

Wildlife resources - a victim of “the Tragedy of the Commons”?

A case study of Zambia

Abstract

Environmental resources consist of a vast diversity of ecosystems and species from forests, waters and wildlife. These resources can be seen as public goods as they provide valuable services to people, but rarely do they have a fair (or any) market price assigned to them. They are extracted without the consideration of externalities imposed on others and exploited at rates that cannot be sustained, which causes natural resources of today to become a victim of the *tragedy of the commons*. This thesis aims to investigate if the tragedy of the commons can be avoided through the underlying principles of community-based conservation of wildlife resources in Zambia. The research method used is a qualitative study approach, including interviews with industry informants from four Game Management Areas (GMAs), complemented with secondary evidence. The empirical data has been analyzed mainly using common-pool resources and incentive theory. Findings indicate that the main causes and threats for the decrease in wildlife population were commercial poaching and human encroachment. And the challenges experienced by the local communities, which also caused people to have a negative attitude toward wildlife, was expressed to be human-wildlife conflict and ZAWA related issues such as unfair revenue distribution. Drawing upon theory and empirics the study illustrates the importance of understanding that if a sufficient benefit can be gained and if shared transparently and with accountability, people in the community will choose to not overexploit wildlife but to preserve it. To fully appreciate the possibilities and limitations of community-based conservation, to prevent wildlife resources of becoming a tragedy of the commons, these factors need to be taken into consideration when forming wildlife conservation policies.

Keywords: Common-pool resources theory, Community-based natural resource management, incentive theory, tragedy of the commons and Zambia

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Table of content

Acknowledgement.....	2
List of Acronyms	5
1. Introduction.....	7
The purpose of study.....	8
Research question	9
Previous research and thesis contribution.....	9
Study Area	10
Zambia	10
Delimitations	13
2. Theoretical framework.....	14
The choice of theory.....	14
Common-pool Resources Theory	14
Empowerment theory	17
Incentive theory	17
Ownership theory.....	18
Expected Findings.....	18
3. Methodology	20
Research Methodology	20
Abductive reasoning.....	20
Qualitative study.....	20
The choice of case selection.....	21
Methodology limitations	25
4. Empirical Findings.....	28
Revenue distribution	31
Poaching.....	32
5. Analysis.....	35
An illustration of the tragedy of the commons.....	35
First case: No benefits are shared from wildlife resources.....	37
Second case: Benefit shared from wildlife resources, +6	38
Third case: Benefit shared from wildlife resources, + 20.....	38
Addressing the research question.....	40

6. Discussion of findings and Conclusion..... 41

 Conclusion 43

 Areas for further research..... 43

References 45

Appendix..... 48

List of Acronyms

CBNRM	Community Based Natural Resource Management
CPR	Common-pool resource
CRB	Community Resource Board
GMA	Game Management Area
HQ	Headquarters
MFS	Minor Field Study
NGO	Non-Governmental Organization
NPWS	National Parks and Wildlife Services
OIDP	Ostrom's Institutional Design Principle
OECD	Organization for Economic Co-operation and Development
VAG	Village Action Group
WPO	Wildlife Police Officer
ZAWA	Zambia Wildlife Authority
ZWA	Zambia Wildlife Act No. 12

Thesis outline

Chapter 1: Introduction- This chapter introduces the subject and the purpose of the thesis.

Chapter 2: Theoretical Framework- The theories used when conducting the analysis is presented. An overall analysis model developed based on the theories.

Chapter 3: Methodology- This chapter explains the methodological choices made for the study, such as research design, the case selection and data collection. The limitations of these choices are also describes as well as the quality of the research method.

Chapter 4: Empirical Findings- This chapter presents the empirical material that the thesis aims to analyze. The chapter provides a broad description of the CBNRM model and the management, characteristics and structure of the wildlife resources sector in Zambia.

Chapter 5: Analysis- A presentation of the analysis, where the thesis addresses the research question through the theoretical framework, but also explores unexpected findings about the nature of CBNRM.

Chapter 6: Discussion of findings and conclusion- This final chapter summarizes and critically assesses the main findings from the analysis chapter. Areas for further research are also presented.

REFERENCES

APPENDIX

1. Introduction

The introduction begins by reviewing the background of Community-based natural resource management in the conservation of natural resources, introducing the dilemma of the “tragedy of the commons”. This is followed by a section explaining the purpose of this thesis, previous research including thesis contribution, research question, and a section introducing the area of study. Lastly a description of the thesis’ delimitations.

Our planet’s great natural resources consist of a vast diversity of species and ecosystems from forests, waters and wildlife. When humans begin to appreciate the potential utility of various characteristics of natural habitats, these become resources and problems arise as authority and local population increase their demands on these resources (Penn, 2003). Environmental resources such as clean air, biological diversity and scenic beauty can be seen as public goods as they provide valuable services to people, but rarely do they have a fair (or any) market price assigned to them (Engel et al., 2008; Ostrom et al, 1999). Resources are often extracted without the consideration of externalities imposed on others. And many times these resources are exploited at rates that cannot be sustained which is not only costly from an environmental perspective but also for societies at large (Engel et al., 2008).

Tragedy of the commons

In 1968, Garrett Hardin argued that users of a *common-pool resource* (also called open-access commons) are caught in an inevitable process that leads to the destruction of the resource on which they depend. The reason is that the “rational” user of the commons will make demand on a resource until the expected benefit of his or her actions equals the expected cost. Each user will ignore the cost imposed on others and the decisions made by the individuals will result in a tragic overuse and the potential destruction of open-access commons. This is the so called *free-rider problem*, the lack of effective rules limiting access and defining the rights and duties. Substantial free-riding in two forms are likely to occur: (1) overuse without concern for the negative effect on others, and (2) lack of contributed resources for maintaining and improving the common-pool resource (CPR) itself (Hardin, 1968; Hardin 2013; Olson, 1965). The creation of institutions for governing and managing the commons, involves in solving CPR problems which are; (1) restricting access and (2) creating incentive (usually assigning individual rights to or a share of

the resource), for users to invest in the resource instead of overexploiting it. Both changes are needed, the great challenge facing us now is to invent the corrective governance that is needed to keep the custodians honest (Ostrom et al., 2004).

Community-based Natural Resource Management

The management of large-scale resources is becoming one of the most difficult challenges that the modern world faces, and institutional diversity may be as important as biological diversity for our long-term survival (Ostrom et al., 1999). To rural people natural resources remain a central part of their livelihood as it is shaping people's everyday forms of resource use as much as local norms and customs (Blaike, 2006; Diets et al., 2003). This should be contrasted to the current commercial use of these natural resources that often remain highly centralized, conditioned by government policies (OECD, 2009; Ostrom, 2000). During the past three decades, there has been a shift from the predominantly centralized natural resource management, towards a more devolved model recognizing the importance of the participation of people who live near and are interconnected with these often threatened natural resources (Murphree, 2005; Roe et al., 2009). The model of involving the rural community in the conservation process is broadly known as Community-based natural resource management (CBNRM) (ibid). The model of CBNRM is essentially an institutional process concerned with restructuring the governance and allocation of resource use, this works to strengthen locally accountable institutions for natural resource use and management enabling them to make better decisions about the use of the resource (Lubilo et al, 2010; Roe et al, 2009) and combines the twin goals of environmental conservation and rural development because localized institutional arrangements can facilitate both aims (Child et al, 2013).

The purpose of study

The primary purpose of this thesis is to investigate if the CBNRM model can be a useful tool in helping to avoid the tragedy of the commons. The secondary purpose, serving as a supportive function for the primary objective, is to create a broad understanding of what factors that contributes to the success of CBNRM programs and protection of wildlife.

Research question

To fulfill the purpose of the study, this thesis will examine the following research question:

“Can the tragedy of the commons be avoided through Community-based natural resource management?”

Previous research and thesis contribution

While the literature has come to a robust consensus about the fact that common-pool resources (CPRs) such as wildlife, is a victim to the tragedy of the commons no solutions have shown to be successful in addressing the issue, at least not in the time that is has been allowed to evolve (Hardin, 1998; Ostrom, 1998; Simasiku et al. 2008; Sharp, 2013). CBNRM has received a lot of attention as a potential solution, in combining environmental conservation with rural development, but in practice it has showed very few success stories (Barnes et al., 2010; Hughes et al., 2001; Simasiku et al., 2008). Most academic studies on CPR in the context of CBNRM have been theoretical overviews of the issues, focusing on explaining the impact and reasons for failure of the model rather than how it materializes in practice or what factors that been decisive elements for success (Lubilo et al., 2010; Saunders, 2011; Sharp, 2013). The studies that do look at how CBNRM as a tool can be used to avoid the tragedy of CPRs have mostly done this through a quantitative study approach. Studies where large sets of data are used might suffer from aggressive or oversimplifying assumptions and the results have the risk of feeling disconnected to reality because the models are not intuitive (Andersen, 1998; Silverman, 2010). According to Lubilo et al. (2010), many of the fundamental challenges to CBNRM besides implementation are in the definition of roles, responsibilities and competition over power and resources. From existing reports and evaluation studies, using a more qualitative approach have in most cases solemnly been based on empirical evidence with weak theoretical ground. The contribution of this thesis is to help in explaining the complex environment of why CBNRM has not always lived up to its conceptual expectations. The proportional contribution to conservation by the CBNRM model and its role in changing behavior can be used to refine or adapt programs to better address shortcomings or oversights in policy and practice, and plan for more effective and enduring programs in the future.

Study Area

Zambia

Zambia, is a landlocked country with a population of about 15 million that is mainly concentrated around the capital Lusaka and the Copperbelt Province in the northwest of the country (Zambia tourism; World Bank Website). Zambia is an ethnically diverse country with 72 different tribes, 7 major native lingual- cultural groups and Christianity as the major religion though indigenous beliefs retain influential (Zambia tourism). Traditional chiefs and their headmen command a great deal of respect but hold limited decision-making power except when it comes to land distribution (ibid.). Some of the country's natural features, such as the Victoria Falls, which have a UNESCO World Heritage Status, have been attracting to a large number of tourists, along with the wide variety of wildlife to be found in the country's National parks (BBC News Website, 2015).

Zambia was colonized in the 1800s and was ruled by the British, as Northern Rhodesia, until it gained its independence in 1964. The country has generally been peaceful with a long period of political stability and experienced six successful multiparty elections. Being the continent's biggest copper producer, a combination of prudent macroeconomic management, market liberalization policies, and steep increase in copper prices have helped drive investments in the copper industry and related infrastructure to achieve an average annual growth of above 6% during the last decade (World Bank Website; BBC News Website, 2015).

Despite the country's dependency on mining, agriculture remains the biggest sector, employing approximately 70% of the population. The World Bank has classified Zambia as a lower middle income state. Social indicators reflect that 60% of Zambians live at the national poverty line and the adult prevalence of HIV/ AIDS, about 13%, is considered to be one of the country's greatest challenges (World Bank Website, 2014).

Wildlife resources in Zambia

Zambia has a vast wildlife estate, made up of 20 National Parks and 36 Game Management Areas (GMAs), which together comprise about 40% of the nation's land area (Zambia Tourism). In the GMAs, communal areas acting as buffer zones to National parks, wildlife use is focused mainly on trophy hunting and wildlife safaris, mainly by international tourists, and hunting for bush meat

by local and national residents. These activities are intended to promote sustainable harvest of wildlife resources, as an alternative to other economic activities not compatible with wildlife conservation and protection.

Zambia is experiencing a growing tourism industry that relies heavily on its natural resources such as wildlife, and has by the Government of Zambia been chosen as one of the key sectors to

combat poverty. Despite the allocated land for wildlife conservation and the potential gain from the tourism sector, wildlife resources in many of the country's GMAs are in a state of steep decline and are not sufficiently productive in ecological, economic and social terms (Lindesy et al., 2013). In response to widespread poaching of wildlife there has been an increased recognition of the importance and need for greater community participation and benefit sharing from wildlife in the GMAs (Child et al., 1999).

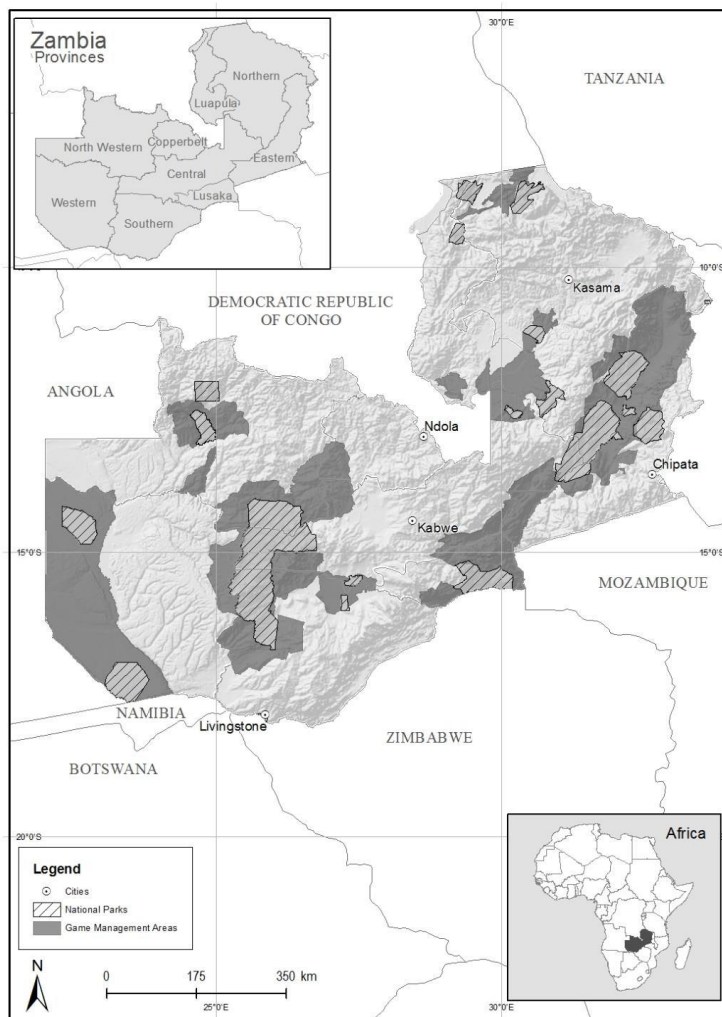
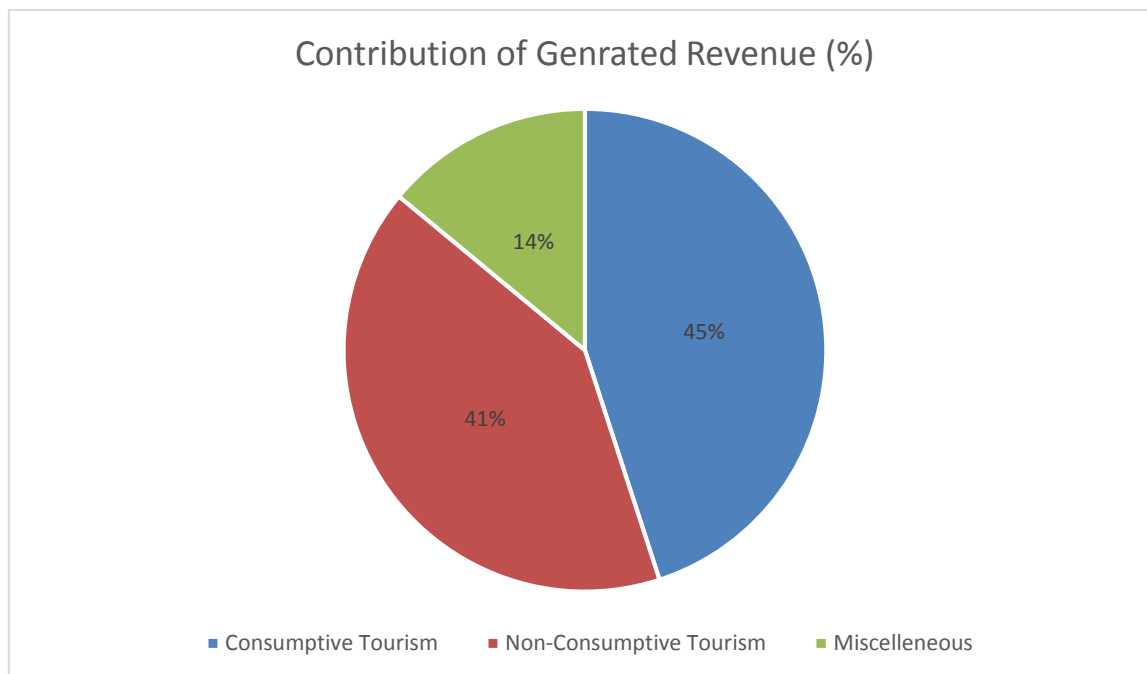
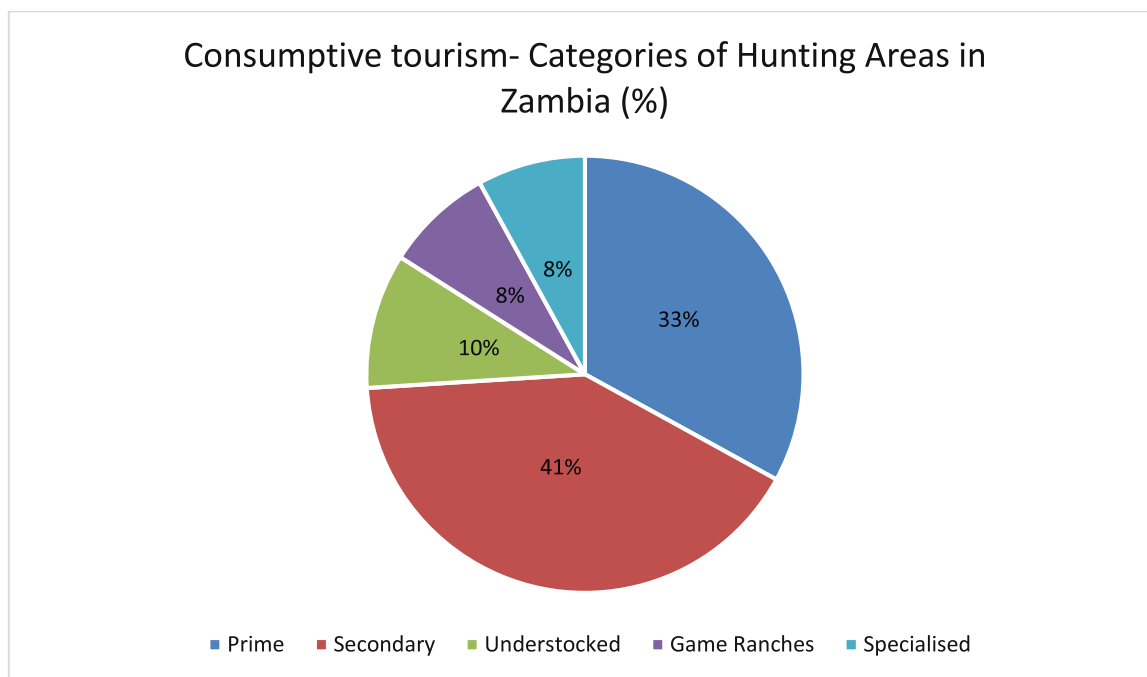


Figure: The network of protected areas in Zambia



Source: Rose Chivumbar, Commercial Manager, ZAWA



Source: Rose Chivumbar, Commercial Manager, ZAWA

Delimitations

The scope of the thesis and due to research resource limitations, several choices were made in the research design to secure a meaningful study, this creates delimitations to the study. Firstly, the study only covers the wildlife resources sector in Zambia, even though it may be possible to apply some of the conclusions to other CPRs and countries. Secondly, the focus is on the conservation model of CBNRM, thus, other conservation approaches of CPRs are not fully investigated. Thirdly, the geographical scope of the research is restricted to four GMAs; Chiwa, Lupande, Mumbwa and Mufunta GMA, that are all located in adjacent to three of the largest National parks in Zambia; Kafue National Park, South Luangwa National Park and Lower Zambezi National Park. However, the thesis's conclusions aim to be applicable for all GMAs in Zambia. Furthermore, the thesis is delimited to only providing general suggestions for the CBNRM program and specific solutions to individual GMAs are not presented in this thesis. Moreover, the thesis emphasizes those factors that the CBNRM program possibly can influence in the management of wildlife conservation. Hence, external factors that go beyond CBNRM, that are difficult to predict, or needs heavy investigation, will not be fully explored in this study. These factors mainly refer to the general economic development in Zambia, climate change or ecological patterns, currency fluctuation and governmental actions. Finally, the analysis is delimited to the thesis' theoretical framework, which in turn is constrained to the main perspectives in CBNRM thinking of CPRs and institutional organizations on the local community level.

2. Theoretical framework

The purpose of this section is to discuss the theoretical framework of Community-based natural resource management (CBNRM). The objective is to understand the role of theory for the explanation of empirical evidence relative to the functionality of CBNRM projects and the experience of beneficiaries (local residents in the GMAs). The main focus will be on the connection between the principles of CBNRM and if common-pool resource theory can prevent wildlife resources of becoming a tragedy of the commons when people are conserving its resources and benefit from them.

The choice of theory

Common-pool Resources Theory

The term, common-pool resources (CPRs), refers to resource systems that include natural resources in which; (1) *exclusion of beneficiaries, through physical and institutional means, is very costly or difficult*, and (2) *exploitation by one user reduces resource availability for others* (Ostrom, 1990). These two attributes - difficulty of exclusion; as wildlife has no boundaries which makes it difficult or extremely costly to protect i.e. all the National parks are to be fenced, and subtractability; wildlife consumption by one person reduces the total wildlife population- create potential CPR dilemmas, in which people maximize utility for themselves often in the short-term, which creates a robust sub-optimal outcome.

	Subtractability		
Excludability		Low	High
	Difficult	Public goods	Common-pool resources
	Easy	Tool goods	Private goods

Figure: A general classification of goods
Source: Ostrom et al. (1994)

Property Right	Characteristic
<i>Open access-</i>	Absence of enforced property rights
<i>Group property-</i>	Resource rights held by a group of users who can exclude others
<i>Individual property-</i>	Resource right held by individuals who can exclude others

Textbox: Property Right Characteristic and the types of property-rights systems used to regulate common-pool resources
Source: Ostrom (1990)

The problem of collective action for efficient and rational organization of CPRs has been seen as an obstacle. The assumption behind it is that the individual CPR user will maximize their own private benefits by consuming a level that means overconsumption on a collective scale and this will lead to the rapid depletion of the resource, which is Hardin's argument why CPRs are a victim to the tragedy of the commons (Olson, 1965; Ostrom et al, 1999; Schlager, 2004). In support of Hardin's argument, Olson (1965) described "the free-riding problem" as a strategy that occurs when group benefits are shared, such as collective ownership of CPRs, it is argued that everyone has an incentive to "free-ride" on the efforts of others, which ultimately reduces the group's interests because they incur the cost of the externalities. These assumptions led to the prediction that CPR users will not cooperate to achieve collective benefits without an intervention by external authorities and the solution proposed by Hardin (1968) whose suggestion was either government ownership or privatization.

In 2009, Elinor Ostrom was awarded the Nobel Memorial Prize in Economic Sciences for her contribution: "...by demonstrating how local property can be successfully managed by local commons without any regulation by central authorities or privatization." (The Official Website of the Nobel Prize). According to Ostrom, many open-access situations have, historically and to date, developed enduring and adaptive rule-based CPR arrangements- that enable them to manage their natural resources over time. She also recognizes four main problems that all CPR management system must address, these are similar to and share what successful CPR regimes have overcome, and include: (1) *How to cope with the free-riding problem*, (2) *how to solve commitment problems*, (3) *how to arrange for the supply of new institutions*, and finally (4) *how to monitor individual compliance with a set of rules*.

In the book "*Governing the Commons*", a framework of eight design principles is presented on how institutions could be designed to facilitate collective action for the usage of CPRs. By design principle, Ostrom means "an essential element or condition that helps to account for the success of these institutions in sustaining the CPRs and gaining compliance of generation after generation of appropriators to the rule in use" (Ostrom, 1990, pp. 90). The operational rules are expected to

be dynamic and adaptive to changing local conditions such as culture and social norms, and sanctions enforced to inhibit free-riders (Ostrom, 2000; Ostrom et al., 1994).

Ostrom's Institutional Design Principles

1. Clearly Defined Boundaries

The boundaries of the resource system (e.g., irrigation system or fishery) and the individuals or households with rights to harvest resource units are clearly defined.

2. Proportional Equivalence between Benefits and Costs

Rules specifying the amount of resource products that a user is allocated are related to local conditions and to rules requiring labor, materials, and/or money inputs.

3. Collective-Choice Arrangements

Most individuals affected by harvesting and protection rules are included in the group who can modify these rules.

4. Monitoring

Monitors, who actively audit bio-physical conditions and user behavior, are at least partially accountable to the users and/or are the users themselves.

5. Graduated Sanctions

Users who violate rules-in-use are likely to receive graduated sanctions (depending on the seriousness and context of the offense) from other users, from officials accountable to these users, or from both.

6. Conflict-Resolution Mechanisms

Users and their officials have rapid access to low-cost, local arenas to resolve conflict among users or between users and officials.

7. Minimal Recognition of Rights to Organize

The rights of users to devise their own institutions are not challenged by external Government authorities, and users have long-term tenure rights to the resource.

For resources that are parts of larger systems:

8. Nested Enterprises

Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.

Table: Design principles derived from studies of long-enduring institutions for governing resources.

Source: Ostrom et al., 2004

Empowerment theory

The conceptual definition of empowerment suggests that participation together with others to achieve goals, efforts to gain access to resources, and some critical understanding of the socio-political environment are basic components of the construct (Douglas et al., 1995). It links individual strengths and competencies, but also well-being with the socio-political environment and includes the perspective that many social problems exist due to unequal distribution and access to resources (ibid). According to Zimmerman (2000), empowerment-oriented interventions enhance well-being while they also aim to solve problems by providing opportunities to participants to develop knowledge and skills, and engage professionals as collaborators instead of authoritative expert, or simply a process which people gain control over their lives, democratic participation in the life of their community. Applying this general framework to an organizational level of analysis suggests that empowerment includes organizational processes and structures that enhance membership participation and improve goals achievement for the community- is not simply a collection of empowered individuals (Douglas et al., 1995; Zimmerman, 1995).

Incentive theory

The theory has normative force whenever, metaphorically speaking, the *invisible hand* of the market fails to provide such motivation automatically (Maskin, 2001), which in this case reflects the low value that is addressed to wildlife and the law enforcement for the protection of wildlife is weak.

Laffont (2002) describes the two basic ingredients of incentive theory which are conflicting objectives and decentralized information. As what have been assumed from the previous sections, individuals will pursue, at least to some extent, their private interests. What is proposed by incentive theory is that this is a major assumption to be maintained in the analysis of organizations, small markets, and any other kind of collective decision-making (ibid). It has its limits, social behavior, particularly in small groups, is more complex, and norms of behavior that are culturally developed over time play a large role in shaping societies. However, it would be foolish not to recognize the role of private incentives in motivation behavior in addition to these cultural phenomena (ibid).

Ownership theory

In Grossman's and Hart's article (1986), they define ownership as the power to exercise *control* and explain the benefits of control in situations in which there are difficulties in writing or enforcing complete contracts and how harmful effects associated with the wrongful allocation of residual rights. This is supported by Demsetz (1983) stating that: "The separation of ownership from control procedures a condition where the interests of owner and of ultimate manager may, and often do, diverge..., thereby the corporation has changed". The entire process of allocating rights and resources is concerned with utility maximization (ibid.). On a community level, ownership can create incentives for optimal resource use as well as incentives for optimal maintenance and investment levels as long as that resource is shared amongst all the users of the resource. Removing rights of control from the manager (in this case CPR users), can distort the manager's incentives sufficiently to make common ownership harmful (Grossman et al., 1986). This means that different incentive structures for communities are expected to change with the implementation of CBNRM.

Expected Findings

Principles and understanding gathered from the thesis' background and theoretical framework, to facilitate and guide the design of the research analysis and methodology, the following hypotheses have been formulated:

H1: When benefits and responsibilities from wildlife resources are shared with the local communities, members of the community will be more willing and want to conserve and protect wildlife.

H2: Different socioeconomic factors such as human-wildlife conflict and household welfare have an impact on the attitudes that community members have towards wildlife and wildlife conservation.

H3: Law enforcement and wildlife policies affect conservation attitudes and behavior.

SUMMARY

The chosen theories have all thoughtfully been selected to best fulfill the purpose of the study. As the CPR theory, has played a prominent role in the set-up and structure of many CBNRM projects, as a good governance scheme to increase democracy while delivering sustainable resource management and rural development, this will be the main theory used for this thesis.

The theory of empowerment, incentive and ownership has also been included as they all represent underlying principles guiding the CBNRM framework model. Based on principles of the theories, three hypotheses have been formulated to facilitate the strategy of the coming analysis and research methodology.

3. Methodology

This chapter illustrates the various research methodological choices made for this study. The chosen approach attempts to maximize methodological fit and logic, while considering the impacts of limitations, such as time constraints, to ensure the quality of the study. The section will cover and explain the chosen research methodologies, case selection, data collection and limitations.

Research Methodology

Exploratory and problem-solving approach

According to Andersen (1998) an exploratory study is helpful when identifying general problems of a situation and useful for the preparatory work to other sections of the study. The problem-solving approach takes one step further and provides solutions to the identified problem(s) (ibid). The study starts with an exploratory approach, to create a broad understanding of the wildlife resources sector in Zambia, and the external and internal environment of Game Management Areas and Zambia Wildlife Authority (ZAWA). The approach also served as preparatory work for the purpose of this thesis, which is to understand if CBNRM can be a useful tool to avoid the “tragedy of the commons”.

Abductive reasoning

An abductive approach (also called Inference to the best explanation), is an interaction between deduction and induction (Douven, 2011; Alvehus, 2013). My research question has its starting point in reality (inductive), that wildlife resources in Zambia are being depleted (inductive). With the help of theories (deductive) the empirical findings have been analyzed to better explain and to see possible solutions on how the tragedy of the commons can be prevented.

Qualitative study

A qualitative study method, based on interviews, observations (through Community Resources Board meetings, workshop participation, field visits to GMAs and community development projects). A document review has also been conducted as the basis for the empirical research of this thesis. The methodology of the study was designed in this way to overcome several of the

potential shortcomings of what it means to do research and in the environmental setting of Zambia (Silverman, 2010; Alvehus, 2013). Firstly, I believe the thesis subject is difficult to fully understand with numbers and statistics which characterize the opposite approach of a quantitative study. Secondly, a qualitative approach is more useful when deep knowledge of the problems and aim to put the problem into a holistic perspective in order to facilitate understanding of linkages (Alvehus, 2013). This is to recognize that the study is meant to provide sound information broken down to the local level what and where the concept of CBNRM is going to have an impact.

The choice of case selection

In this section the choice of case selection is described and the underlying rationale for choosing it to best suit the requirements of the thesis.

Process of case selection

The aim with a screening procedure is to insure that the case(s) represent what the researcher intends to study (Yin 2003). Thus, to be sure that the cases chosen are of value for my research, I developed a few broad requirements. No specific requirements were made in advance prior to the data collection process, because the risk of failing to meet predetermined requirements is higher when conducting a Minor Field Study (MFS). When conducting research in a developing country flexibility is necessary due to the difficulty of predicting the prevailing conditions on field (the supervisor of this thesis, Laurence Romani). Moreover, the time frame, which in this case was limited to two months in the field.

In terms of case selection, the choices made have been related to geographical location (Zambia), natural resource (CPR) and CBNRM program(s). To get a general and meaningful picture of the impact of the CBNRM model I decided to select stakeholders from all of the main groups that are involved in the wildlife sector, i.e. the local community in the GMAs, ZAWA and tour operators. Further, to gain a deep understanding of the impact of CBNRM and what could be important factors for conservation, I have chosen to look how CBNRM in Zambia has evolved, from the time of its implementation up to date. I will consider the results of changes made in the program, such as level of decision-making and benefit-shared with the community, this to improve the generalizability of the research (multiple cases of two CBNRM programs).

Geographical location

Zambia

I decided to conduct my study in Zambia for the country's shallow abundance of natural resources and impressive proportion of its land surface allocated as protected areas. The wildlife population in many areas is being depleted (although the habitat is intact) (Lubilo et al., 2010). Surprisingly enough, there is also the fact that Zambia earns significantly less from its wildlife than its neighboring countries (ibid.).

GMA's

It is in the GMA's where trophy hunting is taking place and revenues are created that can be shared with the rural communities of these GMA's. The local communities are officially the custodians of the land area. The research was conducted from four GMA's namely; Mumbwa, Mufunta, Chiwa and Lupande GMA, which are all adjacent to three of the largest National parks. Lupande GMA, in the Luangwa Valley, will be given extra attention in this thesis. The study area is particularly interesting because it is considered to be the birthplace where the first CBNRM program was initiated in Zambia, but also experienced three distinct phases marked by institutional changes in decision-making in relation to wildlife management and associated revenues, which have occurred over the past 30 years (Dalal- Clayton, 2003; Lubilo et al., 2010).

Data collection and analysis

Data collection process

I have chosen to use multiple sources of evidence; interviews, observations and secondary data, which according to Alvehus (2013), enhances the quality of the research. I also believe that the use of multiple data sources was needed for me to create a correct and more general understanding of the wildlife management and CBNRM program in Zambia. The general process for how I have gathered my data started with writing an application for the MFS

scholarship in a form of a draft synopsis of my thesis. During this process I also began an extensive search through reports and articles on CBNRM on the Internet. Furthermore, through theories within the field of management and my exploratory study in the field, I developed the aim of the thesis's and the research question.

Before travelling to Zambia I contacted and presented my study to ZAWA that was willing to support me in my study by providing me with data and contacts for study visits to the GMAs. Onsite in Zambia I began the primary data collection, after a brief overview of the relevant and involved stakeholders, interview guides were structured in accordance with the research question and the stakeholder's position or role.

- The term *case or model* refers to each CBNRM program if nothing else is stated.

Primary data

The primary data consist of three sources of evidence; interviews with ZAWA officers, CRB/VAG members, NGOs doing conservation projects and tour operators, and observations.

Interviews

I conducted semi-structured interviews with interviewees selected on the terms to represent different levels of interest in the CBNRM program and wildlife sector. The purpose of the interviews was to ascertain information, such as general operational activities and to understand the different stakeholders' perception and level of involvement in CBNRM. In the case of tour operators such as lodges and NGOs running different conservation and social projects, additional focused on data collection, effectiveness of the program and management issues. *See Appendix for a sample of the interview guide.*

Interviews with ZAWA officers

ZAWA represents a key stakeholder in the management of wildlife resources (MWR), not only are they responsible for the National parks and GMAs, they also do the monitoring of the

CBNRM programs. The interviews were conducted with officers sitting on various different positions; upper-level managers (Area Wardens or Park Rangers), mid-level technicians (ecologist, Wildlife Police Officers (WPOs)) and staff dealing with community issues. *See the organizational map in the appendix.* My wish was to conduct as many interviews as possible with officers holding different positions. However, the ZAWA offices connected to each studied GMA were different in terms of size, and because the availability of officers differed, the number of interviews conducted differed between the offices as well.

Interviews with CRB and VAG members

With the purpose of my thesis in mind, local community representatives were vital for the study. The interviews were conducted with people at the CRB board-level because not only were they chosen representatives for the community, but also had excellent insight in the CBNRM program and wildlife management policy

Interview with NGOs and tour operators

I complemented the interviews with people working for NGOs, that were either doing social or conservation projects, and tour operators such as lodge that were involved in the conservation and MWR. The interviewees were recommended via networking and previous contacts, either due to their reputation of having excellent insight or expertise and could contribute with other perspectives on the subject.

Interview process

All the interviewees presented in this thesis are anonymous to allow an open dialogue during the interview and to get at access to sensitive information (Andersen, 1998). As mentioned before, the interviews were conducted according to a semi-structured interview method and this allowed me to ask counter questions and dig deeper into some specific issues that was of special interest for the study. The interview guide served as a reference, and enabled me and the person interviewed to freely select and add questions in the guide. The best I could, I made sure to have my main questions answered before ending the interview, which the interview guide served its

good purpose for me to fall back to, for minimizing the risk of the interviewee only focusing on this person's stronger areas. I conducted all the interviews personally and they were approximately 40-90 min long and carried out at the interviewee's workplace. Being at the workplace where the interviewee operates allowed me to observe and gave me closeness to the subject, which enhance my understanding of the management processes.

During the interviews, notes were taken and to minimize loss of information data, and to facilitate for the data analysis, they were summarized and elaborated shortly after the meeting. Having written the answers in full text provided me with the possibility to do quotations.

Secondary data

A considerable amount of literature has been written on CBNRM, "tragedy of the commons" and the CPR theory. The sources of secondary data that I have used are scientific journals and books, workshop reports, internal documents such as policy papers and academic literature concerning wildlife conservation in Southern Africa. The material was collected to get a broader understanding of the subject and served as complementary data to the data from the interviews with historical evidence, which has been valuable for me to better understand the context.

Methodology limitations

In this section the quality of the research is tested and Yin (2003) explains that it can be done through four different tests; reliability, construct, internal and external validity. As internal validity is more applicable to explanatory case studies, and my study being exploratory and problem-solving nature, this test will not be tested.

Validity

Validity mainly concerns whether one is investigating what is supposed to be studied (ibid). As Yin points out, testing the construct validity, holistic case studies are problematic since there is rarely any hard data. In this case, the analysis is based upon my subjective interpretations of the interviewees, but on the other hand, many quotations are presented so that the reader can appreciate what people actually said and by using multiple sources of evidence, thus, the

construct validity can be said to be uncertain.

The external validity concerns to what extent the findings can be generalized (ibid). To increase generalizability of the case study it is important to describe the data in as much detail as possible and to separate general and specific knowledge. It then follows the logic that the more cases investigated the more generalizable the knowledge is (ibid). As the focused study area, Lupande GMA, has experience models of three different CBNRM programs, it serves as an illustration whether the CBNRM can protect wildlife or not. With the aim to increase the external validity, my approach of choosing a multiple case study and multiple sources of evidence, is now strengthened. In summary, the choices made are deliberate, in accordance to Yin's discussion on validity of a representative sample, has been traded off for a broader understanding and different perspectives on the phenomena.

Reliability

According to Yin, to secure a high degree of reliability errors and biases need to be minimized in the study. The main reliability weaknesses of my method concern bias information, this is often a problem when using qualitative research methods when social interaction is common (Alvehus, 2013). Firstly, there is the risk of information being biased due to my interpretation of the gathered data. In my case, this could be due to cultural difference and preconceptions that may affect my interpretations. Furthermore, even though the official language in Zambia is English, as some of the interviewees only spoke their own local tribe language an interpreter was used which could have resulted in loss of information in the process of translating and mistranslations. Secondly, there is a risk that the answers given were biased and the weakness due to that for each case several people were interviewed but all of them had different positions. To reduce this risk I cross checked the interviewees' responds to one another within and to the other GMAs as well. Additionally, the method of pattern-matching was used which in many cases gave strong theoretical indications. Furthermore, as the interviews were conducted in the respondents' natural environment and anonymously reduces the context affect described by (Andersen, 1998; Yin, 2003). I have also tried to formulate the questions in a way for them to be as objective as possible to minimize the risk of influencing the answer. Lastly, as all the CBNRM programs included in this study were not implemented in the same time period may skew the results and be difficult to

compare due to changes in the environment. For the study of the first implemented CBNRM programs I will have to rely on people's memory and on my secondary data. The risks are that depending on how the current situation might look like is, i.e. if the current situation is less beneficial for them, they might tend to romanticize how it was back then but also weaknesses of the respondents' memory.

Presentation of data

This section provides an explanation of how the empirical findings in the thesis are presented.

The reader should notice the following:

- All interviewed respondents' in this study are presented anonymously with their stakeholder group category; ZAWA, CRB, NGO, community member/ or farmer and tour operator, and their position if mentioned specifically.
- Quotations are used to contribute to greater understanding of a specific issue.
- Central terms and quotations are written in *italics*.
- To facilitate the presentation of empirics without digging myself too deep into terminologies and name descriptions. I have chosen to present two cases out of three of CBNRM models that have been implemented in Zambia. The two chosen programs were selected due to their different approaches in the organizational structures, mainly a centralized/ top-down vs. decentralized and bottom-up. The excluded CBNRM program was characterized to be similar to the centralized and top-down program model.
- The term case or model refers to each CBNRM program if nothing else is stated.

4. Empirical Findings

The empirical findings are presented starting with giving an introduction of the emergence of CBNRM in Zambia. That is followed by a brief overview of the management structure of wildlife and the characteristics of the revenue distribution framework, between ZAWA and the community. Lastly, the focus is then narrowed down in presenting the main causes for wildlife depletion to occur and the conflict of interest between community members and wildlife conservation.

The emergence of CBNRM in Zambia

To understand the dynamics of the wildlife resource sector in Zambia one needs to have some knowledge of its historical and economical background.

Historically, before the period of colonization, natural resource management in Zambia was run by local institutions in the communities. The control of who could access the natural resources within the community was done through traditional leadership, mainly the tribal chief (Chomba et al., 2011). During the colonial time *Controlled hunting areas* were introduced by the British, which were meant to promote subsistence hunting, but also aimed to promote wildlife as an economic commodity (Child et al.; 1999; Simasiku et al., 2008). People that wanted to hunt had to apply for a license and the system evolved to the extent that policies and guidelines were created for game reserves that restricted local communities to access into these areas (ibid). As the colonial government was in control and had the authority of the wildlife, the traditional tribal culture and social structure, that included patterns of allocating and managing wild animals, were disrupted (Child et al, 2013; Barnes et al, 2010). The global shifts, towards increased community participation, decentralization and democratization, have influenced the governance of natural resources in Zambia over the years (Chomba et al.; Simasiku et al, 2008). In the 1970s and early 1980s, Zambia's elephant and rhino population were ravaged by commercial poaching, with rhino becoming extinct and over 100,000 elephants were killed (Lubilo et al, 2010; Dalal-Clayton et al., 2003). In response, the year of 1983 a national workshop was held in the Luangwa Valley (ibid). The workshop identified poverty as the main reason for poaching and recommended that local communities should participate in both management of, and sharing of benefits from,

wildlife (ibid). This was the starting point of how the first, two parallel, CBNRM programs were introduced and launched in the country's GMAs.

Wildlife Resource Management in Zambia

In this section the two different CBNRM models are described and the level and flow of how revenues are distributed. I will be calling the two CBNRM programs; the Lupande program and Mumbwa program, which will be the names which I will refer them to as in the rest of this thesis. With the exception of the changed names everything else such as policy framework and distribution levels of the program remains unchanged.

Characteristics and Revenue distribution of the CBNRM programs

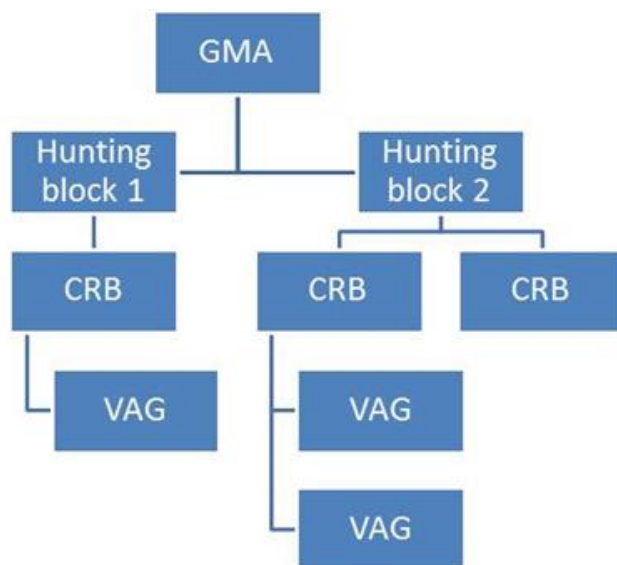


Figure: How the community representation can be structured in a GMA
Source: Author's own elaboration

The Mumbwa program

The revenue distribution from trophy hunting for one GMA, between ZAWA and the community, the revenue is shared as follows:

- 50% National treasury
- 50% Local community.

Out of the 50% that is retained by the community, the revenue is distributed as follows:

- 35% to local authorities for community development
- 40% for wildlife management in the GMAs, the hiring of village scouts
- 25% for CRB administration cost

The 35% rev share goes to community development projects such as building of clinics, water pumps, women's group, beekeeping and schools. Wildlife management- the hiring of village scouts to patrol the area.

The village scouts were recruited among the young members of the local community. Board members of the CRB said that the position as a village scout was considered to be a very attractive financial opportunity for otherwise unemployed people and an alternative to poaching.

Lupande program

The Lupande program followed the regulation of the wildlife management policy from the Zambia Wildlife Act (ZWA) but act as an independent entity from ZAWA HQ. The local ZAWA office in Lupande GMA retains all the revenues gained from park entry fees of South Luangwa National Park and revenue from trophy hunting.

In 1995 the share distributed to the community was 40% and increased over the years, from 1997 to 1999, 100% of the revenues were distributed to the community. Out of this 100%, 20% were distributed to the District Council and 80% directly to the VAGs. At the time of the conducted study (Feb/March, 2015), revenue from wildlife was shared between the local ZAWA office in the GMA and the communities within the GMA, which the community received a similar percentage as in the Mumbwa program (40-50%).

The revenue shared with the community was shared as followed:

- 35% to local authorities for community development
- 40% for wildlife management in the GMAs, the hiring of village scouts
- 25% for administration

Revenue distribution

When a CRB chairman was asked about his opinion on the centralized structure of ZAWA and the top-down distribution flow of revenue I was given the following answer:

"ZAWA is abusing our money, they still owe us money that should have been paid years ago and there is nothing that we can do about it. Having all revenues from trophy hunting first collected by ZAWA HQ and later distributed to us is not working because money goes missing along the way and what we receive is only a small fraction of what belongs to us."

He also expressed that if hunting revenues were properly managed and efficiently distributed to the CRBs, they could be used to help better plan for the recruitment of scouts and the implementation of development projects. Also, the status of wildlife stocks will affect the ability of the GMA to generate funding and to sustain the CBNRM programs. ZAWA officers claimed that even though ZAWA belongs to the government, the organization is economically self-funded in all its operational activities, with their main income coming from park entry fees and trophy hunting. This dependency was expressed by a CRB member to create a conflict of interest, under extreme financial pressure ZAWA repeatedly made decision that compromised sustainability in order to maximize immediate short-term returns. On occasions the size of quotas was increased which caused to threaten wildlife population, some respondents speculated that to be the reason for the hunting ban that has been going on in the past two years, when the number of predators especially cats declined in numbers.

In all the GMAs except from Lupande GMA, the revenue from trophy hunting is collected by the ZAWA HQ and later distributed to the CRBs. Comparing the different approaches of the top-down vs. bottom-up, an interviewees from Lupande GMA, suggested that enormous improvements in conservation incentives, organizational performance in the CRBs and democratic empowerment are associated with revenue distribution. The form of cash dividend to individual households was said to be especially effective but also of other tangible benefit such as community projects so that they could send their children off to school.

Poaching

The rate of poaching was considered by the majority of the interviewees to be unsustainably high and poverty and other social issues such as high unemployment rate and lack of other livelihood opportunities living in the rural areas, was identified as the main reason for poaching. Poachers originate mostly from residents within the GMA, and according to several of the interviewed WPOs of ZAWA, they explained that poaching activities that occurs today mainly is for subsistence purposes, and rarely are species targeted for anything other than meat (also known as bushmeat), mainly commercial bushmeat. It was difficult for them to estimate the number of people who poach as a livelihood. Most meat is sold locally and they mention that in many cases there are middleman that deter transport of bush meat to urban areas where the demand have increased quite substantially in the past several years, worthy to mention is that most sales are to the relatively wealthy or the few residents with a regular income such as government employees. An interviewed community member uttered that on a regular basis bushmeat was offered for sale and during the study period, I myself witnessed purchase offerings to local residents in the community.

Funding shortages has meant that ZAWA mandate of protecting the vast wildlife estate has practically been impossible to achieve, with low presence of wildlife scouts and infrequent patrols (Area Warden). For frequent periods of time ZAWA officers were working for several months, sometimes even over 6 months at the time, without receiving any payment (ZAWA staff). Disregard of conservation mandate was reflected in certain practices when wildlife scouts were given gun bullets with which to hunt for food due to insufficient rations (CRB member and NGO staff).

Human-wildlife conflict

Several studies on household welfare has shown that households living in GMAs experience a lower welfare in comparison to households that live in same rural areas but outside of GMAs (Becker et al., 2013; Wainwright et al., 1998). This could be explained by farming being a universal livelihood in rural areas and the high occurrence of human-wildlife conflicts that were

substantially higher among the communities settled close to the National parks or wildlife corridors. Elephant attacks destroy farms and houses and in some cases claim the lives of villagers. The tensions is also capitalized on by scouts being reluctant to kill the animals; rather they try to scare them away by beating drums or shooting in the air which is not an effective deterrent in the long-term. There is no official compensation mechanism for losses or damages due to wildlife and this was given by majority of the respondents to be the major reason for community's negative attitude towards wildlife and park authorities. The extent of crop damaged due to wildlife could not be verified. This was expressed by one farmer:

“Elephants come every year to destroy our fields and eat our crops. This happens every season and there is not much more that we can do about it but to call ZAWA that will do some blasting to scare them away temporarily. Soon again the elephants will come back, this is what happens when we live so close to the park. “

Encroachment

A CRB representative believed that the wildlife will suffer in the time to come, partly because of human population growth in the GMA areas, resulting in a higher demand for agricultural land and illegal settlements.

"Human encroachment is our biggest threat, people from the Southern province are now moving up here to do farming due to the rich soil. I suspect that not only are they entering onto these areas, that have been assigned to wildlife, for agricultural purpose, as we many times have caught them poaching”- says a former CRB board member in Mumbwa GMA.

Attitudes and Participation in Conservation

Since the implementation of CBNRM programs conservation sensitization has been ongoing to the villages in the GMAs. According to a former CRB chairman, contact persons or having someone in the family being employed in the wildlife sector could either be tour operators or ZAWA, were successful at improving communication and had in general a more positive attitude towards wildlife conservation. Another CRB member from the Lupande program tells that during "the prosperous period" when the community received nearly all benefits from hunting, people

did not only passively receive the economic benefit shared from wildlife (revenue from wildlife was distributed as a cash dividend to all household), but people were also engaged in protecting wildlife by reporting when they caught someone poaching.

Much of the inactivity in some of the CRBs and project initiatives was attributed to a lack of compensation for meetings attended and work performed. All board members except from the secretariat worked voluntarily without any compensation but for small allowances for food and administration cost. Respondents who expressed satisfaction with the CRB, ZAWA and wildlife offered different and sometimes multiple explanations for their approval. The most commonly cited reason was for their work done in constructing schools, clinics and other community projects. Though projects funded by the CRBs, but acted independently, rarely ended up succeeding in self-sustaining the project due to lack of funds or training, but those involved were positive and appreciated the initiatives and possibilities of the projects reasons being for community engagement and the knowledge gained i.e. bee keeping, fishery and poultry.

SUMMARY

In this chapter two policy frameworks have been identified based on the revenue distribution and flow, between ZAWA and communities, of the Lupande program- governed using a bottom-up approach, and the Mumbwa program described as centralized and more top-down.

This is followed by giving the main causes and threats for the decrease in wildlife population in the studied GMAs, which claimed to be poaching for commercial bushmeat and human encroachment. The main challenges experienced by the communities which also caused people to have a negative attitude toward wildlife or low engagement in wildlife conservation, was expressed to be human-wildlife conflict and ZAWA related issues such as unfair distribution of wildlife revenues, lack of decision-making power, transparency and accountability.

5. Analysis

The analysis, is about applying the empirical findings to the theories developed in the thesis' theoretical framework with the purpose to answer the thesis research question: "Can the tragedy of the commons be avoided through CBNRM?"? To do this, the analysis of the thesis will start with illustrating why the tragedy of the commons occurs by including, what the empirical evidence has shown, could be affecting factors in combination with what is stated in the CPR theory. Lastly, analyze the potential outcome when CBNRM principles are included and applied together with Ostrom's Institutional Design Principles, this to investigate and understand, if the tragedy can be avoided through CBNRM.

Testing the hypotheses

When doing the analysis to answer the research question: "Can the tragedy of the commons be avoided, through CBNRM?" By also adding the aspect of when benefits from wildlife resources are shared with the local community, this act as an incentive to not overexploit wildlife resources, the formulated hypotheses will be tested by asking the following (hypotheses) questions:

Q1. Will community members want to protect wildlife when benefits and responsibilities are shared from these resources?

Q2. Do socioeconomic or other factors such as human-wildlife conflict affect the attitudes of community members towards wildlife and conservation?

Q3. Do law enforcement or wildlife policies affect conservation attitudes or behavior?

An illustration of the tragedy of the commons

The illustration is examined and showcased in three case scenarios, where the three hypotheses and *Ostrom's Institutional Design Principle* are integrated into each differently designed case scenario. The three different situations have been designed to show the different outcomes that will occur when the local community can be part of and share the benefits gained from wildlife, which is a key principles of CBNRM. The choices people in the community can make are to Do

nothing, Poach or Conserve wildlife resources. In the first case there are no benefits shared with the community, and all wildlife revenues from hunting are kept by the Central Government (ZAWA). In the second case, a small benefit is shared with the community, to be finalized by a third case situation in which most benefits are shared with the local community.

Community member	Benefit from wildlife resources
Farmer	0
Farmer NP	-3
Poaching	10
Cost to protect wildlife	-2
Cost of Poaching when protected	-10

Farmer: Farmer living in the local community

Farmer NP: A farmer, living in the local community, who consistently suffers from the close proximity to the National park, through e.g. crop damage and injuries.

Poaching: The yield from poaching, such as animal trophies, bush meat for either private or commercial consumption, is a profitable income.

Cost to protect wildlife: The cost for the protection of wildlife, e.g. preventing others to poach by hiring (extra) village scouts to do patrols, educating people about the importance of wildlife etc., requires investments.

Poaching cost when protected: The cost of poaching when the community chooses to conserve and protect wildlife resources, the negative value represents the cost of being captured and penalized.

Explanation of the grids

The grids illustrate the benefits that follow with the different choices the people in the community can make. The values are also contingent on how other people in the community decide to act. Before a farmer makes a decision, he will be mindful of what decision the others make. To facilitate and guide the design of the analyzed method the following assumptions have been formulated:

- The people in the community are fully informed about the “rules” and they will all maximize their own utility.
- If one actor chooses to conserve and protect wildlife, in the case of poaching, the poacher has an expectancy of being caught.
- The poacher will gain from poaching but the risk of being caught will have a negative expected value of being caught ($+10-10=0$)
- In the case of poaching no benefit can be gained or shared from wildlife.
- In the case of conservation by one actor and poaching by the other, the people who chose to conserve or do nothing (cooperators) will receive the benefits shared from wildlife, while the poacher will receive none (non-cooperators).

First case: No benefits are shared from wildlife resources

All revenues from wildlife resources are kept by the central government.

First case: No benefit gained from wildlife resources

		Farmer		
		Conserve	Poaching	Do nothing
Farmer	Conserve	-5/ -2	-5/ 0	-5/0
	N Poaching	-3/ -2	7/ 10	7/ 0
	P Do nothing	-3/ -2	-3/ 10	-3/ 0

Comments:

- If one actor chooses to conserve, the person who poaches will have a negative expected value (-10).
- Even though the negative expected value for the poacher when being caught (and wildlife is protected), for that person who chose to conserve and since there is no benefit shared, this does not outweigh the cost to conserve and the person would rather chose to do nothing.
- If one actor suspects that the chosen strategy for the other person is to poach, this actor will chose to poach as well.

- If the actor suspects that the chosen strategy of the other person is to do nothing, the person will choose to poach to receive a benefit of 10.

In the first case when there is no benefit gained from wildlife resources, to poach will always be the dominant strategy no matter what the other person does. Since the greatest gain lies in poaching, this will be the chosen strategy for both, which will result in overexploitation of wildlife resources and *the tragedy of the commons*.

Second case: Benefit shared from wildlife resources, +6

Benefits from wildlife resources are shared with the local community, each and every member who cooperates receives a benefit value of six. If one chooses to poach no wildlife benefit can be gained by anyone.

Second case: Benefit gained from wildlife resources, +6

		Farmer		
		Conserve	Poaching	Do nothing
Farmer	Conserve	1/ 4	-5/ 0	1/ 6
	N Poaching	-3/ -2	7/ 10	7/ 0
	P Do nothing	3/ 4	-3/ 10	3/6

Comment: In this case, a (small) benefit shared from the wildlife resources when wildlife is protected. The revenue earned from wildlife is shared with the community, giving those who receives the benefit (cooperators) an incentive to conserve or to have a positive attitude towards wildlife instead of exploiting it. Even though the benefit received from the protection and conservation of wildlife, the benefitted value in this case does not outweigh the value received when poaching for both farmers. They will both choose to poach and this will result in *the tragedy of the commons*.

Third case: Benefit shared from wildlife resources, + 20

In this case, there has been an increase of benefits from wildlife resources shared with the local community. Each and every community member who cooperates receives a benefit value of

twenty, and likewise as in the second case, if one actor chooses to poach no wildlife benefit can be gained by anyone.

Third case: Benefit gained from wildlife resources, +20

		Farmer			
			Conserve	Poaching	Do nothing
Farmer		Conserve	15/ 18	-5/ 0	15/ 20
	N	Poaching	-3/ -2	7/ 10	7/0
	P	Do nothing	17/ 18	-3/ 10	17/ 20

Comment: In the third case, the benefits shared from wildlife resources are substantially higher for the people in the community. As the greatest gain for both actors is to “do nothing”, people will not want any poaching activities to happen. The higher value of preserving rather than overexploiting wildlife resources illustrates the situation when *the tragedy of the commons* is avoided.

Answer to the tested hypotheses

Q1. Will community members want to protect wildlife when benefits and responsibilities are shared from these resources? When benefits are shared from wildlife, value is then addressed to the resource and seen as a gained benefit. Though, this value will be compared to the cost of protecting it and/ or the value of poaching. If the benefits shared from wildlife exceeds the cost of protecting it or value of poaching is lower community members will choose to protect and conserve wildlife. **Ostrom's Institutional Design Principle (OIDP); 1, 2, 3, 4, 6 and 7**

Q2. Do socioeconomic or other factors such as human-wildlife conflict affect the attitudes of community members towards wildlife and conservation? Yes, living with wildlife implies a risk of having you crops damaged by elephants, which affects community members to have a negative attitude toward wildlife. If the cost of damage caused by wildlife is compensated change in attitudes toward the resource will shift to become more positive. **OIDP; 1, 2, 3, 7**

Q3. Do law enforcement or wildlife policies affect conservation attitudes or behavior? Yes, if the risk of being caught is high and punishment strong (which implies a high cost for the one

who poaches), and adding the benefits shared from wildlife when conserving and protecting the resource, will change the behavior and willingness of poaching. **OIDP**; 1, 2, 3, 4, 5, 6, 7

Addressing the research question

The outcomes of the three case situations have been illustrated using the different choices individuals in a local community can make. What has been shown is that if a sufficient benefit can be gained from wildlife resources and if shared transparently and with accountability, people in the community will choose to not poach or overexploit wildlife but to preserve it. In conclusion both empirics and theories support that when the potential benefit exceeds the potential cost of living, poaching or protecting wildlife, can the tragedy of the commons be avoided.

Even though much of what is said in the theories do match several of the empirical patterns, especially regarding that benefits shared of a CPR addresses value to the resource and act as an effective incentive for users to choose conservation rather than exploitation. Moreover, one cannot ignore the large number of failures and the few numbers of successful CBNRM programs that more as a rule than exception have been poorly implemented over the last three decades. Which makes one wonder that even though the motivational incentive of benefit sharing holds, but the free-riding problem, issue of excluding others to the CPR and nonetheless that the monitoring structures seems impossible to solve and implement in practice in spite of Ostrom's suggested solutions to address these issues.

6. Discussion of findings and Conclusion

While the research question focused on whether CBNRM can protect CPRs of being a tragedy of the commons, it became clear throughout the analysis that CBNRM is more complicated than it is suggested in the literature. This chapter will present the thesis' theoretical and practical contributions, followed by the limitations of these contributions, as well as suggestions for further research.

An array of factors combined has caused GMAs and CBNRM programs to fail in ecological, economic and social terms. The current tenure and management system in place have created a scenario where all stakeholders are incentivized to overexploit wildlife resources and underinvest for what is necessary in their protection. Changes are clearly needed which will enable and incentivize best practices by communities but also for ZAWA whose primary role in the GMAs should be to facilitate and oversee the development of wildlife-based land uses.

The constraints facing the rural poor are numerous, among the challenges discussed so far include poverty, the limited amount of employment opportunities and the poor productivity in farming due to crop damage caused by wildlife, which they heavily depend on for their subsistence. The wildlife resources in Zambia clearly share the attribute of being a CPR which the protected areas are vast and the cost of protecting wildlife from poachers, i.e. hiring of wildlife scouts for anti-poaching activities, is high. Wildlife is of high value and in high demand due to the consumptive tourism form of trophy hunting and poaching for commercial bushmeat is threatening and putting a lot of pressure on the limited wildlife resources. Even though a benefit is shared through the CBNRM program between the communities and ZAWA, beside the modest share that each community receives, money is being misused due to low accountability and transparency issues. Looking beyond policy and corruption the benefit gained either through a cash dividend or investment in community projects, which also creates an incentive to free ride among the community members due to the difficulty of exclusion, the value of benefit gained through CBNRM will end up being a small fraction to the value of poaching (especially when law enforcement is weak). For the marginalized community member due to lack of other alternatives, the choice of poaching will seem very attractive for that person to earn its livelihood. This will cause the depletion of wildlife and the resource to become a tragedy of the commons. However,

even though the value of poaching has been demonstrated above to be high, but if community members are provided another alternative that exceeds the value of poaching they will choose this alternative instead. This could happen in two ways; (1) either you increase the net benefit shared from wildlife to each individual in the community or (2) you decrease the value of poaching. The value of poaching can either be lowered as illustrated in the case scenarios with increasing wildlife protection and/ or harder punishments. As mentioned before, securing a system for the protection of wildlife by hiring scouts or fencing protected wildlife areas are costly, the protection system must be self-sustaining to be long-lasting. For such an investment to be made the value of protecting wildlife must exceed the cost for such a system. The revenue earned from trophy hunting need to be reinvested into protecting these areas but as it is today that amount and share is not enough to cover the vast area other sources of funding are necessary. In addition to the previous the revenue shared with the community is not enough to keep people from poaching other indirect benefits needs to be created and these activities needs to be co-existent with wildlife conservation. This could happen through employment opportunities i.e. the non-consumptive tourism sector or something equivalent as long as members of the community are given an alternative option to poaching.

The aim of CBNRM is many times described in the community-based conservation literature to be about empowering the rural communities in strengthening their position in decision-making on issues that concern them. Education is another important factor that is mentioned to lift people out of poverty and to educating them about the importance of wildlife. Even if people have the notion of the importance of wildlife conservation but due to poverty they are left with no other option but to poach. Even though empowerment and education are important factors to improve rural people's lives, these alone are not enough for preventing people from poaching.

For CBNRM to work, the rules and conditions of the benefit sharing program from wildlife resources must be clear to all community members who are to receive from the benefit program. The set of rules should also include some sort of punishment if you are caught poaching and that you are not eligible the benefit from the CBNRM program. People must be lifted out of poverty. As people are poor and the high values of poaching persist there is a value gap that needs to be filled, if not, the tragedy of the commons will occur as people are left with no other choice than to poach and it remains nearly impossible to prevent everyone from poaching activities. As the

livelihood of these people improve and they find other livelihood alternatives, even though the benefits from wildlife do not reach the same value as poaching people will still choose not to poach. This is because (1) there is a negative value of poaching when you are caught and (2) the value of poaching do not exceed the value of his or her alternative option, this means that it is no longer worth it to poach.

Conclusion

CBNRM can have a truly positive impact in Zambia but planners of the program must first understand the forces that created an impoverished rural populace diametrically opposed to the local wildlife which threatens their livelihood. The current system provides only a nominal compensation in exchange for conservation, if CBNRM is going to have a chance in succeeding and address what is causing wildlife in Zambia to become this tragedy, the program must find a way for local communities to co-exist and truly benefit from the conservation of wildlife. Many of the underlying principles of the CBNRM model contributes in solving several of the CPR issues, especially using Ostrom's Institutional Design Principles, but as the model solemnly alone do not fully succeed to address the remaining issues in which CPRs therefore still will remain a tragedy of the commons.

Areas for further research

I have chosen one of several possible angles to study the avoidance of CPRs and whether it can be avoided through CBNRM. Below follows different perspectives to further examine on how CPRs can be protected. This thesis addresses some of the general issues that needs to be taken into considered when framing CBNRM programs to succeed in the protection of the wildlife. However, I have not in detail investigated how programs should realize the proposed considerations. One issue that clearly threatens the success of CBNRM towards wealth creation is crop losses associated with wildlife protection. Additional research could look into the capacity of scout patrols to protect wildlife while simultaneously protecting farmers from crop damage. If all focus is on wildlife protection then there might be a need by ZAWA to review the mandate to reflect the need to protect crops as well as wildlife, and thus minimize human-wildlife conflict.

The research method used was primarily a qualitative study of CBNRM in Zambia, more multidisciplinary studies are needed to verify the findings. In particular, future research is needed in the area of household finances and welfare to evaluate how individuals are spending their limited income and how CBNRM can better address household needs and their available resources. In addition, more research is needed to determine CBNRMs quantitative effect on wildlife population numbers. What are the modern poaching trends since the implementation of the programs? What other tools can CBNRM utilize beyond economic incentives to stimulate wildlife conservation among locals?

In this study I have focused on the economic incentive behind the program, what would be interesting to also investigate is how CBNRM could manage to integrate wildlife conservation into the culture and norms of the communities, which Ostrom claims to historically been successful in the management of CPRs in long-lasting decentralized institutions.

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Appendix

Interview Guide

Introduction

I am an undergraduate student from Sweden, at the Stockholm School of Economics, and as part of my program I am doing a study on Community-based Natural Resource Management (CBNRM) if this can be an effective approach for the protection of wildlife resources in Zambia. This interview is part of that research and I will ask you questions about your role and responsibilities (in the community, NGO or ZAWA) your perception on wildlife, ZAWA and the benefits and challenges the community faces because it is located in a Game Management Area (GMA) and so close to the National Park. There is no payment for doing this interview, however, your answers will help communities and academia to improve and gain a better understanding about wildlife management. Everything you say will be confidential, and this information will not be shared or used for any other purpose than for this study, please feel free to speak openly. However, if there is a question that you do not wish to answer you don't have to.

The questions asked during the interviews varied depending on what experience, knowledge/ expertise and position the person had. I have divided the questions into different subject categories

Personal information

1. Name of the person being interviewed

Community Resources Board and Village Action Group

2. Name of the CRB. If the person was a VAG member, which CRB the VAG member belonged to.
3. Please describe the structure of your CRB. When was the CRB established? How many elections have taken place since the establishment? How often does the election take place? Number of VAGs?

Game Management Areas

4. What are the greatest challenges this GMA faces today?
5. How would you rank, 1-5, the risks and challenges associated with: human encroachment, human-wildlife conflict, and monetary shortage? 1= not a problem and 5= a big severe problem.

6. How long have you been engaged in this CRB and what motivates you to engage yourself in wildlife management and community issues?
7. How many times have your CRB received money from the wildlife resources in the GMA (the hunting revenue)?
8. How has the revenue from hunting been used? Household cash distribution and/ or what kind of community development project?
9. Do you think CBNRM is an effective conservation method for wildlife? Why or why not?

CBNRM model

10. From your experience and interaction with the people in the community, the majority, would they prefer an individual benefit (cash dividend) or the investment in community projects and infrastructures?

Human-wildlife conflict

11. Is there any human-wildlife conflict within this CRB? Is it a big disturbance for the household(s) in the community? If yes, what animals, what are the biggest challenges?
12. What precautions have been taken to prevent human-wildlife conflict?
13. The CRBs relation with ZAWA, tour operator (lodge or hunting company)? Are you getting enough support ZAWA?
14. How many village scouts are doing patrols and anti-poaching activities? Are the numbers of scouts enough for the protection of wildlife and their own safety?

Trophy hunting and tour operators

15. What are the reasons for why poaching is taking place?
16. What do you think was the main reason for the hunting ban?
17. How has the hunting ban the past two years affected the CRB, community, people's perceptions and attitudes toward wildlife conservation, ZAWA?

Poaching

18. What are the main reasons for poaching?

19. The poaching activities being done are they mainly for the purpose of animal trophies (e.g. ivory, animal skin) or bush meat? If bush meat, is it for private or commercial consumption?
20. Who and where do the poachers come from? Do they live within the GMAs or do they come from other provinces?
21. What do you think could or would stop people from poaching activities?

South Luangwa Area Management Unit Structure

