. 11
2.6 Origins of the Ideas of GMAs in Zambia........................................................................ 12
2.7 Objectives of establishing GMAs in Zambia................................................................. 13
2.8 Community Support of Landuses in the GMA......................................................... 13
2.9 HWCs in Luangwa Valley.............................................................................................. 14

CHAPTER THREE: SELECTION AND DESCRIPTION OF THE STUDY AREA
3.1 Selection of the Study Area......................................................................................... 16
3.2 Physical Characteristics of the Study Area................................................................. 16
3.2.1 Location and Size of LGMA.................................................................................... 16
3.2.2 Relief and Drainage................................................................................................. 18
3.2.3 Climate................................................................................................................... 18
3.2.4 Vegetation and Soils............................................................................................... 20
3.2.4.1 Miombo, Munga, Mopane Woodlands............................................................... 20
3.2.4.2 Soils.................................................................................................................. 21
3.3 Socio-Economic Characteristics of the Study Area...................................................... 21
3.3.1 The Human Environment....................................................................................... 21
3.3.2 Income and Income Levels..................................................................................... 22
3.3.3 Agriculture.............................................................................................................. 22
3.3.4 Forestry................................................................................................................... 22
3.3.5 Fisheries.................................................................................................................. 23

CHAPTER FOUR: METHODOLOGY
4.1 Sources of Data............................................................................................................ 24
4.1.1 Secondary Data Sources....................................................................................... 24
4.1.2 Primary Data Sources............................................................................................ 24
4.1.3 Field Surveys/Observations................................................................................... 26
4.1.4 Sample Size and Sampling Procedures............................................................... 26
4.1.5 Data Analysis......................................................................................................... 27
CHAPTER FIVE: PRESENTATION OF FINDINGS AND DISCUSSION

5.1 The Current Landuses in LGMA.............................................. 28
  5.1.1 Relationship between Current Landuse and Wildlife........... 30
5.2 Landuse Problems in LGMA.................................................. 33
5.3 Assessment of Problems Related to HWC in LGMA.................. 38
5.4 Conflict Management Options............................................. 45
  5.4.1 Community Perception of HWC in LGMA......................... 46
    5.4.1.1 Provision of Electric and Chilli Fences...................... 46
    5.4.1.2 Killing of Problematic Animals............................... 47
    5.4.1.3 Compensating the Victim...................................... 47
  5.4.2 Human-Wildlife Management Strategies
       by ZAWA................................................................. 47
  5.4.3 Suggested Management Options
       for Minimizing HWC in LGMA..................................... 48
    5.4.3.1 Prevention Strategies......................................... 49
      5.4.3.1.1 Provision of Chilli Fences.............................. 49
      5.4.3.1.2 Relocation: Voluntary Human
                     Population Resettlement............................. 50
      5.4.3.1.3 Regulated Harvest...................................... 50
      5.4.3.1.4 Repellent System...................................... 51
    5.4.3.2 Mitigation Approaches........................................ 51
      5.4.3.2.1 Lethal Problem Animal Control......................... 51
      5.4.3.2.2 Translocation........................................... 52
  5.4.4 Management Options for LGMA...................................... 52
    5.4.4.1 Provision of Chilli Fences.................................. 53
    5.4.4.2 Repellent System............................................ 53
    5.4.4.3 Landuse Practices........................................... 54
# CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Conclusion</td>
<td>56</td>
</tr>
<tr>
<td>6.2</td>
<td>Limitations of the study</td>
<td>57</td>
</tr>
<tr>
<td>6.2.1</td>
<td>Failure to map correct Landuse</td>
<td>57</td>
</tr>
<tr>
<td>6.2.2</td>
<td>Failure to estimate the monetary value of crops damaged by wildlife</td>
<td>57</td>
</tr>
<tr>
<td>6.3</td>
<td>Recommendations</td>
<td>57</td>
</tr>
<tr>
<td>6.3.1</td>
<td>For managing the HWCs</td>
<td>57</td>
</tr>
<tr>
<td>6.3.2</td>
<td>For further research</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>References</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Appendices</td>
<td>63</td>
</tr>
</tbody>
</table>
## LIST OF TABLES

<table>
<thead>
<tr>
<th></th>
<th>Table Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Population Distribution in Chiefs Areas from 1963-2000</td>
<td>8</td>
</tr>
<tr>
<td>5.1</td>
<td>Current Landuses in LGMA</td>
<td>28</td>
</tr>
<tr>
<td>5.2</td>
<td>Cases of Reported Crop Damage 2000-2005</td>
<td>34</td>
</tr>
<tr>
<td>5.3</td>
<td>Status of the HWC problems in LGMA</td>
<td>34</td>
</tr>
<tr>
<td>5.4</td>
<td>Wild Animal Induced Deaths and Injuries 2004-2000</td>
<td>36</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

3.1 Relative Location of LGMA………………………………… 17
3.2 Drainage and Location of Study Sites in LGMA…………… 19
5.1 Current Landuses in LGMA………………………………… 29
5.2 Settlements in LGMA 2000-2005…………………………… 32
5.3 Landuse Problems and their Magnitude in LGMA……… … 33
5.4 Size of Crop Land…………………………………………… 38
5.5 Problems Related to HWC in LGMA……………………… 39
5.6 Crops Destroyed by Animals in LGMA…………………… 39
5.7 People’s Expectations from ZAWA………………………… 40
5.8 Elephant Population versus Number of Reports Received in LGMA ……………………………… 43
5.9 Community Perception of HWC in LGMA………………… 46
5.10 Management Option as perceived by different interest groups in LGMA ……………………………………………. 48
5.11 Management Option for LGMA…………………………… 53
5.12 Landuse Map for LGMA…………………………………… 55
# ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADC</td>
<td>Area Development Committee</td>
</tr>
<tr>
<td>ADMADE</td>
<td>Administrative Management Design</td>
</tr>
<tr>
<td>AWF</td>
<td>Africa Wildlife Foundation</td>
</tr>
<tr>
<td>CBNRM</td>
<td>Community Based Natural Resource Management</td>
</tr>
<tr>
<td>CRB</td>
<td>Community Resource Board</td>
</tr>
<tr>
<td>CSO</td>
<td>Central Statistical Office</td>
</tr>
<tr>
<td>EPDT</td>
<td>Elephant Pepper Development Trust</td>
</tr>
<tr>
<td>GMA</td>
<td>Game Management Area</td>
</tr>
<tr>
<td>GRZ</td>
<td>Government of the Republic of Zambia</td>
</tr>
<tr>
<td>HIPPO</td>
<td>Hippopotamus</td>
</tr>
<tr>
<td>HWC</td>
<td>Human Wildlife Conflict</td>
</tr>
<tr>
<td>IUCN</td>
<td>International Union for Conservation of Nature/ The World Conservation Union</td>
</tr>
<tr>
<td>KWS</td>
<td>Kenya Wildlife Society</td>
</tr>
<tr>
<td>LGMA</td>
<td>Lupande Game Management Area</td>
</tr>
<tr>
<td>LIRDP</td>
<td>Luangwa Integrated Resource Development Project</td>
</tr>
<tr>
<td>LUP</td>
<td>Landuse Planning</td>
</tr>
<tr>
<td>MDC</td>
<td>Mambwe District Council</td>
</tr>
<tr>
<td>NGO</td>
<td>Non Government Organization</td>
</tr>
<tr>
<td>PAC</td>
<td>Problem Animal Control</td>
</tr>
<tr>
<td>UNCED</td>
<td>United Nations Conference on Environment and Development</td>
</tr>
<tr>
<td>SLAMU</td>
<td>South Luangwa Area Management Unit</td>
</tr>
<tr>
<td>SLNP</td>
<td>South Luangwa National Park</td>
</tr>
<tr>
<td>VAG</td>
<td>Village Action Group</td>
</tr>
<tr>
<td>WWF</td>
<td>World Wide Fund for Nature</td>
</tr>
<tr>
<td>ZAWA</td>
<td>Zambia Wildlife Authority</td>
</tr>
</tbody>
</table>
# APPENDICES

<table>
<thead>
<tr>
<th></th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Interview Schedule</td>
<td>63</td>
</tr>
<tr>
<td>2</td>
<td>Spearman Rank Correlation Coefficient</td>
<td>65</td>
</tr>
<tr>
<td>3</td>
<td>Banana plantation destroyed by elephants</td>
<td>67</td>
</tr>
<tr>
<td>4</td>
<td>Elephant Killed</td>
<td>68</td>
</tr>
<tr>
<td>5</td>
<td>The Minister’s Address to Parliament on HWC in LGMA</td>
<td>69</td>
</tr>
</tbody>
</table>