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FOREST GOVERNANCE, CONSERVATION AND LIVELIHOODS: THE CASE OF FOREST PROTECTED AREAS AND LOCAL COMMUNITIES IN NORTH-WESTERN ZIMBABWE

Thesis submitted in fulfilment of the requirements for the degree

Doctor of Philosophy

By

VURAYAI MUTEKWA

Department of Environmental Science
Faculty of Science

RHODES UNIVERSITY

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Abstract

Forest protected areas (FPAs) constitute one of the main strategies for achieving the triple benefits of biodiversity conservation, livelihoods sustenance and climate regulation. The quality of FPA governance plays a major role in the achievement of these conservation objectives. Governance encompasses policies, institutions, actors, processes and power and how they interplay to determine conservation outcomes. Currently, no research has systematically explored the historical and contemporary governance of Zimbabwe's protected indigenous forests and its implications on forest condition and local communities' livelihoods. This is despite the fact that improving forest governance depends on learning from those that prevailed in the past as well as those currently obtaining on the ground in terms of how they have performed in relation to conservation and livelihood sustenance. This study assessed Zimbabwe's historical and contemporary FPA governance and its implications on social and ecological outcomes. The overall rationale of the study was to provide evidence of the impact of past governance arrangements on forest condition and local communities' livelihoods, improve understanding of the current governance arrangements and propose future FPA governance strategies and mechanisms to enhance conservation and local communities' livelihood outcomes. Accordingly, the specific objectives of the study were to: 1) characterize and collate historical governance of FPAs in western Zimbabwe, 2) evaluate the impact of governance on forest condition and local communities' livelihoods, 3) explore the nature of contemporary governance at the forest level, and 4) propose the governance model for Zimbabwe's FPAs into the future.

The study employed a combination of quantitative and qualitative data collection and analysis methods including the systematic literature review methodology. Using specific case studies of indigenous FPAs in western Zimbabwe as examples, the study initially evaluated through literature review (Chapter 2) the history of forest governance in Zimbabwe showing how four main powers (force, regulation, market and legitimation) led to different types of local community exclusion and how community agency countered exclusion especially from the year 2000 to date. Chapter 3 uses six case study forests to assess the quality of historical FPA governance by analyzing the application of seven governance principles. The results showed that the quality of governance was high during precolonial times, deteriorated with the inception of colonialism and remained poor after independence in 1980. Forest condition also varied in tandem with the quality of governance variations showing a positive relationship between the two variables. Participation in decision making, fairness in sharing benefits and effective rule enforcement emerged as key principles for FPA authorities to earn local community support and improve forest condition. Chapter 4 employed remote sensing techniques to determine the impact of governance on FPA land cover change by comparing FPAs with *in situ* and *ex situ* inhabitants. Results revealed that there was a significant relationship between governance quality and land cover change. FPAs with *in situ* inhabitants experienced higher forest loss than those with *ex situ* inhabitants. Poor governance accelerated forest conversion to other land uses particularly agriculture and settlement. Chapter 5 explored contemporary FPA governance at the forest level. Results showed that human agency that led to the invasion of FPAs from the year 2000 onwards disrupted the governance arrangements that were previously in place subjecting Zimbabwe's FPAs to near open access by local communities and other actors. The FPAs'

contemporary governance is characterized by involvement of multiple actors with diverse interests, lack of Forestry Commission legitimacy, very low levels of local people's participation in decision making and rule enforcement, lack of compliance with FPA rules and actual benefits that do not match local communities' expectations.

Overall, the study has revealed the ineffectiveness of the conventional centralized FPA governance in achieving positive conservation and local communities' livelihoods outcomes. The study recommended a shift from conventional centralized governance to pro-people adaptive collaborative management (ACM). This has the potential to address most of the governance ills affecting Zimbabwe's FPAs if it is designed and implemented with the full commitment of all relevant actors. This governance approach should, however, avoid some of the pitfalls such as elite capture, corruption in benefit sharing, gender inequality and technocratic professional management approaches that have characterized some collaborative governance systems in developing countries further perpetuating marginalization and poverty amongst local communities. Forestry Commission must also exercise visionary leadership and motivation. ACM becomes possible through leadership, vision, establishment and maintenance of links through culture and management and high levels of motivation. Designing and implementing ACM avoiding the highlighted pitfalls improves the capacity of the FPAs to continue providing social and ecological benefits such as improvement of local communities' livelihoods, biodiversity protection and climate change mitigation.

Keywords: *Governance, forest protected areas, local community, forest condition, livelihoods, Zimbabwe.*

Weak and illegitimate governance—both within and between countries—explain to a significant degree why the benefits of development are not equally shared nor sustainable over time, despite the existence of abundant material and human resources sufficient to enable people and future generations everywhere to live lives of dignity, free of disparity and deprivation.

(Beyond 2015 Governance Drafting Committee, 2013:2)

Just Governance: A critical cornerstone for an equitable and human rights-centered sustainable development agenda post-2015, GCAP, South Africa.

Declaration

I declare that this thesis in its entirety is my own work, and all other sources used or quoted have been fully acknowledged and referenced. The thesis is being submitted for the Degree of Doctor of Philosophy at Rhodes University, and has not been submitted for a degree or examination at any other university.

December 2016

Signature **Date**

Mutekwa Vurayai

Full name

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ACRONYMS

ACM	Adaptive collaborative management
ANOVA	Analysis of variance
AREX	Agricultural Research and Extension
BSAC	British South Africa Company
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
DN	Digital Number
EMA	Environmental Management Agency
ESAP	Economic Structural Adjustment Programme
ETM+	Enhanced Thematic Mapper
FAO	Food and Agricultural Organisation
FC	Forestry Commission
FLEGT	Forest Law Enforcement, Governance and Trade
FPA	Forest protected areas
FPU	Forest Protection Unit
FTLRP	Fast Track Land Reform Programme
GCP	Ground Control Point
GFI	Governance for Forests Initiative
GIS	Geographic Information System
GloVis	Global Visualization Viewer
GPS	Global Positioning System
IEEP	Indigenization and Economic Empowerment Programme
IKS	Indigenous knowledge systems
IFRI	International Forestry Resources and Institutions
IUCN	International Union for Conservation of Nature
ENVI	Environment for Visualizing Images
MA	Millennium Ecosystem Assessment
MDGs	Millennium Development Goals
MSU	Midlands State University
MTT	Matabele Timber Trust
NASA	National Aeronautics and Space Administration
NDVI	Normalized Difference Vegetation Index
NGO	Non-governmental Organization
NIR	Near Infra-red

NTFP	Non-timber Forest Product
NUST	National University of Science and Technology
PA	Protected area
PIP	Permanent Increment Plot
PROFOR	Program on Forests
PSP	Permanent Sampling Plots
RC	Residents Committee
RDC	Rural District Council
ROI	Region of interest
SAM	Spectral Angle Mapper
SES	Social ecological system
REDD+	Reducing Emissions from Deforestation and forest Degradation in developing countries
RNTC	Rhodesia Native Timber Concessionaires
SFM	Sustainable forest management
SNR	Strict Natural Reserves
TM	Thematic Mapper
UNEP	United Nations Environment Programme
UZ	University of Zimbabwe
WRI	World Resources Institute
WWF	World Wildlife Fund for Nature
Zimstat	Zimbabwe Statistical Agency

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Many people and institutions have played a part in one way or the other to ensure the successful completion of this thesis.

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Chapter One

General introduction: Setting the scene

1.1: Introduction

Hardin's conviction in his 1968 thesis was that environmental change is driven by: (1) increased demands on environmental resources due to human population growth and consumption, and (2) the ways in which humans organise themselves to extract environmental resources (Institutional arrangements) (Dietz et al. 2003). Ungoverned or poorly governed environmental resources are subject to overuse and collapse (Hardin, 1968, Myers and Worm 2003). Hardin (1968) prescribed public or private ownership of all natural resources leading to the creation of parks or 'protected' areas around the world because resource users on their own in the 'commons' are helpless to limit use patterns. In 1962, there were 9 214 protected areas for the world and just 46 years after Hardin's 1968 thesis, in 2014, there were over 209 000 designated protected areas and approximately 10% of these are forests (Worboys, 2015).

A protected areas (PA) is a "*clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values*" (IUCN, 1994; Dudley, 2008; Borrini-Feyerabend et al. 2013). PAs play a critical role in conserving natural areas and their resources that would otherwise have been converted to other land uses (Loon and Polakow, 2001).

A Forest Protected Area (FPA) is a subset of all protected areas that include a substantial amount of forest as defined for purposes of Forest Protected Areas (Dudley and Phillips 2006). FPAs help to sustain the world's life support systems, and provide vital services such as water supply and soil protection for local and more distant communities (Dudley and Phillips, 2006). They help conserve ecosystems that provide habitat, shelter, food, raw materials, genetic materials, a barrier against disasters and many other ecosystem goods and services upon which national and global economies depend (Mansourian *et al.,* 2009). They have been and continue to be central to human survival, livelihoods, and prosperity. Their importance in relation to two of the most important global environmental threats – climate change, and biodiversity loss – is hard to overstate (Agrawal 2007). FPAs are a national and international priority for conservation because they fulfil an enormous range of functions.

FPAs all over the world are beset by a host of direct and indirect threats that undermine the aims of conservation. Among the many underlying threats are climate change, human population growth, growth in consumption, economic development aspirations and activities, weak or inadequate legal systems, powerful vested interests, imbalance of power, poor decision making, lack of political will, absent or weak tenure and rights regimes, policy failures and contradictory or opposing values (Mathur et al. 2015). These are leading to deforestation, degradation and biodiversity loss (Peres and Palacios, 2007). The governance authorities and managers need to develop the capacity and apply innovative and adaptive governance and management approaches for handling a range of complex and often interrelated threats that not only originate from issues specific to an individual protected area but also are driven by factors beyond protected area boundaries and control.

In recent years, new challenges such as atmospheric carbon capture and storage in forests and the role they fulfill in global climate change mitigation, conservation of biodiversity and more specifically many endangered species at a time of global change have led to heightened international effort to urgently and seriously curb deforestation and degradation (Butchart et al. 2012; Siry et al. 2015). Various public, private and nongovernmental efforts such as the setting up of the Alchi Biodiversity Targets of the CBD Strategic Plan 2011-2020, Reducing Emissions from Deforestation and Forest Degradation (REDD+) among other international, national and local initiatives have been developed and implemented to address these problems.

In relation to climate change, the Paris agreement on climate change puts forests at the top of the global environmental agenda (Editorial, Tropical Forest Update 2015). To maintain global average temperature increases below 2^{o} C above pre-industrial levels, parties to the Paris Agreement have been encouraged to take action to implement and support among other measures policy approaches and activities aimed at reducing deforestation and forest degradation (REDD+), promote forest conservation, sustainable forest management (SFM) and forest expansion (Paris Agreement, 2015; Editorial, Tropical Forest Update 2015). Despite these international efforts to curb deforestation and degradation, forests especially in developing countries continue to vanish at a considerable rate (Pfeil and Sepp, 2008) causing severe decline of the goods and services they provide with profound adverse consequences for human well-being and the environment (MA 2005).

Common forest management concerns in many developing countries include deforestation, forest degradation, biodiversity loss, forest sector corruption, over-concentrated control and inequitable access, rural poverty, an ill-informed citizenry; and poorly-resourced, inflexible forestry institutions (Weiland and Dedeurwaerdere, 2010). Success in addressing

forestry challenges has been limited to date due to a constellation of factors among which are the complexities of understanding, describing and analyzing how forests and their conservation interplay with society and governance (Lockwood *et al.* 2014). Governance is therefore understood to be at the heart of forest challenges and their possible solutions and therefore issues about the nature of forest governance at all levels and sectors have to be taken seriously (Tucker, 2010; Mincy, 2014).

1.2: The FPA governance concept

Governance is a rich and multifaceted concept and therefore has been variedly defined. For the purpose of this study, it encompasses policies, institutions, actors, processes, procedures and power and how they interact to determine conservation outcomes (Macura, 2016). It is a critical part of FPAs because it identifies how organizations administer a FPA and the associated power and decision making arrangements. It addresses who makes decisions for protected areas and their management, and how the decisions are made. Governance differs from management that focuses on what responses are needed for a given situation or location in need of attention (Worboys, 2015). Management focuses on the coordination of people, resources and activities to achieve the objectives of a protected area organization. General management actions include setting priorities, developing a situation analysis, designing and implementing strategic plans, developing and implementing monitoring plans, and analysing and communicating results (CMP, 2013). They also include fundraising, reporting, administrative work, and developing and managing the institutions associated with a protected area. At times they may involve the creation or strengthening of institutional structures for the purpose (Hitt et al., 2011). On the other hand governance is about how power is exercised, how decisions are taken on issues of public concern and how other stakeholders have their say (Graham et al. 2003).

The major concepts in forest governance include tenure, power, control, actors, rights, decision making and institutions. According to the FAO (2011), forest tenure encompasses ownership, tenancy, rights and other arrangements to manage and use forest land and its resources. It determines who can use what resources, for how long and under what conditions (Galik and Jagger 2014; Siry et al. 2015). It therefore can be regarded as 'a bundle of rights' over a piece of forest, a tree or a group of trees that have people, time and space dimensions (Acharya et al. 2008). Tenure can be formal or informal, whereby formal tenure arrangements are legally recognized by the state while informal tenure arrangements have no statutory recognition (FAO, 2011). Tenure is not directly interchangeable with ownership. Ownership directly allocates strong rights to the holder of land, often including exclusive and permanent rights along with the

right to sell or lease the land and its resources. On the other hand, tenure consists of a bundle of property rights that represent an enforceable authorization to undertake particular actions in a specific domain (Ostrom and Hess, 2007). As outlined by Schlager and Ostrom (1992), property rights include the right to enter a specified property-access; the right to harvest specific products-withdrawal; the right to transform or regulate the resource-management; the right to decide who can access , harvest or manage the resource-exclusion and the right to lease or sell any of the other four rights-alienation. Tenure is important because it affects the incentive framework faced by forest owners, users and managers. It has an economic role in determining who benefits and who loses in the competition for forest resources. Clear tenure therefore influences local decisions related to forest protection and forest destruction.

The centrality of tenure has led to proposals for forest tenure reforms in order to clarify the rights of forest resource users, protect the resource and enhance sustainable forest management. In Zimbabwe, FPAs are government-owned in terms of legal ownership but there is room for community management and use. As this tenure system is increasingly getting stressed by growing population requiring food security and with environmental degradation and climate change reducing the availability of land and forests, the governance of tenure is becoming ever more important in determining whether and how people are able to acquire rights to use and control these lands and forests along with the associated responsibilities (Mayers et al. 2013). There is therefore pressure to reform this arrangement and take onboard communities in order to enhance sustainable FPA management.

Institutions are regarded as 'rules of the game' of a society (B). Agents and organisations are all embedded in a set of both formal and informal rules that constrain their behavior. Rules become institutions only when they are enforced either through self-enforcement or an external enforcer. Incentives of the governed and those of potential enforcers become critical issues in designing the institutional mechanism. Control on the other hand refers to checking and direction of action, the function or power of directing and regulating free action (Rangan 1997). It is a social position that crystalize around means of access and constitutes an important component in relation to resource appropriation, management use (Ribot and Peluso, 2003). Since property is composed of rights and duties, claiming of rights is a means of access control whilst the carrying out of duties constitutes a form of access maintenance aimed at sustaining those rights. To maintain access, the less powerful individuals or groups may transfer some benefits by expending resources to those that control access in order to derive their own benefits. This in some cases characterize the relationship between the governing authorities such as the Forestry Commission and local community members and groups in the negotiation of benefits.

The concept of power has received significant attention in natural resources governance literature despite its varied definitions. This study follows VeneKlasen and Miller (2002) who stated that power is how sections of a society control resources. Agrawal and Ribot (1999) state that without an understanding of the power of various actors, the domains in which they exercise their powers and whom and how they are accountable, it is difficult to understand how natural resources are governed.

These major concepts of governance that include tenure, power, control, rights and institutions operate in different political and economic forces and contestations that condition governance outcomes such as forest condition, carbon storage and livelihoods (Chhatre and Agrawal, 2009). The political economy of Zimbabwe's FPA conservation initiatives associated with control of people, unequal distribution and access to land and social inequalities in access to resources have resulted in conservation initiatives during the colonial period being ineffective leading to environmental degradation (Murombedzi, undated). The post-colonial land distribution, poor tenure reforms and poor environmental management policies have compounded environmental and social problems that originated during the colonial period. The motivation for local natural resources management has therefore been the need to address historically created conditions of deprivation and the post-independence policies motivated by the search for solutions to the 'national question'. With regard to natural resources governance, the policy focus has been on devolution/decentralisation, natural resource use and tenure, access and benefit sharing and institutional arrangements for resource governance. According to Murombedzi (undated), natural resource use governance in Zimbabwe is still weak and many natural resources are subject to some degree of unregulated and unsustainable use. Policies that have been implemented purporting to devolve control over resources to local communities have largely been a failure.

1.3: Why focus on forest governance?

An analysis of 20 studies of deforestation in and around 'protected' forests by Naughton-Treves et al. (2005) showed that 32 of the 36 protected forests had faster deforestation outside their boundaries than within indicating that public 'protected' areas have some degree of effectiveness. However, this is contradicted by studies by WWF (2004) that examined 200 'protected' areas in 27 countries and Nepstad et al. (2006)'s evaluation of different forest tenure regimes in Brazil which found that many forest protected areas in developing countries lack financial and human resources to effectively control their boundaries and are therefore much more vulnerable to deforestation and degradation.

Scepticism therefore exists among scholars about claims that 'protected' areas are an effective way to conserve forest biodiversity (Hill *et al.,* 2015) while on the other hand evidence on the ground is not really convincing that turning forests over to local users is a guaranteed method to improve forest and livelihood conditions ((McDougall *et al.,* 2013). Forest governance is therefore a critical issue the world over because it effectively captures many if not most of the problems facing the world's forest resources today particularly in developing countries (Anderson and Ravikumar 2010). Governance is critical in determining the expansion of FPAs coverage, effectiveness and efficiency of their management and appropriateness and equity of decisions made about them (Borrini-Feyerabend et al. 2013). Therefore, improving governance can help to maximise the ecological, social, economic and cultural benefits of FPAs without incurring unnecessary costs or causing harm. Despite the efforts of practitioners, academics and policy makers over the years, good forest governance is still not yet mainstream and many local people and forest dependent communities remain marginalised (Forest Governance Learning Group 2011). The question still to be adequately addressed is 'How can the governance for forests be meaningfully improved to guarantee effective conservation and positive livelihoods for forest dependent communities?' Governance arrangements that have evolved to conserve forests, enhance livelihoods and solve conflicts have had mixed results and much is still to be learnt.

The fate of forests and their societal benefits are therefore strongly hinged on the prevailing governance arrangements and the extent to which they fit their context (Agrawal, undated). Good governance leads to fair decisions, forest sustainability and can promote equitable distribution of benefits leading to positive conservation and livelihoods outcomes. Poor governance on the other hand can have significant negative impacts on forest resources, poverty reduction, social development and economic growth. Poor governance at multiple levels is arguably behind indiscriminate deforestation, illegal logging, corruption, encroachment into protected forests and adverse livelihood situations of forest dependent communities (Anderson and Ravikumar 2010). For forests to be effectively governed there is need to devise institutions that establish conditions for good governance (Dietz et al. 2003).

The governance components (policies, institutions, actors, processes, procedures and power) determine how access to, rights over, and benefits from FPAs are allocated and secured, including the planning, monitoring and control of use, management and conservation of FPAs. These result in diverse and varied FPA governance outcomes that include but not limited to ecological condition, economic productivity, carbon storage and the quality of life for those

whose livelihoods depend on the FPA sector (Contreras-Hermosilla, 2011). The quality of FPA governance is therefore central to their ecological and socio-economic outcomes.

Many FPAs have over the years followed the conventional government-led exclusionary governance approach and as such have failed to integrate fully other aspects such as social, cultural and political issues (Andrade and Rhodes, 2012). This has made FPAs controversial. The government-led command-and-control governance has imposed restrictions on FPA resources use leading to the conservation of biodiversity that would otherwise be depleted, degraded or destroyed (Brockington and Wilkie, 2015). On the other hand, this conventional model of governance has threatened people's rights and livelihoods by allowing access for some people whilst excluding others. FPAs have therefore over the years distributed fortune and misfortune unevenly by favoring commercial timber production and biodiversity protection whilst excluding local inhabitants and other marginalized sections of society.

In recent years, FPA governance discourses have been changing and new directions emerging to make protected areas deliver positive outcomes on biodiversity conservation, livelihoods sustenance, economic development and climate change mitigation. This has seen a shift from centralized systems where government was steering to new adaptive collaborative governance in which several actors are co-steering that is spreading in developing countries across the world (Mutekwa and Gambiza, 2016). Of late, there has also been a strong emphasis towards the adoption and application of good governance principles such as participation, transparency, accountability, equity, legitimacy among others (Cavanagh, 2015) which link conservation, human rights and the fight against poverty.

Despite the changing discourses and emerging new trends, Zimbabwe's FPAs are still rooted in conventional government-led guards-and-fences approach that preclude local communities from FPAs and deprive them of deriving meaningful benefits from them. The FPAs also face a myriad of other problems that include encroachment for settlement and agriculture, poaching, deforestation and forest degradation. These problems are centered on governance which holds fort both as a cause of the problems as well as a possible solution. Therefore, the importance of improving our understanding especially of FPA governance so as to establish effective governance systems at all levels cannot be overemphasized. Proper diagnosis of the historical and contemporary FPA governance arrangements and their outcomes needs to be done so that innovative governance approaches can be adopted to address the challenges and bring about hope for the present and future generations. This requires that FPAs be understood not just in terms of the wood volumes that are harvested, but in the context of a variety of goods and

services that they provide, e.g. jobs created, non-timber forest products (NTFPs) obtained, rivers protected, biodiversity conserved and livelihoods sustained.

In fact, forest governance needs to be approached in the context of the 'eight rationales for the conservation of nature: recreational, spiritual, inspirational, cultural, utilitarian, ecological, aesthetic and moral' (Botkin, 2012). It is the competing forest goods, services and values that make good governance imperative but very difficult to establish since the multiplicity of forest sector actors try to balance social, environmental, and economic values for both present and future generations. Forest governance reform conceptually and practically has potential to change the way FPAs are governed in Zimbabwe. In light of this, policymakers, forest managers, academics, non-governmental organizations (NGOs) and the generality of the public are grappling with the questions, 'wither Zimbabwe's FPAs?' in view of the unprecedented and unrelenting human pressures that they face. What governance arrangements need to be put in place to ensure that they continue to play their essential role of preventing erosion, conserving biodiversity, climate change adaptation and mitigation, fresh water supply and provision of sustainable incomes and livelihoods? The concerns, views and discussions ensuing are taking place with very limited empirical evidence from the field about what the situation is like (Chingarande, 2010). It is the hope and conviction of the researcher that this project and subsequent researches that will follow it contribute to the evidence base that can help to enhance forestry policy making and implementation to meet FPAs' objectives of conservation and livelihoods sustenance.

1.4: Enter evidence based FPA governance

Evidence based practice is defined as the process of systematically finding, appraising and using evidence to demonstrate the (in)effectiveness of a specific intervention in decision making (Sutherland *et al.* 2004). In the medical field, evidence based medical practice was formalised in the early 1990s to promote the judicious use of existing best evidence in decision-making when caring for individual patients (Laurent *et al.*, 2009). The evidence based approach was subsequently extended to other public decision making spheres such as the environment leading to the emergence of the concept of *'evidence-based environmental governance'*. The need for evidence based conservation has never been more pressing than currently (Ntshotsho *et al.*, 2012). The United Nations declared year 2011as the International Year of Forests, and in 2015 the United Nations Forum on Forests was to assess progress on achieving the Global objectives on Forests, coinciding with the deadline for achieving the Millennium Development Goals

(MDGs) (Pfeil and Sepp 2008). To achieve these forest conservation targets, the following questions need to be addressed: (1) What can we learn from the history of forest governance? (2) What should our goals be and how do we measure progress in reaching them? (3) How can we learn to do conservation better? (Salafsky *et al.*, 2002) and (4) how can we benefit and adapt governance approaches from the experience gained from success and failure? (Hobbs *et al.*, 2009). These questions essentially lay the foundation for evidence based FPA governance into the future.

Effective forest governance reform will depend on learning from historical and contemporary arrangements and their outcomes. Without this evidence, there is a danger of continuing with ineffective and damaging governance arrangements into the future. Despite the research effort that has gone into Zimbabwe's FPAs over the years (Matose, 2002, 2007, 2011; Mudekwe, 2007; FAO, 2007; Kwashirai, 2008; Maravanyika, 2012), there has been no formal systematic evaluation of the evidence of the impact of various governance regimes that have obtained on livelihoods or an assessment of forest condition from a governance perspective. How have these governance regimes performed over the years in relation to conservation and local community livelihoods goals? This calls for a critical assessment of the impact of past and prevailing forest governance arrangements to find out how they are working for forest conservation and livelihoods in order to draw lessons for the future. For the researcher, there is no better time than the present, especially considering that Zimbabwe's governance situation in general is currently problematic as is manifested by the socio-economic, political and environmental conservation challenges that the country is currently going through. These have driven the majority of the population into poverty and therefore an exploration of governance albeit in the forest sector to determine how it can be reformed into the future and improve the contribution of forests to poverty alleviation should be a welcome development. The FPA sector is therefore strategically positioned in Zimbabwe to provide a useful entry point for governance reform that may constitute an important source of learning for governance reforms in other sectors.

1.5: Hence this study

After a number of excursions with undergraduate students to Zimbabwe's FPAs such as Chesa, Gwaai, Fuller and Gwampa to make students have practical and first-hand experience of FPA governance, I observed first-hand the myriad of governance challenges that forestry officials were battling with. I then thought of embarking on a study to understand Zimbabwe's FPA

governance and its implications on biodiversity conservation and local communities' livelihoods. The overall rationale of the study was to provide evidence of the impact of past governance arrangements on forest condition and local community livelihood outcomes, improve understanding of the current governance arrangements and propose future FPA governance strategies and mechanisms to enhance FPA conservation and local communities' livelihood outcomes. Accordingly, the specific objectives of the study were to:

1) characterize and collate historical governance of FPAs in western Zimbabwe;
2) evaluate the impact of governance on forest condition and local communities' livelihoods;
3) explore the nature of contemporary governance at the forest level, and
4) propose a governance approach that can make Zimbabwe's FPAs achieve their conservation and local communities' livelihoods outcomes.

1.6: Research hypotheses

The main objective of this study was to assess how governance mechanisms influence forest condition and local communities' forest-based livelihoods. It focuses on tenure, access, institutions, rights and decision making and how they influence forest protection, benefit sharing, law enforcement and compliance. The study was therefore premised on and therefore tested a number of hypotheses.

The overall study hypotheses were:

- H_0 : Both historical institutions and current political events and institutions had no influence on protected area forest cover and local communities' livelihoods
- H_1 : Both historical institutions and current political events and institutions had a strong influence on protected area forest cover and local communities' livelihoods

The overall thesis hypothesis was addressed through chapter specific hypotheses that were as follows:

Chapter 2

- H_0: Colonial and post-colonial FPA governance mechanisms did not physically and economically exclude local communities from FPAs and their resources
- H_1: Colonial and post-colonial FPA governance mechanisms physically and economically excluded local communities FPAs and their resources

Chapter 3

- H_0: There is no strong correlation between good governance principles' level of application and forest condition in FPAs
- H_1: There is a strong correlation between good governance principles' level of application and forest condition in FPAs

Chapter 4

- H_0: There is no correlation between land cover change, governance type and time in FPAs
- H_1: There is a strong correlation between land cover change, governance type and time in FPAs

1.7: Methodological approaches and techniques

The richness and multifaceted nature of governance make it difficult to reduce it to a few simple parameters and indicators of study. These are however required to understand, evaluate, report on it and make it as effective as possible for conservation and equity (Borrini-Feyerabend et al. 2013). To address all the study objectives and test hypotheses, both quantitative and qualitative methods and techniques of data collection and analysis were employed. The data collection techniques included review of published and grey literature, analysis of remote sensed (RS) images, key informant interview and questionnaire surveys. Interview and literature based qualitative data were analysed mainly through content and thematic techniques. Image based data were analysed using GIS whilst all other quantitative data were subjected to various statistical tests using SPSS.

More specifically, basing on the objective that was to be achieved and the hypothesis to be tested, each chapter required specific type of data, collection and analysis methods. Chapter 3 that explored the concept of physical and economic exclusion of communities from FPAs and their resources in the long term historical trajectory of forest governance in Zimbabwe relied mainly on published and grey literature data sources. Literature reviewed included conference papers, journal articles, FC reports and management obtained from FC archives in Bulawayo, internet database searches and by contacting some of the authors through research gate. The qualitative data obtained was analysed using the discourse thematic method and the results were organised according to governance type, historical period and form of community exclusion and associated outcomes. Chapter 3 that assessed the application of good governance principles combined data from the literature, key informant interviews of purposively sampled FC authorities and local community 'experts' who provided perception based measures of

governance quality and forest condition at different historical periods. Perception-based forest condition was assessed using density and species diversity indicators on a four-point Likert scale and this was complemented by forest officers' specific forest inventory reports. The qualitative governance indicators were converted to a quantitative scale where the resultant scores were aggregated to determine the desirability of the governance quality per each historical period. Governance quality and time as well as forest condition and governance quality scores were graphically presented to determine the association of the variables.

Chapter 4 investigated the correlation between governance and land cover/use change. Data on landuse/cover change was generated from the analysis of Landsat imagery that were produced in the years 1984, 1993, 2004 and 2013 covering the 6 study forests. FPA governance data was obtained and analysed as per the governance data for chapter 3. The Kolmogrov-Smirnof test was used to test data normality, Tukey post hoc test was carried out to determine the statistical difference in governance amongst the time periods under study whilst a bivariate ANOVA was used to establish the statistical significance of the correlation between governance and land cover change. Lastly, chapter 5 that explored contemporary governance resorted mainly to governance questionnaire data complemented by key informant and focus group interviews. The 3 pillar and 4 principles framework for governance assessment and monitoring developed by the World Bank/Profor and FAO was adopted. To assess the practical activities and actions carried out by FPA actors Secco et al. (2013)'s local level governance indicators were adopted with some modifications to suit the studied forests sites and context. Descriptive statistics were employed to analyse questionnaires whilst thematic discourse analysis was used to analyse qualitative interview data.

1.8: Note to the reader

This is a paper-based thesis and therefore it is structured in a paper format whereby chapters 2 to 5 constitute papers that have been prepared for submission to different journals. They have therefore been formatted according to the requirements of the target journals. Each of the papers however addresses particular aspects of FPA governance and their forest condition and livelihoods outcomes as partial fulfillment of the overall objective of the study which was to assess how governance mechanisms influence forest condition and local communities' forest-based livelihoods. Chapter 2 examines the concept of community exclusion and traces its forms and manifestations throughout the historical trajectory of FPA governance in Zimbabwe. Chapter 3 examined the application of governance principles in 6 FPAs to determine the quality of

governance at different historical periods and its correlation with forest condition. Chapter 4 analysed FPAs land cover change using remote sensed imagery to establish the correlations amongst forest loss, governance quality, presence or absence of forest inhabitants in FPAs and time. Chapter 5 focused on measurement of contemporary governance to establish its current status and quality. Lastly, Chapter 6 discusses the research findings in the context of governance concepts of tenure, power, institutions and rights indicating the contribution of the thesis to the existing body of knowledge on these concepts. It ends by providing conclusions about the entire thesis and the challenges encountered in carryout the study. Since the chapters are written as standalone papers, there are some overlaps in their introductions and methodology sections. Although the manuscripts have been co-authored, I was the primary author who came up with the thesis idea, formulated the hypotheses, designed the methodology, collected and analyzed the data, presented the results and drafted all the chapters with the co-author, Prof. J. Gambiza as my academic supervisor.

1.9: References

Acharya, K. P., Adhikari, J. and Khanal, D. R. 2008. Forest tenure regimes and their impact on livelihoods in Nepal. *Journal of Forest and Livelihood,* 7(1), December, pp 5-18.

Agrawal, A. 2007. Forests, governance, and sustainability: Common property theory and its contributions. International Journal of the Commons 1(1): pp 51-76.

Andrade, G. S. M. and Rhodes, J. R. 2012. Protected areas and local communities: an inevitable partnership toward successful conservation strategies? *Ecology and Society* **17**(4): 14. http://dx.doi.org/10.5751/ES-05216-170414.

Borrini-Feyerabend, G., N. Dudley, T. Jaeger, B. Lassen, N. Pathak Broome, A. Phillips and T. Sandwith (2013). *Governance of Protected Areas: From understanding to action*. Best Practice Protected Area Guidelines Series No. 20, Gland, Switzerland: IUCN. xvi + 124pp.

Botkin, D. B. 2012. No Man's Garden: Thoreau and a New Vision for Civilization and Nature. Croton River Publishers, New York.

Brockington, D. and Wilkie, D. 2015. Protected areas and poverty. *Philosophical Transactions of the Royal Society B,* 370: 20140271. http://dx.doi.org/10.1098/rstb.2014.0271.

Cavanagh, C. J. 2015. Protected area governance, carbon offset forestry, and environmental (in)justice at Mount Elgon, Uganda. DEV Reports and Policy Paper Series, The School of International Development, University of East Anglia, UK.

Chingarande, S. D. 2010. Gender and Livelihoods in Nyabamba A1 Resettlement Area, Chimanimani District of Manicaland province in Zimbabwe. Working paper 5, Livelihoods after Land Reform in Zimbabwe, Ruzivo Trust, Harare.

Contreras-Hermosilla, A. 2011. People, governance and forests: The stumbling blocks in forest governance reform in Latin America. *Forests* 2: pp 168–199.

Conservation Measures Partnership (CMP). 2013. *Open Standards for the Practice of Conservation. Version 3.0 April 2013*, The Conservation Measures Partnership. www.conservationmeasures.org/wp-content/uploads/2013/05/CMP-OS-V3-0-inal.pdf

Dudley, N. 2008. *Guidelines for Applying Protected Area Management Categories*, IUCN, Gland.

Dudley, N. and Phillips, A. 2006. Forests and Protected Areas: Guidance on the use of the IUCN protected area management categories. IUCN, Gland, Switzerland.

Editorial, 2015. Tropical Forest Update: A news letter from the International Tropical Timber Organisation to promote the conservation and sustainable development of tropical forests, Vol. 24 (4): pp 1-2.

FAO. 2007. The management practices for the protection of forest reserves: The case of Kalahari sand teak forest reserves in western Zimbabwe. Forest management working paper FM/31. Forest Resources Development Service, Forest Management Division. FAO, Rome.

Food and Agriculture Organization of the United Nations (FAO) 2011. *Reforming Forest Tenure: Issues, Principles and Process, FAO Forestry Paper 165.* Rome: Food and Agriculture Organization of the United Nations.

Galik, C. S. and Jagger, P. 2014. Bundles, Duties and Rights: A revised framework for analysis of natural resources property rights regimes. Duke environmental and energy economics working paper series, Working paper EE 14-08.

Graham, J., Amos, B. and Plumptre, T. 2003. Governance principles for protected areas in the 21st century, Paper prepared for the Fifth World Parks Congress, Durban, South Africa, Institute of Governance, Ottawa.

Hitt, M. A., Black, S. and Porter, L. W. 2011. 'The nature of management', in A. Jayawardana (ed.) *Management and Organisations*, pp. 4-28, Pearson Australia, Sydney.

Hobbs, R. J., Higgs, E. and Harris, J. A. 2009. Novel ecosystems: Implications for conservation and restoration. *Trends in ecology and evolution,* Vol. 24 (11): pp 599-605.

IUCN, 1994. Guidelines for Protected Area Management Categories. IUCN and the World Conservation Monitoring Centre, Gland, Switzerland and Cambridge, UK.

Kwashirai, V. C. 2008. Poverty in the Gwaai Forest Reserve, Zimbabwe-1890-1953. *Global Environment,* 1: pp 146-175.

Laurent, C., Baudry, J., Berrier-Solliec, M., Kirsch, M., Perraud, D., Tinel, B., Trouve, A., Allsopp, N., Bonnafous, P., Burel, F., Carneiro, M. J., Giraud, C., Labarte, P., Matose, F. and Ricroch, A. 2009. Why should we care about evidence-based policy? *MPRA* paper No. 27073, https://mpra.ub.uni-muenchen.de/27073/ .

Lockwood, M., Mitchell, M., Moore, S. A. and Clement, S. 2014. Biodiversity governance and social-ecological system dynamics: Transformation in the Australian Alps. *Ecology and Society* 19(2): 13. http://dx.doi.org/10.5751/ES-06393-190213.

Loon, R. M. and Polakow, D. 2001. Ecotourism Ventures. Rags or Riches? *Annals of Tourism Research* 28 (4): pp 892 – 907.

MA. 2005. *Ecosystems and human well-being: Synthesis*. Island Press, Washington, DC.

Macura, B. 2016. Measuring the effectiveness of conservation governance, policies and programmes in forest protected areas. Unpublished PhD thesis, Bangor University, United Kingdom.

Mansourian, S., Belokurov, A. and Stephenson, P. 2009. The role of forest protected areas in adaptation to climate change. *Unasylva 231/232,* Vol. 60: pp 63-69.

Maravanyika, S. 2012. Local responses to colonial evictions, conservation and commodity policies among Shangwe communities in Gokwe, North-western Zimbabwe, 1963–1980. *African Nebula*, Issue 5, pp 1-20.

Mathur, V. B., Onial, M. and Mauvais, G. 2015. 'Managing threats' , in G. L. Worboys, M. Lockwood, A. Kothari, S. Feary and I. Pulsford (eds) *Protected Area Governance and Management*, pp. 473-494, ANU Press, Canberra.

Matose, F. 2007. Trends in forest ownership, institutional arrangements and the impact on forest management and poverty reduction. Programme for land and agrarian studies, University of the Western Cape, South Africa.

Matose, F. 2002. Local people and reserved forests in Zimbabwe. What prospects for co-management? Unpublished PhD thesis, University of Sussex, UK.

Matose, F. 2011. Nature, villagers and the state or capital: Quotidian politics from protected areas in Zimbabwe. Paper presented at the ISS Conference on Questioning the Market Panacea in Environmental Policy and Conservation, 30 June – 02 July 2011, The Hague.

Mayers, J., Morrison, E., Rolington, L., Studd, K. and Turrall, S. 2013. *Improving governance of forest tenure: a practical guide.* Governance of Tenure Technical Guide No.2, International Institute for Environment and Development, and Food and Agriculture Organization of the United Nations, London and Rome

Mincy, G. A. 2014. Managing the Anthropocene. Centre for Stateless Society, USA.

Mudekwe, J. 2007. Management practices for the protection of forest reserves: The case of Kalahari sand teak forest reserves in western Zimbabwe. Forest Management Working Paper FM/31 Forest Management Division, FAO, Rome.

Murombedzi, J. C. Undated. Policies to support local management of natural resources. IUCN, Harare.

Mutekwa, V. T. and Gambiza, J. 2016. Assessment of governance principles application in forest protected areas: The case of six state forests in western Zimbabwe. *International Forestry Review*, Volume 18, Number 4, pp 466-484.

Ntshotsho, P. 2012. Towards evidence-based ecological restoration in South Africa. Unpublished PhD dissertation, Stellenbosch University, South Africa.

Ostrom, E., and Hess, C. 2007. *Private and Common Property Rights.* Bloomington, IN: Social Science Electronic Publishing Inc.

Paris Agreement, 2015. Paris Agreement on Climate Change, COP 21, 30 November to 11 December 2015, Paris, France.

Peres, C. and Palacios, E. 2007. 'Basin-wide effects of game harvest on vertebrate population densities in Amazonian forests: implications for animal mediated seed dispersal', *Biotropica* 39: 304-15.

Pfeil, V. and Sepp, C. 2008. *Forest governance in a rapidly changing world.* GTZ, Eschborn, Germany.

Rangan, H. 1997. "Property vs. Control: The State and Forest Management in the Indian Himalaya." *Development and Change* 1:71–94.

Ribot, J. C. and Peluso, N. L. 2003. A theory of access. *Rural Sociology* 68 (2), pp 153 – 181.

Salafsky, N., Margoluis, R., Redford, K. H. and Robinson, J. G. 2002. Improving the practice of conservation: A conceptual framework and research agenda for conservation science. *Conservation Biology* 16: pp 1469–1479.

Schlager, E., & Ostrom, E. (1992). Property-Rights Regimes and Natural Resources: A Conceptual Analysis. *Land Economics,68,* 249-262. http://dx.doi.org/10.2307/3146375.

Siry, J. P., McGinley, k., Cubbage, F. W. and Bettinger, P. 2015. Forest tenure and sustainable forest management. *Open Journal of Forestry,* 5, pp 526-545.

Sutherland, W. J., Pullin, A. S., Dolman, P. M. and Knight, T. M. 2004. The need for evidence-based conservation. *Trends in Ecology and Evolution* Vol.19: pp 305-308.

Tucker, C.M. 2010. Learning on governance in forest ecosystems: Lessons from recent research. *International Journal of the Commons,* Vol. 4 (2): pp 687-706.

Weiland, S. and Dedeurwaerdere, T. 2010. Change in forest governance in developing countries – in search of sustainable governance arrangements. *International Journal of the Commons.* 4(2): pp 683–686.

Worboys, G. L. (2015) 'Concept, purpose and challenges', in G. L. Worboys, M. Lockwood, A. Kothari, S. Feary and I. Pulsford (eds) *Protected Area Governance and Management*, pp. 9-42, ANU Press, Canberra

Chapter Two

Forest protected areas governance in Zimbabwe: Shift needed away from a long history of local community exclusion

This chapter is in press as: Mutekwa, V. T. and Gambiza, J. Forest governance, conservation and livelihoods: Shift needed away from a long history of local community exclusion. *Journal of Environmental Management* - Elsevier.

2.1: Introduction

Forests provide ecosystem services that are important for human well-being (MA, 2005) particularly in developing countries' rural areas. To sustain these ecosystem services and conserve biodiversity, forest protected areas (FPAs) have been established in many tropical countries dating back to the early years of colonialism (Hall *et al.*, 2011; Hansen and Lund, forthcoming). This governance instrument favoured commercial timber production and forest protection whilst closing up forests from local inhabitants (Rantala, 2013; Brockington and Wilkie, 2015). Exclusion, which according to Hall *et al.* (2011) is the different ways in which people are prevented from benefiting from such things as land and its resources has been a common feature of Zimbabwe's FPA governance during the colonial and post-colonial periods. It has however vacillated over time. During the colonial period, it took the form of physical exclusion through evictions, denial of economic benefits through illegitimating commercialization of forest products by local communities and denial of access to even basic livelihoods requirements such as harvesting of construction timber. The post-colonial period particularly in the 1990s onwards, evictions were scaled down and access to basic livelihoods requirements such as thatching grass, grazing and fuel wood was allowed. However, commercialization of forest products by local communities and sharing of benefits such as income generated from forestry enterprises through cash dividends or investment in social services and infrastructure remained a pipe dream to local communities. The exclusion of local communities from accessing resources from FPAs stemmed from the now disputed idea of pristine ecosystems that could be preserved only if segregated from human presence and use (Adams and Hutton, 2007). Social inequality and exclusion of local communities from accessing

and controlling forest resources and benefits are common problems in FPAs (Uprety *et al.*, 2012). People have been displaced and/or denied access to resources by the establishment of FPAs causing poverty amongst local communities (Holling and Meffe, 1996; Kwashirai, 2008; Brockington and Igoe, 2006; Brockington and Wilkie, 2015). In Zimbabwe, the centralised government-led FPA governance system is still seen as essential in sustaining FPAs and making them contribute towards provision of socio-economic and environmental goods and services. Whilst the effectiveness of FPAs in achieving conservation goals is debatable (Campbell *et al.*, 2008, Laurance *et al.*, 2012), it is their impacts on local communities' livelihoods that most criticism of these exclusionary governance systems has been directed at in recent decades.

The heightened debate on the relationship between conservation and development drew attention to the negative human impacts of protected area conservation systems that marginalise and impoverish local communities through human displacement and restrictions on access to resources imposed through regulatory frameworks (Holling and Meffe, 1996; Coad *et al.*, 2008; Agrawal and Redford, 2009; Uprety *et al.*, 2012). Besides impoverishing local communities and creating conflicts, the governance system that determines who enjoys which use and access rights to particular forest resources also constitutes a major underlying cause of forest depletion, degradation and loss (Stellmacher, 2007). Research is therefore needed on the exclusion of local communities from accessing resources from FPAs since the early colonial period to better understand the different forms, mechanisms, causes and outcomes of local communities' exclusion from FPAs.

2.2: Conceptual aspects of exclusion

Exclusion is a complex and multi-dimensional process involving denial of access to resources, rights, goods and services and the inability to participate in the activities available to other stakeholders in a society (De Haan, 1998; Khadka, 2009) (Figure 2.1). Hall *et al.* (2011) stated that exclusion is simply the different ways in which people are prevented from benefiting from things such as land and its resources. Framing exclusion in terms of prevention from ability to benefit (access) goes beyond the focus on rights alone and therefore its solution is not just inclusion through provision of ownership-type property rights to forests (Myers, 2012). Myers (2012) pointed out that exclusion is not also just the opposite of access since it involves issues of conflict, contention and power relations among the different stakeholders.

According to Ribot and Peluso (2003), exclusion is intimately associated with 'access', which 'is about all possible means by which a person is able to benefit from things' and therefore

is more akin to a 'bundle of powers' than to a 'bundle of rights, as espoused by Schlager and Ostrom (1992) in the notion of property. The concept of access presented by Ribot and Peluso (2003) focuses on issues to do with who gets to enjoy some kind of benefit or benefit stream from 'things', in what ways and under what circumstances. Within the context of diverse FPA resources as the 'things' in question, there is a range of powers embodied in and exercised through various mechanisms, processes and social relations that affect people's ability to benefit from them. The nature of power and forms of access to resources shift over time because people and institutions are positioned differently in relation to resources at various historical periods and geographical scales. This means that people have more power in some relationships than in others or at some historical moments and not others. Also different political-economic circumstances change the terms of access and may therefore change the specific individuals or groups most able to benefit from a set of resources. The analysis of access therefore requires the identification and mapping of the flow of benefits of interest, mechanisms by which different actors involved gain, control and maintain the benefit flow and its distribution, an analysis of power relations underlying the mechanisms of access involved in instances where benefits are derived (Ribot and Peluso 2003). In analysing access to FPA resources, we firstly identified the particular benefits that can be derived from them, the policy environment that enable and disable different actors to access resources and then the mechanisms by which community members and institutions gain, control and maintained access at different historical times.

The power relations that structure and shape the operation of exclusion from FPAs are found in four interwoven and mutually reinforcing domains: regulation, force, market and legitimation (Hall *et al.,* 2011; Akram-Lodhi, 2012) (Figure 2.1). Regulation refers to the rules that determine FPAs' ownership, their boundaries, acceptable land uses within their boundaries and conditions under which the FPAs and their resources can be accessed (Hall *et al.,* 2011). In Zimbabwe's FPAs, regulation is mainly carried out by the state and implemented by the Forestry Commission (FC). Our study analysed the regulatory framework, its implementation mechanisms and varying levels of its effectiveness. Force excludes local communities through various forms of sanctions which can involve violence or threats of violence. Force is usually applied by FC officials, forest protection guards, state security members who are occasionally requested to assist with squatter eviction and management of poachers in FPAs. Force is also used by the local communities through starting of forest fires (arson) and encroachment into FPAs for settlement and agriculture. Real confrontation and violence may not be common in FPAs, but force can be quite effective even if it is implied without being used. Markets exclude through pricing or the cost of acquiring permits to access FPA resources or leases to utilise forest

land for example for grazing purposes. These determine who has access to FPAs and their resources and who cannot. The value of some key forest resources such as hardwood timber is critical in the understanding of exclusion dynamics (Hall *et al.*, 2011). Lastly, legitimation relates to the moral basis for justifying exclusion, entrenching regulation, market and force as acceptable bases for exclusion. Legitimation is therefore of vital importance for supporting different forms of exclusion in FPAs.

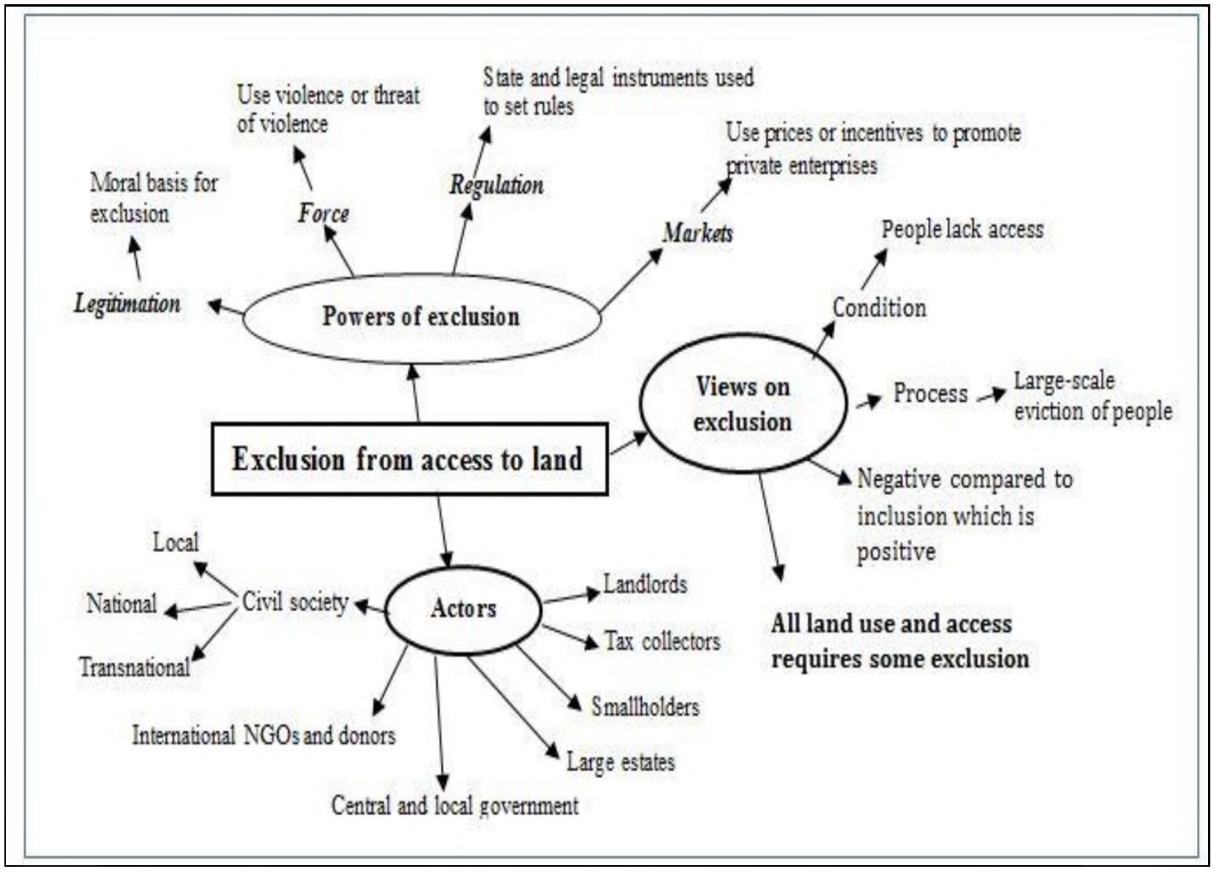

Figure 2.1: Hall *et al.*'s (2011) conceptual framework of exclusion from access to land. Bold text is Hall *et al.*'s (2011) argument which underpins the conceptual framework.

Regulation, legitimation, force and market constitute the mixture of the power elements that are usually deployed by the FPA actors in seeking to exclude and to which the excluded must respond to (Hall *et al.*, 2011). Whilst these powers do not provide the whole picture about how FPA land and its resources are accessed, they provide a sound basis for understanding local communities' access and exclusion from FPAs. Additionally, the actors' interests or goals are critical in determining the type and severity of exclusion in FPAs. Interests are difficult to

observe but they can be inferred by observing the behaviour of the stakeholders (Schusser *et al.*, 2015). They can be ecological, social, economic or a combination of different types of interests. Interests influence the actions of individuals and groups of actors. We examined in our paper the interests and power that actors seeking to exclude others deploy and mechanisms that prevent local communities from deriving meaningful benefits from FPAs and the intricate problems that follow from these.

The powers and mechanisms that determine access to FPAs resources or lack of it result in different forms of local community exclusion. Exclusion can be in the form of physical or economic displacement. Physical displacement or eviction is the involuntary removal of people from their homes and homelands to give way to conservation whilst economic displacement entails restrictions that make it hard to pursue a livelihood (Cernea and Schmidt, 2003; Brockington and Wilkie, 2015). Cernea (2005) collectively defined physical and economic displacement as restrictions on the use of resources imposed on people living outside a protected area, or on those who continue living inside a protected area, during and after implementation leading to loss of assets and income sources or means of livelihood whether or not the affected person has been relocated to another area. The loss of access to important natural resources has been found to be associated with landlessness, loss of identity, increased morbidity, mortality and marginalisation (Cernea and Schmidt, 2003). This is associated with people that lack political power to fight or defend their entitlement.

Local people are excluded from accessing or benefiting from resources in FPAs through fencing, posting guards or through signs and associated sanctions (Hall *et al.*, 2011). The state through the FPA management agency may deprive local community members opportunities to participate in and influence decision making processes and actions pertaining to access and use of FPA resources (Lockwood, 2010). By excluding local communities from decision making, the governing agency is deprived of diverse perspectives that may lead to better solutions to complex resource management problems. In the field of conservation, the effects of local communities' exclusion include violation of peoples' rights, displacement, conflicts, poverty and resource depletion and loss. Our study focussed on the forms of local community exclusion during the pre- and post-colonial periods and their implications on livelihoods, forest conservation and the relationships between forest officials and local communities.

In Zimbabwe, the colonial (1890-1980) and post-colonial (1980-to present) FPA governance regimes have dispossessed, alienated and impoverished local communities (Matose, 2011). We argue that few scholars have studied the different forms of local communities exclusion associated with colonial and post-colonial forms of FPA management and governance

practices. Also most research on forest governance takes an ahistorical approach that blinds it from many governance issues that can inform current and future arrangements for improved conservation outcomes. The governance of natural resources should not ignore the historical context because the 'ghost of history' may affect current and future forest governance arrangements (Gunderson and Holling, 2002; Hulse, 2007). In this paper, we explored FPA conservation based exclusions, citing examples of specific forests where exclusion events and processes have been strikingly clear.

This paper is structured in such a way that after this introduction follows the methods of data collection and synthesis section, then an exploration of the different forms of exclusion in FPAs at selected historical times (early colonial period: 1890 to 1929; era of FPAs establishment: 1930 to 1979), current counter-exclusion period: 2000 – to present) and finally the conclusion marks the end of the paper.

2.3: Materials and methods

2.3.1: Study context

Zimbabwe has a forest endowment of about 800 000 hectares of forest protected land the bulk of which is in Matabeleland north province in north-western Zimbabwe (Figure 2.2). The forests are endowed with rich flora and fauna biodiversity. The dominant vegetation types include *Colophospermum mopane, Acacia,* Miombo, *Terminalia/Combretacea and Baikiaea* woodlands White, 1983). They also have large populations of most indigenous mammals that include the big five (African Elephant, Lion, Leopard, Buffalo and Rhino) among others as well as fish in the warm waters of Kavira and Sijarira forests (Forestry Commission, 2006). The north-western FPAs are underlain by infertile and highly drained Aeolian deposited Kalahari sands and their continued existence safeguard these endemic ecosystems from degradation (Timberlake and Chidumayo, 2011). The forests receive low and highly variable annual rainfall ranging from 300 mm to 600 mm (Vincent and Thomas, 1960). The rich biodiversity and the harsh environmental conditions of poor soils and low rainfall make the resources in FPAs important sources of livelihoods for the poor and marginalized communities in and around the forests who depend on subsistence agriculture and exploitation of natural resources for survival (WWF, 2012).

The FPAs are owned, controlled and managed by the state through the Forestry Commission's Conservation and Extension Division. This is a statutory body established through the Forest Act chap 19:05 with the authority to control, protect and manage FPAs in line with the provisions of the Act and forestry policy. This framework of central control over forests was

established during the colonial period and has remained so even after independence in 1980. The establishment of FPAs ruptured many of the forest resource rights of local communities as state law subordinated local customary laws (Rantala, 2013). There has been significant inertia in the forest sector over the years to shift from the centralised control to embrace community participation despite international decentralisation trends since the 1980s and devolution in related sectors such as wildlife management under the Parks and Wildlife Authority. This has maintained the shortcomings of centralised FPA control rooted in the forest sector leading to failure to create meaningful benefits for the poor local communities.

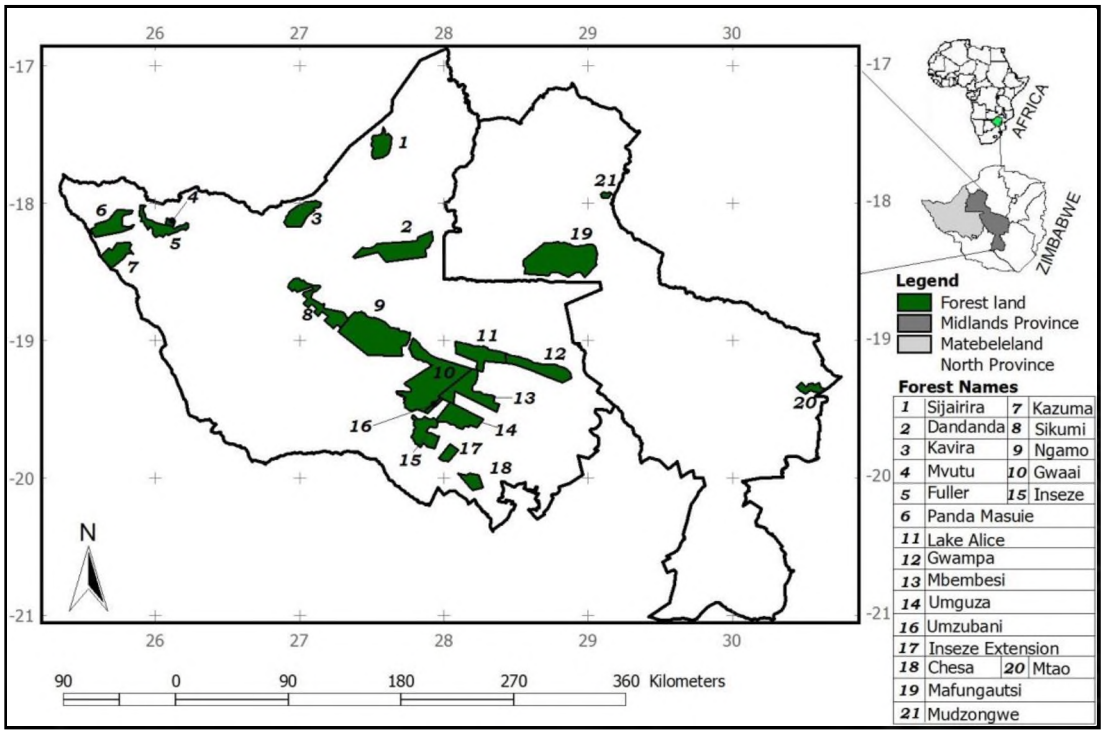

Figure 2.2: Forest protected areas in north-western Zimbabwe. (Forestry Commission 2006)

2.3.2: Methods

The paper focuses on local community exclusion in indigenous FPAs in Zimbabwe. It cites specific forest information to exemplify broad patterns emerging from the analysis. This study draws from literature on forest governance and management because there is a close association between governance and management (UNEP, 2002). Lockwood (2010) argues that since effective governance is a prerequisite for effective management, the distinction between governance and management is somewhat blurred and therefore, literature relating to both

concepts complements each other. We reviewed literature that included conference papers, theses, book chapters, journal articles, FC reports and management plans. For published sources, we undertook database searches using key words related to the study: FPAs, history of PA management and governance, exclusionary PA management and governance regimes and FPA governance outcomes. The online databases used in the search were Scopus, Science index, Social Sciences Research Network, Digital library of the Commons and Directory of Open Access Journals. We obtained some articles by contacting the authors through Research Gate. We employed the snowball technique where an article we found led to the next until we could not find additional literature (Shackleton *et al.,* 2015). Unpublished historical forest governance and management documents (grey literature) were obtained from the FC's archives.

2.3.3: Data analysis

We employed discourse thematic analysis methods and procedures (Braun and Clarke, 2006) to categorize the forms of community exclusion that were highlighted and implied in the published literature we reviewed. Grey literature was analysed to assess the FC's main ideological orientation, perceptions of exclusion and causes of its persistence. We adopted and applied O'Laughlin (1998)'s recommended approach that to use grey "materials well, we must recognize key words and interpret both messages and silences as part of the socially constructed institutional discourses." The results were organized according to governance type, historical period, and form of community exclusion and associated outcomes. However, the different forms of exclusion identified could not distinctively be categorised due to their interlinkages and overlaps.

2.4: Results and Discussion

2.4.1: The early colonial period (1890 - 1929): Laying the foundation for community exclusion

Before colonialism, forests in north western Zimbabwe were inhabited and managed by local communities under the common property regime with their own set of rules and systems that determined forest access and use (Anderson *et al.,* 2015). Forests such as Gwaai, Mbembesi and Gwampa were inhabited by the Ndebeles while Kazuma, Fuller and Pandamasuie were inhabited by the Tonga people. Traditional leaders and spirit mediums were the custodians of the land and its resources. The forests used to provide a diverse range of livelihood supporting resources to the local inhabitants.

After the establishment of colonial rule in 1890, the colonial authorities began by carrying out universal land-use planning that categorised land into white and African areas, national parks, forests and game reserves as a basis for introducing rational and scientific management, and as an instrument of state control (Kwashirai, 2008). In 1898 the colonial government enacted Land Ordinances that saw the establishment of the African reserves starting with the Gwaai and Shangani 'Native' Reserves where many Ndebele people were resettled. This necessitated forest assessment for its commercial value and conservation culminating in Blocker's (1898) localised Gwaai-Umguza area and Sim's (1910) nation-wide surveys. Both survey reports identified marketable tree species and demonstrated the significance and economic potential of indigenous forests in north-western region of Zimbabwe for the establishment of a timber industry. The failure by these surveys and subsequent studies to demonstrate the social and economic significance of the forests to local communities constituted one of the factors that led to the physical and economic displacement of locals from the forests. The reports implied that the forests and their resources were of no value to locals and therefore they had to give way to valuable commercial timber extraction enterprises. Commercial timber extraction by companies such as the British South Africa Company (BSAC), Rhodesia Native Timber Concessionaires (RNTC) and the Matebele Timber Trust began in hardwood-rich forests such as Gwaai and Ngamo immediately after the surveys had been completed..

Besides timber extraction for international trade, the harvesting of all types of trees was also accelerated by the growth of the mining and agricultural industries that depended exclusively on timber and wood fuel due to the absence of hydroelectric power (Kelly-Edwards, 1938). In the early 1890s, commercial timber harvesting was not regulated resulting in excessive extraction employing wasteful techniques that led to deforestation, forest degradation, soil erosion and threats to conservation of water resources. The desire to arrest the emerging environmental problems saw colonial administrators putting in place conservation measures to protect the dwindling forests and to combat land degradation (Schroeder, 1999). This led to the appointment of the first forest officer in 1920 and the creation of the state funded Forestry Department. In 1924, a policy statement was presented by J.S. Henkel, the country's first forest officer that called for the establishment of forest reserves, provision of funds for protection and for the supervision of timber harvesting which was supposed to be done on a sustained yield basis (Mudekwe, 1996). The policy was accepted and in 1929, forestry laws were promulgated in the form of the Native Reserves Forest Produce Act (Chapter 115) and the Forest Herbage Preservations Act. The policy, laws and appointment of the forest officer dismantled and/or ignored the traditional community governance regime in favour of a centralized forest

administration system that focused on commercial forest exploitation, conservation and creation of forest reserves.

2.4.2: Era of FPAs establishment: The community exclusion madness period (1930 – 1979)

The 1930 Land Apportionment Act saw the first forests, Gwaai and Ngamo being gazetted. The majority of the forests were gazetted between 1940 and 1954 under various amendments to this Act. The current forest legislation, the Forest Act (Chapter 125) of 1948 and its subsequent amendments gave birth to the FC in 1954. The last revision of the extent of the various forest reserves was made in 1969 describing the area of the protected forests totalling 847 419 hectares (Mudekwe, 2007). Since then, forest ownership changed from traditional common property to protected forest reserves characterised by state ownership and management, under which other stakeholders including local communities, depending on use objectives, would or would not be permitted access (Katerere, 2000).

The Forest Act bestowed the ownership and management responsibilities of state forests to the FC. The FC's administrative structure from national to local level excluded local people and their institutions. The Forest Act governed access to all forest resources on forest land. These forest sector laws and policies had in-built inequality that excluded local communities from the governance of forests. The laws legitimised state control of indigenous forests. They gave power to the FC to protect state forests and regulate their use. Sections 78 – 85 of the Forest Act stated the various forest related offences and penalties. The Act authorized the police and forest officials to confiscate forest produce they suspected to have been wrongfully acquired and to arrest the person found in possession of such produce (Makonese, 2008). The control of local people's access and use of forests through the provisions of these laws was the beginning of exclusion which persisted even after colonialism since the Forest Act remained hugely unchanged. The laws were designed to benefit the state in collusion with white capital whilst excluding the basic rights of local communities to access forest resources and participate in their governance (Matose, 2011; Chomba *et al.,* 2015). The local communities had no power or influence over decisions regarding the governance of FPAs including inputs into rules of access and disposition of products (Dressler *et al.,* 2015).

These state laws replaced traditional forest governance institutions that the locals were familiar with. The forest policy and laws focussed on commercial forestry. Forest resources were accessed through licenses and permits issued by the FC. Since the colonial government's interest was to exploit resources for economic gain and to meet the timber requirements of European

markets, licences were granted to colonial companies such as the British South Africa Company, Rhodesia Native Timber Concessionaires and the Matebele Timber Trust. The revenue that was generated went to the individual companies and the state. The FC enforced these polices through patrols by members of the forest protection unit that was formed to monitor all illegal activities including settlements and collection of non-timber forest products (NTFPs) by locals without permits. Utilisation of resources by local communities without permits became illegal and offenders were penalised through fines or imprisonment.

The forest governance arrangements under the Forest Act and other colonial legislation vested all decision making authority in the state. The FC had no legal obligation to inform or consult other stakeholders when making governance decisions on state forests. Colonial authorities introduced land-use planning that brought about transformation from traditional knowledge systems to scientific natural resource management that privileged knowledge held by forest professionals and other experts. External consultants were hired to assess the suitability of land for different uses leading to the apportionment of land into white and African areas, national parks, forest and game reserves as a basis for introducing 'rational and scientific management' (Kwashirai, 2008). Local communities were not consulted during these ecological inventories, mapping and other forest research activities. The FC perceived local communities as unable to effectively participate in forest governance activities. They found inclusion of locals as serving no real purpose and tended to down play their potential contributions to forestry activities (Agarwal, 2001). The FC regarded the locals' traditional forest management practices as unscientific and at worst as detrimental to forest conservation (Khadka, 2009).

Western experts produced scientific reports that ignored the NTFPs that local communities derived from the forests. Forest assessment focused on timber resources for commercial purposes. This saw forests being measured, demarcated and protected to this day (Ojha *et al.,* 2008). The ecology of individual tree species, rate of regeneration, growth, flowering and seeding under specific soil, moisture and light conditions were used to model growth rates and possible responses to different management conditions as reported by other workers (Gambiza *et al.*, 2005; Hansen and Lund, *Forthcoming*). This was done to ensure the perpetual existence of a forest estate and a sustainable production of timber.

From the 1930s to late 1990s, the permanent sampling plots (PSP) programme was implemented in Gwaai, Gwampa, Kazuma and Fuller forests to provide scientific knowledge for estimating and predicting the productivity of economically valuable tree species. In tandem with PSPs were Strict Natural Reserves (SNRs) for *in-situ* gene conservation and Permanent Increment Plots (PIPs) for tree species growth modelling. The thrust on standardised forest

inventories aimed at sustained yield of commercial timber excluded local forms of experience–based knowledge and in turn excluded the locals from decision making on FPA management matters (Nightingale, 2005). Foresters believed that local communities were ignorant about conservation and that their activities such as livestock grazing caused erosion and reduced woody seedling generation and thereby damaging the forest biodiversity. The role of livestock in reducing fuel loads was ignored in forest fire management (Gambiza, 2001). Foresters during the colonial period lacked understanding of indigenous forest governance practices. They disregarded indigenous knowledge systems such as taboos, customs and rules of use and access and sacred forests where resource extraction was strictly controlled. Indigenous knowledge remained marginalized during the post-colonial period.

The Land Apportionment Act and the Forest Act were very clear about the need to physically exclude the local communities from protected areas for purposes of conservation and commercial logging. Exclusion through evictions was therefore justified by the regulatory framework. The reservation of forests saw the *in situ* inhabitants being evicted to reserves such as the Gwaai and Shangani. Small scale evictions started at the creation of these reserves in the late 1890s. Large scale forced evictions particularly from Gwampa, Gwaai and Mbembesi forests were carried out in the 1940s onwards. For Fuller, Kazuma and Pandamasuie forests, the indigenous inhabitants were driven from their land by the colonial settlers before the forests were demarcated and gazetted. Some indigenous groups moved into Botswana while the Tonga people settled around Victoria Falls.

The FC in 1970 legalised the stay of a few 'forest tenants' so that they would provide labour to the FC and timber millers. Forest tenants' stay in the forests was legalised by annually renewable passes (for moving in the forest) and residential permits whilst their rights to land and grazing were restricted by law and management practices (Judge, 1975; Currey, 2000; Katerere, 2000). The rest of the forest occupants were evicted to 'native reserves'. Some evicted families resisted resettlement in the 'native reserves' and became landless and destitute. The highly unequal power between the colonial authorities and the local inhabitants made the evictions unfair as they occurred without any compensation to loss of property, land and access to livelihood resources that was being experienced by the evictees. The actors reserving the FPAs for conservation did not regard their actions as land grabbing but as protecting land from uncontrolled logging and conversion to agriculture.

Forest tenants were subjected to economic displacement (Cernea, 2005) whereby they were not physically removed from the forests but were restricted from using the land and resources important for livelihood sustenance with negative livelihood-related consequences.

Their physical access to FPAs did not guarantee full access to their resources (Larson *et al.*, 2006). These tenants' socio-economic situation ended up being the same as those that were forcibly physically displaced from FPAs. The loss of houses, land for settlement and agriculture and livelihood forest resources through both evictions and involuntary restriction of access to FPAs resulted in adverse impacts on the livelihoods of the displaced people (Cernea, 2005). Kwashirai (2008) argued that poverty amongst local communities in and around Gwaai forest reserve was to a greater extent a result of this physical and economic displacement of the communities from the forests that had sustained their lives for millennia.

The marginalization of local communities through various exclusionary arrangements led to informal claims to and use of FPA resources by local communities in direct challenge to the laws and FC's management practices leading to intransigent resources conflicts (To *et al.*, 2015) in Zimbabwe's FPAs particularly between FC and locals. Denial of access to resources for basic livelihoods requirements and harassment by forest officials led in some cases to open confrontation between the FC and local communities. For example, in 1993, a major dispute arose between the Gwaai forest residents and FC over the non-issuance of residency permits and attempts by the FC to relocate forest dwellers to the east of Gwaai forest. The dispute was resolved through mediation and negotiation with forest administrators by the Residents Association and the intervention of the Provincial Governor and the ruling party provincial hierarchy. In 1997, the Forester in charge of Gwaai was beaten by a youth from the local community for having fined his mates and for denying their request to clear land for farming in the forest.

Local communities reverted to surreptitious activities such as poaching and arson in protest to the FC for denying them access to forest resources. Some conflicts were based on the use of the term "squatter". Local communities felt the FC officials were the real squatters since they were not born in these forests. Residents argued that they were better placed to manage forests since they had accumulated knowledge over generations than most young foresters who were being deployed to manage the forests for the first time. Other causes of conflicts were confiscation of poached meat, hunting tools like axes, shooting of dogs found in the forest and payment of fines which local residents could not afford. The illegal access of the FPA resources undermined conservation objectives leading to biodiversity depletion, degradation and destruction. Instead of a 'win-win' scenario, a 'lose-lose situation' was the result (Cernea, 2005).

2.4.3: The early post-colonial period: Maintenance of the status-quo (1980 – 1999)

Forest inhabitants had grown significantly by the beginning of the post-colonial period in 1980. They had moved in during the late 1970s when the war of independence intensified and forests became unmanned. The FC embarked on forcible evictions in the late 1980s and 1990s using brutal methods such as burning down forest residents' homes in Gwaai and Gwampa forest areas. Even the settlers that were previously under residents' permit arrangements were evicted. Fuller forest was successfully cleared of *in-situ* inhabitants and remains uninhabited to date. The FC's lack of adequate resources to complete the evictions, intervention by politicians for fear of losing votes and resistance by local authorities to receive the evictees led to evictions being scaled down. Forests such as Gwaai, Mbembesi and Gwampa therefore remained with some *in-situ* inhabitants. The forest inhabitants, however, were still regarded as squatters and were supposed to be evicted under the Forest Act.

In response to participatory forestry approaches that emerged in the 1970s and became a standard forest governance model in developing countries by the 1990s (Lund, 2015), FC adopted in the mid-1990s an 'operating forest policy' whose emphasis was on forestry for the people. This was a form of community or collaborative governance arrangement which the FC adopted to improve the participation of local communities in forest governance and harness their management abilities and knowledge to make FPA resources conservation less disruptive to local livelihoods and more empowering to local people (Brosius *et al.* 2005). Dressler *et al.* (2015) explained community governance as the exercise by local people of power or influence over decisions regarding management of forests, including the rules of access and the disposition of products. The thrust is community empowerment and improvement of livelihoods benefits accruing to the communities.

The 1990s FPA collaborative governance model adopted by the FC coincided with the government's adoption of the Economic Structural Adjustment Programme (ESAP) that resulted in budget cuts to all departments leaving the FC with grossly inadequate operating resources. This necessitated collaborative governance to be in line with international trends and to reduce the costs of forest monitoring and management. The most common and longest existing arrangements involved the harvesting of thatch grass. In Kazuma and Fuller forests, collaborative resource sharing between the FC and communal people started in the early post-colonial period. Thatch grass harvesting in Fuller forest started in 1993 and the major consumers being the FC's Ngamo safaris and Zimbabwe Sun Hotels in the Victoria Falls resort town.

Local communities in Gwaai and Mbembesi forests obtained permits to collect grass from 1997. In Gwaai forest, collaborative arrangements also included firewood sales from 1995 to 1997. Locals were asked to form cooperatives of five to six members and register with the FC to obtain a permit to harvest firewood for sale. Other goods and services locals were allowed to access with minimal restrictions included grazing land, collection of mushrooms and broom grass. Strenuous efforts were made to commercialise some of the NTFPs, for example, thatching grass from Fuller and Kazuma forests was sold to FC's Ngamo safaris and Zimbabwe Sun Hotels whilst firewood from Gwaai forest was sold to firewood merchants from cities such as Bulawayo. The products' livelihoods transformational value was praised by foresters to justify the arrangements and continued community involvement whilst the benefits were not enough to develop the community. Forest managers were also pleased with the schemes since they helped reduce the risk of fire by reducing grass and dead wood fuel loads. The locals were also involved in the monitoring of illegal resource harvesters.

Forest monitoring committees were established as communities participated in joint monitoring of illegal activities. Although this was being done on rotational basis, each member of the community monitoring team was to carry out his/her duties for about 4 hrs/day/week. This did not cost committee members time and effort only, but strained their relationships with other members as they were accused of working with FC to deprive other local community members from extracting livelihood resources from FPAs. Members of the monitoring committee were also carrying out these duties without being remunerated as was happening to members of FC forest protection unit.

The governance arrangement, however, fell short of its objectives of equitably distributing social and economic benefits to local communities. As the ultimate authority in forest management, the FC maintained its dominance in decision making by determining the composition of the committees and had the final say on the harvesting and sharing of NTFPs and overall management of the forests. Local communities realised that they were not playing a significant role in decision making concerning FPA activities. They realised that the arrangements had been promoted to make the locals assist FC in protecting the forests than to induce sound forest management that improved the livelihoods and development aspirations of their localities (Lund, 2015).

The FC remained the ultimate authority that perpetuated the same old forest management strategy in a disguised manner. The forest management committee members were also not familiar with the standardised professional technical forest monitoring and management requirements such as forest patrols, inventories and management planning that required them to

be literate and numerate and to possess specialist knowledge on procedures of forest management (Green and Lund, 2015). This led foresters to view local community members as people that had no capacity to participate in forest management and therefore forest management planning and implementation remained exclusively the preserve of foresters and conservators.

The collaborative arrangements became short-lived because of four reasons. First, the collaborative governance arrangements were not defined in any forest legislation since the forest legislation remained unchanged. The parties involved were therefore not bound by any legislative instrument leading to their failure to abide by the collaborative rules. Ideally, collaborative forestry should be implemented under a reformed policy, legal and institutional framework (Anderson *et al.,* 2015). Second, both parties failed to fully comply with the rules of the agreement and the strict permit system was re-imposed. For example, in 1997 about 20 households were fined amounts ranging from Z$34 to Z$85 for cutting poles from Gwaai forest without permits. Third, the state institution maintained control of highly valuable resources and activities such as commercial timber logging, wildlife hunting and photographic safaris and forest grazing leases. These generated significant revenue that was channelled to central government with nothing going to local communities. For instance, in 1998 the FC received US$362 430 (about 63% of the total revenue from the forest) from timber sales, US$20 000 from silvicultural fees and US$30 860 from grazing leases in Gwaai forest (Matose, 2011).

The local communities were left to make ends meet with 'leftover' resources (forest products that remain for consumption and use by locals after more powerful stakeholders have taken control over most commercially valuable resources) (Anderson *et al.,* 2015). Leftover resources included thatch and broom grass, mushrooms, edible insects and worms. And fourth, the collaborative arrangements led local communities to incur increased costs through carrying out forest patrols to monitor illegal activities and to fight fires. The costs were higher than the marginal benefits the communities received. The arrangements were therefore in favour of forest protection for the benefit of the state than benefiting the local communities.

Whilst the policy had seemingly shifted in favour of local communities' participation in forest management and benefit sharing, the legislative framework maintained the exclusionist provisions of the colonial era and therefore had little impact on local communities' wellbeing. The foresters continued with their firmly established professional forestry where inventory based management plans constitute the main instrument regulating the relationship between the state and local communities (Mohammed and Inoue, 2014). This confirms Anderson *et al.,* (2015)'s observation that the technical and managerial requirements stipulated by collaborative forestry governance frameworks are often incompatible with local realities and interests. Foresters to date

are still much oriented towards this approach because of the forest authorities' entrenched habits and fear of losing power to forest users and local communities (Lund, 2015).

2.4.4: The period of counter-exclusions (2000 - present)

Several developments occurred on the economic, political and institutional landscapes during this period that had direct and indirect effects on forest resources and their governance. In the year 2000, the government implemented policies and programmes such as the Fast Track Land Reform Programme (FTLRP) and the Indigenisation and Economic Empowerment Programme (IEEP). These triggered a precipitous economic meltdown that reached its crescendo in the year 2008. Many industries folded up forcing hordes of former employees to either enter the urban informal sector or look for settlement and agricultural land on the country side. The land reform programme and the economic challenges saw different groups of people mobilizing and invading white owned commercial farms, conservancies, FPAs and other land uses they deemed illegitimate according to criteria such as social justice or ethnic belonging (Hall *et al.*, 2011).

The FC due to resource shortages was grossly incapacitated to carry out its monitoring and management mandate. The resultant weak monitoring and management of the forests further facilitated easy entry into the forests for settlement, agriculture and extraction of forest resources. During this period, legitimate and illegitimate access to mainly low value FPA resources increased leading to a wide variety of forest products being harvested that are critical to local communities' livelihoods sustenance. Mudekwe (2007) established that in addition to land occupations, local communities extract and use 23 different products from Fula forest. Firewood, building poles, thatch grass and grazing were the most extensively harvested resources. Other commonly harvested products were medicinal plants, wild fruits, edible caterpillars and honey, wood for carving curios, ilala leaves, reeds, bark fibre, broom grass and mushrooms. In terms of the forest products importance for household and economic use women generally allocated higher priority than men to harvesting thatch grass, broom grass, firewood, medicines, ilala and reeds. Men prioritised grazing, construction poles, wood for carving curios, medicines and bark fibre. This resembles a situation where millions of people throughout the world make extensive use of biological resources from protected areas for both subsistence and commercial purposes as a fall back during times of hardships (Shackleton and Shackleton 2003; Grundy and Michell 2004).

The mobilisation and reclamation of land from different owners and uses were legitimized by the need to sustain livelihoods under a dying economy, address colonial injustices

and the failure of the ruling party to fulfil war time promises of equal access to land for all (Ho-Tai and Sidel, 2013) after achievement of independence. Most importantly, it was an unambiguous statement by local communities that a paradigm shift was needed from the exclusionary centralized FPA governance system to a more human centred system where impoverished communities set priorities and make decisions for developing forest resources in order to reduce vulnerability and improve forest conservation locally (Dressler *et al.*, 2015). The most affected forests were Gwampa, Mbembesi and Gwaai forests due to their accessibility and proximity to overcrowded and environmentally degraded communal areas. Forests such as Kazuma and Pandamasuie were not affected by settler inflows due to several reasons. They are located far away from populated areas and they are highly infested with dangerous wildlife species such as elephants, buffalos, leopards and hyenas that make human habitation difficult.

Institutionally, the counter-exclusions period was characterised by contradictory laws and policies. The current Forest Act states that FPAs are owned and managed by the state for conservation and *in situ* human settlements are prohibited. On the other hand, the Forest-based Land Reform Policy of 2004 allows for the regularization of settlements in FPAs. This co-existence of a policy that allows settlement in FPAs and the law that justifies eviction and preclusion of access to FPAs has put the FC in a dilemma. The FC can evict *in situ* inhabitants from FPAs or it can allow them to stay because they recognise that the local inhabitants are entitled to stay and this dilemma remains unresolved.

2.5: Conclusion

Several factors led to local community exclusion during both the colonial and post-colonial periods. The main causes of community exclusion were in-built exclusion in forestry laws, power differentials between community and governing authorities and the professional scientific approach to forest management pursued by forest officials. Exclusionary forest governance was deeply entrenched during the colonial period. Similarly, community exclusion was recorded in post-colonial decentralized governance with negative social, economic and ecological outcomes. It however vacillated during these broad periods. During the colonial period, it was total exclusion whereby people were evicted from forest land as well as denied access even to basic livelihoods resources. The post-colonial period saw low value FPA resources access by local communities improving but access to high value resources like commercial timber as well as sharing income benefits derived from FPA commercial activities remained a pipe dream. However, the improved access to basic livelihood resources proved critical to local communities

in times of economic, political and social upheavals and global environmental change. FPA resources have acted as safety nets and shock mitigators. The harvested resources contribute to household food security and income through petty trading for the majority of household heads with no formal employment as is the case in several developing countries. Coad *et al.* (2008) found out that forest products contribute between 20% to 40% of total household income in forest areas.

Local communities have demonstrated through overt and covert activities during the colonial and post-colonial periods their right to participate in the governance of FPAs and meaningfully benefit from them. To date, deforestation and degradation threaten FPAs due to encroachment for settlement, agriculture and unregulated resources access and use. To address the ills of more than 100 years of exclusionary centralised forestry governance, the state should formulate policies that integrate local communities in the governance of FPAs. In-built exclusion in forest laws, ideological orientation and poor forest policies constitute the main causes of exclusion of local communities. Without a thorough review of the pre- and post-colonial policies, the 'ghost of history' will continue to haunt the governance of state forests in Zimbabwe.

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2.7: References

ADAMS, W. M. and HUTTON, J. 2007. People, parks and poverty: Political ecology and biodiversity conservation. *Conservation and Society* 5(2): pp 147–183.

ANDERSON, J., MEHTA, S., EPELU, E. and COHEN, B. 2015. Managing left overs: Does community forestry increase secure equitable access to valuable resources for the rural poor? *Forest Policy and Economics* 58: pp 47-55.

AGARWAL, B. 2001. Participatory exclusions, Community Forestry and Gender: An Analysis for South Asia and a Conceptual Framework. *World Development* 29(10): pp1623-1648.

AGRAWAL, A. and REDFORD, K. 2009. Conservation and displacement: An overview. *Conservation and Society* 7(1): pp 1–10.

AKRAM-LODHI, A. H. 2012. Powers of Exclusion: Land Dilemmas in Southeast Asia – By Derek Hall, Philip Hirsch and Tania Murray Li. *Journal of Agrarian Change* 12 (4): pp 611-627.

BRAUN, V. and CLARKE, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology,* 3 (2): pp 77-101.

BROCKINGTON, D. and IGOE, J. 2006. Eviction for conservation: A global overview. *Conservation and Society* 4: pp 424–470.

BROCKINGTON, D. and WILKIE, D. 2015. Protected areas and poverty. *Philosophical Transactions of the Royal Society B,* 370: 20140271. http://dx.doi.org/10.1098/rstb.2014.0271.

BROSIUS, P., TSING, A., ZERNER, C., 2005. *Communities and Conservation: Histories and Politics of Community-Based Natural Resource Management.* Altamira Press, New York

CAMPBELL, A., CLARK, S., COAD, L., MILES, L., BOLT, K. and ROE, D. 2008. Protecting the future: Carbon, forests, protected areas and local livelihoods. *Biodiversity* 9 (3-4): pp 117–121.

CERNEA, M. M. 2005. 'Restriction of access' is displacement: A broader concept and policy. *Forced Migration Review 23*: pp 48–49.

CERNEA, M. M. and SCHMIDT, K. 2003. The end of forcible displacement? Conservation must NOT impoverish people. *Policy Matters*, 12.

CHOMBA, S., TREUE, T. and SINCLAIR, F. 2015. The political economy of forest entitlements: Can community based forest management reduce vulnerability at the forest margin? *Forest Policy and Economics* 58: pp 37-46.

COAD, L., CAMPBELL, A., MILES, L. and HUMPHRIES, K. 2008. *The Costs and Benefits of Protected Areas for Local Livelihoods: A review of the current literature*. Working Paper. UNEP World Conservation Monitoring Centre, Cambridge, UK.

CURREY, J. 2000. *Violence and memory: One hundred years in the "Dark Forests" of Matabeleland*. Oxford, UK.

De HAAN, A. 1998. Social exclusion: An alternative concept for the study of deprivation? *IDS Bulletin* 29 (1): pp 10-18.

DRESSLER, W. H., McDERMOTT, M. H. and SCHUSSER, C. 2015. The politics of community forestry in a Global age-A critical analysis. *Forest Policy and Economics,* 58: pp 1–4.

FOREST ACT, Chapter 19:05, Government of Zimbabwe, Harare.

FORESTRY COMMISSION. 2006. Position paper on illegal settlements in all the gazetted forests of Zimbabwe. Unpublished Forest Commission report, Bulawayo.

GAMBIZA, J. 2001. The regeneration of Zambezi teak forests after logging: Influence of fire and herbivory. Unpublished PhD thesis, University of Zimbabwe, Harare.

GAMBIZA, J., CAMPBELL, B. M., MOE, S. R. and FROST, P. G. H. 2005. Fire behaviour in a semi-arid *Baikiaea plurijuga* savanna woodland on Kalahari sands in western Zimbabwe. *South African Journal of Science*, 101(5-6): pp 239 – 244.

GREEN, K. E. and LUND, J. F. 2015. The politics of expertise in participatory forestry: A case from Tanzania. *Forest Policy and Economics*, 60: pp 27-34.

GUNDERSON, L. H. and HOLLING, C. S. 2002. Panarchy: Understanding transformations in human and natural systems. Island Press, Washington.

GRUNDY, I. M. AND MICHELL, N. 2004. Participatory forest management in South Africa. *In*: Lawes, M.J., Eeley, H.A.C., Shackleton, C.M. and Geach, B.G.S. (eds). Indigenous forests and woodlands in South Africa: Policy, people and practice. University of KwaZulu Natal Press. pp 679-707.

HALL, D., HIRSCH, P. and LI, T. M. 2011. Powers of Exclusion: Land dilemmas in Southeast Asia. NUS Press, Singapore.

HANSEN, C. H. and LUND, J. F. (Forthcoming). *Environment and History,* The White Horse Press http://www.whpress.co.uk/

HOLLING, C. S. and MEFFE, G. K. 1996. Command and control and the pathology of natural resource management. *Conservation Biology* 10(2): pp 328–337.

HO-TAI, H. T. and SIDEL, M. 2013. *State, society and the market in contemporary Vietnam*. Routledge, London and New York.

HULSE, J. H. 2007. *Sustainable development at risk: Ignoring the past.* International Development Research Centre, Ottawa.

JUDGE, J. G. 1975. The Kalahari sand forests of Rhodesia: Management Report. Forestry Commission, Bulawayo, Zimbabwe.

KATERERE, J. 2000. Legal and policy studies for shared forest management preparation project. Forestry Commission/DFID, Bulawayo, Zimbabwe.

KELLY-EDWARDS, E. 1938. Parliamentary Report on Rhodesian "Teak" (Umgusa) Industry, 22 March 1938 from CCF to Sec. Department of Lands and Agriculture (DLA), National Archives of Zimbabwe (NAZ), ZAZ2/1/1, No.1663/399/38, Harare.

KWASHIRAI, V. C. 2008. Poverty in the Gwaai Forest Reserve, Zimbabwe: 1880-1953. *Global Environment* 1:pp 146-175.

KHADKA, M. 2009. Why does exclusion continue? Aid, knowledge and power in Nepal's community forestry policy process. Unpublished PhD thesis, International Institute of Social Studies, The Hague.

LARSON, A., PACHECO. P., TONI, F. and VALLEJO, M. 2006. Exclusion and inclusion in Latin American forestry: Whither Decentralization? Paper prepared for the 11th Biennial Conference of the International Association for the Study of Common Property (IASCP), Bali, Indonesia, June 19-23, 2006.

LAURANCE, W. F., USECHE, C. D., RENDEIRO, J., KALKA, M., BRADSHAW, C. J. A., … and ZAMZANI, F. 2012. Averting biodiversity collapse in tropical forest protected areas. *Nature* 489 (7415): pp 290–294.

LOCKWOOD, M. 2010. Good governance for terrestrial protected areas: A framework, principles and performance outcomes. *Journal of Environmental Management,* 91: pp 754-766.

LUND, J. F. 2015. Paradoxes of participation: The logic of professionalism in participatory forestry. *Forest Policy and Economics,* 60: pp 1-6.

MAKONESE, M. 2008. Zimbabwe's Forest laws, Policies and Practices and implications for access, control and ownership of forest resources by rural women. Unpublished Masters Dissertation, University of Zimbabwe, Harare.

MATOSE, F. 2011. Nature, villagers and the state or capital: Quotidian politics from protected areas in Zimbabwe. Paper presented at the ISS Conference on Questioning the Market Panacea in Environmental Policy and Conservation, 30 June – 02 July 2011, The Hague.

MA. 2005. *Ecosystems and human well-being: Synthesis*. Island Press, Washington, DC.

MOHAMMED, A. J. and INOUE, M. 2014. Linking outputs and outcomes from devolved forest governance using a Modified Actor-Power-Accountability Framework (MAPAF): Case study from Chilimo forest, Ethiopia. *Forest Policy and Economics* 39: pp 21–31.

MUDEKWE, J. 1996. The history of tenants and squatters in demarcated forest reserves. Unpublished Forest Commission report, Chesa Research Station, Bulawayo.

MUDEKWE, J. 2007. Management practices for the protection of forest reserves: The case of Kalahari sand teak forest reserves in western Zimbabwe. Forest Management Working Paper FM/31 Forest Management Division, FAO, Rome.

MUDEKWE, J. 2007. The impact of subsistence use of forest products and the dynamics of harvested woody species populations in a protected forest reserve in western Zimbabwe. Unpublished PhD thesis, University of Stellenbosch, South Africa.

NIGHTINGALE, A. J. 2005. "The experts taught us all we know": Professionalization and knowledge in Nepalese community forestry. *Antipode* 37(3): pp 581–604.

OJHA, H. R., SUBEDI, B. P., DHUNGANA, H. and PAUDEL, D. 2008. Citizen participation in forest governance: Insights from community forestry in Nepal. Paper presented at Conference on Environmental Governance and Democracy (Institutions, public participation and environmental sustainability: Bridging research and capacity development), May 10-11, 2008, Yale University, New Haven.

O'LAUGHLIN, B. 1998. 'Interpreting institutional discourses' in: Thomas, A., Chataway, J. and Wuyts, M. (Eds) *Finding out fast: Investigative skills for policy and development.* Sage Publications, London.

RANTALA, S. E. 2013. The winding road from exclusion to ownership: Governance and social outcomes in contemporary forest conservation in north-eastern Tanzania. Tropical forestry reports 43, VITRI, University of Helsinki, Finland.

RIBOT, J. C. and PELUSO, N. L. 2003. A theory of access. *Rural Sociology* 68(2), pp 153-181.

SCHLAGER, E., & OSTROM, E. (1992). Property-Rights Regimes and Natural Resources: A Conceptual Analysis. *Land Economics,68,* 249-262. http://dx.doi.org/10.2307/3146375.

SCHROEDER, R. A. 1999. Geographies of environmental intervention in Africa. *Progress in Human Geography* 23: pp 359-378.

SCHUSSER, C., KROTT, M., MOVUH, M. C. Y., LOGMANI, J., DEVKOTA, R. R., MARYUDI, A., SALLA, M. and BACH, N. D. 2015. Powerful stakeholders as drivers of community forestry – Results of an international study. *Forest Policy and Economics* (58): pp 92-101.

SHACKLETON, C. M. and SHACKLETON, S. E. 2003. Value of non-timber forest products and rural safety nets in South Africa. Paper presented at The International Conference on Rural Livelihoods, Forests and Biodiversity, 19-23 May 2003, Bonn, Germany.

SHACKLETON, S., ZIERVOGEL, G., SALLU, S., GILL, T. and TSCHAKERT, P. 2015. Why is socially-just climate change adaptation in sub-Saharan Africa so challenging? A review of barriers identified from empirical cases. *WIREs Climate Change* 6(3). doi: 10.1002/wcc.335

STELLMACHER, T. 2007. The historical development of local forest governance in Ethiopia-from imperial times to the military regime of the Derg. *Africa Spectrum* 42(3): pp 519 – 530.

TIMBERLAKE, J. and CHIDUMAYO, E. 2011. Miombo ecoregion vision report. Occasional Publications in Biodiversity 20. WWF – SARPO, Bulawayo.

TO, P. X., MAHANTY, S. and DRESSLER, W. H. 2015. A new landlord? Community, land conflict and state forest companies. *Forest Policy and Economics* 58: pp 21-28.

UNEP, 2002. *Global Environmental Outlook 3: Past, Present and Future Perspectives*. Earthscan, London.

UPRETY, D. R., GURUNG, A., BISTA. R., KARKI, R. and BHANGARI, K. 2012. Community forestry in Nepal: A scenario of exclusiveness and its implications. *Frontiers in Science,* 2 (3): pp 41-46.

VINCENT, V. AND THOMAS, R. G. 1960. *An agricultural survey of Southern Rhodesia: Part I: Agro-ecological survey*. Government printer, Salisbury.

WHITE, C. 1983. *The vegetation of Africa. Vol 1, UNESCO.*

WWF. 2012. Miombo eco-region conservation Strategy: 2011 – 2020. World Wide Fund for Nature and Natural Resources, Miombo Eco-region Programme, Harare.

Chapter Three

Assessment of governance principles application in forest protected areas: The case of six state forests in western Zimbabwe

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3.1: INTRODUCTION

A protected area is a: ". . .*clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values*" (Borrini-Feyeraband *et al.*, 2013). Zimbabwe's gazetted indigenous forests constitute protected areas because they are spatially defined forested lands with demarcated borders and legally recognized through the Forest Act Chapter 19:05. They are owned, controlled and managed by the state through the Forestry Commission (FC) to achieve the long-term *in-situ* protection, maintenance, sustainable utilization and enhancement of biodiversity for the perpetual provision of ecosystem goods, services and a wide range of socio-economic benefits. Forest protected areas (FPAs) constitute one of the tried and tested *in-situ* conservation strategies for forest and other terrestrial biodiversity (Woodley *et al.*, 2012; Macura, 2016). These FPAs have been criticized for belonging to a vision rooted in the past and championing the exclusivist approach that distrusts local communities and ignores traditional institutions and approaches. Governance arrangements and quality that steer *in-situ* conservation strategies are crucial for effective management and improvement of conservation outcomes (Macura *et al.*, 2015). These forest governance arrangements constitute a subject that can be investigated and appropriately treated on the basis of a thorough understanding of local and national history. Zimbabwe's protected forests are facing increasing pressures from both natural and anthropogenic causes that present significant management challenges (Turner *et al.*, 2014). The problems of deforestation, forest degradation, poaching and encroachment among others bedevilling these forests have their roots in the various governance arrangements that have prevailed for more than a century spanning over the precolonial, colonial and post-colonial periods. These challenges necessitate the establishment of governance arrangements that are context specific and 'good' for the forests' effective and

equitable conservation (Borrini-Feyeraband *et al.*, 2013). The existing problem is how the protected forests can be governed to meet the diverse goals of the local communities, national and global stakeholders, e.g. subsistence resources for local users, timber and ecotourism for the state, and biodiversity and carbon sequestration for global users? (Vogt *et al.*, 2006).

Forest governance constitutes the norms, processes, instruments, people and organizations that control how people interact with forests and their resources (Kishor and Rosenbaum, 2012) to sustain and improve their economic productivity, environmental values and the welfare and quality of life for those whose livelihoods depend on the sector (Contreras-Hermosilla, 2011). This relates to how access, rights over, and benefits from forests are allocated and secured, including the planning, monitoring and control of their use, management, and conservation (FAO, 2012). Forest governance has gone through significant metamorphosis over the years from centralized systems where the government was steering to new adaptive governance in which several actors are co-steering that is spreading in developing countries across the world. Of late, there has also been a very strong emphasis towards the adoption and application of good governance principles in the forest sector to achieve 'triple win' outcomes of forest conservation, national development and local communities' livelihoods sustenance (Cavanagh, 2015).

Good forest governance means that decisions that are made are 'fair, transparent and just, rights are respected, laws and rules are enforced equitably, decision-makers are accountable and decisions are made based on the analysis of what is good for the people and forests (Larson and Petkova, 2011). Important principles that need to be applied for 'good forest governance' to be achieved include inclusiveness, transparency, accountability, legitimacy, public participation, fair and clear tenure rights, coherent legislation and its enforcement, inter-sectoral linkages, efficiency, equity and incentives, well capacitated institutions, environmental sustainability, clear mandates of and arrangements between different stakeholders (Dietz *et al.*, 2003; Ortolano, 2009; PROFOR, 2011; Secco *et al.*, 2013; Sheng, 2010; FAO, 2012; Phelps *et al.*, 2010 and World Bank, 2009). These provide a 'conceptual yardstick' against which to evaluate the quality of governance (Kooiman *et al.*, 2005). Of crucial importance to these principles in the context of forest governance is the link between conservation, human rights and the fight against poverty. While the principles are meant to be universally applicable since they are based on the Universal Declaration of Human Rights, different stakeholders may interpret them differently depending on their background and interests leading to different designs and operationalization of governance arrangements at the forest level.

There is however no clear evidence in most of the existing literature on the role of governance arrangements and the correlation between decision-making style and conservation outcomes of forest protected areas (Macura, 2016). Knowledge on the application of governance principles at forest level and its influence on protected forest conservation outcomes is also lacking (Macura *et al.*, 2015). Therefore, much is still to be learnt about the governance arrangements that can meet desirable forest conservation goals whilst enhancing forest dependent communities' livelihoods and the institutional arrangements that can foster cooperation amongst forest stakeholders and solve forest related conflicts. Consensus is building that application of good governance principles in the forest sector is the cornerstone for improving forest condition, resolve conflicts and sustain livelihoods (B2015 Governance Drafting Committee, 2013). However, there is no one-size-fits-all governance approach since forests are complex socio-ecological systems that exhibit various degrees of uniqueness. Each situation needs to be investigated so that each forest's governance mechanism is designed and operationalised with respect to its specific historical, locational, priorities and opportunities context.

Forest governance outcomes on the other hand include forest condition, carbon storage and livelihoods (Chhatre and Agrawal, 2009). Taking into cognizance the fact that governance quality results in multiple conservation outcomes, this study focused on forest condition. Forest condition describes the generalized state of a forest with regard to its 'sustainability, productivity, aesthetics, contamination, utilization, diversity and extent' (Ritters *et al.*, 1992). In several cases, it is used to describe forest health. There are multiple indicators of forest condition that include but not limited to forest cover, stocking (volume, biomass, density) and even status of forest structure (size/age distribution, patch fragmentation and ground debris). Studies that focus on forest condition do not agree on ideal indicators that should be examined, how they should be examined and the temporal/spatial frequency and intensity at which the examination should be done (Tucker *et al.*, 2008). The choice of indicators is therefore determined by the particular study research questions. In this study, the International Forestry Resources and Institutions (IFRI) (2008)'s qualitative expert assessment of vegetation density and diversity was used. These are outcomes that can be assessed using perception-based methods more accurately than outcomes such as carbon storage that require empirical measurements (Cook *et al.* 2014). Temu (1993) acknowledged that there is a serious dearth of both historical and contemporary data on Zimbabwe's indigenous forests and their rate of change for rational conservation decision making. Since the study traced the historical trajectory of forest governance outcomes, forest condition particularly estimates of density and species diversity change could also be

estimated using FPA officials inventory records that over the years mainly focused on these vegetation condition parameters. These variables were adjudged to be reliable measures of forest condition (Randolph *et al.*, 2005).

Most studies on protected forests in Zimbabwe have focused on stakeholder conflicts, resources access conditions and benefits sharing issues leaving out the broader governance issues that have implications on the collective of protected forests challenges – conflicts, livelihoods, conservation and environmental services provision (Mandondo, 2000; Chigwenya and Manatsa, 2007; Chigwenya, 2008). Limited attention has been given to issues of Zimbabwe's protected forest decision-making, policy implementation and governance arrangements over the years and how these have impacted forest condition. Despite the fact that governance history in the indigenous forest sector may be difficult to trace, characterize and explain, examining its intended and unintended impacts on conservation is an important step towards evidence-based protected area management (Ferraro and Pressey, 2015). It also provides important insights and lessons that can help shape current and future governance practices, forest policy and management approaches.

This study assessed the historical application of seven governance principles relevant across a wide range of circumstances and different forest and other natural resources governance arrangements (Graham *et al.*, 2003). The principles are transparency, accountability, participation, fairness and rights, rule enforcement, legitimacy and voice and capacity of governing authorities to effectively carryout their mandate. These principles are similar to those recommended and applied in governance assessment studies by Graham *et al.*, 2003; Lockwood, 2010; Lockwood *et al.*, 2010 and Turner *et al.*, 2014. Governance history was divided into six significant periods: 1) the pre-colonial era up to the appointment of the first colonial forest officer in 1920; 2) the colonial period before the liberation struggle intensified in 1975; 3) the liberation war period until independence in 1980; 4) the early years of independence until the adoption of the Economic Structural Adjustment Programme (ESAP) in 1990; 5) the ESAP era till the start of the Fast Track Land Reform Programme in year 2000, and 6) the Fast Track Land Reform Period from 2000 to 2005. These divisions were based on the social, political and economic conditions that affect the type and operationalisation of governance mechanisms. The political economy of Zimbabwe exhibited distinct characteristics that do not just enable clear demarcations, but they also had significant implications on FPA governance quality as shall be discussed under each period. The study showed the extent to which the principles were adopted and applied under each set of governance arrangements at a specific historical period and their consequential impacts on forest condition. It has been argued that information on the application

of governance principles in the past can better inform contemporary governance arrangements and influence future governance of protected forests. This can help managers to better understand the evolving dynamics of the system that they battle to manage (Steen-Adams *et al.*, 2015). It also forms an important foundation for measuring prevailing governance arrangements that may be aimed at reforming governance to foster sustainable forest management.

3.2: RESEARCH MATERIALS AND METHODS

3.2.1: Study Area location and biophysical characteristics

The study was meant to collect data that would enable the understanding of the application of governance principles in diverse protected indigenous forests in western Zimbabwe. Six forests located in Matabeleland north province (Figure 3.1) were selected to represent diverse governance arrangements and forest condition. Basing on the literature reviewed and consultation with forest management authorities in the province, the study forests were selected and categorized by shared characteristics into two groups of three forests each: the Gwaai, Mbembesi and Gwampa group and the Fuller, Kazuma and Pandamasuie group (Figure 3.1). The main criterion for categorisation of the forests was the presence or absence of peasant population settled in the forests. The Gwaai, Mbembesi and Gwampa group has the longest history of *in situ* forest inhabitants (unacceptable situation) whilst Kazuma, Pandamasuie and Fuller have *ex situ* inhabitants (acceptable situation under the Forest Act chapter 19:05). The presence or absence of settlers was a critical criterion since the study, in addition to assessing the correlation of governance quality and forest condition, also intended to evaluate the association between the presence/absence of inhabitants and forest condition. The two groups of forests therefore presented the required conditions for this study.

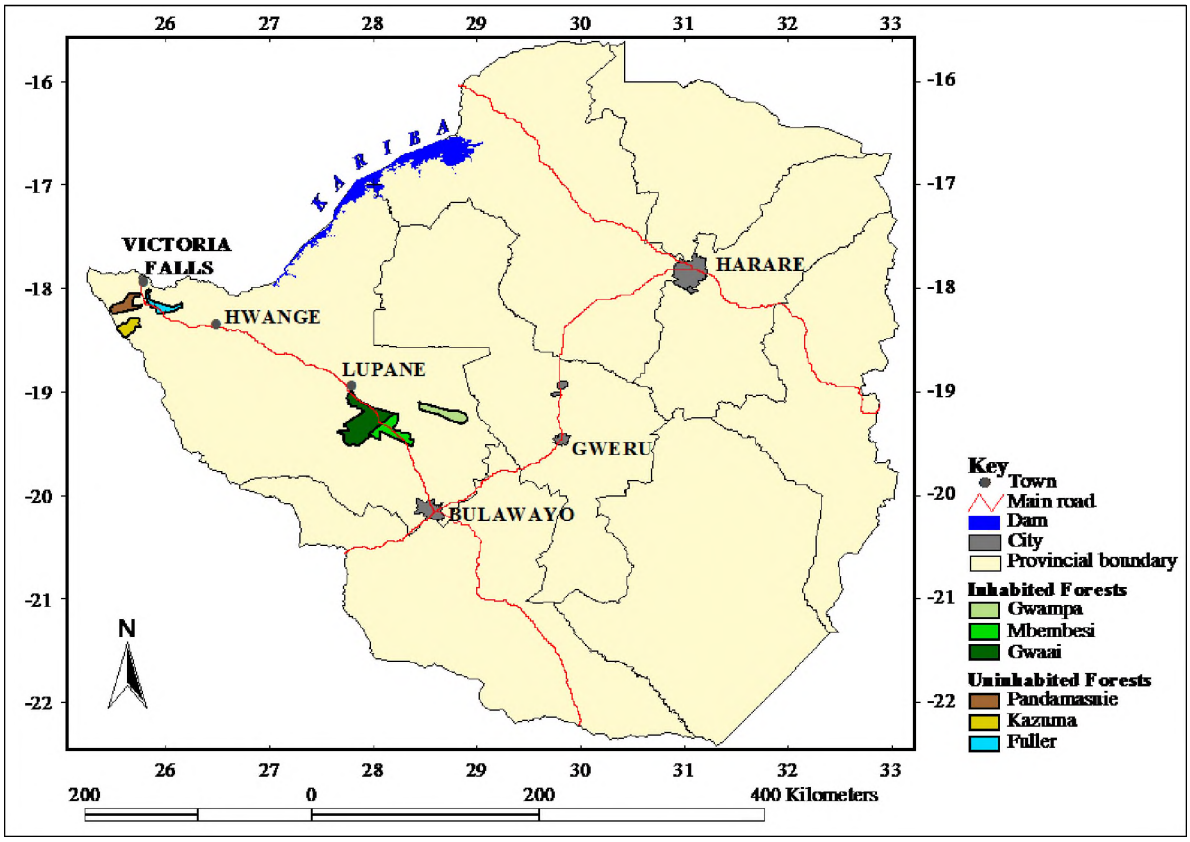

FIGURE 3.1: *The location of case study forests in Matabeleland North province, Zimbabwe.*

3.2.2: Gwaai, Mbembesi and Gwampa group of forests

These forests despite their proximity to each other are each located in its own district but close to Lupane centre, the provincial capital of Matabeleland north (Figure 3.1 and Table 3.1). Each of these three forests' designation involved the eviction of indigenous forest inhabitants who resided in each forest area at the time. Their history since then has been characterised by tenurial and other conflicts between forest management authorities and the local inhabitants (Mapedza and Mandondo, 2002). Presently, the forests have *in situ* inhabitants that are mainly confined to road networks and river valleys. Their main sources of livelihood are crop cultivation, remittances from towns, livestock rearing and exploitation of forest resources. The poor quality of soil and abundance of land results in some of the inhabitants practising shifting cultivation. Of the three forests, Gwaai is the largest of the demarcated forests in Zimbabwe and was one of the first to be identified for protection in 1923 leading to its subsequent gazettement in 1930. The forests are surrounded by Tsholotsho, Nkayi, Lupane, Gwaai and Shangani communal lands. The surrounding communities significantly depend on the forests for wood, livestock grazing, bushmeat and collection of various types of non-timber forest products to supplement the little

livelihood resources they get from their degraded localities. Other forms of settlements around this group of forests include Mbembesi resettlement area and the Gwaai African purchase farms.

TABLE 3.1: *The three case study forests with in situ inhabitants (Forestry Commission Management plans, 2014)*

Name of forest	Year gazetted	District	Area (Hectares)	Total inhabitants
Gwaai	1930	Lupane	144 300	8 238
Gwampa	1936	Nkayi	47 000	5 371
Mbembesi	1941	Bubi	55 100	6 263

These forests are in agro-ecological region IV that receives annual rainfall ranging from 400–700 mm. Rainfall is temporally poorly distributed and seasonal droughts are common. It has become more variable in recent years with climate change and new trends are yet to be established. The forests are on generally flat to undulating terrain that is predominantly underlain by deep unconsolidated Kalahari sand deposits with small patches of hydromorphic black clay mainly in the vlei areas. All the forest lands have distinct vegetation zones that are related to soil and topography. Vleis are characterised by different formations of grasses that are good habitats for grazers. The Kalahari sand zones are the most extensive and they support commercially valuable Baikiaea plurijuga woodlands associated with *Pterocarpus angolensis*, *Recinodendron rautanenii, Burkea Africana, Brachystegia spiciformis, Julbernadia globiflora, Terminalia sereca, Guibourtia coleosperma, Combretum* species and *Diplorynchus condylocarpon* (Judge, 1975). The *colophosperum* mopane woodlands occur mainly on vlei margins.

3.2.3: Fuller, Kazuma and Pandamasuie group of forests

This group of forests lies in Hwange district at the extreme western part of Zimbabwe close to the resort town of Victoria Falls (Figure 3.1 and Table 3.2). They have *ex situ* inhabitants. Fuller shares its boundary along the Bulawayo-Victoria Falls highway with Jambezi communal area where subsistence farming is practised. Up until 1961, it was felt that Fuller forest was not worth protecting since surveys had indicated that it had little timber of commercial value. A major infrastructure development in this forest is the Victoria Falls Airport that falls in Ursula forest management block. It has been recently expanded taking up a significant portion of the forest area.

TABLE 3.2: *The three case study forests with ex situ inhabitants (FC management plans, 2014)*

Name of forest	Year gazetted	District	Area (Hectares)
Fuller	1959	Hwange	24 449
Kazuma	1961	Hwange	23 850
Pandamasuie	1961	Hwange	33 500

Like Kazuma, Pandamasuie is part of the land previously occupied by Pioneer colonial settlers that had displaced indigenous inhabitants by forcing them to relocate to Botswana and to the Victoria Falls area. Kazuma forest's western boundary is the international boundary between Zimbabwe and Botwsana. To its northern side is Kazuma national park and to the south is Matetsi safari area. The Jambezi communal land inhabitants collect low value forest resources for subsistence purposes from both Kazuma and Fuller forests under the permit and licence arrangements with the Forestry Commission authorities. Pandamasuie forest is basically a wildlife habitat where photographic and consumptive hunting safaris operate.

3.2.4: Data collection and analysis

This paper is based on the synthesis of data from the following sources: archival research of grey literature from Forestry commission records, policy framework reports and management plans that were available at the study forests' administration offices and Chesa Forest Research Station in the city of Bulawayo; contemporary studies (journals, books, book chapters, internet websites and other documents) about environmental and forest governance in general and Zimbabwe's indigenous forest sector in particular and key informant interviews.

There is a serious dearth of data on Zimbabwe's indigenous forests and their rate of change for rational conservation decision making (Temu, 1993). The study therefore resorted to key informant interviews that provided mainly perception-based measures of governance quality and forest condition. Cook *et al.* (2014) measured the accuracy of protected area officials' knowledge of vegetation condition within protected areas relative to an empirical vegetation measurement tool and found that most officials' assessments matched the empirical condition measurements. They also found no relationship between the accuracy of officials' vegetation condition knowledge and their level of experience, education or their gender. Information derived from personal judgements was therefore adjudged to be relevant and reliable and therefore a cost effective substitute for empirical data for this study. The forestry officials that

were interviewed were Matabeleland North Forestry Provincial Officers, district conservators and foresters as well as retired former forestry officials. These are or were once responsible for addressing a wide range of governance issues and are most familiar with on-ground conditions (Cook *et al.*, 2014). For the Gwaai, Mbembesi and Gwampa group of forests, personal interviews were conducted with 3 Forestry Commission officials from each forest (district conservator, forester and a member of the forest protection unit). Fuller, Kazuma and Pandamasuie group is found in one district and therefore has one district conservator. This led to personal interviews with one conservator for the 3 forests and 2 other officials from each forest (forester and Forest Protection Unit member). At the provincial level 2 officials (The indigenous resources ecologist and chief conservator) were interviewed. Therefore a total of 18 forestry officials participated in the survey.

From the forests' local communities, purposively selected key informants included the local traditional and political authorities such as chiefs and councillors as well as elderly local residents. From Jambezi, Mvutu, Shangani, Mbembesi, and Nkayi communal areas, 2 leaders (Chief and Councillor) and 2 elderly local residents (one male and one female) who had grown up in each community and were considered local *experts* in their villages were interviewed since we were interested in the long term perspective of governance principles application and forest condition changes. Chalmers and Fabricius (2007) established that in some African traditional societies, local ecological knowledge is unevenly spread and held by individuals rather than groups and therefore this study found it important to interview *experts* rather than randomly selected community members. The elderly members interviewed came from villages bordering study forest reserves and forest residents (for Gwaai, Mbembesi and Gwampa forests with *in-situ* inhabitants) that rely heavily on forest resources for their subsistence requirements. The interviews with local community members determined local communities' involvement or lack of it in forest governance activities that indicated the principles that were being applied by state officials and the availability of subsistence forest resources to determine forest condition. The selected respondents allowed for in-depth discussions drawing from their knowledge and experiences in the forest sector. The multiple data sources enabled a comprehensive review of the evolution of forest governance arrangements and forest condition outcomes.

On forest condition, the forest officials (foresters, conservators and ecologists) and representatives of forest users (Local leaders and elderly 'experts') were asked to assess the status of forest condition using density of vegetation and species diversity as indicators on a four-point Likert scale (International Forest Resources and Institutions, 2008) (4-not at all degraded, 3-moderately degraded, 2-very degraded, 1-extremely degraded (Brown 2010) (Table

3.3). On the same scale, local leaders were asked to indicate the subsistence value of the forest by assessing the availability of non-timber forest products.

TABLE 3.3: *A summary of combined qualitative and quantitative scales used to estimate principles application, governance quality and forest condition*

Governance principles application	**Governance quality desirability**		**Forest condition**
1 - Very low	7-13	Undesirable	1 – Extremely degraded
2 - Low	14-20	Moderately desirable	2 – Very degraded
3 - Moderate	21-27	Very desirable	3– Moderately degraded
4 - High	28-35	Extremely desirable	4 – Not at all degraded
5 - Very high			

In addition to data collected through key informant interviews, forest condition data per specific historical period was also determined using archival forest officers' inventory reports, management plans and peer-reviewed articles that reported empirical data (information collected through a structured method that is reported in the study – Lund *et al.*, 2010) on forest management and conservation impacts based on field vegetation measurements and assessments by forest managers and users. Therefore, data collected was validated through asking multiple individuals and using results of inventories carried out by foresters at specific historical periods as well as published empirical data.

Qualitative data collected through scholarly works, key informant interviews and archival document searches were in form of transcripts of interviews and discussions, written texts from published literature and Forestry Commission reports. These were analysed using mainly discourse thematic analysis methods and procedures according to the analytic plan that was developed in line with the research design. Taking into cognizance that discourses reside in open social systems (Hopf, 2004), the wide context in which various discourses occurred were considered during their analyses. The specific procedures followed included firstly going through the data sets to gain an overview of the data coverage. Then data were sorted according to the seven governance principles under study so that materials that belonged to the same principle were grouped together. This enabled the researchers to make judgements about the performance of the governing institutions for each principle per specific historical period. To make a summative judgement of the extent of application of each principle, combined qualitative and quantitative scales were used: 'very low (1)', 'low (2)', 'moderate (3)', 'high (4)', 'very high (5)' (Table 3.3). For each principle, the quantitative scores were aggregated to determine the desirability of the governance quality per each historical period. The governance quality

desirability scores ranged from a minimum of 7 (if the application of each of the seven principles was 'very low (1)' at the forest level at a particular historical period) to 35 (if the application of each of the seven principles was 'very high (5)' at the forest level at a specific historical period) (Table 3.3).

3.3: RESULTS

3.3.1: Forest governance principles application at different historical periods and the resultant governance quality desirability

The relative application of the 7 forest governance principles in each of the six study forests at different time periods is shown in Tables 3.4 and 3.5. The principles were applied almost in the same manner throughout the study forests. There were minor intra and inter forest group variations in governance principles application. The published literature reviewed and archival records consulted showed that all the 7 governance principles were highly applied in governing all the study forests during the pre-colonial period resulting in desirable governance quality with a score of 28 out of 35 for all the forests. The application of the governance principles however deteriorated drastically with the inception of colonialism. All other principles were very lowly applied during the colonial period except rule enforcement and the capacity of FC to carry out its mandate that averaged high (4 out of 5) and moderate (3 out of 5) respectively. The FC had all the powers to make all decisions about the forests and their resources without consulting stakeholders. The rights to forest resources were however at times enjoyed through pilfering and theft of prohibited forest resources e.g. grazing in Gwaai forest was at times accessed through cutting of fences to let cattle graze in the forest.

TABLE 3.4: Governance principles application, governance quality and forest condition at different historical periods in settled FPAs

		Governance principles and their level of application								
Name of Forest	**Historical period**	**Transparency**	**Accountability**	**Participation of locals**	**Fairness & rights**	**Rule enforcement**	**Legitimacy and voice**	**Capacity of FC**	**Governance desirability**	**Forest condition**
Gwaai	Precolonial	*high*	*high*	*high*	*high*	*High*	*high*	*high*	Extremely desirable (**28**)	Not at all degraded
	Colonial	*very low*	*Very low*	*Very low*	*Very low*	*high*	*Very low*	*moderate*	Undesirable (**12**)	Moderately degraded
	War period	*very low*	*Very low*	*low*	*moderate*	*Very low*	*low*	*Very low*	Undesirable (**11**)	Very degraded
	Early years of independence	*low*	*low*	*low*	*Very low*	*moderate*	*low*	*low*	Moderately desirable (**14**)	Moderately degraded
	ESAP era	*moderate*	*moderate*	*Moderate*	*low*	*low*	*low*	*low*	Moderately desirable (**17**)	Moderately degraded
	FTLRP era	*very low*	*Very low*	*high*	*moderate*	*Very low*	*low*	*Very low*	Undesirable (**13**)	Very degraded
Mbembesi	Precolonial	*high*	*high*	*high*	*high*	*High*	*Very high*	*high*	Extremely desirable (**29**)	Not at all degraded
	Colonial	*very low*	*Very low*	*Very low*	*Very low*	*High*	*Very low*	*high*	Undesirable (**13**)	Moderately degraded
	War period	*very low*	*Very low*	*low*	*moderate*	*Very low*	*low*	*Very low*	Undesirable (**11**)	Very degraded
	Early years of independence	*moderate*	*moderate*	*moderate*	*low*	*moderate*	*low*	*low*	Moderately desirable (**18**)	Moderately degraded
	ESAP era	*high*	*High*	*high*	*low*	*low*	*low*	*Very low*	Moderately desirable (**19**)	Moderately degraded
	FTLRP era	*very low*	*Very low*	*low*	*moderate*	*Very low*	*low*	*Very low*	Undesirable (**11**)	Very degraded
Gwampa	Precolonial	*high*	*high*	*high*	*high*	*High*	*high*	*high*	Very desirable (**28**)	Not at all degraded
	Colonial	*very low*	*Very low*	*Very low*	*Very low*	*high*	*Very low*	*moderate*	Undesirable (**12**)	Moderately degraded
	War period	*very low*	*Very low*	*low*	*moderate*	*Very low*	*low*	*Very low*	Undesirable (**11**)	Very degraded
	Early years of independence	*moderate*	*moderate*	*moderate*	*low*	*moderate*	*low*	*low*	Moderately desirable (**16**)	Moderately degraded
	ESAP era	*moderate*	*moderate*	*moderate*	*low*	*low*	*low*	*low*	Undesirable (**17**)	Moderately degraded
	FTLRP era	*very low*	*Very low*	*high*	*moderate*	*Very low*	*low*	*Very low*	Undesirable (**13**)	Extremely degraded

TABLE 3.5: *Governance principles application, governance quality and resultant forest condition at different historical periods in unsettled FPAs*

		Governance principles and their level of application								
Name of Forest	**Historical period**	**Transparency**	**Accountability**	**Participation of locals**	**Fairness & rights**	**Rule enforcement**	**Legitimacy and voice**	**Capacity of FC**	**Governance quality desirability**	**Forest condition**
Fuller	Precolonial	*high*	*high*	*high*	*high*	*high*	*high*	*high*	Extremely desirable (**28**)	Not at all degraded
	Colonial	*very low*	*very low*	*very low*	*very low*	*high*	*very low*	*moderate*	Undesirable (**12**)	Moderately degraded
	War period	*very low*	*very low*	*low*	*low*	*very low*	*low*	*very low*	Undesirable (**10**)	Very degraded
	Early years of independence	*moderate*	*moderate*	*moderate*	*Very low*	*moderate*	*low*	*low*	Moderately desirable (**17**)	Moderately degraded
	ESAP era	*low*	*low*	*moderate*	*moderate*	*low*	*low*	*Very low*	Moderately desirable (**15**)	Moderately degraded
	FTLRP era	*low*	*low*	*moderate*	*moderate*	*low*	*low*	*Very low*	Moderately desirable (**15**)	Moderately degraded
Kazuma	Precolonial	*high*	*high*	*high*	*high*	*High*	*high*	*high*	Extremely desirable (**28**)	Not at all degraded
	Colonial	*very low*	*Very low*	*Very low*	*Very low*	*high*	*Very low*	*moderate*	Undesirable (**12**)	Moderately degraded
	War period	*very low*	*Very low*	*low*	*moderate*	*Very low*	*low*	*Very low*	Undesirable (**11**)	Moderately degraded
	Early years of independence	*moderate*	*moderate*	*moderate*	*low*	*moderate*	*moderate*	*low*	Moderately desirable (**18**)	Moderately degraded
	ESAP era	*low*	*low*	*low*	*low*	*low*	*low*	*low*	Moderately desirable (**14**)	Moderately degraded
	FTLRP era	*very low*	*Very low*	*high*	*moderate*	*Very low*	*low*	*Very low*	Undesirable (**13**)	Degraded
Panda masuie	Precolonial	*high*	*high*	*high*	*high*	*High*	*high*	*high*	Extremely desirable(**28**)	Not at all degraded
	Colonial	*very low*	*Very low*	*Very low*	*Very low*	*High*	*Very low*	*low*	Undesirable (**11**)	Moderately degraded
	War period	*very low*	*Very low*	*low*	*moderate*	*Very low*	*low*	*Very low*	Undesirable (**11**)	Very degraded
	Early years of independence	*moderate*	*moderate*	*moderate*	*Very low*	*moderate*	*low*	*low*	Moderately desirable (**17**)	Moderately degraded
	ESAP era	*low*	*low*	*moderate*	*moderate*	*low*	*low*	*low*	Moderately desirable (**16**)	Moderately degraded
	FTLRP era	*moderate*	*low*	*moderate*	*low*	*Very low*	*low*	*Very low*	Moderately desirable (**14**)	Moderately degraded

The liberation war which was waged mainly in the 1970s saw a slight improvement in the application of the fairness and rights principle as people could access various forest resources without hindrances including settling and cultivating crops on forest land. Rule enforcement and the capacity of FC to effectively manage the forests deteriorated drastically as FC personnel moved to urban areas for security reasons. The local communities' voice with regards to forest resources also slightly improved since most forest officers had left their offices as a result of security concerns. Despite the improvement in fairness and rights principles, the governance of the time remained undesirable for all study forests with the governance quality score ranging between 10–11 out of 35. The achievement of independence in 1980 saw the application of most principles across the 6 forests improving from very low to moderate resulting in the governance quality of the time being moderately desirable (with average scores varying between 14–18) for all the forests. However, fairness and respect for local people's rights particularly those resident in the forests were not observed as the FC with the assistance of security agencies embarked on an exercise to evict forest residents and in some cases violently through destruction of homes particularly in Gwaai, Mbembesi and Gwampa forests. A similar exercise was carried out in Fuller forest though it was not as violent as in the other three forests. Fuller forest was therefore cleared of its *in-situ* inhabitants during this period and has remained uninhabited to date.

The introduction of the Economic Structural Adjustment Programme (ESAP) in the 1990s resulted in reduction of funding of government departments including FC which significantly reduced its capacity to effectively manage the forests. However, the same period saw the introduction of pilot co-management activities in Gwaai, Gwampa and Mbembesi group leading to the moderate application of transparency, accountability and participation in these 3 forests. During the same period, interviewed elderly 'experts' attributed the high incidence and increased forest damage by forest fires to inexperienced and young FC managers who had no capacity to fight forest fires. They further argued that this was worsened by their failure to involve forest residence and other locals who had vast knowledge about the behaviour of forest fires which was acquired over generations and therefore had become part of their way of life as forest people. A sharp contrast in the application of the forest governance principles between the two groups of forests occurred from the year 2000 onwards with the implementation of the Fast Track Land Reform Programme (FTLRP). For the Gwaai, Gwampa and Mbembesi group that is close to densely populated and

impoverished communal areas, lawlessness that characterised the land reform program led to collapse of law enforcement and capacity of FC to manage the forests as forests were invaded by the land hungry people for settlement and agriculture. Participation, fairness and rights principles dominated as local communities reclaimed the forests where their ancestors had been evicted from during the colonial period.

After realising that the forest invaders were there to stay in the inhabited forests, foresters started holding meetings particularly with forest residence explaining provisions of the Forest Act, the importance of conserving forest resources among other issues. FC also started to involve other stakeholders such as Environmental Management Agency (EMA), Rural District Councils (RDCs) and other key stakeholders in the resolution of forest conflicts. On the other hand, Fuller, Kazuma and Pandamasuie group had most governance principles lowly to moderately applied since the same arrangements that prevailed during the early years of independence of accessing low value forest resources under the permit system continued to prevail. Fuller and Kazuma forests had the permit system actually scaled up to include not only women, but men as well in subsistence resources collection. However, FC capacity and rule enforcement remained lowly applied. Governance principles application varied more with historical period rather than between forest groups and within a group of forests. The Gwaai, Mbembesi and Gwampa's governance quality was therefore undesirable whilst the Fuller, Kazuma and Pandamasuie group had moderately desirable governance during the FTLRP period until 2005.

3.3.2: Governance quality desirability

Governance quality desirability in the study forests as shown in Figure 3.2 fluctuated over the years. The most desirable governance took place during the pre-colonial times when the governance score was 28 out of 35 for all the study forests. The quality of governance plummeted from extremely desirable to undesirable immediately after the introduction of the first colonial forester in 1920 and the subsequent creation of restrictive and discriminatory land and natural resources policy and legislation. The strongest echoes of the undesirability of the colonial period forest governance came from the local elders who remembered vividly the bad ways in which they were treated by colonial foresters then and the extent to which the forests became inaccessible for the extraction of basic livelihood resources including NTFPs even for the forest resident communities. The deterioration of governance quality reached its climax during the liberation war period in the late 1970s with Fuller forest having the lowest

score of 10. Governance quality improved with the achievement of independence in the 1980s to moderate desirability level with all the scores above 15. This trend continued into the ESAP era (1990s) for most forests except for Kazuma which had a governance desirability score of 14. All forests governance arrangements deteriorated with implementation of the FTLRP from the year 2000 onwards. Mbembesi experienced the worst fall from a score of 19 to 11. Generally, the periods with worst governance quality were the colonial period and the FTLRP whilst the pre-colonial period had the highest quality of governance.

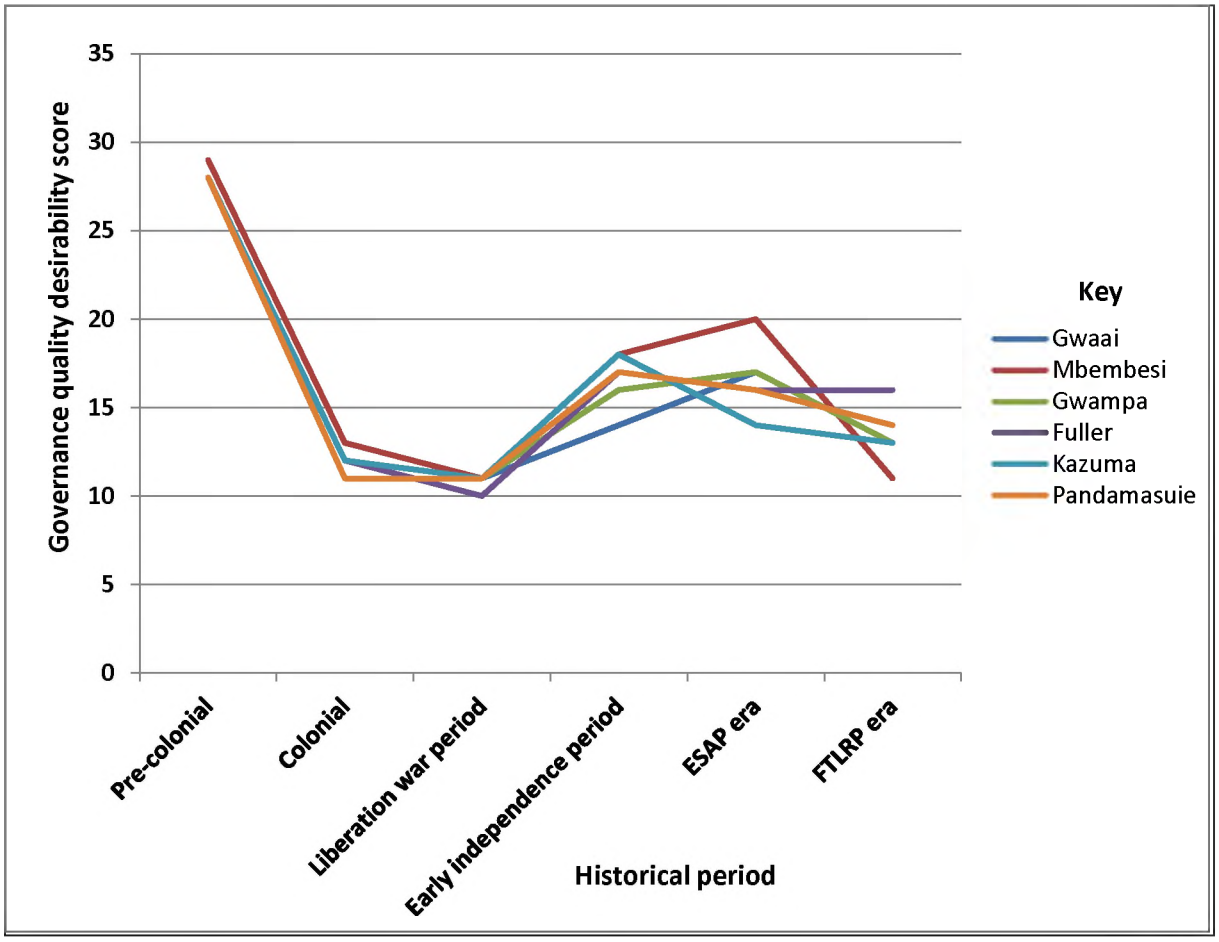

FIGURE 3.2: *Forest governance desirability trends since precolonial times until 2005*

3.3.3: Forest condition

Forest condition rose and fell in tandem with fluctuations in governance quality desirability (Figure 3.3). Archival reports and peer reviewed literature reported that forests were not degraded during the pre-colonial period. This was confirmed by Kelly Edwards (1938)'s report that the volume of commercial timber in well stocked areas of Gwaai-Mbembesi forests

averaged fifteen mature trees per acre in the precolonial era. This fell by about 80% to an average of four exploitable trees per acre in the mid-1930s. All forests' condition fell continuously until it reached a score of 2 (very degraded) during the liberation war era. Kazuma forest is the one that remained moderately degraded (score 3) during the entirety of the colonial era and after. With the improvement in the application of the governance principles and the resultant improvement in governance quality at independence in 1980 and thereafter, all forests' condition improved in tandem with these changes until the year 2000 when the government commenced the implementation of FTLRP. Fig. 3.3 shows that the inhabited forest group of Gwaai, Mbembesi and Gwampa was most affected by human agency that characterized the FTLRP leading to excessive clearance for settlement and agriculture. One of the district conservators stated that 'people believe in airport creation' where deforestation is the first in a chain of environmental problems caused by influx of settlers in the forests. Gwampa forest became extremely degraded since it was the one most affected by the influx of land hungry local inhabitants.

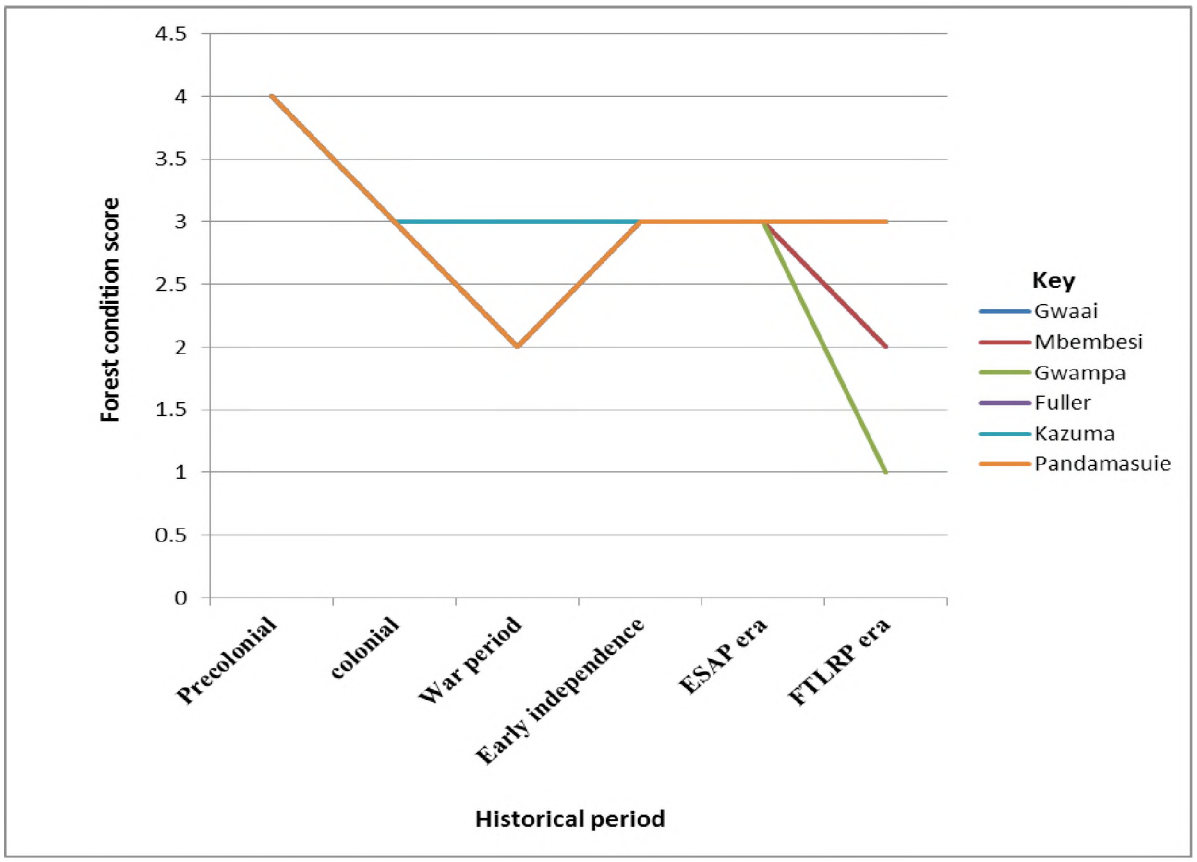

FIGURE 3.3: *Forest condition at the different historical periods*

Generally, the post year 2000 economic environment characterized by high rate of inflation, shortage of foreign currency, exodus of professionals, the FTLRP, political disturbances and lack of donor support compromised FC's capacity to carry out its forest stewardship roles of fire protection, biodiversity protection, supervision of timber harvesting and conducting anti-poaching patrols (Tsiko, 2010) leading to excessive forest degradation after the year 2000. Settlement and cultivation by forest inhabitants are regarded by FC as the greatest threats to forest condition because their impacts are very visible whilst impacts of commercial timber poachers are clandestine and therefore difficult to determine. Foresters stated that without recapitalization of FC and engagement and active involvement of local communities in the governance of the forests protected areas, the country's hardwoods will be depleted within the next 10 to 15 years. The Fuller, Kazuma and Pandamasuie group was not affected by forest invasion associated with the FTLRP and their level of degradation remained moderate with the exception of Fuller which was reported to be very degraded. The trend shows a continuous deterioration in forest condition over the years from the pre-colonial times until 2005.

3.4: DISCUSSION

3.4.1: Traditional forest governance approaches of pre-colonial times: Shall we return to these basics?

Results have shown that people in Zimbabwe, like elsewhere in Africa and other developing regions appreciated the value of forests because they relied heavily on them for their livelihoods sustenance and development (McCullum, 2000). Interviewed local elderly 'experts' pointed out that forests were major sources of a diverse range of services and goods including grazing, poles for construction, firewood, thatch grass, traditional medicines, honey, wild fruits, edible caterpillars and mushrooms among others. This led the pre-colonial communities to put in place the oldest form of elaborate forest governance systems that prevailed during pre-colonial times (Fabricius, 2004). The traditional systems were enshrined in Indigenous Knowledge Systems (IKS) and included rules of access and use, customs and procedures that created small-scale disturbances, taboos where certain resources were prohibited from being used at certain times of the month or year, situations where certain plants and animals were out of bounce for certain families and clans as well as designation of sacred areas and forests where resource extraction was strictly controlled (Barrow, 1996).

The traditional institutions such as kings, chiefs, headmen and healers created rules and regulations governing ownership and access to forests enforced by the chief and ruling lineages (Piearce and Gumbo, 1993). The institutions earned their legitimacy through acceptance by their subjects. The control instruments and mechanisms that were applied were based on shared norms, values and regulations that were based on community-specific customary laws (Counsell, 2009). The interviewed local elders in and around both forest groups confirmed that forest resources were accessed under specific rules and regulations that were passed from parents to children. Chiefs and headmen had mechanisms in place of monitoring and enforcing the rules and regulations through fines in form of livestock or other household assets and at most through exclusion from the chief's area of jurisdiction. Transparency was maximized by the clarity through which reasoning behind decisions was communicated to all members of the community (Lockwood, 2010). Everyone, young and old was made aware of the dos and don'ts with regards to forests and their resources.

Members of the community participated in rule enforcement and monitoring of transgressors. Those who contravened the rules were punished by the traditional leaders or by the supernatural through various types of misfortunes. People's rights to resources were respected and special requests were accepted. Governance of the forests and their resources was done in the interest of the entire community where all community members had equal access to collect the multiple forest products on which indigenous material culture was based. There was a symbiotic relationship between the forests and people in that people obtained various livelihood forest products whilst activities such as livestock grazing reduced fire hazards by reducing forest fuel load (inflammable biomass). There were no meaningful variations in traditional governance processes and mechanisms between the communities surrounding the two groups of forests studied. The application of a wide range of governance principles in a direct and indirect way made the governance quality very desirable and resultantly maintained the forest in an undegraded state.

Kwashirai (2008) and Maravanyika (2012), argue that traditional governance systems were generally based on social justice, fairness and participation, making them effective means to ensure stewardship of forest resources and livelihood sustenance. It should be borne in mind however that traditional governance systems were possible and forest condition remained stable then because human population densities were low, people's impact on the land was minimal due to their nomadic nature and simple lifestyles (Fabricius, 2004). Where the practices still exist such as in some Sri Lankan coastal fishing villages and Indian

Panchayats forests, they have been maintained by the isolation of the villages that has kept them 'closed' to external influences. Similar practices in Malaysia, Philippines and Thailand became dysfunctional because the communities were open to other occupations and trade opportunities with the outside world (Baland and Platteau, 1996).

In Zimbabwe, like in other southern African states, the traditional forest governance systems collapsed due to colonial-era social engineering and forest condition suffered (Rhodes University *et al.*, 2001). This is in line with Dietz *et al.* (2003)'s observation that locally evolved institutional arrangements governed by stable communities and buffered from outside forces have sustained resources successfully for long periods of time, but they often fail when external forces interfere with them or when rapid change occurs. It is evidently the case that good governance systems that prevailed during the pre-colonial era have been effective in conserving forest resources. According to Mawere (2013), the colonial and post-independent Zimbabwe's conservation measures have been failing because the state tended to 'favour and privilege western scientific models at the expense of the indigenous conservation practices of local people'. He supports his argument by sighting the success story of the Norumedzo forest in south-eastern Zimbabwe where blending of expert scientific based conservation methods and indigenous epistemologies enforced by traditional leaders have had positive conservation outcomes. The major question is: Can we reinvigorate the traditional governance systems that existed in the past and can they be as effective as they used to be? Whilst attempts to reinvigorate the traditional systems have considerable appeal particularly to donor-funded programmes given the ready legitimacy of traditional authority, its potentially powerful sanctions and the challenges associated with arbitration between competing claims to resources (Brown, 1999), many authorities have acknowledged the difficulties of reverting to these systems under contemporary conditions.

Baland and Platteau (1996) argued that traditional systems' effectiveness would be guaranteed in a static environment, that is, where peace reigns, population is stationary (or is controlled to match the resources), no technical change, economic activities are not affected by radically new trade programmes among others. The situation in Zimbabwe and other southern African countries' forests today presents significant challenges as the conditions highlighted by Baland and Platteau no longer exist formerly. Challenges in the contemporary world that make it difficult for traditional systems to apply good governance principles are diverse and varied. These constitute drivers of change that require institutional, that is, 'rules

of the game' changes and innovation that are capable of bringing about FPA resources conservation whilst adapting to technical and population change (Brousseau *et al.* 2011).

Central government's intervention in environmental matters and other aspects of social organization through establishment of institutions such as Environmental, Village and Ward Development Committees as well as Councillors with different and sometimes conflicting powers and mandates make it difficult for traditional authority to flex its muscles and assert its authority over forest resources. Government programmes such as the FTLRP led to Gwampa, Gwaai and Mbembesi forest areas becoming melting pots where people of different cultures and traditions came together and settled in the same geographical area. This created tensions associated with leadership wrangles, different traditional and cultural beliefs making the much needed cooperation difficult. In the past, people in the same community would share common cultural beliefs that would make them easily work together.

Globalisation has led to rapid spread of technology, market integration and transformation of value and belief systems (Brown, 1999; Baland and Platteau, 1996). Market integration has exposed local communities to the wider world through the sale of outputs, buying of inputs, labour exchanges and financial transactions (Baland and Platteau, 1996). These have been promoted by recent massive growth in communication technologies leading to weakening of traditional beliefs and taboos which were important components of the traditional forest governance systems. In India, traditional mechanisms of forest resources allocation and access broke down due to commercial penetration of the hill economy of Panchayat forests of Uttar Pradesh in the work of state forestry (Guha, 1985 in Baland and Platteau, 1996). Technological change in one hand may allow more intensive exploitation of forest resources whilst on the other it may be beneficial by improving the monitoring of resource users. Its overall impact has been found to be however negative. In all the six case study forests in western Zimbabwe, foresters and Forest Protection Unit (FPU) members concurred that poachers and illegal loggers use cell phones to warn each other of the movements and location of forest monitors and therefore their operations have become more sophisticated, difficult to monitor and apprehend.

Demographic changes have also increased pressure on forest resources to the extent that subtle traditional rules cannot provide effective regulation. Young generations' interests in local community affairs and in traditional resource management systems in particular seem to be gradually fading especially when they get alternative income sources or when they get employed in distant places. Matsa and Matsa (2011) found out that migrant labour from

Matabeleland region where study forests are located to South Africa losses interest on its return to participate in discussions of local problems and therefore are unlikely to be interested in forest monitoring and traditional rule enforcement. Climate change adds another layer to challenges of traditional resources governance systems. It is resulting in resource deterioration even if they are not exploited. Its negative effect on food security has made forest resources important safety nets for communities on forest margins. Additionally, not all traditional leaders have claims to traditional legitimacy. In Zimbabwe, the institution has been politicized and some leaders are imposed on their positions by politicians for political gain. Many therefore view the restoration of the traditional institution through the Traditional Leaders Act as a political attempt to create an authority for purposes disconnected to the local interests and natural resources governance (Brown, 1999).

While there are arguments in favour of reinvigorating traditional governance systems that existed in the past, we are sceptical that the changing circumstances create new challenges for the systems to be as effective in contemporary times and beyond. Ostrom (1999)'s work on self-governance and forest resources also shows that traditional governance regimes are not likely to work under conditions of contested boundaries, unclearly defined users, authority whose legitimacy is questionable and where rights of participation are unequal. However, although the systems may not be replicable in today's world, they had components that may need to be incorporated in modern day forest governance systems. Since the governance system of the colonial period was associated with several ills that were an affront to the principles of good governance, a more tempered governance system may be required to address the current challenges.

3.4.2: Adaptive co-management and its prospects in Zimbabwe's FPAs

Devolved governance systems have been widely embraced by the research community and adopted as policy by the majority of governments particularly in developing countries since the early 1980s (Ratner *et al.*, 2012). In Zimbabwe, there were attempts by the FC in the late 1990s to shift from the centralized and state controlled governance regimes that had proved to be a failure in sustainably managing forest protected areas to some semblance of co-management (Shared Forest Management) where the local communities were to participate in forest governance (Chigwenya and Manatsa, 2007) to deal with forest degradation and the sour relations between the State and local communities around protected forest areas (Matose, 2006). These governance arrangements were introduced in Gwaai, Gwampa and Bembesi to

empower grassroots institutions to make decisions pertaining to forest resources conservation, access and benefit sharing. The agreements however, explicitly indicated that ownership of the forests remained with the state with FC remaining the legal custodian of the forests (FC 1997). Residents Committees (RCs) were established to work with FC. Local communities were allowed to access mainly low value forest products such as thatching and broom grass, mushrooms, edible insects and worms, firewood and grazing of livestock under specific license conditions. Like decentralization in India, the state devolved to local communities' access to products important for subsistence purposes while the forestry authorities retained control over commercial benefits from the sale of high value resources such as hardwood timber (Agrawal and Ribot, 2002). In turn local communities were to participate in some aspects of forest management planning and monitoring of illegal exploiters of forest resources. This was for both researchers and local communities a positive and promising move by the state and forestry authorities as communities started to participate in forest governance.

It is vital as suggested by Cornwall (2008) to scrutinize closely who participates, in what and for whose benefit? The agreements entered with community representatives clearly stated that the ownership of the forest remained with the state and FC remained the legal custodian of the forest and the agreements could be revoked if the FC felt the conservation status of the forest was declining (FC 1997). The intention of FC in initiating community participation was to enhance forest resources protection more than livelihoods improvement of which this was at variance with the locals who thought their livelihoods were going to improve due to their increased involvement in forest governance activities. As it ended up to be, the involvement of locals was meant by FC to be a form of local community control and manipulation by legitimating already-made decisions (Cornwall, 2008) and making committee members monitor members of their constituency from illegally accessing forest resources. This would reduce the monitoring costs on the part of FC that was reeling under the shortage of resources due to reduced funding from government under ESAP. The rules for collaboration were formulated by FC and imposed on locals for FC to achieve its own conservation objectives.

Key resources highly valued by the locals such as construction timber, farming land and game meat remained excluded from the resource sharing arrangements and therefore continued to be a cause for conflict between FC and the local community (Matose, 2006). With no meaningful benefits from the shared resources arrangements, locals were forced to

illegally settle in Gwaai, Mbembesi and Gwampa forests and engaged in sabotage activities such as arson, timber and wildlife poaching leading to general environmental degradation in the affected forests (Tsiko, 2010). Foresters argued that activities of forest inhabitants and surrounding communities constitute the greatest threat to the continued existence of protected forests. Local communities were therefore not genuinely conferred rights and power to jointly manage the forests. The local communities' enthusiasm fizzled out as it became clear that they had been sold a dummy since no real powers had been devolved and local communities did not get rights to revenues from exploitation of commercial timber, grazing leases and wildlife safari hunting.

Co-management that was implemented on experimental basis in the three of the six case study forests faced challenges some of which are similar to situations in other developing countries. Co-management as a form of decentralization of natural resources governance according to Agrawal and Ribot (2002)'s framework requires the devolution of real powers over the disposition of productive resources and a resolution of divergent interests among multiple actors to prevent one group of stakeholders from disproportionately bearing the externalities associated with resources being managed. Mapedza and Mandondo (2002) have aptly described the pitfalls of co-management not just in Zimbabwe's forest sector, but in various sectors in developing countries. They pointed out that powers over natural resources have remained centralized in the state and its institutions; the little power devolved has ended at levels that are distanced from communities. Furthermore, communities' main role has been to initiate project plans whilst the state and its agencies retained the responsibility of approval, implementation and fiscal control (Chigwenya and Manatsa, 2007). For those arrangements that have been hailed as success stories such as CAMPFIRE in Zimbabwe's wildlife sector, there have been concerns that local people have not been doing the real management and impressive benefits have accrued at national and district levels whilst the household level situation has realized little change (Dzingirai, 2003, Campbell and Shackleton, 2000). Traditional leaders interviewed in Gwaai forest confirmed this by attributing failure of the programmes to marginal benefits that accrued to local communities whilst grazing leases, safari hunting and commercial timber logging incomes wholly accrued to FC and the national government. The contrast in perceptions between FC and local 'experts' indicate the tug-of-war for forest control between forest officials and local
communities. One forester stated that:

'our operations always facilitate participation by local people. They harvest resources such as grass, firewood among other non-timber resources. Therefore what else do these people want? For commercial timber proceeds to become part of local community benefits is not good for the commission and overall national development'.

On the other hand, the local elderly 'experts' concurred that as communities, for them to put effort and cooperate with the FC officials they also wanted '*to eat the liver*' of the forests, not the peanuts they have always been subjected to since the colonial period. For example, school classrooms in Gwaai west in the late 1990s were still mainly brick under thatch while teachers' houses were built of pole and mud.

Despite the proven importance of local participation and community empowerment in several case studies around the world, the state in Zimbabwe through the FC continues to hold fort its position of primacy frustrating local communities and forcing them to resort to unorthodox activities such as squatting, poaching, setting up veld fires to express their anger and demand greater involvement in forest governance. This shows that the state adopted co-management before it had dislodged itself from its assumed position of control and could not embrace meaningful co-management as has been witnessed in some east African, Asian and south American countries (Matose, 2006). One major reason for this scenario is that Zimbabwe's indigenous forests are dominated by hardwood species of high commercial value. They earn the country income that is channelled into national treasury for other national development priorities. The government is unwilling to share forest benefits equally with communities considering the strategic importance of revenue to the national treasury especially in view of the fact that most of its streams of revenue have dried up.

The success of co-management arrangements depends on several socio-economic and political factors. The experimental co-management arrangements in Gwaai, Mbembesi and Gwampa collapsed together with the economy and general rule of law. The success stories in countries such as India, Nepal and Tanzania occurred in more or less uniform socioeconomic and political conditions. In Nepal, McDougall *et al.* (2013) observed that collaborative governance of community forests led to increased income generation, micro-credit and employment of the poorest and female user group members due to increased engagement and influence of the previously marginalized and decision making based on social learning and nested arrangements. Their resilience was not tested under different socio-economic conditions. The unstable and uncertain political and economic environment in Zimbabwe

make it difficult to determine governance arrangements that work in the forest sector, because they may work temporarily and then fail when the socio-politico-economic conditions change. Campbell *et al.* (2001) questioned the optimism about the effectiveness of co-management arrangements in contemporary conservation discourse as one of the institutional vehicles that can achieve positive conservation outcomes. They found this optimism unfounded in Zimbabwe's forest sector as the few attempts at co-management arrangements have become dysfunctional due to challenges associated with unconducive policy and legislative environment, changing and differentiated household strategies, the economic meltdown and the land reform program that have seen forest areas and their resources constituting important livelihood alternatives leading to a rise in illegal activities. The FC officials confirmed the absence of any meaningful forest governance arrangements to address the challenges that Zimbabwe's forest sector is currently facing. There is therefore the need to formulate and adopt meaningful governance arrangements for the sustainable management of Zimbabwe's indigenous forests.

3.5: CONCLUSIONS, POLICY IMPLICATIONS AND FUTURE RESEARCH NEEDS

The paper has addressed a number of forest governance issues. It assessed the application of the good governance principles to determine the quality of forest governance at different historical periods in Zimbabwe's six protected forests. As shown by the presented results, the governance performance in all six study forests was sound during the pre-colonial period, deteriorated during colonial period and did not change much during the post-colonial period. This correspondingly affected forest condition that deteriorated in tandem with deteriorating governance quality as was observed and perceived by forest officials and local elderly 'experts'. Local communities' participation and benefit sharing slightly improved with attempts made for co-management in Gwaai, Mbembesi and Gwampa forests in the 1990s. However, the power struggles between FC officials and local communities over ownership and sharing of benefits from more lucrative resources as well as lack of transparency and accountability led to the collapse of the co-management arrangements. Although rule enforcement has been a challenge during the colonial period and early years of independence, the worst period in rule enforcement resulting in worst forest condition in most affected forests was from the year 2000 when the FTLRP was implemented. The reported poor forest condition under periods of low application of most governance principles showed that there was an association between forest condition and governance quality. Whilst the application of

all the assessed principles is desirable for sustainable forest governance to be realized, participation in decision making, fairness in benefits sharing and effective rule enforcement appeared to be most critical to earn local communities' support and improve forest condition.

The paper also analysed the challenges of revitalizing traditional forest governance in modern social and economic set up. Although traditional governance practices have been credited for conserving resources and sustaining livelihoods, contemporary societal conditions associated with population growth, market integration, technical and climate change make it difficult for these systems to resolve complex governance challenges obtaining in the protected forest sector. At the same time forest governance arrangements established during the colonial period failed on the moral component of forest conservation. It also shows that marginalization or non-participation of local communities leads to degradation of forest resources as locals embark on illicit activities to access resources and to undermine state institutions.

Furthermore, the paper interrogated the prospects of co-management in protected forests basing on attempts made in the 1990s and the prevailing socio-economic and legislative environment. The application of the principles remained low leading to perpetuation of poor quality governance. FC was not really ready to embrace genuine co-management as has been the case in countries such as Tanzania, Uganda as well as Asian countries like India, Nepal and Indonesia. The arrangements also became dysfunctional due to challenges associated with unconducive policy and legislative environment, the economic meltdown and the land reform program that have seen forest areas and their resources constituting important livelihood alternatives leading to a rise in illegal activities.

The section on co-management prospects must not be viewed as pessimistic, but it's a call for a detailed understanding and careful consideration of the challenges and hurdles that need to be navigated through for good forest governance to be realized. Co-management, if it is properly designed and adopted has potential to address the complex problems affecting Zimbabwe's indigenous forest sector since it combines elements of traditional systems and scientific methods both of which as separate entities cannot subsist in the prevailing environment. It's recommended that the state and local communities come together and engage in consensus-oriented decision making based on Ansell and Gash (2008)'s critical variables that include pre-history of cooperation and conflict, incentives, power/resource imbalances, facilitative leadership, institutional design and economic conditions. In this study, none of these critical variables was applied when co-management was attempted leading to

governance failure. The government should review forest laws and policies to create a conducive regulatory framework that is compatible with real commitment to genuine co-management arrangements and the application of good governance principles. The lack of genuine co-management arrangements and effective application of governance principles will continue to compromise conservation outcomes contradicting the purpose of establishing forest protected areas.

To enable proper designing of co-management arrangements that have greater chances of succeeding, further research is needed to properly characterize currently obtaining governance arrangements within the context of the prevailing economic and political environment and the impact that the FTLRP and the influx of people of diverse socioeconomic backgrounds have had on forest condition. There is also need for quantitative research on the ecology of forest protected areas to form an important baseline for future assessment of governance impact on forest condition.

3.6: REFERENCES

AGRAWAL, A. and CHHATRE, A. 2006. Explaining success on the commons: Community forest governance in the Indian Himalaya. *World Development* 34: 149–166.

AGRAWAL, A. and RIBOT, J. 2002. Accountability in decentralization: A framework with South Asian and West African cases. *The Journal of Developing Areas* 33(4): 473–502.

ANSELL, C. and GASH, A. 2008. Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory* 18(4): 543–571.

ARMITAGE, D., DE LOE, R. and PLUMMER, R. 2012. Environmental governance and its implications for conservation practice. *Conservation Letters* 5: 245–255.

BALAND, J.M. and PLATTEAU, J.P. 1996. Halting degradation of natural resources: Is there a role for rural communities. FAO, Switzerland.

BARROW, E. G. C. 1996. *The drylands of Africa: Local participation in tree management.* Initiatives publishers, Nairobi.

BELL, R. H. V. 1987. Conservation with a human face: Conflict and reconciliation in African land use planning. In ANDERSON, D. and GROVE, R. (eds) *Conservation in Africa: People, policies and practice.* Cambridge University Press, Cambridge.

B2015 GOVERNANCE DRAFTING COMMITTEE. 2013. Just Governance**:** A critical cornerstone for an equitable and human rights-centered sustainable development agenda post-2015. GCAP, South Africa.

BORRINI-FEYERABEND, G., DUDLEY, N., JAEGER, T., LASSEN, B., PATHAK BROOME, N., PHILLIPS, A. and SANDWITH, T. 2013. Governance of protected areas: From understanding to action. Best practice protected area guidelines series 20, IUCN, Gland, Switzerland.

BROWN, D. 1999. Principles and practice of forest co-management: Evidence from west-central Africa. European tropical forestry paper 2, ODI, London.

BROWN, S. 2010. Likert scale examples for surveys. ANR Program evaluation, Iowa State University, USA.

CAMPBELL, B., MANDONDO, A., NEMARUNDWE, N., SITHOLE, B., DE JONG, W., LUCKERT, M. and MATOSE, F. 2001. Challenges to proponents of common property resources systems: Despairing voices from the social forests of Zimbabwe. *World Development* 29(4): 589–600.

CAMPBELL, B. and SHACKLETON, S. 2000. Empowering communities in Southern Africa to manage natural resources: Where does the new power lie? *Mimeo*.

CAVANAGH, C. J. 2015. Protected area governance, carbon offset forestry, and environmental (in)justice at Mount Elgon, Uganda. DEV Reports and Policy Paper Series, The School of International Development, University of East Anglia, UK.

CHALMERS, N. and FABRICIUS, C. 2007. Expert and generalist local knowledge about land-cover change on South Africa's Wild Coast: can local ecological knowledge add value to science? *Ecology and Society* 12(1): 10. [online] URL: http://www.ecologyandsociety.org/vol12/iss1/art10/.

CHIGWENYA, A. and MANATSA, D. 2007. The history of natural resource management in Zimbabwe: A chronicle of how sustainable resource management has remained an elusive concept. *Journal of sustainable development in Africa* 9(2): 102–115.

CHIGWENYA, A. 2008. Situating Zimbabwe's community-based natural resource management practices in the sustainable development framework. *Journal of Sustainable Development in Africa* 10(3): 172–187.

CHHATRE, A. and AGRAWAL, A. 2009. Trade-offs and synergies between carbon storage and livelihood benefits from forest commons. *PNAS Early Edition.* http://www.icarus.info/wp-content/uploads/2009/11/ChhatreAgrawalNAS2009main.pdf

CONTRERAS-HERMOSILLA, A. 2011. People, governance and forests: The stumbling blocks in forest governance reform in Latin America. *Forests* 2: 168–199.

COOK, C. N., WARDELL-JOHNSON, G., CARTER, R. W. and HOCKINGS, M. 2014. How accurate is the local ecological knowledge of protected area practitioners? *Ecology and Society* 19(2): 32. http://dx.doi.org/10.5751/ES-06341-190232

CORNWALL, A. 2008. Unpacking 'participation': Models, meanings and practices. Oxford University Press, Oxford.

COUNSELL, S. 2009. Forest governance in Africa. Occasional paper 50. Governance of Africa's resources programme, South African Institute of International Affairs, Johannesburg.

DIETZ, T., OSTROM, E. and STERN, P. C. 2003. The struggle to govern the commons. *Science* 302(5652): 1907–1912.

DOVE, M. R. and KAMMEN, D. M. 1997. The epistemology of sustainable resource use: Managing forest products, swiddens and high-yielding variety crops. *Hum Org* 56(1): 91–101.

DZINGIRAI, V. 2003. The new scramble for African country side. *Development and Change* 34(2): 243–263.

FABRICIUS, C. 2004. The fundamentals of community based natural resources management. In: FABRICIUS, C., KOCH, E., MAGOME, H. and TURNER, S. (Eds) *Rights, resources and rural development: Community-based natural resources management in Southern Africa*, Earthscan, London.

FAO, 2012. Strengthening effective forest governance monitoring practice: An approach for integrating forest governance into national forest-related monitoring systems. *Forestry Policy and Institutions Working paper* 29, Rome.

FORESTRY COMMISSION, 1997. Mafungabusi Resource Sharing National Seminar, Kadoma Ranch Motel: 9–11 April, 1997. Forestry Commission, Harare.

FERRARO, P.J. and PRESSEY, R.L. 2015. Measuring the difference made by conservation initiatives: Protected areas and their environmental and social impacts. *Philosophical Transactions of the Royal Society B* 370: 20140270. http://dx.doi.org/10.1098/rstb.2014.0270.

FOREST ACT, Chapter 19:05, Government of Zimbabwe, Harare.

GRAHAM, J., AMOS, B. and PLUMPTRE, T. 2003. Governance principles for protected areas in the 21st century. Institute On Governance, Ottawa, Canada.

HOLLING, C. S. and MEFFE, G. K. 1996. Command and control and the pathology of natural resource management. *Conservation Biology* 10(2): 328–337.

HOPF, T. 2004. Discourse and content analysis: Some fundamental incompatibilities. *Qualitative methods* 2(1):31–33.

INTERNATIONAL FORESTRY RESOURCES AND INSTITUTIONS. 2008. Field manual. Version 13. Revised August 2008. Center for the Study of Institutions, Population, and Environmental Change, Indiana University, Bloomington, Indiana, USA. [online] URL: http://sitemaker.umich.edu/ifri/files/ifri_manual_v13_rev8-08_compressed.pdf.

JUDGE, J. G. 1993. Early forestry management in Zimbabwe. In: *The ecology and Management of Indigenous Forests in Southern Africa.* Forestry Commission, Harare.

JUDGE, J. G. 1975. The Kalahari Sand forests of Rhodesia: Management Report. Forestry Commission, Bulawayo, Zimbabwe.

KELLY-EDWARDS, F. 1938. Parliamentary report on Rhodesian Teak Industry. *NAZ*, Bulawayo.

KISHOR, N. and ROSENBAUM, K. 2012. *Assessing and Monitoring Forest Governance: A user's guide to a diagnostic tool.* PROFOR, Washington DC.

KOOIMAN, J., BAVINCK, M., JENTOFT, S. and PULLIN, R., 2005. *Fish for life: Interactive governance for fisheries.* Amsterdam University Press, Amsterdam.

KWASHIRAI, V. C. 2008. Poverty in the Gwai Forest Reserve, Zimbabwe - 1880–1953. *Global Environment* 1:146–175.

LARSON, A. M. and PETKOVA, E. 2011. An introduction to forest governance, people and REDD+ in Latin America: Obstacles and Opportunities. *Forests* 2: 86–111.

LOCKWOOD, M. 2010. Good governance for terrestrial protected areas: A framework, principles and performance outcomes. *Journal of Environmental Management* 91(3):754–766.

LOCKWOOD, M., DAVIDSON, J., CURTIS, A., STRATFORD, E. and GRIFFITH, R. 2010. Governance principles for natural resource management. *Society & Natural Resources: An International Journal* 23(10):986–1001. DOI:10.1080/08941920802178214.

LUDWIG, D. (2001) The era of management is over. *Ecosystems* 4(8):758–776.

LUND, J. F., BALOONI, K. and PURI, L. 2010. Perception-based methods to evaluate conservation impact in forests managed through popular participation. *Ecology and Society* 15(3): 5. [online] URL: http://www.ecologyandsociety.org/vol15/iss3/art5/

MACURA, B., SECCO, L. and PULLIN, A. S. 2015. What evidence exists on the impact of governance type on the conservation effectiveness of forest protected areas? Knowledge base and evidence gaps. *Environmental evidence* 4(24): 1–29.

MACURA, B. 2016. Measuring the effectiveness of conservation governance, policies and programmes in forest protected areas. Unpublished PhD thesis, Bangor University, United Kingdom.

MANDONDO, A. 2000. Situating Zimbabwe's natural resources governance systems in history. Occasional Paper No. 32, Center for International Forestry Research, Jakarta, Indonesia.

MAPEDZA, E. and MANDONDO, A. 2002. Co-management in the Mapfungautsi state forest area of Zimbabwe: What stakes for local communities? Institutions and Governance Program, World Resources Institute, Washington DC.

MAPPING AND INVENTORY UNIT. 1998. Status report on the strict natural reserves and permanent sample plots under the SAREC project. *The Ecology and Management of Indigenous Forests in Zimbabwe.* Chesa Forest Research Station, Bulawayo.

MARAVANYIKA, S. 2012. Local responses to colonial evictions, conservation and commodity policies among Shangwe communities in Gokwe, North-western Zimbabwe, 1963–1980. *African Nebula*, Issue 5.

MATOSE, F. 2006. Co-management options for reserved forests in Zimbabwe and beyond: Policy implications of forest management strategies. *Forest Policy and Economics* 8: 363–374.

MATOSE, F. 2007. Trends in forest ownership, institutional arrangements and the impact on forest management and poverty reduction. Programme for land and agrarian studies, Universty of the Western Cape, South Africa.

MATSA, M. and MATSA, W. 2011. Bulilima's 'look south policy': gender and socio-economic implications. *Eastern Africa Social Science Research Review* 27(1): 85–106.

MAWERE, M. 2013. Traditional environment conservation strategies in pre-colonial Africa: Lessons for Zimbabwe to forget or to carry forward into the future. *Afro-Asian Journal of Social Sciences* 4(4): 1–23.

McCULLUM, H. 2000. *Biodiversity of indigenous forests and woodlands in Southern Africa.* Southern African Research and Documentation Centre, Harare.

McDOUGALL, C., JIGGINS, J., PANDIT, B. H., RANA, S. K. T. M. and LEEUWIS, C. 2013. Does adaptive collaborative forest governance affect poverty? Participatory action research in Nepal's community forests. *Society and Natural Resources* 26(11): 1235–1251.

MUDEKWE, J. 1996. The history of tenants and squatters in demarcated forest reserves. Unpublished Forest Commission report, Chesa research station, Bulawayo.

MUDEKWE, J. 2007. Management practices for the protection of forest reserves: The case of Kalahari sand teak forest reserves in western Zimbabwe. Forest Management Working Paper FM/31 Forest Management Division, FAO, Rome.

MUDEKWE, J. 2007. The impact of subsistence use of forest products and the dynamics of harvested woody species populations in a protected forest reserve in western Zimbabwe. Unpublished PhD thesis, University of Stellenbosch, South Africa.

ORTOLANO, L. 2009. Environmental governance. Department of Civil and Environmental Engineering, Stanford University.

OSTROM, E. 1999. Self-governance and forest resources. CIFOR Occasional paper 20. CIFOR, Bogor.

PHELPS, J., GUERRERO, M. C., DALABAJAN, D. A., YOUNG, B. and WEBB, E. L. 2010. What makes a 'REDD' country? *Global Environmental Change* 20: 322–332.

PIEARCE, G. D. and GUMBO, D. J. 1993. The ecology and management of Indigenous forests in Southern Africa. Proceedings of an International Symposium, Victoria Falls, Zimbabwe, 27–29 July 1992, Forestry Commission, Harare.

PROFOR/FAO, 2011. Framework for assessing and monitoring forest governance. http://www.fao.org/climatechange/27526-0cc61ecc08404 8c7a9425f64942df70a8.pdf.

RANDOLPH, J. C., GREEN, G. M., BELMONT, J., BURCSU, T. and WELCH, D. 2005. Forest ecosystems and the human dimensions. E.F. Moran and E. Ostrom (eds). *Seeing the forest and the trees: Human–environment interactions in forest ecosystems.* The MIT Press, Cambridge, Massachusetts, USA.

RATNER, B. R., OH, E. D. and POMEROY, R. S. 2012. Navigating change: Second-generation challenges of small-scale fisheries co-management in the Philippines and Vietnam. *Journal of Environmental Management* 107:131–139.

RHODES UNIVERSITY, UNITRA and COX, F. 2001. A monitoring system for community forestry: Combining scientific and local knowledge in the Eastern Cape. Report on the Department of Water Affairs and Forestry, DWAF project RU/100, Pretoria.

RITTERS, K. H., LAW, B. E., KUCERA, R. C., GALLANT, A. L., DEVELICE, R. L. and PALMER, C. J. 1992. A selection of forest condition indicators for monitoring. *Environmental Monitoring and Assessment* 20: 21–33.

SAIDI, T. A. and MALIVHO, M. C. 2010. System inertia in the changing paradigm for biodiversity conservation in South Africa' *Africa Insight* 39(4): 99–108.

SECCO, L., DARE, R., PETTENELLA, D. M. and GATTO, P. 2013. Why and how to measure forest governance at local level: A set of indicators. *Forest Policy and Economics*, http://dx.doi.org/10.1016/j.forpol.2013.07.006.

SHENG, Y. K. 2010. What is good governance? UNESCAP, Bangkok, Thailand.

STEEN-ADAMS, M. M., LANGSTON, N., ADAMS, M. D. O. and MLADENOFF, D. J. 2015. Historical framework to explain long-term coupled human and natural system feedbacks: application to a multiple-ownership forest landscape in the northern Great Lakes region, USA. *Ecology and Society* 20(1): 28.

TEMU, A. B. 1993. 'Problems in resource data acquisition' in PIEARCE, G. D. and GUMBO, D. J. (Eds), *The ecology and management of indigenous forests in Southern Africa*. Proceedings of an International Symposium, 27–29 July, 1992, Victoria Falls, Zimbabwe.

TSIKO, S. 2010. Hardwood catastrophe: Plunder and looting of Zimbabwe's priceless forests – Who is eating the liver? Centre for Public Accountability, Harare.

TUCKER, C. M., RANDOLPH, J. C., and EVANS, T. 2008. An approach to assess relative degradation in dissimilar forests: Towards a comparative assessment of institutional outcomes. *Ecology and Society* 13(1): 4. [online] URL:http://www.ecologyandsociety.org/vol13/iss1/art4/.

TURNER, R. A., FITZSIMMONS, C., FORSTER, J., MAHON, R., PETERSON, A. and STEAD, S. M. 2014. Measuring good governance for complex ecosystems: Perceptions of coral reef-dependent communities in the Caribbean. *Global Environment Change* 29: 105–117.

VOGT, N.D., BANANA, A.Y., GOMBYA-SSEMBAJJWE, W. and BAHATI, J. 2006. Understanding the stability of forest reserve boundaries in the West Mengo region of Uganda. *Ecology and Society* 11(1): 38. [online] URL:http://www.ecologyandsociety.org/vol11/iss1/art38/.

WILKINS, J.S. 1934. General inspections of the timber operations in the Gwaai Native Reserve. *NAZ*, Bulawayo.

WOODLEY, S., BERTZKY, B., CRAWHALL, N., DUDLEY, N., LONDONO, J. M., MACKINNON, K., REDFORD, K. and SANDWITH, T. 2012. Meeting Aichi target 11: What does success look like for protected area systems? *Parks* 18(1), September: 1–13.

WORLD BANK. 2009. Roots for good forest outcomes: An analytical framework for governance reforms. Report No. 49572-GLB, Agriculture and Rural Development Department, Sustainable Development Network, Washington DC.

Chapter Four

Insights on the implications of governance on land use/cover change in forest protected areas (FPAs): The case of six forest protected areas in western Zimbabwe

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4.1: Introduction

Forest protected areas (FPAs) are managed under a wide range of governance regimes whose effectiveness in avoiding deforestation and forest degradation has been under scrutiny in recent years (Nelson and Chomitz, 2011; Nolte *et al.,* 2013; Macura, 2015). Even if different FPAs are under the same governance regime, they may not necessarily have homogeneous rules or management inputs. For example, some restrict most human uses, while others permit resource extraction under regulated conditions leading to heterogeneous conservation impacts (Ferraro and Pressey, 2015). Sustainable forest governance where there are *in situ* and *ex situ* FPA inhabitants presents even more unique challenges (Paulson Priebe, 2012).

Major debates have been occurring about whether FPAs have been effective in achieving their conservation objectives (Chape, 2005; Nagendra, 2008; Borrini-Feyerabend, 2013). Concerns have been raised about species loss in areas where local communities coexist with protected areas (Terborgh *et al.,* 2002). This has seen policy makers and conservationists pondering about the types of governance arrangements that can achieve desirable conservation outcomes. This is because governance lies at the heart of forest problems as well as their possible solutions. Despite the intensity of the debate about FPA governance and conservation outcomes, there are few quantitative studies that evaluate protected area conservation effectiveness. There are also no agreed criteria applicable to protected areas across the world that can be used to evaluate their effectiveness in an acceptable manner (Hockings, 2003). Evidence on the impact of governance arrangements on forest protected area conservation outcomes is therefore insufficient and skewed towards small as opposed to large scale studies.

This study adopted Secco *et al.* (2011)'s definition of governance in the context of protected areas (PAs) as 'a set of processes, procedures, resources, institutions and actors that determine how decisions are made and implemented.' In the context of forest protected areas, governance extends from policy to practice, behaviour to meaning, and from investments to impacts (Borrini-Feyerabend, 2003). Governance aspects that affect forest condition include tenure types, rules governing resource access, policies and regulations that define allowable harvests, management procedures, local stakeholder participation and the extent of regulation enforcement (Dietz *et al.*, 2003; Burgess *et al.*, 2012). The governance of forest protected areas is a crucial concept because it affects the achievement of management objectives (effectiveness), the sharing of costs and benefits (equity) and the generation and sustenance of community, political and financial support (Borrini-Feyerabend, 2003).

The calls for good governance where stakeholders' rights are respected, costs and benefits are shared fairly and where recourse to justice is ensured when conflicts occur are increasingly getting louder (Corrigan and Murtazashvili, 2015). This is because conservation in general and good governance for FPAs in particular should ensure that principles such as 'fairness, transparency and justice, respect for human rights, equitable law enforcement, accountability and decision making based on the analysis of what is good for the people and forests are applied (Larson and Petkova, 2011). There is therefore no room in the current dispensation to justify conservation governance that impoverishes people, undermines their rights and fails to prevent deforestation and degradation. This study determined the quality of governance by assessing the application of seven governance principles relevant across a wide range of circumstances and different forest and other natural resources governance arrangements (Graham *et al.*, 2003). The principles are transparency, accountability, participation, fairness and rights, rule enforcement, legitimacy and voice and capacity of governing authorities to effectively carryout their mandate. These principles have been recommended and applied by different scholars in terrestrial natural resources governance assessment studies (Graham *et al.*, 2003; Lockwood, 2010; Lockwood *et al.*, 2010; Turner *et al.,* 2014; Mutekwa and Gambiza, 2016).

To establish and maintain effective FPAs, there is need for credible scientific evidence about the extent to which protected area governance affects biodiversity conservation and human wellbeing (Ferraro and Pressey, 2015). This evidence on the relationship between governance regime and ecological and social outcomes is in most cases missing and therefore there is no consensus on the effect of governance regimes on conservation outcomes (Nolte *et*

al., 2013). Evaluation of the effectiveness of FPA governance is an emerging field of scientific inquiry that can extend the horizons of conservation science, improve the evidence base for policy making and conservation practice (Ferraro and Hanauer, 2014; Brockington and Wilkie, 2015).

Hutton *et al.* (2005) argued that although the social costs of protected areas are considerably high, the establishment of protected areas remains the primary means of achieving biodiversity conservation. This has to be proven through evaluation of the impacts of protected area governance arrangements to determine whether the intended conservation outcomes have been achieved (Leeuw *et al.,* 2010). Time series remotely sensed imagery analysis can confirm whether the conservation objectives of a particular period's governance arrangements were met. When combined with governance assessments for specific time periods, studies of land cover change enable us to analyse the relationship between governance and forest cover change (Ostrom amd Nagendra, 2006).

In this paper, we explored the question: What governance arrangements have existed for forest protected areas in western Zimbabwe and how have they fared in terms of biodiversity conservation? However, evaluation of the relationship between governance and conservation outcomes remains a contested field of inquiry (Romero *et al.,* 2013). Interview-based data on protected area governance effectiveness, although an attractive complement to or substitute for empirical data due to their cost effectiveness have been accused of introducing bias in analysis since the interviewees may have vested interest in a particular outcome (Nepstad *et al.,* 2006). These concerns mean that scholars need to conduct research that employs mixed-methods that focus on different temporal and spatial scales. Such sounder methods are available in the form of time-series remote sensed images and should be employed to provide firmer evidence on the degree of success of protected areas under different governance systems.

Remote sensing permits repeated and consistent monitoring of forest cover. It allows independent control and its quality can be assessed (Leeuw *et al.,* 2010). This provides information concerning past and present forest conditions and generates projections regarding future scenarios making remote sensing a tool with desirable characteristics for evaluating governance impacts.

Quantitative information derived from forest cover change studies based on satellite imagery analysis have become more widely used to evaluate the impacts of governance arrangements on forest condition (Dudley *et al.*, 2005; Slayback and Sunderland, 2013;

Ferraro and Pressey, 2015). Landsat imagery, because of its wide range of spectral bands in the vegetation-sensitive infrared region is particularly well suited to detecting changes in vegetation cover (Slayback and Sunderland, 2013).

Officially recognised indigenous forest reserves in north-western Zimbabwe covering more than 800 000 hectares are publicly protected for biodiversity conservation and the provision of a myriad of other environmental services (Forestry Commission, 2007; Mudekwe, 2007). These forests have undergone governance arrangements changes since colonial times to the present (Mutekwa and Gambiza, 2016). In some forests, the governance arrangements have allowance for *in-situ* inhabitants while others have always had *ex-situ* inhabitants. The performance of these arrangements in terms of biodiversity conservation outcomes has not received adequate attention from researchers. Nepstad *et al.* (2006) observed that there is a dearth of comparisons of the performance of inhabited versus uninhabited FPAs in conserving biodiversity. Therefore, the assumption that the conservation value of uninhabited protected areas is higher than reserves with *in situ* residents remains untested (Nepstad *et al.*, 2006). Our study attempted to analyse that relationship.

We analysed trends in forest cover change over four approximately decade-long time intervals (determined by the availability of remote sense image data) – 1984, 1993, 2004 and 2013 for two categories of forests in western Zimbabwe. The first category consisted of Mbembesi, Gwaai and Gwampa forests (accessed and settled forests (*in-situ* inhabitants) whilst the second category consisted of Fuller, Kazuma and Pandamasuie (accessed but not settled forests (*ex-situ* inhabitants). We defined forest degradation as both complete forest clearance and damage in which the resulting forest cover may still have tree cover, but at a substantially reduced density. The key study question was: How are the governance arrangements that prohibit human habitation and those that have permitted human habitation correlate with forest cover change in protected forests of western Zimbabwe? The paper therefore assessed the relationship amongst settlement type, time and governance quality as well as that of governance quality and land use/cover change in settled and unsettled forests.

4.2.: Materials and Methods

4.2.1: Study forests

This study focused on six protected indigenous forests in north-western Zimbabwe (17^0 05'S and 20^0 02'S and 15^0 00'E and 19^0 00'E). The forests fell into two groups on the basis of whether the forests had *in-situ* inhabitants or *ex-situ* inhabitants as shown on Figure 4.1.

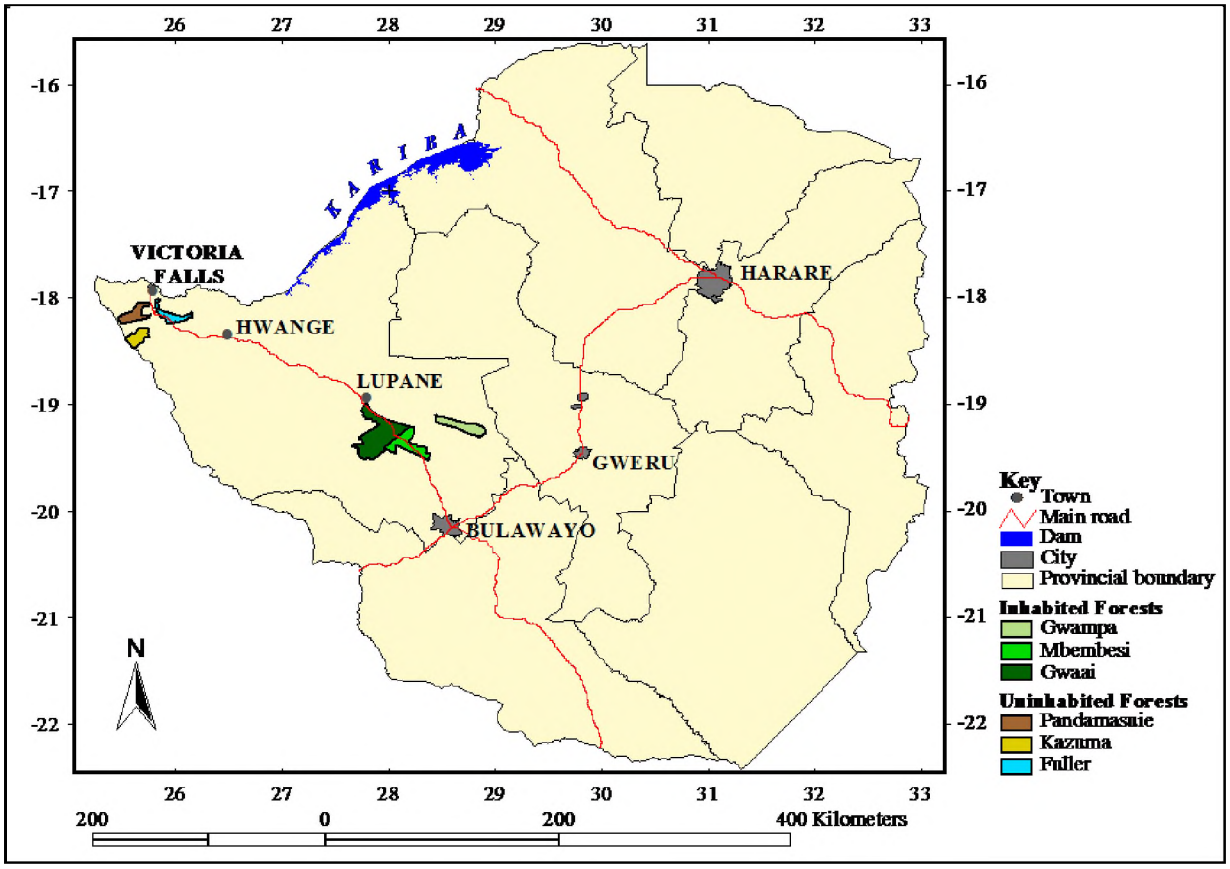


Figure 4.1: Location of the six study forests in western Zimbabwe.

The study forests are commonly known as Kalahari sands teak (*Baikiaea plurijuga)* forests that are restricted to the north-western part of the country. They are dominated by the commercial hardwood timber species (*Baikiaea plurijuga, Guibourtia coleosperma* and *Pterocarpus angolensis*) (White, 1983). The main commercial activity in these woodlands has been the harvesting of timber where trees with a diameter at breast height (1.3 m) greater than 35 cm are harvested on a 40-year rotation (Gambiza *et al.*, 2005). The FPAs are located in an area characterised by low and erratic rainfall averaging 600 mm extending from mid-November to mid-March. The year-to-year rainfall variations have seen some years receiving rainfall below 300 mm while others above 800 mm. Mean annual temperature in the region is approximately 21.5^{0}C. Mean monthly temperatures in the hot and cold months are about 30^{0}C and 17^{0}C, respectively (Nyamapfene, 1991).

In terms of agro-climatic classification the forests generally fall within Natural Region IV that is suitable for extensive livestock production and wildlife ranching. The low and

erratic rainfall is a major constraint to dryland crop production and is also a major determinant of the annual availability of grass for livestock production. The major function of these and other forests in north-western Zimbabwe is seen as conserving watersheds for the major rivers that flow into the Zambezi River on which Lake Kariba, the country's main source of hydro-electric power from the mid-1950s was built. This is because these forests lie on structureless aeolian sands of uniform texture, colloquially referred to as Kalahari sands (Gambiza *et al.,* 2005). The forests therefore maintain vegetation cover that reduces erosion and prevents siltation that might occur if the forests are lost or degraded. To date, this remains the main basis for maintenance of state intervention in forest conservation and management (Buscher and Mutimukulu, 2007). Except for the small areas occupied by small scale commercial farms, the forests are entirely surrounded by communal and resettlement areas and therefore constitute an important livelihood resource - providing food, medicine, building materials and animal feeds for surrounding communities (Schweithelm *et al.,* 2006).

4.2.2: Land use/cover change analysis

Landsat imagery is well suited to detecting changes in vegetation cover and condition because it contains several spectral bands in the vegetation-sensitive infrared region of the electromagnetic spectrum (Walsh, 1980; Trotter *et al.*, 1997; Tomppo *et al.*, 2002). For this study, a series of Landsat Thematic Mapper (TM, on-board Landsat 5 satellite), Enhanced Thematic Mapper (ETM+, on Landsat 8) imagery (path 171; row 73) (Table 4.1) covering the study forests were acquired from NASA portal (GloVis). The scarcity of imagery covering the forests we studied made it difficult to measure forest cover change over uniform 10 year periods. To try to make the periods over which change was measured almost similar in length, four dates of 1984, 1993, 2004 and 2013 were chosen as target years. Metadata files for imagery available in the NASA portal (GloVis) Landsat archive for path 171; row 73 were evaluated to identify suitable images for use in the analysis using the following Slayback and Sunderland (2013) criteria:

- whether it was produced in one of the target years (1984, 1993, 2004 and 2013);
- minimum cloud cover over the study forests, and
- April to June date to minimize changes in vegetation due to annual phenological cycles.

Given the available imagery and the stated selection criteria, four images covering inhabited Gwaai, Gwampa and Mbembesi forests were selected for cloud free days during

April, May, and June (Table 4.1). Another set of four images covering the uninhabited Fuller, Kazuma and Pandamasuie forests was selected using the same criteria. The satellite image for 1984 was selected as the base image for the study for this was four years after independence from colonial rule that coincided with the early launch of Landsat 5, which has the same band characteristics and spatial resolution with Landsat TM, ETM+ and Landsat 8. This allowed easier comparison of Landsat 7 and 8 images and Landsat 5 images from earlier dates. The imagery analysed was provided at 30-m spatial resolution, and contained six spectral bands covering the visible, near-infrared, and mid-infrared. Geographic Information System (GIS) and remote sensing software that were used to analyse the acquired imagery included ArcGIS version 10, Arcview 3.2, ENVI and Idrisi Andes. A hand held Global Positioning System (GPS) was used for ground truthing exercises to collect Ground Control Points (GCPs). All the data were downloaded into the workstation for analysis using the GIS software.

Table 4.1: Analysed Landsat imagery for the studied forest protected areas

Study forests	Satellite	Path/Row	Date of image acquisition
Gwaai	Landsat 5	171/73	29 June 1984
Gwampa	Landsat 5	171/73	03 April 1993
Mbembesi	Landsat 5	171/73	04 June 2004
	Landsat 8	171/73	12 May 2013
Fuler	Landsat 5	173/73	26 May 1984
Kazuma	Landsat 5	173/73	03 May 1993
Pandamasie	Landsat 5	173/73	21 April 2004
	Landsat 8	173/73	11 June 2013

Imagery data served as a tool to track changes in forest cover that short-term fieldwork could not establish. Spatial and temporal data from image analysis were used to determine the effectiveness of on-the-ground governance actions over the period under study between the two categories of study forests.

4.2.2.1: Image preparation

4.2.2.2: Ground truthing

The main aim of the ground truthing exercise was to collect Ground Control Points (GCPs) which were used for geo-referencing and registration of satellite images. The GCPs were also used to determine training areas that were used during image classification. A hand held GPS receiver was used to collect coordinates on GCPs which were used to geo-reference all the images using the exact location of permanent features such as road junctions and bridges. The exact ground positions were automatically collected and reflected on the image. This method helped the researchers in identifying locations of interest such as open fallow areas, vegetated areas or bare ground. These locations were then overlaid on the satellite images so as to clearly identify and digitize the training sites. Systematic transect walks were conducted in a Y-shaped form through the study forests to observe environmental conditions which would assist in the process of supervised classification of the study area. The ground truthing exercise was carried out in June and July 2014. It also focused mainly on selecting training sites that were used to generate the classified images.

4.2.2.3: Image enhancement

Image enhancement techniques used were contrast stretching at 2.5% and false colour composites. These were applied to the images to facilitate the identification of features. The near infrared composite was combined with visible bands (band combination: NIR, Red and Green) to produce a false colour composite. Vegetation in the Near Infra-red (NIR) band was highly reflective due to chlorophyll pigment and false colour composites vividly showed vegetation in various shades of red. Built up areas were displayed in cyan blue in the false colour composites while soil colours varied from dark to light brown. Deep red hues indicated broadleaf health vegetation while lighter reds signified grasslands or sparse vegetation. Water appeared dark and black depending on depth and clarity, due to absorption of energy in the visible red and NIR bands. False colour composites helped in differentiating water, soil and vegetated areas.

4.2.2.4: Image normalization

Most sensors including Landsat record reflected electromagnetic radiation by earth features in the form of Digital Numbers (DN). These pose difficulties when comparing multi-temporal images because of differences in sun angle, sensor angle and flight height among other reasons. In this research, this problem was addressed by changing DN values to radiance and then radiance to reflectance, a process called image normalization. This combined surface and atmospheric reflectance of the Earth is computed with the following formulae (NASA, 2011, P.119):

Digital Numbers to Radiance:

$$\text{rad} = \frac{\text{LMAX}-\text{LMIN}}{255*\text{DN}+\text{LMIN}} \qquad \textit{Equation 4.1}$$

Radiance to reflectance:

$$\rho p = \frac{\pi * L\lambda * d2}{\text{ESUN}\lambda * \text{COS}(\Theta s)} \qquad \textit{Equation 4.2}$$

Where:

ρp = Unitless planetary reflectance,

L_λ=spectral radiance at sensor's aperture,

$ESUN_\lambda$= band dependant mean solar exo-atmospheric irradiance,

Θs = solar zenith angle in degrees, which is reciprocal of the sun elevation angle

d= earth-sun distance, in astronomical units

4.3 Image Analysis

The images were classified based on four techniques, namely unsupervised K-means, supervised Spectral Angle Mapper (SAM), Normalised Difference Vegetation Index (NDVI) and visual interpretation.

4.3.1 K-means

K-means is a form of unsupervised classification technique which calculates initial class means evenly distributed in the data space. It then iteratively clusters the pixels into the nearest class using a minimum distance technique. All pixels were classified to the nearest class. It generated a general view of the area, creating a classified image with many clusters that aided in training site selection.

4.3.2 Spectral Angle Mapper (SAM)

The Spectral Angle Mapper (SAM) is a physically-based spectral classification that uses an n-dimensional angle to match pixels to reference spectra. It worked by determining the spectral similarity between two spectra, calculating the angle between the spectra, treating them as vectors in a space with dimensionality equal to the number of bands. This technique was used on calibrated reflectance data and was more effective because it was relatively insensitive to illumination and albedo effects. The end member spectra were collected from false colour images through region of interest (ROI) average spectra. The spectra for different land cover classes were compared to typical spectra of known land features for the purpose of separating ambiguity features. The method was effective since it was difficult in semi-arid areas like Lupane and Hwange districts to use texture of the image only because the land covers are always a mixture of different plant and grass species with distinct soil cover.

4.3.3 Visual analysis

After the SAM analysis, visual aids were employed for further feature identification based on the features' site, location, arrangement and their shape. Land cover maps were produced for all the satellite image dates and the earlier date image was compared against the later date image in order to establish percentage changes. Image subtraction was done for each class to assess whether there were positive or negative changes on identified corresponding land cover classes, for example:

Deforestation rates were calculated as:

$$\mathbf{r} = (F1984/F1993)1/t - 1,$$

where: **r** is the annual deforestation rate (%),

F1984 and F1993 are forest cover in 1984 and 1993 respectively,

t is time in years.

Forest degradation rates were calculated in the same manner.

4.3.4: Forest governance evaluation methods

Governance quality was evaluated using data from key informant interviews and a governance questionnaire that was administered to local residents of surrounding communities. Key informants were mainly purposively selected Matabeleland North Forestry Provincial Officers, district conservators and foresters, local traditional and political authorities such as chiefs and councilors. For the Gwaai, Mbembesi and Gwampa group of forests, personal interviews were conducted with three Forestry Commission officials from each forest (district conservator, forester and a member of the forest protection unit). Fuller, Kazuma and Pandamasuie group is found in one district and therefore have one district conservator. This led to personal interviews with one conservator for the three forests and two other officials from each forest (forester and Forest Protection Unit member). At the provincial level two officials (the indigenous resources ecologist and chief conservator) were interviewed. Therefore a total of 18 forestry officials participated in the survey.

A standardized governance questionnaire was administered to the local communities of Jambezi, Mvutu, Shangani, Mbembesi, and Nkayi communal areas. These communities were selected on the bases of their proximity to the study forests and the extent to which they utilized forest resources for subsistence purposes as pointed out by local foresters. The questionnaires were self-administered with the assistance of five pre-trained research assistants. The administered questionnaires were meant to determine local communities' involvement or lack of it in forest governance activities that indicated the principles that were being applied by state officials and the causes of deforestation and degradation since the early 1980s. The questionnaire targeted household heads and these were selected using the random sampling technique. The total number of households per community was obtained from the community headman's register. A 10% sample size was selected from each community as indicated in Table 4.2.

Table 4.2: Sample size distribution for the governance questionnaire

Community	Number of households	Sample size
Jambezi	412	41
Mvutu	389	39
Shangani	442	44
Mbembesi	358	36
Gwaai	566	57
Total	**2167**	**217**

The multiple data sources enabled a comprehensive review of forest governance arrangements and drivers of land cover change over time.

4.3.5 Data Analysis

Governance data obtained from the household survey were coded and analysed using SPSS Statistics 20. The household's participation in forest governance activities was assessed on a 5-point Likert scale from very low to very high (1 - Very low, 2 – Low, 3 – Moderate, 4 – High, 5 - Very high) leading to the generation of ordinal data. These were integrated to determine the overall governance score per forest per given time period (for the determination of governance scores detailed procedure, see Mutekwa and Gambiza, 2016 – Chapter Three). Data were tested for normality using the Kolmogrov-Smirnof test. Factorial analysis of variance (ANOVA) was used to analyse the data. A two-way ANOVA was used to determine if: 1) there was a statistically significant difference in governance between settled and unsettled forests, 2) if governance differed with time. To determine governance differences amongst the different time periods, a Tukey post hoc test was done. Lastly, a two-way ANOVA was carried out to determine: 1) the correlation between land cover change, governance and time in the study forests, 2) whether the relationship of governance and land cover was the same across all the four decade long sub-divisions of the study period. Interview results were analysed using the discourse thematic technique (Hopf 2004) for reporting and discussion of statistical results.

4.4: Results

4.4.1: The spatial and temporal variations in FPA governance quality

Results obtained revealed that there was no statistically significant difference in governance scores across sites, that is, between FPAs with *in situ* and *ex situ* inhabitants (F=1.31; p=0.205). Settled forests had a mean governance score of 14 as compared to 15 for unsettled forests out of a total score of 35. However, governance scores statistically differed with time (F=2.64; p=0.045). The Tukey post hoc results showed that there was a statistically significant difference in governance quality between the pre-1980 period and the 1980s decade (p=0.036), as well as between the 1990s decade and the post-2000 era (p=0.043). However, there were no differences between the pre-1980s period and the post-2000 era (p=0.898), as well as between the 1980s and 1990s decades (p=0.654). This shows that FPA governance experienced changes over the study period.

The variations in governance quality were confirmed by fluctuations of governance scores amongst the study forests over the entire study period (Figure 4.2). This shows that there was a correlation between governance quality and time. It was poor during the colonial and Fast Track Land Reform Programme (FTLRP) periods, moderately high during the 1980s and 1990s for most forests except for Kazuma which had a governance desirability score of 14.

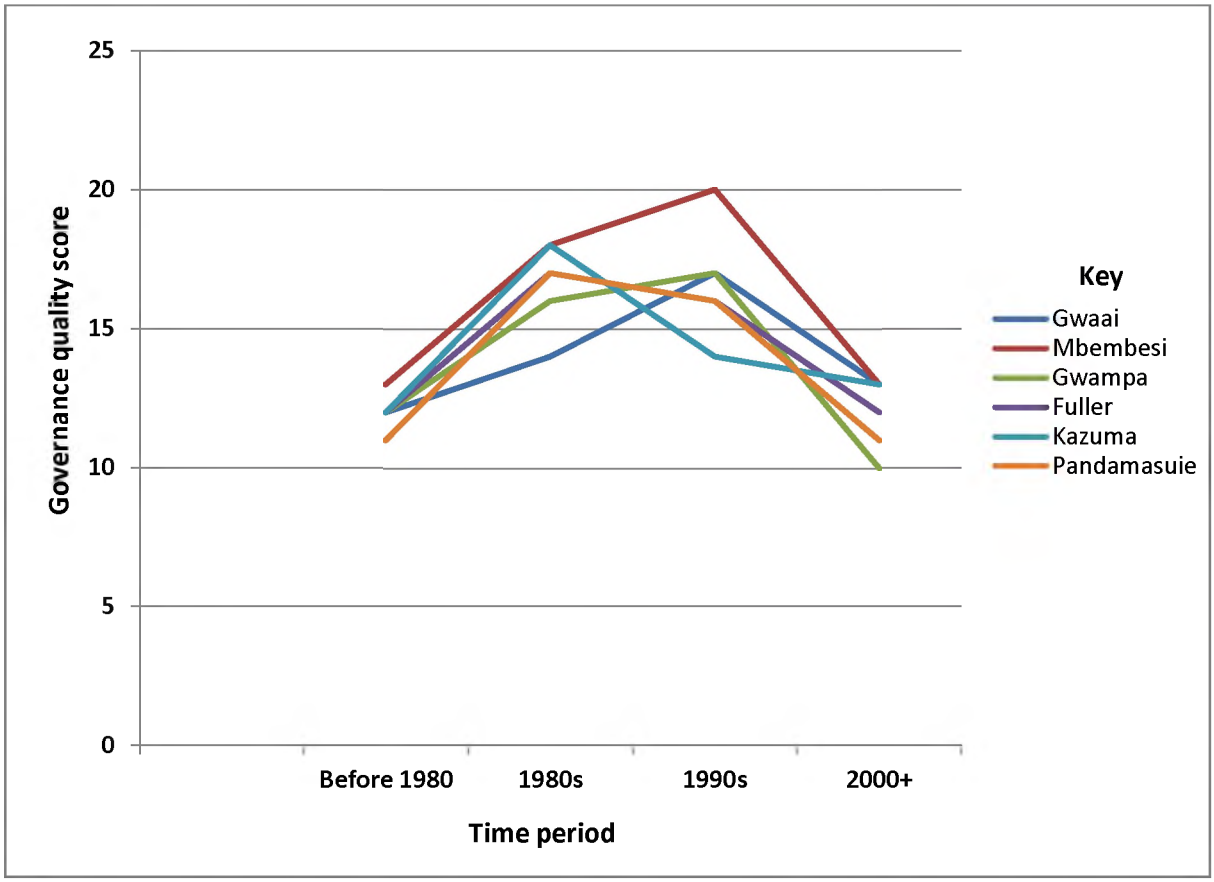


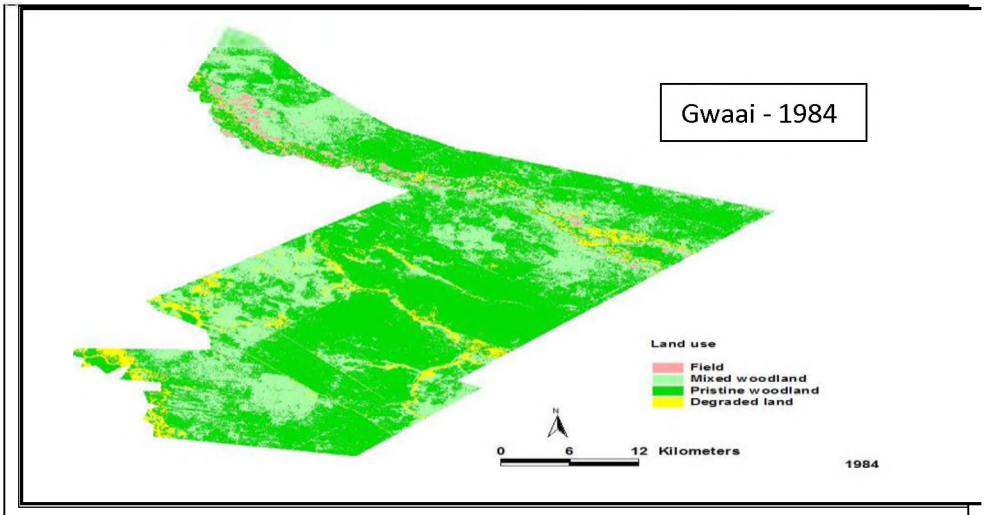
Figure 4.2: Governance quality scores variations over the study period amongst studied forests

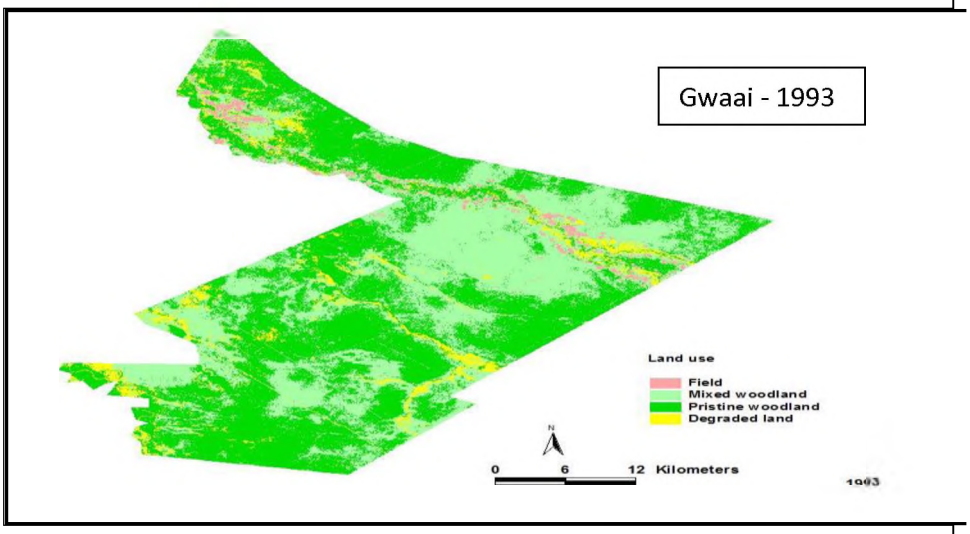
4.4.2: Governance and land use/cover change: Comparison of FPAs with *in situ* and *ex situ* inhabitants

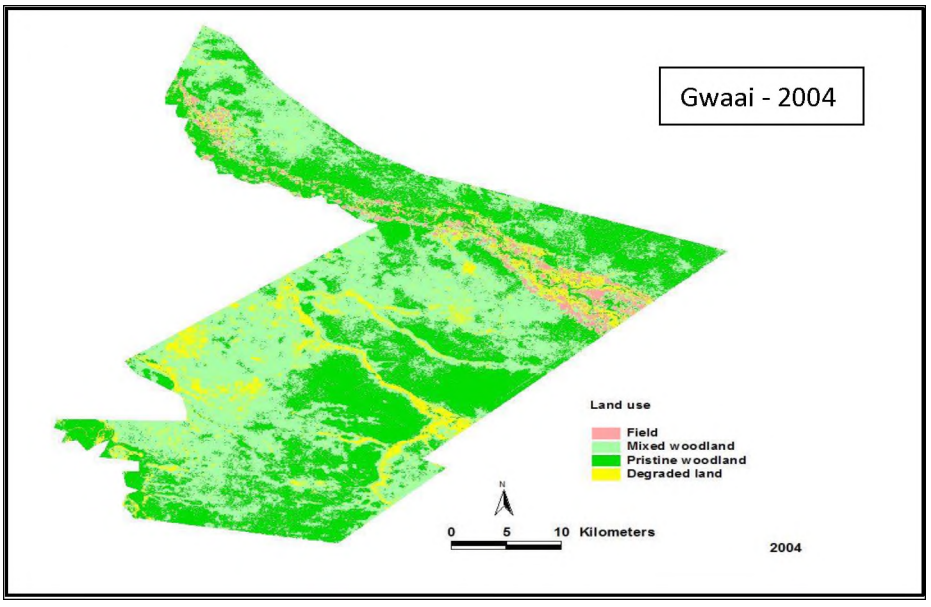
Governance and time interacted to significantly influence land use/cover change ($F=5.141$; $p=0.015$). This was evidenced by Figures 4.3 and 4.4 and Tables 4.3 and 4.4 that showed that all land cover/use types notably changed over the 29 year period of study in all studied forests. As shown on Table 4.3, settled forests with a low mean governance quality score of 14 out of 35 experienced extensive land use/cover change between 1984 and 2013 with Mbembesi and Gwampa forests losing 107 km^2 (-19.7%) and 104 km^2 (-24.7%) respectively to other cover types. Dense forest net loss over the 29 year period for the two forests averaged 22.2%. Dense forest was either degraded or converted to farmland. Degraded forest land in settled forests increased by an average of 17.3% over the 29 year period. For Gwampa forest, degraded land increased by 20.2% whilst for Mbembesi, degraded forest experienced a net increase of 14.3%. Settled and cultivated land in the two forests also changed positively over the same period. In Mbembesi forest, built up area and fields combined increased by 5.52%

from 1984 to 2013. Gwampa, however, experienced a fairly small increase of 4.75% in cultivated area over the same period (Table 4.3). Although land use/cover data for Gwaai forest could not be obtained for the period 2004 to 2013, the data for 1984 to 2004 revealed a similar pattern of change to the other two settled forests. The periods with lowest governance quality scores had highest dense forest loss and degraded forest expansion compared to periods with high governance quality scores.

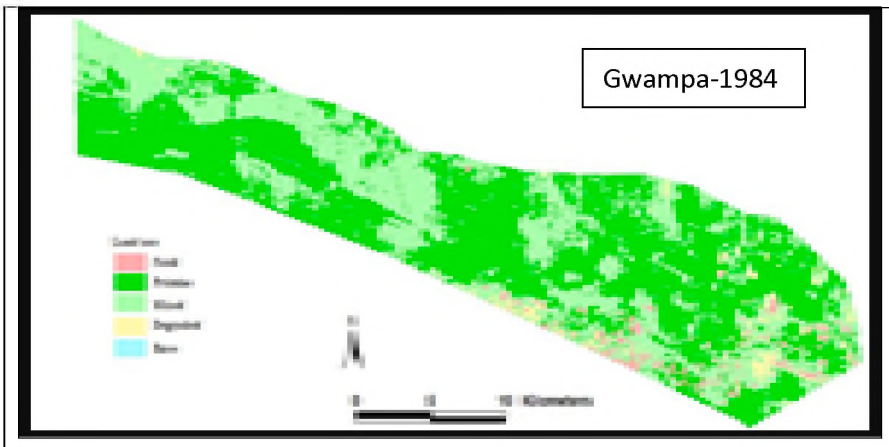
The FPAs with *ex situ* inhabitants that had a higher mean governance quality score of 15 had generally higher proportions of dense forest for the entire study period than those with *in situ* inhabitants. They, however, experienced a mixed pattern of land use/cover change. Both Pandamasuie and Kazuma experienced an increase in area covered by dense forest and a decrease in degraded forest area from 1984 to 2013 as shown in Table 4.4. Dense forest increased by 6.11% and 3.09% whilst degraded forest decreased by 13.08% and 2.56% for Pandamasuie and Kazuma, respectively. Fuller forest, however, exhibited a pattern fairly similar to settled forests. It experienced a dense forest area decrease of 22.21% and an increase in degraded forest of 20.95% over the 1984 to 2013 period. With the exception of Fuller forest that experienced shrinkage in the area covered by dense forest and increase in degraded forest area, the other two unsettled forests revealed an increase in dense forest land and a decrease in areas experiencing degradation as shown in Table 4.4. Overall, FPAs with *in situ* inhabitants had smaller areas of dense forest and large areas of degraded forest than those with *ex situ* inhabitants over the whole study period.

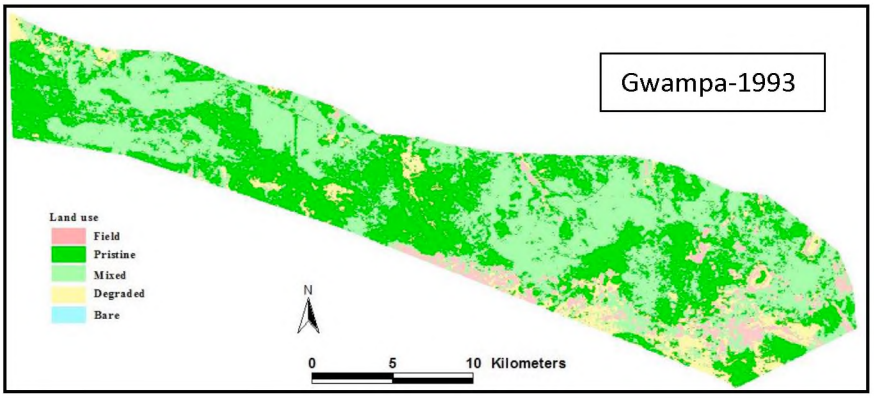

Gwaai - 1984
Land use
Field
Mixed woodland
Pristine woodland
Degraded land
N
0 6 12 Kilometers
1984

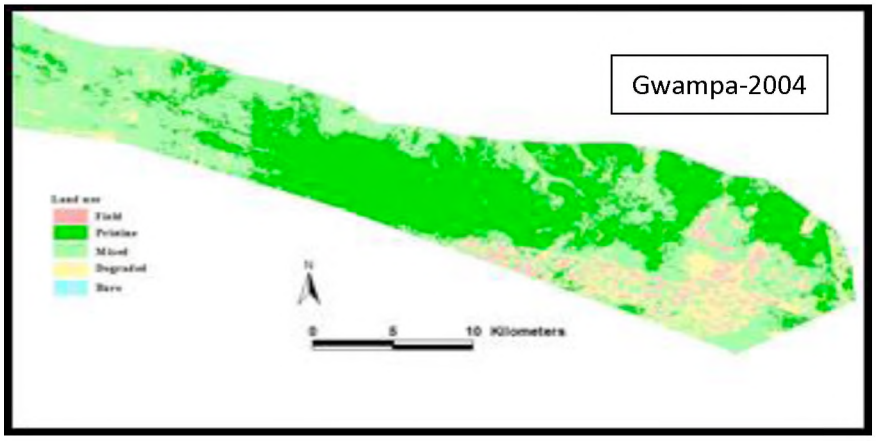

Gwaai - 1993
Land use
Field
Mixed woodland
Pristine woodland
Degraded land
N
0 6 12 Kilometers

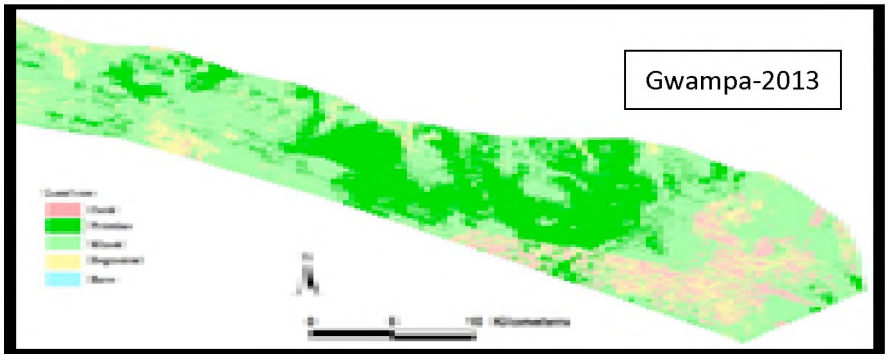

Gwaai - 2004
Land use
Field
Mixed woodland
Pristine woodland
Degraded land
N
0 5 10 Kilometers
2004

A 1


Gwampa-1984


Gwampa-1993
Land use
Field
Pristine
Mixed
Degraded
Bare
N
0
5
10 Kilometers


Gwampa-2004
N
0
5
10 Kilometers


Gwampa-2013

A 2

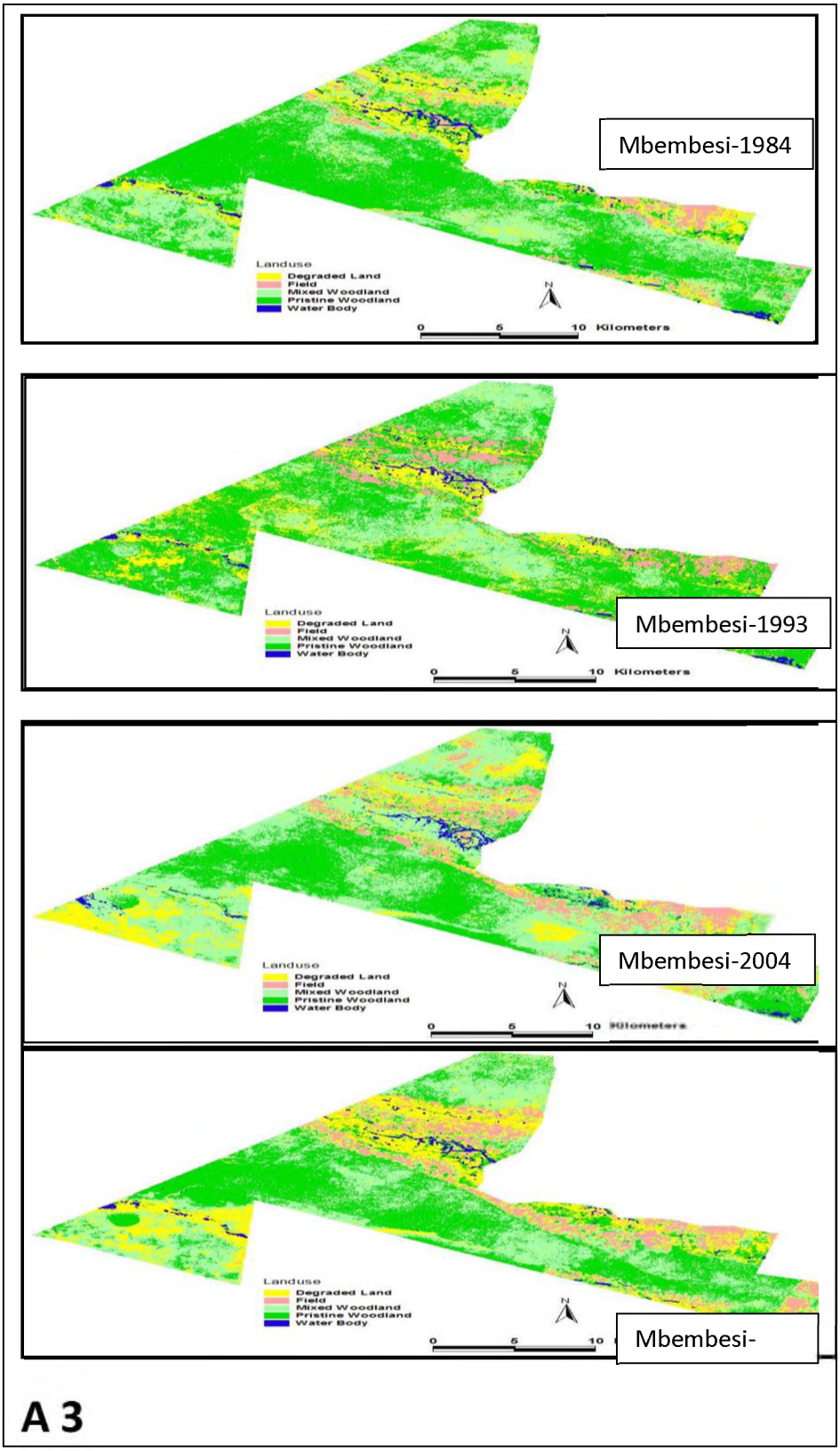
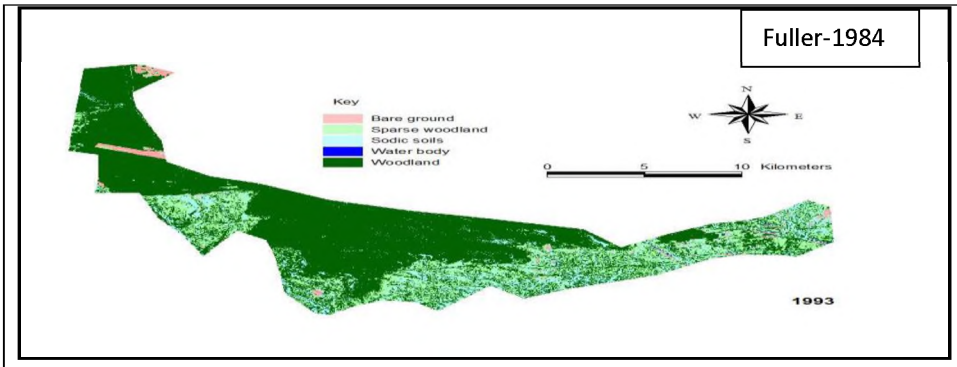
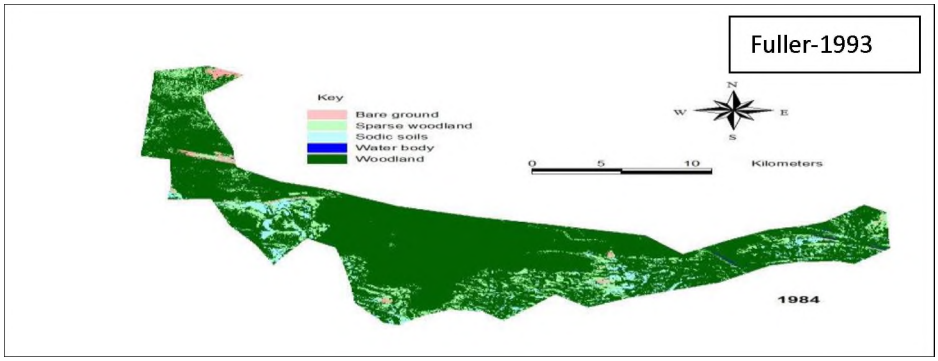
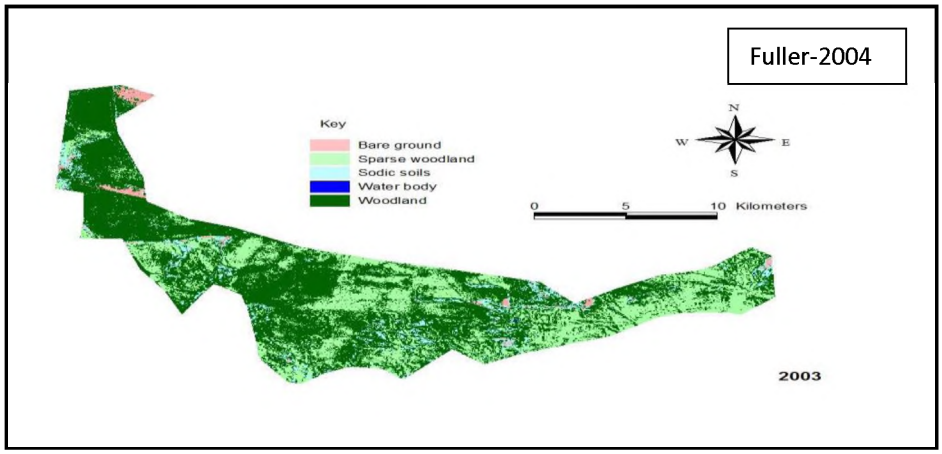
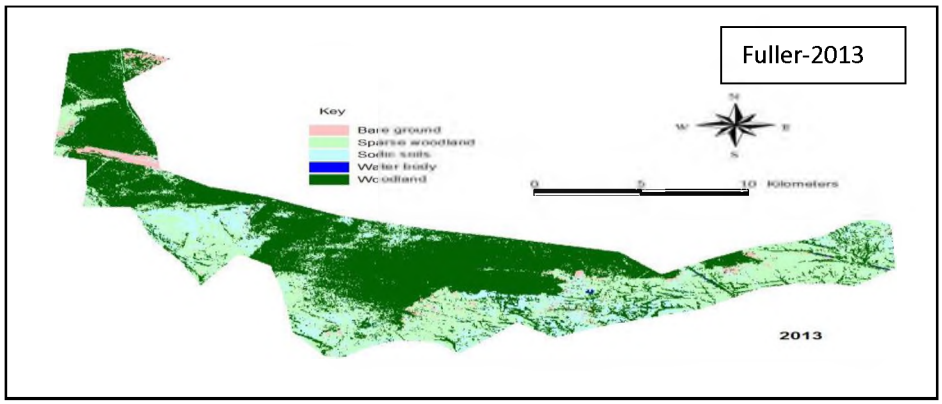


Figure 4.3: Land use/cover change from 1984 – 2013 for (A 1)-Gwaai; (A 2)-Gwampa and (A 3)-Mbembesi (*in-situ* inhabitants) forests

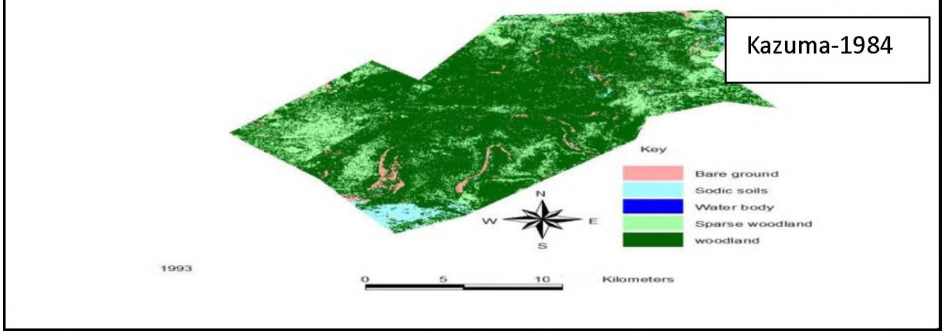

Fuller-1984
Key
Bare ground
Sparse woodland
Sodic soils
Water body
Woodland
N
W
E
S
0 5 10 Kilometers
1993

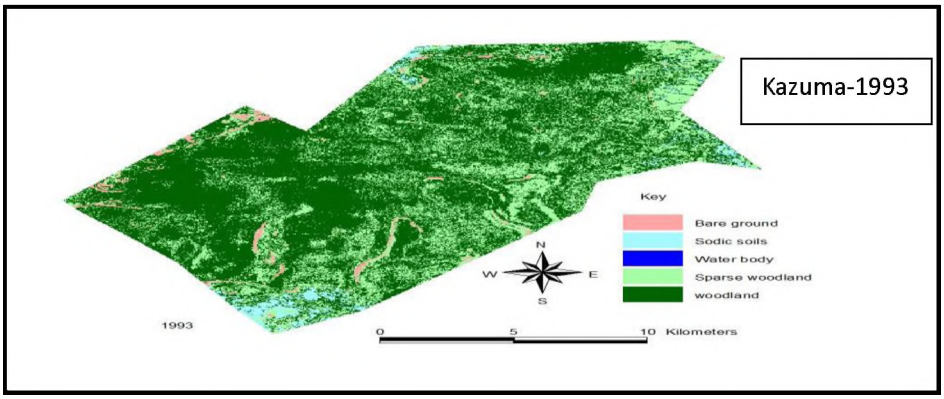

Fuller-1993
Key
Bare ground
Sparse woodland
Sodic soils
Water body
Woodland
N
W
E
S
0 5 10 Kilometers
1984

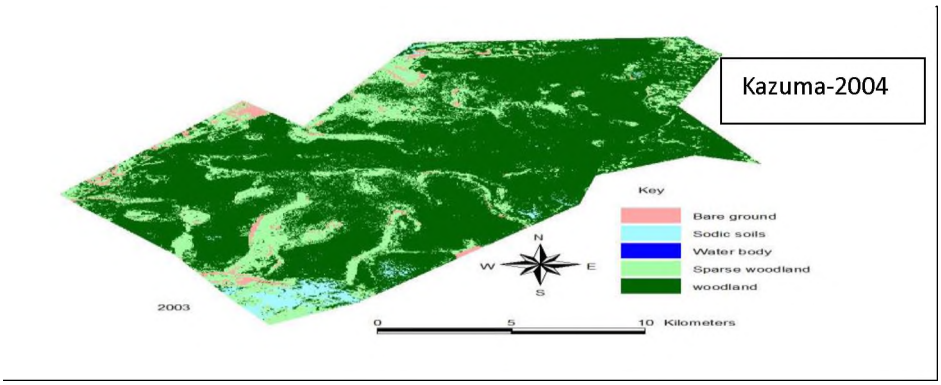

Fuller-2004
Key
Bare ground
Sparse woodland
Sodic soils
Water body
Woodland
N
W
E
S
0 5 10 Kilometers
2003

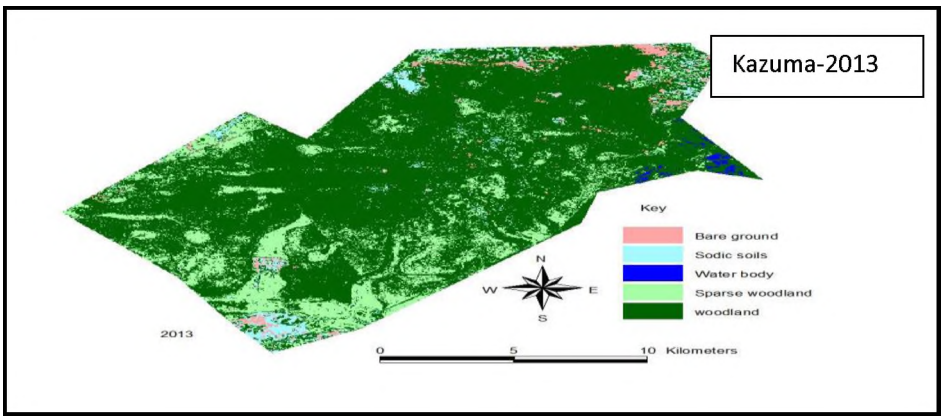

Fuller-2013
Key
Bare ground
Sparse woodland
Sodic soils
Water body
Woodland
N
W
E
S
0 5 10 Kilometers
2013

B 1


Kazuma-1984
Key
Bare ground
Sodic soils
Water body
Sparse woodland
woodland
N
W
E
S
1993
0
5
10
Kilometers


Kazuma-1993
Key
Bare ground
Sodic soils
Water body
Sparse woodland
woodland
N
W
E
S
1993
0
5
10 Kilometers


Kazuma-2004
Key
Bare ground
Sodic soils
Water body
Sparse woodland
woodland
N
W
E
S
2003
0
5
10 Kilometers


Kazuma-2013
Key
Bare ground
Sodic soils
Water body
Sparse woodland
woodland
N
W
E
S
2013
0
5
10 Kilometers

B 2

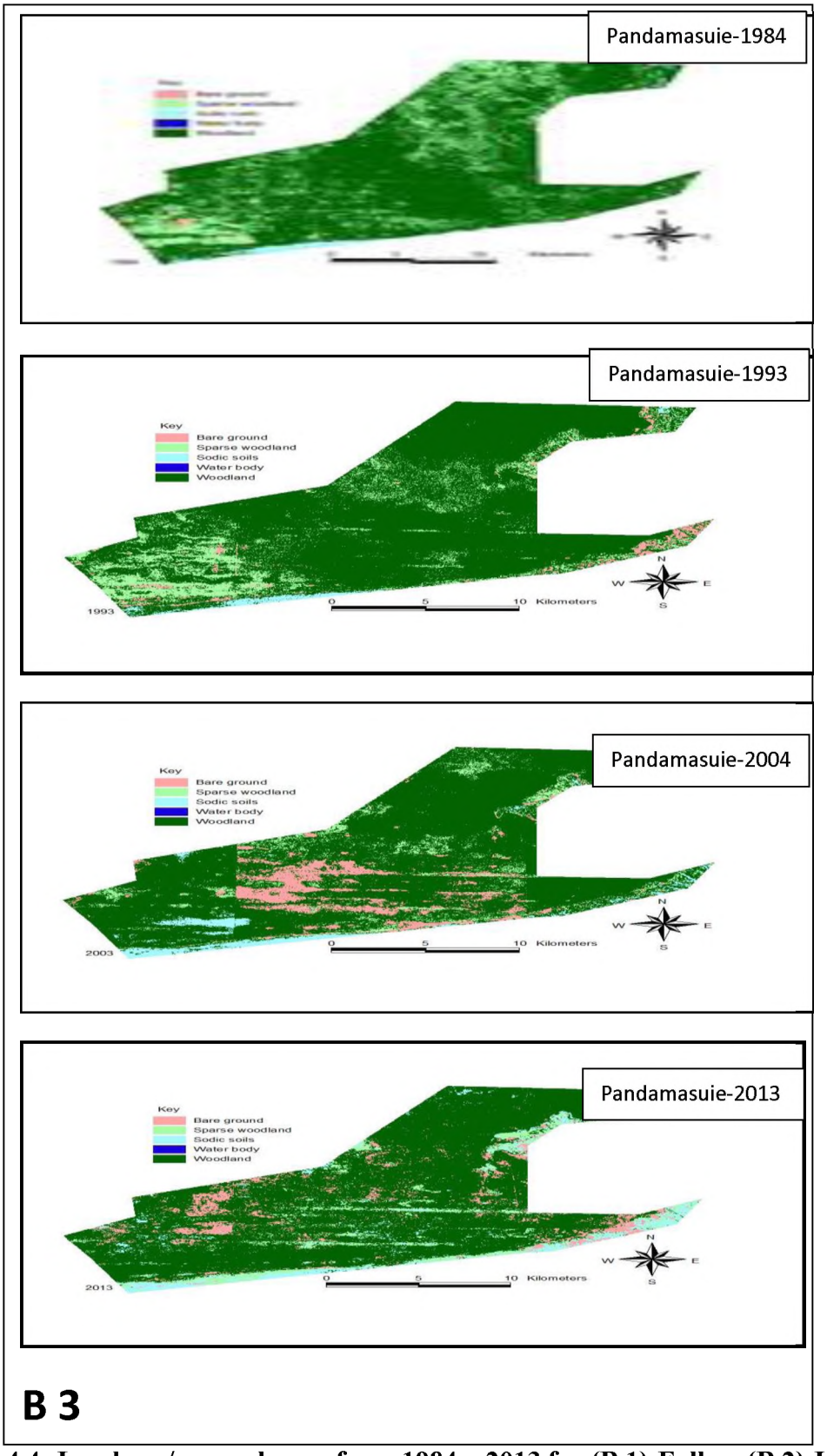


Figure 4.4: Land use/cover change from 1984 – 2013 for (B 1)-Fuller; (B 2)-Kazuma and (B 3)-Pandamasuie (*ex situ* inhabitants) forests.

Table 4.3: Area and amount of change in different land use/cover types in FPAs with *in situ* inhabitants (1984 – 2013)

Forest Name	Land use/ cover Type	Year								Change 1984-2013	
		1984		1993		2004		2013			
		Km²	%	Km²	%	Km²	%	Km²	%	Km²	%
Mbembesi	Built up/Field	24	4.4	41	7.5	51	9.4	54	9.9	30	+5.5
	Dense forest	257	47.2	251	46.1	191	35.1	150	27.6	107	-19.7
	Degraded forest	260	47.8	250	46.0	300	55.2	338	62.1	78	+14.3
	Total	**544**	**100**	**544**	**100**	**544**	**100**	**544**	**100**		
Gwampa	Built up/field	10	2.4	22	5.2	25	5.9	30	7.1	20	+4.8
	Dense forest	220	52.3	193	45.8	179	42.5	116	27.6	104	-24.7
	Degraded forest	191	45.4	206	48.9	219	52.0	275	65.6	85	+20.2
	Total	**421**	**100**	**421**	**100**	**421**	**100**	**421**	**100**		
Gwaai	Field/Built up	24	1.9	33	2.6	34	2.6	n.d	n.d	10	+0.8
	Dense forest	770	59.8	634	49.2	510	39.6	n.d	n.d	260	-20.2
	Degraded forest	494	38.4	621	48.2	743	57.7	n.d	n.d	249	+19.3
	Total	**1288**	**100**	**1288**	**100**	**1288**	**100**	**n.d**	**n.d**		

Table 4.4: Area and amount of change in different land use/cover types in FPAs with *ex situ* inhabitants (1984-2013)

Forest Name	Land use/ Cover type	Year								Change 1984-2013	
		1984		1993		2004		2013			
		Km²	%	Km²	%	Km²	%	Km²	%	Km²	%
Fuller	Dense forest	240	88.3	217	79.9	183	67.1	180	66.1	60.4	-22.2
	Degraded forest	29	10.5	50	18.3	85	31.3	86	31.5	57.0	+20.9
	Bare ground	3	1.16	6	2.1	5	1.8	8	2.9	4.7	+1.7
	Total	**272**	**100**	**272**	**100**	**272**	**100**	**272**	**100**		
Kazuma	Dense forest	201	76.6	181	69.0	202	77	209	79.7	8	+3.1
	Degraded forest	53	20.2	77	29.3	54	21	46	17.7	7	-2.6
	Bare ground	9	3.3	5	1.8	6	2.3	6	2.2	3	-1.1
	Total	**262**	**100**	**262**	**100**	**262**	**100**	**262**	**100**		
Panda masuie	Dense forest	271	79.3	287	83.8	287	83.8	292	85	21	+6.1
	Degraded forest	67	19.7	47	13.7	22	6.6	23	7	45	-13.1
	Bare ground	4	1.1	9	2.6	33	9.8	28	8	24	+6.9
	Total	**342**	**100**	**342**	**100**	**342**	**100**	**342**	**100**		

4.4.3: Perceptions on causes of forest loss and degradation: Comparison of Forest officials and local communities' views

The causes of forest loss and degradation differed mainly according to whether the respondent was a Forestry Commission official or a member of the community as shown on Table 4.5.

Table 4.5: Perceptions of forest officials and local communities on causes of forest loss and degradation

Forestry Commission officials' views (n=18)	%	Local communities members' views (n=217)	(%)
Commercial logging	22	Foresters lack knowledge of fire management	33
Wildlife herbivory	39	Lack of respect and involvement of traditional leaders	60
Encroachment for settlement and cultivation by local communities	89	Failure to involve locals in forest management	58
Illegal timber and NTFPs harvesting by locals	66	Lack of respect of local traditions and cultures	25
Forest fires caused by locals	78	Ineffectiveness of FC's forest protection unit	54
Frequent Droughts	56	Discriminatory laws that preclude local subsistence use	43
Climate change	28	Access to forest resources by non-locals with no-sense of conservation	18
		A long history of commercial extraction of timber by commercial loggers	37

The views of these two groups of actors on causes of forest loss and degradation differed widely. There seemed to be a blame game where foresters blamed the local communities and local communities blamed forest officials for causing forest loss and degradation. Results revealed that most of the local communities' views constituted complaints and criticisms of the FC pertaining to how the FPAs are governed. They also did not cite any natural causes whilst forestry officials pointed out both human and natural causes of forest loss and degradation. The forestry officials cited predominantly proximate causes such as wildlife herbivory, illegal activities carried out by locals and commercial logging. The majority of forestry authorities felt local community-related activities constituted the real challenges faced by FPAs causing biodiversity loss and degradation. The main problem in settled forests according to forestry authorities was deforestation due to clearance of land by local communities for settlement and cultivation. This confirms the chief conservator of all FPAs in western Zimbabwe's view that the main threat to biodiversity conservation were the local

communities who carried out various illegal activities particularly squatting in the FPAs. On the other hand locals cited mainly ultimate causes of forest loss that included failure to involve locals and their leadership in forest management activities, discriminatory laws and a long history of predominantly commercial timber extraction by concessionaires who rarely followed set rules due to poor monitoring.

4.5: Discussion

4.5.1: FPA governance quality

The low mean governance quality scores showed that governance has been of poor quality in almost all the study FPAs. It has, however, been fluctuating over the study period with the 1980s and 1990s having higher governance quality than the pre-1980s and the post-2000 periods showing the association between governance and time. During the 1980s and 1990s, the FC introduced social forestry as an operational policy. FC entered into collaborative arrangements with local communities where they were supposed to participate in forest monitoring and in return the locals were allowed to access the forest and extract low value NTFPs such as dry wood, edible insects, mushrooms, thatching and broom grass. The arrangements, however, collapsed in the late 1990s when it became evident that locals' involvement was meant by FC to be a form of local community control and manipulation by legitimating already made decisions (Conrnwall, 2008). The lack of a statistically significant difference in governance quality between settled forests and unsettled forests is because all the forests are under the same state-led governance system that applies the governance principles almost uniformly across all FPAs (Mutekwa and Gambiza, 2016). The Forest Act and forest policy also form the main regulatory framework for all the forests and they are enforced by FC uniformly across the FPA spectrum.

4.5.2: Impact of governance on FPAs' land use/cover change

Remote sensing has brought about significant improvements in land cover data availability and characterisation. This, however, needs to be matched by enhanced understanding of the causes of land cover change and this requires going beyond simplistic explanations (Committee on Global Change Research, 1999; Lambin *et al.*, 2001). Results have shown that land cover changed significantly in the study FPAs from 1984 to 2013. There was a significant difference in land cover change between FPAs with *in situ* inhabitants and those

with *ex situ* inhabitants. Settled forests were much more deforested and degraded than unsettled ones. The inhabited forests due to their proximity to areas with high population densities were affected more than those far away from areas of high population concentration. Two of the unsettled forests (Kazuma and Pandamasuie) demonstrated an increase in forest cover over the study period indicating the occurrence of forest recovery. However, Fuller forest which was cleared of *in situ* inhabitants in the late 1980s but is surrounded by communal areas exhibited patterns of change similar to currently settled forests. Forest cover pattern is a result of both natural and socio-economic factors and the way the forests have been utilised in time and space (Rawat and Kumar, 2015). These are directly and indirectly influenced by historical and current governance processes and arrangements at multiple levels.

4.5.3: Perceptions of forest officials on causes of forest loss and degradation

Forest officials blamed local communities, commercial loggers, wildlife herbivory and climate change as the main drivers of deforestation and degradation in the study forests. They argued that forest loss and degradation were driven by poverty amongst local communities, forest fires and encroachment for settlement and agriculture. They regard local communities as anti-conservation and therefore recklessly and wantonly cut down trees. One forester stated that local communities perceive land in the forest as abundant and therefore some of the people practice shifting cultivation. "The local communities believe in airport creation", he argued meaning that they prefer to see bare ground around them.

In addition, communities are blamed for deliberately causing forest fires when hunting for wildlife and clearing land for agriculture and settlement. These fires frequently ravage protected forests with devastating effects especially during the dry season. This is supported by Allen and Barnes (1985) who stated that the invasion, slashing and burning of forests by local people have driven deforestation and degradation. Agrawal *et al.* (2013) also observed that in impoverished communities, forest cover and increase in forest degradation are a result of subsistence activities of the poor such as firewood extraction, clearing for agriculture and extracting timber for construction purposes. This seems to explain why settled forests of Gwampa, Mbembesi and Gwaai that are close to communal and resettlement areas and Fuller forest that is close to Mvutu and Jambezi communal areas and was once settled before the successful eviction of the settlers in the late 1980s have experienced high rates of deforestation and forest degradation. The settled forests particularly along water courses and

on their boundaries with communal and resettlement areas have higher rates of clearing and forest degradation because these areas are subjected to significant human pressure compared to Kazuma and Pandamasuie that are infested with dangerous wildlife and far away from communal settlements and roads and therefore inaccessible to local communities.

As the local community members carryout their hunting and gathering of various wildlife and non-timber forest products, they frequently start forest fires that ravage forests especially during the dry season. Woody vegetation cover is reduced more by long term exposure to dry-season fires because the intensity of dry season fire is far much higher than wet season fire intensity (Gambiza *et al.*, 2005; Smit *et al.*, 2010). According to FC fire records, the Gwaai, Gwampa and Mbembesi group of forests with *in situ* inhabitants experienced 33 fire incidents in 1988 and 46 in the year 2005 that were attributed to local communities compared to 17 fire incidents in 1983. The Fuller, Kazuma and Pandamasuie group of forests with *ex situ* inhabitants had eight fire incidents in 1988 and five in 2005, a far much lower fire incidence rate compared to settled forests. This showed that fire incidence was high in settled forests during the violent evictions of the late 1980s and post year 2000 due to land invasions. Given the FC's limited capacity to deal with forest fires, fire has become one of the major drivers of forest degradation particularly in settled forests. The harvesting of mature trees by commercial loggers and reduction in levels of livestock grazing led to increase in grass fuel load and consequently increase in fire frequency (Gambiza *et al.*, 2000). The amount of grass fuel load also determines the extent of fire damage on vegetation. Frequent intense fires suppress woody plant regrowth resulting in the reduction in availability of canopy trees as the woodland would be rapidly converted to bushland.

In addition to human uses of the study forests, forest officials also stated that the forests were important wildlife habitats and therefore herbivory was an important factor in forest degradation. The Gwaai, Gwampa and Mbembesi group of forests is found away from areas of wildlife herbivores such as *Loxodonta africana* (elephant), *Taurotragus oryx* (eland), *Tragelaphus strepsiceros* (kudu) and buffalos concentrations and therefore there was light utilization of forests by these animals (Gambiza *et al.*, 2005) leading to reduced impact of wildlife on forest cover. On the other hand, the uninhabited forests particularly Pandamasuie and Kazuma are found in areas where elephants are abundant leading to reduced cover of small and medium sized trees. The African elephant is regarded as the main factor determining savanna woody cover, because it is able to destroy mature trees and open up closed canopies (Mukwashu *et al.*, 2012). At high density, elephants increase tree mortality

and may convert woodland to grassland (Guy 1989). In Tsavo National Park, Kenya, elephant browsing impact on vegetation was evidenced by the recovery of woodlands typical of that region after large numbers of elephants had died (Leuthold, 1996). Other browsers of all sizes prevent recruitment and establishment of mature trees and thereby are instrumental in reducing forest cover (Staver *et al.,* 2009).

Foresters also argued that climate change is already affecting the forests as evidenced by increased tree mortality and low rates of regeneration due to increased frequency and prolonged droughts. Although new climatic trends are not yet clear, locals claimed that amount of rainfall has been decreasing in recent years and this is believed to be taking a significant toll on forest biodiversity. Also when fires are started, they burn quickly and easily get out of control due to the increasing dry and hot conditions in the region (Boddy, 2016). Abatzoglou and Williams (2016) have also established that climate change has become an important driver of increased forest fire activity in recent decades leading to significant forest damage and loss.

Forest officials argued that herbivory, climate change, commercial logging, subsistence use, fire regimes constitute the drivers that have determined the current forest condition and are likely to determine the future trajectory of land cover change in the study forests. These cause-effect relationships have gained credence among forest officials at national and local levels and have therefore influenced forestry policy and practice. These factors according to Lambin (2001) have become popular because they are in line with prevailing worldviews, suggest simple technical or population control solutions and they serve the interests of the Forestry Commission – to be the sole owner, controller and manager of the FPAs in the country. The thrust of forest policy and practice over the years has been the eviction of forest inhabitants, restricting forest entry by surrounding communities through increased patrols by forest guards and sometimes enlisting the services of the police among other measures. However, most of these reasons proffered by forest officials are proximate causes whilst there are the ultimate challenges that are behind land cover change in the study FPAs.

4.5.4: Governance as the ultimate cause of deforestation

Local communities exacerbated forest loss in the case study forests. Laying the blame squarely on the poor local inhabitants may be an over simplification of the protected area forest loss challenges. Results showed that governance has a statistically significant

correlation with land cover change in FPAs. High governance scores were associated with lower rates of forest loss and the opposite was true. Explaining this relationship requires an analysis of deeper FPA governance arrangements and processes that constitute ultimate drivers of forest loss (Contreras, 1999). These depend on the historical and present organisation of the people, allocation and exercise of power and authority, capacity of governing institutions to enforce rules that determine FPA access as well as the extent to which the governance principles are applied.

Deforestation of FPAs was high during the pre-1980s and the post-2000 periods. The problem of poverty amongst local communities in the study forests led to overdependence on forest resources (Mutanga *et al.,* 2015). The colonial forest officials ruthlessly controlled locals' access to land and forest resources such as timber, firewood and grass. Indeed, some measure of control is required in any type of governance to prevent open access problems. The challenge was not the presence of controls, but how much, by whom, what type and in what ways were the controls exerted. The colonial type of governance focussed just on regulations instead of incentive-based instruments (Cox, 2016). Kwashirai (2008) argued that the evictions, dispossession, taxation of locals and forest rules and regulations in and around forest protected areas caused poverty among local communities. In addition, she stated that foresters in cahoots with commercial loggers exploited forest residents under appalling working conditions of overwork and low wages driving several families into destitution. Subjecting locals to these conditions without providing other livelihood options forced local communities to 'steal' from the forests to make a living. This made the locals unwilling to support the forest protected areas. With limited capacity of the FC to patrol the forests and enforce forest laws, the local communities pillaged FPA resources. Since commercial loggers were not also adequately monitored, poaching of timber and noncompliance with harvesting quotas allocated were rampant leading to FPA forest loss.

Also during the pre-1980s, forest policy and management practices were premised on globally generated expertise without taking into account existing local knowledge leading to the side-lining of local communities and their indigenous knowledge in favour of scientific knowledge (Mapedza, 2007). For example, local community members as shown in Table 4.5 argued that the forests were managed by young professionals who had little knowledge and experience in fire management leading to extensive forest lands being ravaged by wildfires that the officials could not control. Local forest settlers as people who had lived in forests for

years had vast experience in fire management if they were to be actively involved in forest management activities.

The post year 2000 forest loss was triggered mainly by the government's national policies of indigenisation and land reform which have resulted in spontaneous invasion of FPAs and other land areas. The 2004 forest-based land reform policy called for the regularisation of forest settlements which seemed to legitimise forest land occupation and therefore encouraged more human settlement in FPAs. These together with the economic meltdown that saw industries folding up forced hordes of former employees and other people to settle in FPAs. Forest resources became critical for livelihood sustenance leading to both timber and non-timber products overharvesting. This saw Gwampa, Mbembesi and Gwaai forests experiencing a surge in illegal settlers who included former industrial workers who migrated to rural areas after closure of industries leading to extensive land clearance for settlement and agriculture.

The former urban dwellers who moved into FPAs but still had links with their colleagues who remained in towns 'opened floodgates' to complex and organised crime networks involved in wildlife poaching, illegal logging and trade in timber products obtained from the FPAs as commercialization of forest products increased due to deepening national economic hardships (Tsiko, 2010). Forests such as Kazuma and Pandamasuie were not affected by settler inflows because of their inaccessibility and presence of dangerous wildlife species that make settling and living in the forests difficult. These FPAs are therefore largely managed for tourism and conservation. Deep rooted governance challenges and FPA management approaches in line with the perceptions of local communities largely explain land cover change in the study FPAs.

4.6: Conclusion

The results show that governance quality did not vary significantly between settled and unsettled areas. However, it varied significantly with time in line with political changes from colonial period to independence in 1980. The implementation of the FTLRP and its associated economic meltdown, the adoption of other populist policies and the general deterioration of the rule of law led to a significant deterioration of FPA governance from the year 2000 onwards. FPA land cover change fluctuated in tandem with changes in governance quality over the study period. Settled forests experienced greater forest loss and degradation than unsettled forests. Overall, the studied FPAs governance quality was poor and this led to

significant forest loss and degradation from 1984 to 2013. The views of forest officials differed from those of local communities on the causes of forest loss and degradation. Forest officials provided proximate causes whilst locals gave ultimate reasons that indicated the underlying governance and management challenges associated with FPAs. The study showed that remote sensing can be employed to evaluate the impact of governance quality on FPA land use/cover change. To arrest forest loss and degradation, there is need to address the underlying governance challenges being experienced by FPAs. In this context, involvement of local communities in FPA governance can provide viable options for forest resources utilisation, monitoring and protection.

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4.8: References

Abatzoglou, J. T. and Williams, A. P. 2016. Impact of anthropogenic climate change on wildfire across western US forests. *PNAS* Vol.113 (42): 11770-11775.

Agrawal, A., Cashore, B., Hardin, R., Shepherd, G., Benson, C. and Miller, D. 2013. Economic contribution of forests. United Nations Forum on Forests 8-19 April, Istanbul, Turkey.

Allen, J. C. and Barnes, D. F. 1985. The causes of deforestation in developing countries. *Annals of the Association of American Geographers,* 75 (2): 163-184.

Boddy, J. 2016. As record Appalachian wildfires fizzle out, scientists look to learn from the destruction. *AAAS Science magazine.* 24 December 2016.

Borrini-Feyerabend, G. 2003. Governance of protected areas: innovations in the air.... *Policy Matters*, 12: 92–101.

Borrini-Feyerabend, G., Dudley, N., Jaeger, T., Lassen, B., Broome, P. N., Phillips, A., and Sandwith, T. 2013. *Governance of Protected Areas: From understanding to action.* Best Practice Protected Area Guidelines Series No. 20, IUCN, Gland, Switzerland.

Brockington, D. and Wilkie, D. 2015. Protected areas and poverty. *Philosophical Transaction of the Royal Society* B, 370: 20140271. http://dx.doi.org/10.1098/rstb.2014.0271.

Burgess, R., Hansen, M. Olken, B.A., Potapov, P. and Sieber, S. 2012. The political economy of deforestation in the tropics. *Quarterly Journal of Economics* 127: 1707–1754.

Buscher, B. E. and Mutimukuru, T. (2007), 'Buzzing too far? The ideological echo of global governance concepts on the local level: the case of the Mafungautsi Forest in Zimbabwe', *Development Southern Africa*, 24 (5): 649-664.

Chape, S., Harrison, J., Spalding, M. and Lysenko, I. 2005. Measuring the extent and effectiveness of protected areas as an indicator of meeting global biodiversity targets, *Philosophical Transactions of the Royal Society (Botanical)* 360: 443–455.

Committee on Global Change Research, 1999. Global Environmental Change: Research Pathways for the Next Decade. National Academy Press, Washington, DC. USA.

Contreras. H. A. 1999. The Underlying Causes of Forest Decline. CIFOR Occasional Paper # 30. Bogor, Indonesia: Centre of International Forestry Research (CIFOR).

Cornwall, A. 2008. Unpacking 'participation': Models, meanings and practices. Oxford University Press, Oxford.

Corrigan, C. and Murtazashvili, I. 2015. Governance of Fracking in Africa. *Governance in Africa* 2 (1): 1-14.

Cox, M. 2016. The pathology of command and control: a formal synthesis. *Ecology and Society* 21(3):33. http://dx.doi.org/10.5751/ES-08698-210333.

De Leeuw, J., Georgladou, Y., Kerle, N., De Gler, A., Inoue, Y., Ferwerda, J., Smiles, M. and Narantuya, D. 2010. The function of remote sensing in support of environmental policy. Remote sensing 2, 1731-1750.

Dietz, T., Ostrom, E. and Stern, P. 2003. *Science* 302: 1907-1912.

Dudley, N., Baldock, D., Nasi, R. and Stolton, S. 2005. Measuring biodiversity and sustainable management in forests and agricultural landscapes. *Philosophical Transactions of the Royal Society B 360:* 457-470.

Ferraro, P. J. and Hanauer, M. M. 2014. Advances in measuring the environmental and social impacts of environmental programs. *Annual Review of Environmental Resources*. 39: 495–517.

Ferraro, P. J. and Pressey, R. L. 2015. Measuring the difference made by conservation initiatives: Protected areas and their environmental and social impacts. *Philosophical Transactions of the Royal Society B* 370: 20140270. http://dx.doi.org/10.1098/rstb.2014.0270.

Gambiza, J., Bond, W., Frost, P. G. H. and Higgins, S. 2000. A simulation model of miombo woodland dynamics under different management regimes. *Ecological Economics* 33: 353-368.

Gambiza, J., Campbell, B. M., Moe, S. R. and Frost, P. G. H. 2005. Fire behaviour in a semi-arid Baikiaea plurijuga savanna woodland on Kalahari sands in western Zimbabwe. *South African Journal of Science* 101: 239-244.

Forestry Commission, 2007. Position paper on illegal settlements in all the gazetted forests of Zimbabwe. FC, Harare, Zimbabwe.

Graham, J., Amos, B. and Plumptre, T. 2003. Governance principles for protected areas in the 21st century. Institute On Governance, Ottawa, Canada.

Guy, P. R. 1989. The influence of elephant and fire on the Brachystegia julbernadia woodland in Zimbabwe. *Journal of Tropical Ecology*, 5: 215-225.

Hockings, M. 2003. Systems for assessing the effectiveness of management in protected areas. *Bioscience* 53: 823–832.

Hopf, T. 2004. Discourse and content analysis: Some fundamental incompatibilities. *Qualitative methods* 2(1): 31–33.

Kwashirai, V.C. 2008. Poverty in the Gwaai Forest Reserve, Zimbabwe: 1880-1953. *Global Environment* 1:146-175.

Lambin, E. F., Turner, B. L., Geist, H. J., Agbola, S. D., Angelsen, A., Bruce, J. W., Coomes, O. T., Dirzo, R., Fischer, G., Folke, C., George, P. S., Homewood, K., Imbernon, J., Leemans, R., Li, X., Moran, E. F., Mortmore, M., Ramakrishnan, P. S., Richards, J. F., Skanes, H., Steffen, W., Stone, G. D., Svedin, U., Veldkamp, T. A., Vogel, C. and Xu, J. 2001. *Global Environmental Change* 11: 261–269.

Larson, A. M. and Petkova, E. 2011. An introduction to forest governance, people and REDD+ in Latin America: Obstacles and Opportunities. Forests 2: 86–111.

Leuthold, W. 1996. Recovery of woody vegetation in Tsavo National Park, Kenya, 1970–1994. *African Journal of Ecology*, 34: 101-112.

Lockwood, M. 2010. Good governance for terrestrial protected areas: A framework, principles and performance outcomes. *Journal of Environmental Management,* 91: 754-766.

Lockwood, M., Davidson, J., Curtis, A., Stratford, E. and Griffith, R. 2010. Governance principles for natural resource management. *Society & Natural Resources: An International Journal* 23(10): 986–1001.

Macura, B., Secco, L. and Pullin, A. 2015. What evidence exists on the impact of governance type on the conservation effectiveness of forest protected areas? Knowledge base and evidence gaps. *Environmental Evidence* 4 (24): 1-29.

Mapedza, E. 2007. Forestry policy in colonial and postcolonial Zimbabwe: continuity and change. *Journal of Historical Geography* 33: 833-851.

Mudekwe, J. 2007. Management practices for the protection of forest reserves: The case of Kalahari sand teak forest reserves in western Zimbabwe. Forest Management Working Paper FM/31 Forest Management Division, FAO, Rome.

Mukwashu, K., Gandiwa, E. and Kativu, S. 2012. Impact of African elephants on Baikiaea plurijuga woodland around natural and artificial watering points in northern Hwange National Park, Zimbabwe. *International Journal of Environmental Sciences*, Vol. 2 (3): 1355-1368.

Mutanga, C. N., Vengesayi, S., Muboko, N. and Gandiwa, E. 2015. Towards harmonious conservation relationships: A framework for understanding protected area staff-local community relationships in developing countries. *Journal for Nature Conservation* 25: 8–16

Mutekwa, V. T. and Gambiza, J. 2016. Assessment of governance principles application in forest protected areas: the case of six state forests in western Zimbabwe. *International Forest Review* Vol. 18 (4): 466-484.

NASA, 2011. *Landsat 7 Science Data Users Handbook.* Maryland: Landsat Project Science Office at NASA's Goddard Space Flight Center in Greenbelt.

Nagendra, H. 2008. Do Parks Work? Impact of Protected Areas on Land Cover Clearing. *AMBIO: A Journal of the Human Environment*, 37(5): pp 330-337.

Nelson, A. and Chomitz, K. M. 2011. Effectiveness of Strict vs. Multiple Use Protected Areas in Reducing Tropical Forest Fires: A Global Analysis Using Matching Methods. *PLoS ONE* 6(8): 1-14.

Nepstad, D., Schwartzman, S., Bamberger, B,. Santilli, M., Ray, D., Schlesinger, P., Lefebvre, P., Alencar, A., Prinz, E., Fiske, G. and Rolla, A. 2006. Inhibition of Amazon Deforestation and Fire by Parks and Indigenous Lands. *Conservation Biology,* Vol. 20. No. 1: 65-73.

Nolte, C., Agrawal, A., Silvius, K. M. and Soares-Filho, B.S. 2013. Governance regime and locational influence avoided deforestation success of protected areas in the Brazilian Amazon. *PNAS*, Vol. 110 (13): 4956-4961.

Nyamapfene, K. 1991. *The soils of Zimbabwe*. Nehanda Publishers, Harare, Zimbabwe.

Ostrom, E. and Nagendra, H. .2006. Insights on linking forests, trees and people from the air, on the groung and in the laboratory. *PNAS,* Vol. 103, No. 51: 19224-19231.

Paulson Priebe, M. E. 2012. Forest governance institutions, anthropogenic disturbance and forest cover change in Central American forests. Unpublished PhD dissertation, Indiana University, USA.

Rawat, J. S. and Kumar, M. 2015. Monitoring land use/cover change using remote sensing and GIS techniques: A case study of Hawalbagh block, district Almora, Uttarakhand, India. *The Egyptian Journal of Remote Sensing and Space Sciences* 18: 77-84.

Romero, C., Putz, F. E., Guariguata, M. R., Sills, E. O., Cerutti, P. O. and Lescuyer, G. 2013. An overview of current knowledge about the impacts of forest management certification: A proposed framework for its evaluation. Occasional Paper 91. CIFOR, Bogor, Indonesia.

Schweithelm, J.; Kanaan, R. and Yonzon, P. 2006. Conflict over natural resources at the community level in Nepal. ARD, Vermont.

Secco, L., Da Re, R., Gatto, P., Tassa, D. 2011. How to measure governance in forestry:

Key dimensions and indicators from emerging economic mechanisms. *Allgemeine Forst und Jagdzeitung* 182(5): 69-82

Slayback , D. and Terry C. H. Sunderland, T. C. H. 2013. 'Forest degradation in the Lower Mekong and an assessment of protected area effectiveness *c*.1990–*c*.2009: A satellite perspective.' in Sunderland, T. C. H., Sayer, J. and Ha Hoang, M, H. (eds) *Evidence – based Conservation: Lessons from the Lower Mekong.* Bogor, Indonesia: CIFOR

Smit, I. P. J., Asner, G. P., Govender, N., Kennedy-Brown, T. and Jacobson, J. 2010. Effects of fire on woody vegetation structure in African savanna. *Ecological Applications*, 20(7): 1865–1875

Staver, A. C., Bond, W. J., Stock, W. D., Van Rensburg, S. J., Waldram, M. S. 2009. Browsing and fire interact to suppress tree density in an African savanna. *Ecological Application*. 19: 1909–1919.

Terborgh, J., van Schaik, C., Davenport, L. and Rao, M. (eds). 2002. *Making Parks Work: Strategies for Preserving Tropical Nature*. Island, Washington DC.

Tomppo, E., Nilsson, M., Rosengren, M., Aalto, P. and Kennedy, P., 2002. Simultaneous use of Landsat-TM and IRS-1C WiFS data in estimating large area tree stem volume and above ground biomass. *Remote Sensing of Environment*, 82: 156-171.

Trotter, C., Dymond, J. and Goulding, C., 1997. Estimation of timber volume in a coniferous plantation forests using Landsat TM. *International Journal of Remote Sensing,* 18(10): 2209-2223.

Turner, R.A., Fitzsimmons, C., Forster, J., Mahon, R., Peterson, A. and Stead, S.M. 2014. Measuring good governance for complex ecosystems: Perceptions of coral reef-dependent communities in the Caribbean. Global Environment Change 29: 105–117.

Walsh, S.J., 1980. Coniferous tree species mapping using Landsat data. *Remote Sensing of Environment*, 9: 11-26.

White, C. 1983. *The vegetation of Africa. Vol 1, UNESCO.*

Chapter Five

Exploring the nature of contemporary governance in forest protected areas: Empirical findings from two case study forests in western Zimbabwe

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5.1: Introduction

Globally forest cover is declining at 0.2% per year with Africa, South America and the Caribbean losing forests at higher rates (FAO, 2007; MA, 2005; Plummer and Armitage, 2010). The major drivers for this forest loss and degradation include among other factors competing demands for settlement, food, fuel, and profit as forests are converted to timber, plantations, agriculture and settlements. These conversions, in particular tropical forest clearing have attracted attention because of the potential effects on erosion, flooding, increasing carbon dioxide concentration, climate change, biodiversity loss and disruption of livelihoods especially for forest dependent communities and indigenous peoples in developing countries (Brito *et al.*, 2009). Given the current rates of forest loss through harvesting and general degradation, there are worries that forests existing today may collapse by the end of the 21st century (Ostrom, 2007) with consequences for the environment, livelihoods and societal development.

Zimbabwe's FPAs are not immune to these challenges. They face serious challenges ranging from inadequate allocation of resources, increasing land encroachment for settlement and agriculture, illegal timber harvesting and uncontrolled fires resulting in high rates of deforestation and degradation (Judge, 1975; Gambiza *et al.*, 2005). It has become apparent that most of these forest sector challenges stem from failures of governance among other factors. Governance encompasses policies, institutions, actors, processes, procedures and power and how they interact to determine conservation outcomes (Macura, 2016). If effective governance arrangements are not in place at the appropriate scale, forests are at risk of destruction and degradation. The quality of governance is known to have impacts on forest condition as well as other direct and indirect social and economic conditions of diverse forest

stakeholders (Umemiya *et al.,* 2010). The need for governance improvement in Zimbabwe's protected indigenous forest sector cannot be over-emphasized. Yet what improvements need to be made, how effective, efficient and equitable those improvements would be remain unclear.

Forests, like other humanly used resources in the Anthropocene constitute complex socio-ecological systems (SESs) where social and ecological processes are inextricably interrelated (Armitage *et al.,* 2009). Ostrom (2009)'s general framework for analysing SESs states that a SES consists of a resource system (e.g. forest) with resource units (e.g. trees), that provide goods and services to improve human wellbeing while the social system is composed of resource users (actors) and the governance systems that influence the actions of the users through rules, monitoring and sanctioning (Binder *et al.,* 2013; McGinnis and Ostrom, 2014). Actors and the governance system interact with the resource and its units within the context of prevailing social, economic and political conditions to produce specific types of resource conditions and livelihoods as outcomes. Governance is therefore one of the key elements in a SES that helps to determine conservation of resources and actors' livelihoods outcomes.

Zimbabwe since the year 2000 has implemented the radical Fast Track land Reform Programme (FTLRP) that has led to a significant reconfiguration of landuse and devastating consequences on the economy (Chigumira, 2010). The FTLRP, economic collapse and the political volatility that has prevailed have created fertile ground for research mainly into their impacts on various socio-economic and environmental facets of the country. Much thrust of contemporary research has been on the impacts of FTLRP together with climate change and economic crisis on environmental and natural resources degradation particularly in resettlement areas (Chibisa *et al*., 2010; Chigumira, 2010). Little attention has been paid to the post year 2000 programmes and policies and their economic and political consequences on the governance of natural resources particularly protected indigenous forests that dominate the north western part of the country. Our study assessed contemporary governance arrangements at the local level in two protected forests in north-western Zimbabwe.

Exploring contemporary governance is critical for demonstrating its performance and identification of areas that require improvement (Lockwood, 2010). It is hoped that the study will provide insights into FPA governance to many stakeholders particularly by providing information about forest governance practices at the local level. At the local FPA level, it provides a basis for improving the performance of FPA governance to reduce biodiversity loss and sustain livelihoods. At national level, it is hoped that the results of the study can provide a

basis for reforming laws and policies and building the capacity of forest governance institutions at local level, a situation that can go a long way to reduce and manage persistent conflicts between local communities and the Forestry Commission (FC).

5.2: Why measure forest governance in Zimbabwe

There are several reasons why Zimbabwe as a country, its policy makers, forestry authorities and other stakeholders would require an exploration of contemporary governance of the countries' FPAs. Zimbabwe's protected indigenous forests are of international, national and local importance in that they play crucial environmental, economic and livelihoods roles. They provide hardwood timber resources, are rich in biodiversity, protect part of the Zambezi river catchment from degradation, sequester carbon, regulate climate and support diverse livelihoods. These require that their governance arrangements be assessed and reformed to achieve a triple win situation – climate change mitigation, biodiversity conservation and livelihoods sustenance.

Zimbabwe's FPAs are fast deteriorating due to deforestation and degradation. The key drivers of these problems include commercial logging, encroachment for settlement and agriculture, poaching of timber and non-timber forest products (NTFPs). Most of these challenges are associated with weak governance mechanisms and therefore require improvements in governance arrangements. Although measurement does not guarantee improvement, it promotes understanding which is the first step towards improvement (Kishor and Rosenbaum, 2012). Other domestic forest governance reform pressures emanate from decentralization, indigenization and empowerment, land reform policies and programmes that have resulted in communities pressurizing for recognition and participation in activities and programmes that have implications on their lives at both national and local levels. On the other hand, at the international level, devolved forest governance and progressive tenure legislation and policy frameworks that protect the rights of forest dependent communities have become an increasingly common and important element of good governance that several countries in Asia and some in Africa have adopted (Phelps *et al.,* 2010). These domestic pressures and international trends put Zimbabwe's governance in general and forest governance in particular on the spotlight in terms of what it is and what it should be.

Zimbabwe is positioning itself to participate in the programme on Reducing Emissions from Deforestation and Forest Degradation (REDD+) in developing countries. The first inaugural Zimbabwe REDD+ Stakeholders Consultative Workshop was held in 2013 to

develop a national position, a way forward and draw recommendations for developing a national REDD+ programme for Zimbabwe (Jiri *et al.*, 2013). This may require reforming governance systems in the country's forest sector (Contreras-Hermosilla, 2011; Kishor and Rosenbaum, 2012). Although REDD's main thrust is carbon accounting, the quality of forest governance is a central factor behind the successful implementation of REDD projects (Ebeling and Yasue, 2008; Cotula and Mayers, 2009). An effective REDD+ mechanism requires political will, participation of stakeholders; a clear policy position, a functioning legal framework; clarity of land ownership; low levels of corruption and rule of law as well as incentivizing forest conservation (Ansah, 2011; Phelps *et al.*, 2010). These have to be assessed to provide evidence of their current status so as to determine how they can be improved to meet REDD+ requirements. REDD+ has a higher chance of succeeding where good governance principles are adhered to or at least where needed reforms are implemented to improve forest governance.

5.3: The study framework

Forest governance in general and good governance in particular are usually defined broadly. The challenge associated with the wide range of issues that constitute good governance is the difficulty to address all its aspects within one study whilst at the same time maintaining the required scientific rigour (Giessen and Buttound, 2014). As a result, small studies focusing on specific aspects of governance at a particular level of analysis are usually undertaken. This study focused on exploring forest governance at the individual FPA level, which is the lowest tier of forest administration in Zimbabwe at which a forest project or programme can be implemented by involving various actors (Secco *et al.*, 2013). At the forest level, FPA governance constitutes efforts by forest level authorities in planning, decision making, implementing policies, monitoring and enforcing regulations pertaining to access, use and management of the forest under their jurisdiction. The governance process will be analysed in line with the following definitions by Rahman *et al.* (2014):

- Planning refers to the activities of FPA authorities at forest level in planning the use and exploitation of the FPA as per the authority granted by the relevant legal and policy framework.
- Management refers to activities of authorities at the FPA level in using the forest for development and non-development activities. It also involves protecting the FPA by

preventing damage to the FPA resulting from human actions, fire, livestock, natural forces and by maintaining rights over the forest area, products and instruments related to forest governance.

- Participation involves the efforts by FPA authorities to ensure public involvement in FPA governance. The components of participation under review include means and level of participation, diversity of participants and the regulatory framework that govern participation.
- Capacity of FPA authorities focuses on the human and material resources available at the forest level and how they are deployed in the planning and management of the forest and their effectiveness in achieving the desired objectives.
- Benefit sharing involves reviewing of the actual and expected benefits from the FPA, their accessibility and the level of satisfaction of the locals with the actual benefits obtained from the FPA.
- Monitoring and law enforcement refers to the activities of the FPA authorities in monitoring the use and exploitation of forest resources as well as exercising law enforcement for violations as is expected of them at the FPA level.

The conceptual framework for this study is shown in Figure 5.1.

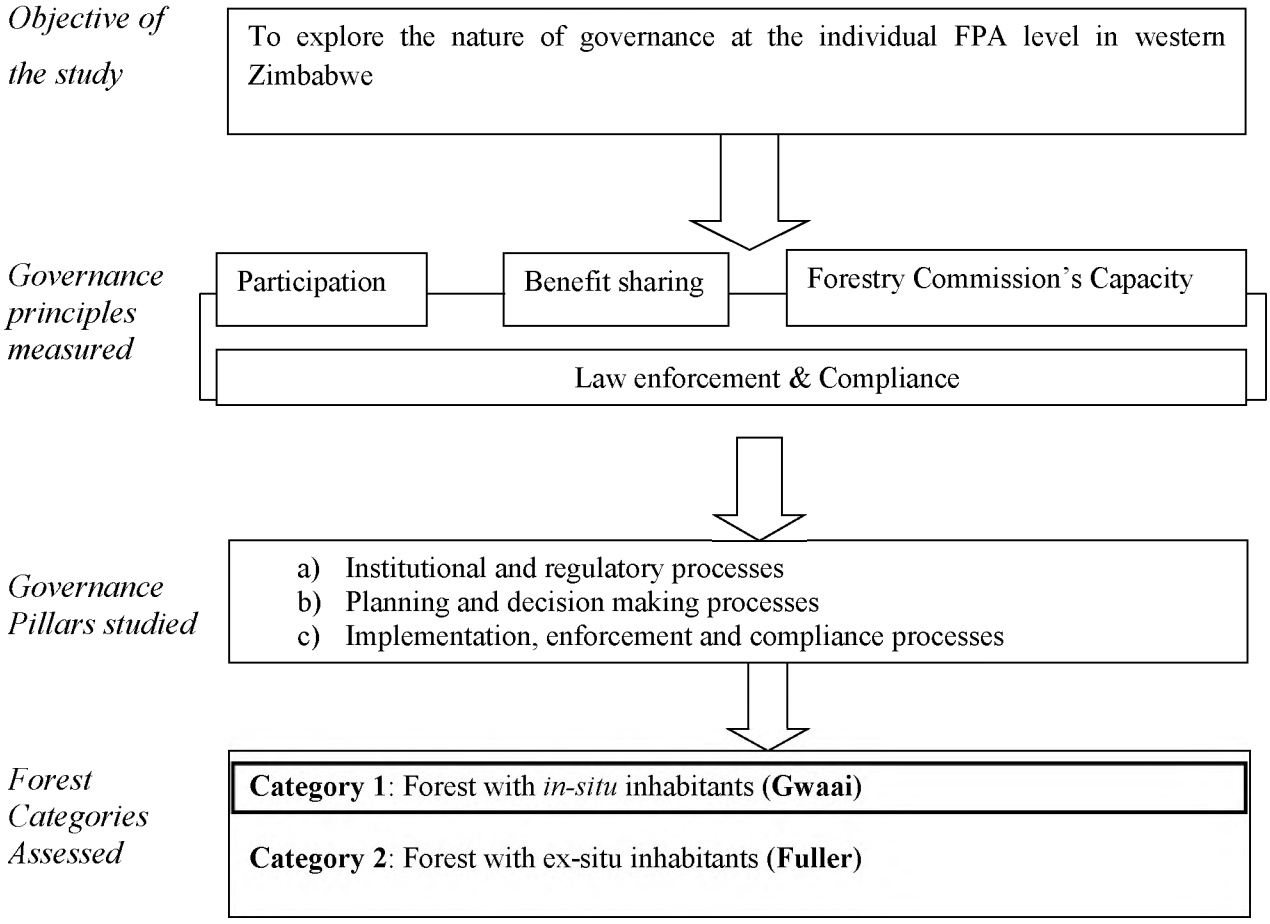

Figure 5.1: The study conceptual framework (Based on Profor (2011) and Rahman *et al.*, (2014) frameworks with some modifications by the authors)

The study focused at the individual FPA level because:

a) That is where practical implementation of policies to fulfil specific requirements takes place. On the ground measures associated with forest governance such as issuing of forest resources extraction permits, community-forest authorities benefit sharing, conflict resolution and forest management planning and implementation are carried out at the individual forest levels.

b) Understanding and addressing forest governance challenges at the local level has greater potential for reducing deforestation and degradation since measures at this level have direct and immediate impact on conservation and livelihoods outcomes.

c) To the best of the researchers' knowledge, no meaningful study has been undertaken in Zimbabwe on forest governance in general and at the individual FPA level in particular.

Exploring governance at the local level can provide a governance quality baseline, help to improve local governance by identifying weaknesses and strengths in the manner in which it operates. It can also constitute a means of providing feedback to higher levels on the effectiveness of the implementation of higher level policies and may therefore justify national or global policy reform.

5.4: Measuring forest governance empirically: Methodological challenges

Governance constitutes one of the concepts that are very challenging to measure empirically. International forest policy developments such as the European Union (EU)'s Forest Law Enforcement, Governance and Trade (FLEGT) action plan and the REDD+ initiatives as well as the need to enhance the contribution of forests to national economic development and local livelihoods without compromising forest conservation have led to the increased demand for empirical means with which to measure forest governance (Lawson, 2012). Unfortunately, the methods and instruments for forest governance measurement at all levels are still being developed (Secco *et al.,* 2013) and those that are available are still far from being perfect. Currently, some of the governance assessment methodologies in use were produced by organizations such as EU (FLEGT Barometer); FAO/PROFOR (Framework for Assessing and Monitoring Forest Governance); World Bank (Forest Governance Diagnostic Tool); World Resources Institute (WRI) (Governance of Forests Toolkit); Transparency International, Global Witness and International Forestry Resources and Institutions (IFRI) among others. The approaches were developed for different types of users and applications and to achieve different objectives (See Broekhoven *et al.,* 2012's appendix 1). The key aspect in relation to this study is that the methodologies developed by these institutions focus mainly on levels higher that the local, which is the focus of this study.

The nature of forest governance and related forest issues make it difficult to find a governance measurement method that is perfectly accurate or objective. Researchers and

policy practitioners need to balance between practicality and robustness. Challenges to deal with large numbers of potentially influential variables, problems of measuring the chosen variables, and multiple groups of interacting and mediating factors are always encountered in the study of forests and other natural resources. All measurement methods available are by necessity compromises between practicality and robustness and therefore results that they provide are always contestable (Lawson, 2012).

On governance indicators, there is lack of consensus amongst researchers on the best type of indicators to use (Roosbroek, 2007; Kaufmann *et al.*, 2010; Broekhoven *et al.,* 2012; Secco *et al.,* 2013). An indicator as defined by Secco *et al.*, (2013) is a quantitative or qualitative variable or factor that can be used to accurately describe, understand, monitor and assess a complex phenomenon such as governance. A common belief is that a governance indicator must be objectively quantifiable. This is despite the fact that some quantifiable indicators are far-fetched proxies for the aspects being assessed. This possibly stems from researchers' desire to ward-off criticism of results by parties with an interest in the field (Lawson, 2012). In the field of forest governance, it is a real challenge to find objectively quantifiable indicators that measure accurately what is intended. Qualitative indicators are therefore used, despite their lack of precision and objectivity. Usually qualitative indicators are transformed into quantitative by devising a scoring method to facilitate monitoring of change over time (Lawson, 2012). Another challenge with indicators is their multiplicity; for example, the Governance for Forests Initiative (GFI) Indicator Framework has one hundred and twenty-two indicators. Researchers therefore should choose priority themes and subthemes and their associated indicators depending on the purpose of the assessment, resources available and the time devoted to the assessment.

To circumvent the challenges associated with individually formulated methods and ensure comparability of results with other researches, a standardized three pillar and three-five components framework for assessing and monitoring forest governance developed by the World Bank/Profor and FAO with other practitioners such as WRI and Chatham House was adopted for this research. Despite it having been widely tested in countries such as Kenya, Burkina Faso, Uganda among others, it balances several considerations that include its practical applicability across a wide range of situations, the rapidity and reasonably low cost of its implementation. The framework was also preferred because it does not prescribe a specific set of indicators to use. It can be used with a wide range of indicators.

At the local level, there is need to assess the practical activities and actions carried out by protected forest officials. This necessitates the availability of indicators of forest governance at the local level. These are supposed to be site and context specific. For the purposes of this study, we adopted Secco *et al.*'s (2013) local level forest governance indicators with some modifications.

5.5: Materials and Methods

5.5.1 Location, choice and characteristics of case study forests

This study focused on exploring governance mechanisms at the individual forest level with the focal system being the indigenous FPAs in western Zimbabwe. The FPAs are found in Matabeleland north province (Figure 5.2) which is one of Zimbabwe's eight provinces covering about 19 percent of the total area of Zimbabwe (AOAD, 1992). The population of the province was 749 017 in 2012 (excluding Bulawayo city) or 5.7% of Zimbabwe's total population (Zimstat, 2013). The province's main land uses are national parks, sanctuaries, resettlement land, communal areas and FPAs (Hill and Katerere, 2002). These land divisions were first established under the Land Apportionment Act of 1930 followed by the Land Tenure Act of 1969 and then the post-independence land reform programme which was accelerated since the year 2000.

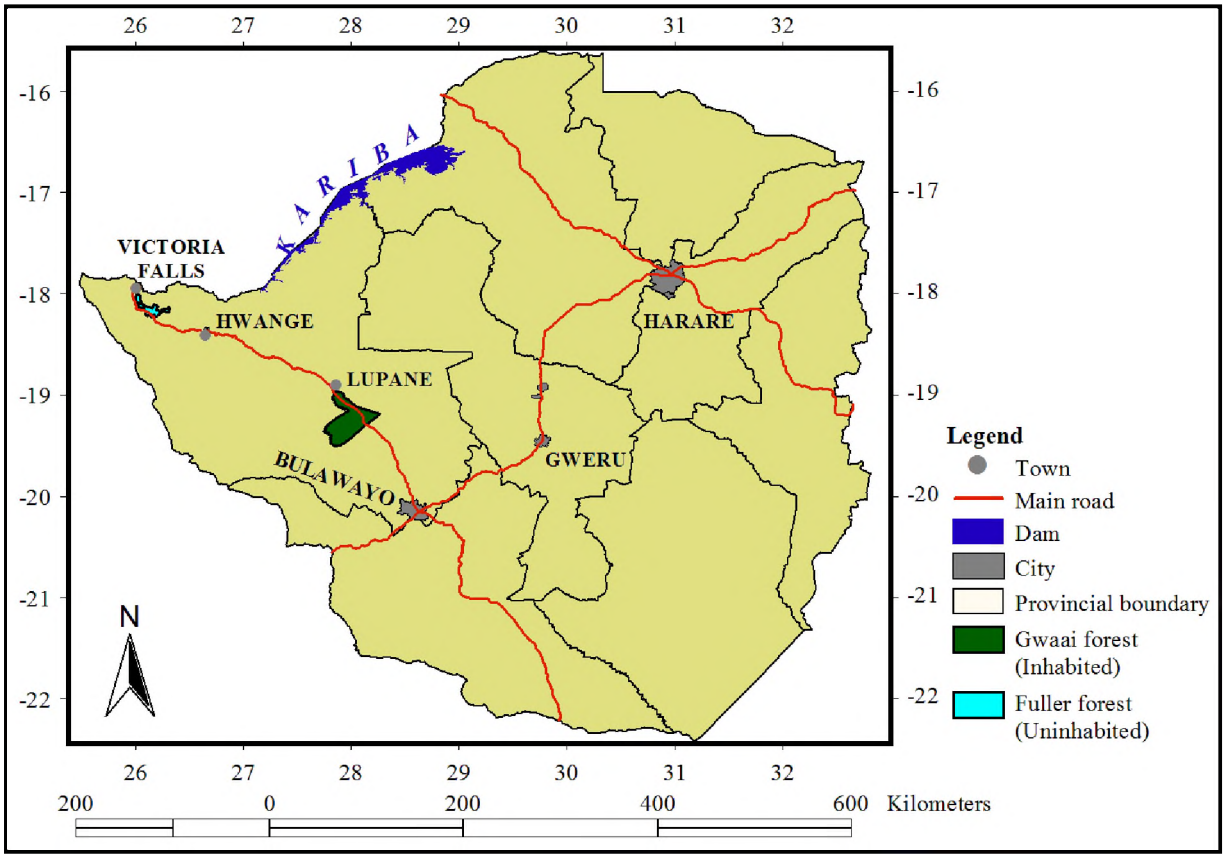

Figure 5.2: The location of Gwaai and Fuller forests in Matabeleland North province, Zimbabwe

Matabeleland region was selected because all the *Baikiaea* hardwood forests of vital local, national and international ecological and economic significance are found in this region (Judge, 1975). The region, due to the role of the forests as wildlife habitats, is both socially and economically significant for its wildlife-based tourism activities that include game viewing, trophy hunting and photographic safaris. From a governance point of view, all the major forest areas in the region are demarcated as protected state forests that are owned and managed by the state through the Forestry Commission under the Forest Act chapter 19:05. The forests are in agro-ecological region IV that receives annual rainfall ranging from 400 – 700 mm (Vincent and Thomas, 1960). The rainfall is temporally poorly distributed and seasonal droughts are common. The rainfall has become more variable with climate change and new trends are yet to be established. The forests are on generally flat to undulating terrain that is predominantly underlain by deep unconsolidated Kalahari sand deposits. These climatic and edaphic conditions have made the region's agricultural potential very limited resulting in the FPAs being important sources of local peasant population's livelihoods. All

the forest lands have distinct vegetation zones that are related to soil and topography. Vleis are characterised by different formations of grasses that are good habitats for grazers. The Kalahari sand zones are the most extensive and they support commercially valuable *Baikiaea plurijuga* woodlands associated with *Pterocarpus angolensis, Combretum collinum, Schinziophyton rautanenii, Croton gratissimus and Guibourtia coleosperma.* Dicotyledonous herbs such as *Vernonia poskeana, Clerodendrum ternatum and Jasminum stenolobum* are also common. (Judge, 1975; White, 1983; Gambiza *et al.*, 2005). The C*olophosperum mopane* woodlands occur mainly on vlei margins.

Through consultation with forest management authorities in the region, the two study forests were selected – Gwaai and Fuller forests (Figure 5.2). The main criterion for categorisation of the forests was the peasant population settled in the forests. Gwaai has *in situ* forest inhabitants whilst Fuller has *ex situ* inhabitants. The Forestry Commission argues that the most serious threat to the sustainable management of the indigenous forests in Matabeleland north province is the presence of *in situ* inhabitants (squatters) on forest land. The Forest Act chapter 19:05 states that there should not be human inhabitants in protected state forests except forest management authorities and their families. The two forests were chosen for comparison of governance arrangements and their outcomes because they represent the reality of forest management situation in the region. Gwaai forest with *in situ* inhabitants represents the unacceptable situation whilst Fuller with *ex situ* inhabitants represents the acceptable situation according to the Forest Act chapter 19:05 and the FC management authorities.

5.5.2: Data collection methods and procedures

In this paper, the term local governance is used to refer to governance arrangements that exist at each individual protected forest level such as the roles and inter-relationships of different actors and institutions, decision making processes, law enforcement and benefit sharing mechanisms among others. To understand the existing forest governance arrangements in the case study forests, a combination of key informant interviews, desk study review, focused group interviews and governance questionnaire addressing governance issues such as public participation, rule compliance, forest legislation enforcement and benefits sharing were employed.

Governance questionnaires constituted the main primary data collection instruments. One questionnaire was designed and administered to FC staff members at forest level and

these were the three FC officials (District conservator, Forester and Forest Protection unit Head for each forest), the Rural District Council (RDC) natural resources officers for the four districts, Parks and Wildlife management Authority, Environmental Management Agency (EMA) district officers. Another questionnaire was designed for the local community members in and out of the forest areas. For Gwaai forest, 40 questionnaires were administered to randomly selected *in situ* residents and 40 to forest fringe community of Gwaai communal area. For Fuller forest 40 questionnaires were administered to Jambezi and the other 40 to Mvutu communal area household respondents that form boundaries with Fuller forest. Respondents were household heads who were randomly selected using the household list obtained from the headman of each area.

Key informant interviews were carried out with a councillor, chief and village head from each of the communities around the study forests where questionnaires had been administered, two representatives of the companies that were logging timber at the time of study in Fuller forest, two timber processing companies (one at Lupane and one in Victoria Falls), two safari operators in Victoria falls. Planning for the interviews involved the designing of thematic interview guides, acquiring and pre-testing recording equipment and determination of venues which were convenient for both the interviewer and interviewee. All individual interviews were tape-recorded after obtaining informed consent and subsequently transcribed.

Secondary data were obtained from both grey and published literature. Grey literature consulted was obtained from the district forest offices and included forest management plans and forester reports on forest management activities in each forest. Descriptive statistics were used to analyze questionnaires whilst thematic discourse analysis was employed to analyse key informant interview data.

5.6: Results and discussion

5.6.1: Actors involved in the governance of Gwaai and Fuller FPAs

The actor identification process carried out through the key informant interviews conducted and the questionnaire administered to both forestry officials and local community members in and around Gwaai and Fuller forests showed that there was a wide range of actors that were involved directly or indirectly in the governance of the two study forests. The actors who had interest in each of the two FPAs ranged from local staff of government agencies and

ministries to traditional and elected officials, from local communities to entrepreneurs, international agencies, professional and educational institutions as shown in Table 5.1. Some of these actors were individuals whilst others were groups of people as well as institutions. These actors constituted entities that had the possibility of influencing governance processes in pursuit of their own distinctive interests (Schusser *et al.,* 2015).

As reported by forest officials, Gwaai forest has more traditional leaders and local resource users compared to entrepreneurs than Fuller forest. This is because Gwaai is surrounded by many communal areas and it also has *in situ* population. Fuller is close to two main local communities of Jambezi and Mvutu areas. However, due to its proximity to Victoria Falls, an internationally acclaimed tourist destination, forest resources-based entrepreneurs such as wood carvers, furniture and basket makers and commercial thatching and broom grass traders dominate its governance actors. These multiple actors involved in FPA governance with diverse interests create a complex governance arrangement. Whilst all the other actors are important, for this study, the local forest resource users will receive more attention since they interact with the forest officials and the forests much more than other actors. Failure to recognize and incorporate them in forest governing structures at the individual forest level can have serious consequences for their livelihoods and the FPA's conservation outcomes.

Table 5.1: Actors involved in the governance of Gwaai and Fuller FPAs

Governing structure	**Actors/ Organisation**	**Role in forest management**
Statutory (Government Actors)	Forestry Commission (FC)	A statutory body mandated to provide advice on, and control over management and exploitation of forest resources.
	Department of Agricultural Research and Extension (AREX)	Government department responsible for providing technical extension services to forest users and training e.g. on beekeeping among other agricultural related roles.
	Environmental Management Agency (EMA)	Advises, regulates, and supervises all environmental issues in the country.
	Rural District Council (RDC)	Local government authority responsible for district development activities.
	Zimbabwe Republic Police	Is sometimes requested to assist the Forest Protection Unit in forest patrols
	The Zimbabwe Judicial Service	Presides over the reported forest crimes

	Academic institutions	Involved mainly in research activities e.g. National University of Science and Technology (NUST), University of Zimbabwe (UZ), Midlands State University (MSU)
Traditional or customary	Traditional leaders (Chiefs, Headmen and village heads)	Mandated by the Traditional Leaders Act to sustainably manage natural resources in their area of jurisdiction. Can make binding decisions for the community
International organisation	FAO	Offers advice, equipment and funds for forest management e.g. fire management
	Resource users at the community level	These are local people who utilize forest resources.
Political	Councillors	These are elected people who fulfil a public mandate and who can make binding decisions
Hybrid	Conflict resolution committee- consists of several actors e.g. police, FC, EMA, RDC and traditional leaders.	Collectively meets ones a month to preside over district issues and challenges and proffers solutions to be implemented by specific departments. E.g. forest, land, crime issues
Market	Hotels and lodges,	Are involved in timber and wood extraction for commercial purposes
Forest Entrepreneur	Individual and groups of actors using the forest for production or consumption of products and services	Sawmill operators, Logging companies, Illegal loggers, Professional hunters, Commercial firewood vendors, Grazing land leasers

5.6.2: Policies and laws governing FPAs

Zimbabwe's original FPA policy enunciated during the colonial era called for demarcation and reservation of natural forest reserves, the provision of funds for forest protection and for the supervision of timber exploitation (Mudekwe, 2007). The then focus, still remains today as to exploit and earn revenue from the valuable timber. This law reduced local community rights to privileges and free access became restricted access. This curtailment of local customary rights to natural resources and associated activities has made it difficult to end conflicts between local communities and state institutions (Borrini-Feyerabend *et al.* 2013). The management authorities for the two study forests stated that the Forest Act and Forest-based Land Reform Policy are the principal regulatory instruments governing FPA areas. The Act confers full legal rights and power to FC, including rights of ownership, control and management. By implication, no one is entitled to any rights in a FPA or to any produce other

than may be given to them by the FC in line with the provisions of the law. This has seen local people accessing FPA resources illegally. Ramcilovic-Suominen (2012) observed that defective and unfair laws encourage lack of compliance with the laws. The Gwaai officer said it is the duty of the local forest manager to make arrangements that may see locals access and utilize FPA resources. The Fuller conservator stated that the Forest Act also guides managers at forest level on the formulation of forest management plans. Each forest plan establishes priorities and a forest zoning system, timing the use of resources, opening or closing access to an area, and allowing or disallowing a particular activity or technology in the forest.

The Forest Act does not provide for consultation of stakeholders particularly local communities when formulating and implementing local forest management plans. It also does not clarify the relationship that should exist between people and the FPAs because it does not recognize the social and economic values of FPAs to local communities. Scoones and Matose (1993) advocated for policy and legislative reforms that emphasize the local communities as beneficiaries to facilitate the adoption and implementation of the collaborative adaptive governance arrangements. The protectionist approach currently employed in the two study FPAs does not promote sustainable forest management (Mudekwe, 2007). Mudekwe went on to argue that the FC can no-longer afford to continue denying local communities access to FPA resources since this will result in increased degradation of the FPAs through pillaging.

5.6.3: Illegal activities in FPAs and their causes

The results shown in Table 5.2 revealed that there are numerous actions that constitute illegal activities in FPAs according to the Forest Act – the main law that governs ownership, control, management, access and use of FPAs and according to the rules and regulations at each FPA operational level. In both forests, the main illegal activities reported were associated with breaking permit rules by failing to get authorization from FPA authorities to carry out prohibited activities through obtaining permits and payment of required permit related fees (Table 5.2). The main permit related offences reported included the non-payment of permit fees, trading of firewood without a permit and the collection of several other forest resources without permits. In Gwaai forest, additional major illegal activities included settling on FPA land, clearing of land for farming and starting fires in the forest. These activities were mainly associated with *in situ* inhabitants. This was confirmed by foresters who pointed out that most people no longer collect permits from their offices. Illegal activities to do with logging were low in both forests. Also starting of forest fires, settling and clearing land for cultivation was

very low in Fuller forest since it did not have in-forest inhabitants. Gwaai forest that had *in situ* inhabitants had serious problems of settling and clearing land for cultivation as well as starting of fires in the forest. Since self- reported non-compliance tends to be lower than true non-compliance rate, the results may not be a true reflection of the extent of non-compliance for the studied rules.

Table 5.2: Illegal activities carried out by local community members in FPAs

Illegal activities in FPAs	Gwaai Forest	Fuller Forest
	Respondents (n=80)	Respondents (n=80)
	%	%
Logging without a permit	16	10
Logging species protected by law	28	41
Processing timber without documents indicating its legal origins	3	18
Not complying with the provisions of the permit	51	64
Trading in firewood without permit	82	90
Non-payment of permit fees/fines	80	91
Settling in FPAs	79	23
Clearing land and cultivating in FPAs	74	26
Starting fire in FPAs	70	19
Collecting resources without permit	85	78

The magnitude of criminality in the two FPAs showed the ineffectiveness of FC in rule enforcement and the lack of respect of FPA rules by local communities. The foresters confirmed that they were very thin on the ground to effectively patrol the forests. They also lack important enforcement equipment such as vehicles and radio communication systems to alert each other of the presence of poachers in the forests. Gwaai forest conservator stated that they had one vehicle for the whole district which is always down due to lack of spare parts or fuel. To help in reducing illegal activities, they sometimes request the services of police officers especially if large game poachers are detected. The interviewed Gwaai forester complained about unenforceable and contradictory regulatory framework such as the Forest

Act and the Forest-based Land Reform Policy. The Forest Act prohibits *in situ* settlements whilst the policy allows settlements in FPAs. Although the law supersedes the policy, the forester stated that they ended up following the policy because the settlers were backed by politicians to remain in the forests for politicians' political benefits.

Scholars have interrogated the problem of people's lack of compliance with protected area rules and regulations and established several possible causes. Ramcilovic-Suominen (2012) established that lack of compliance with forest rules by small scale farmers in Ghana's High forest Zone was associated with flawed policy and legal framework. Laws such as the Forest Act that exclude other stakeholders and are unfair to local communities breed vices in form of illegal activities in FPAs.

Andrade and Rhodes (2012) argued that perceived illegitimacy of the forest management authorities can discourage rule compliance. In the study FPAs, there could be lack of acceptance of FC authority since it was a creation of the colonial government and it enforced the same colonial legislation and management practices that marginalized the role of locals in forest management. The FC also lacked procedural legitimacy in that its decision and rule making processes were non-participatory (Ramcilovic-Suominen, 2012). Scholars argued that people are more likely to comply with rules when decision making is an open process, affected groups are represented and where transparency is ensured (Nielsen, 2003; Viteri and Chavez, 2007; Ramcilovic-Suominen, 2012). The low levels of participation as indicated by the few people that attended meetings (Gwaai - 23%) and Fuller - 9%) convened by FC (Table 5.3) resulted in locals having little knowledge of forest laws, policies and rules that should be complied with. The knowledge of forest rules varied with forest and place of residence. Forest residents in Gwaai (63%) were aware of most rules and their duties whilst *ex situ* residents (71%) and new comers in the area were not clear about critical rules that governed their access and use of forest resources. Knowledge of rules also varied with the extent to which locals attended forest meetings convened by FC to discuss forest management issues.

Struggle for livelihood constitute a major factor in rule compliance and therefore, FPA governance should enhance local communities' livelihoods to encourage rule compliance behavior. The lack of compliance with the tree felling rule confirmed the importance of livelihood and other subsistence needs in rule compliance behavior. Prohibition of subsistence use left people without choice (FAO, 2005).

5.6.4: Local communities' participation in governance activities

The results in Table 5.3 showed the level of participation of local community members in activities and processes such as management planning, decision-making and awareness meetings as well as in rule enforcement and other activities. Participation was generally low for both forests. Participation in all activities was higher in Gwaai than in Fuller forest because FC authorities engaged more *in situ* residents to conscientise them about the acceptable and prohibited activities in the forest than *ex situ* inhabitants. Fuller forest local communities were resident out of the forest far away from the FC offices and 16% of them had no idea about the occurrence of the meetings. The majority of the *ex situ* Fuller forest inhabitants did not find it necessary to travel long distances just to attend a forest related meeting despite the fact that these were the people that totally rely on the forest for their subsistence and other livelihoods requirements.

Table 5.3: Local community participation in FPA governance.
Sample size was 80 in each forest.

Governance activities	Participated		Not participated		No idea	
	Gwaai (%)	Fuller (%)	Gwaai (%)	Fuller (%)	Gwaai (%)	Fuller (%)
Management planning	11	06	72	85	17	09
Decision making and awareness meetings	23	09	66	75	11	16
Law enforcement	14	04	58	88	28	08

Interviewed foresters provided insights into the composition of those who participate. In general, participation of women and youths was reported to be low compared to elite groups comprising educated and entrepreneurs like hotelier and lodge owners, timber harvesters and processors, furniture and curio manufacturers. Some locals shunned meetings because they felt they were just convened to tell them what they must not do in the forests. Very rarely were they consulted about how management should be improved or how FPA resources should be accessed and used in a legitimate manner. For those settled in Gwaai forest, they were always reminded of their illegal status in the forest and therefore they found the meetings to be counterproductive. Their lack of attendance was like boycotting in protest

of forest management approaches and the purpose or agenda of the meetings. The managers neither listened nor attended to the locals' problems and needs (Andrade and Rhodes, 2012).

Asked why they did not participate in activities such as management planning, most stated that it's an office job done by managers; they were never invited or asked to provide their input. They also could not contribute to the way planning is done; it's too technical and therefore required educated people.

5.6.5: FPA resources access and benefit sharing

The FPAs offer a wide range of goods and services that are important for income generation as well as those for domestic subsistence use. As Table 5.4 reveals, communities were mainly allowed to access non-timber forest products for basic household needs such as food, medicines, housing and animal feed.

Table 5.4: FPA products communities are prohibited/allowed to utilize under current governance conditions

Prohibited products/activities	Allowed products/activities
Hunting wildlife	Dry wood collection
Logging commercial timber	Thatch and broom grass
Land for cultivation	Fruits
Land for settlement	Medicine
Commercial livestock grazing	Cultural/religious activities
Entering forest with an axe/dog	Honey farming
Starting fire in the forest	Gazing on forest fringe

The extraction, however, is restricted to specific species and quantities. For resources such as firewood and thatching grass, collectors must obtain permits from FPA authorities that stipulate where collection or harvesting is allowed and the quantities permitted. Firewood is strictly confined to collection of dry wood. There should not be cutting of wet wood or standing trees. Thatching and broom grass are harvested under their own conditions. Each community is given a specific day of the week to harvest from a specific part of the FPA. The grass bundles are shared between FC and the collector at a ratio 1:3. The FC share covers the

cost of the grass harvesting permit since the FC would sell the bundles to get money. The FC argued that access to certain resources is regulated through permits for sustainability purposes. Permits are not required for collection of medicinal products and carrying out cultural and religious activities in the forests such as rainmaking ceremonies. These determine some of the benefits that the communities can derived directly from the FPAs. These have not been categorized by forest because foresters said the conditions of access and the products to be accessed are the same.

Prohibited activities as shown in Table 5.4 were forest degrading and therefore adversely affected the provision of ecosystem services (Winberg, 2011). The restrictions on these activities were in line with one of the objectives for demarcating the forests –to protect them from degradation. Prohibited products such as wildlife, commercial grazing, harvesting commercially valuable timber had high economic value. These were accessed and extracted by rich individuals, companies and the state. The local communities therefore were left to extract and manage what Anderson *et al.* (2015) referred to as the leftovers – that is, the forest products that remained for consumption and use by the local population once more powerful interests had taken control of the most commercially valuable resources.

As discussed earlier, local communities were mainly obtaining subsistence benefits whilst they expected much more to improve their livelihoods. The FPAs generated revenue through commercial timber sales, tourism activities such as trophy hunting and photographic safaris as well as grazing leases granted to commercial livestock producers. Asked about how proceeds from these activities benefited the local communities, all forest officials concurred that most of the revenue generated went to national treasury whilst FC remained with little money for its operations. The locals, however, expected benefits from high value products in the form of infrastructure provision such as schools, clinics, roads, water and sanitation. They also expected the FC to use the resources in capacity building programs such as forest management skills training as part of FPA benefits sharing.

5.7: Conclusion and policy implications

There is a broad variety of actors involved in the governance of Gwaai and Fuller forests. These actors have diverse powers and interests that are difficult to reconcile. The Forestry Commission officials, however, have full legal rights and responsibilities conferred on them by the Forest Act which makes them the most powerful actors on FPA land. This regulatory framework still emphasizes protection and the commercial timber production role of FPAs

ignoring the livelihood requirements of the local communities. The local communities therefore have no respect for forest management authorities and their rules. This is evidenced by the various forms of pillaging activities they carry out in FPAs as a form of protest and to meet their livelihoods requirements. Overall, the governance of Gwaai and Fuller forests is poor and requires serious attention to enhance biodiversity conservation and local livelihoods sustenance. Designing, adopting and implementing collaborative arrangements between the state institution and local communities may help to improve the FPAs' triple objectives of biodiversity conservation, enhancement of livelihoods and climate change mitigation. The real task is to convince the FC that institutional reforms to bring about a change in governance mechanisms are in their own interest as well as the interest of FPA conservation and local communities livelihoods.

5.8: References

Anderson, J., Mehta, S., Epelu, E. and Cohen, B. 2015. Managing left overs: Does community forestry increase secure equitable access to valuable resources for the rural poor? *Forest Policy and Economics* 58: 47-55.

Andrade, G. S. M., and Rhodes, J. R. 2012. Protected areas and local communities: an inevitable partnership toward successful conservation strategies? *Ecology and Society* 17(4): 14. http://dx.doi.org/10.5751/ES-05216-170414.

Arab Organization for Agricultural Development (AOAD). 1992. Technical Assistance for the Technical and Economic Feasibility Study for The State Forests Development of Zimbabwe. Volume 1, Main Report, (December 1992).

Armitage, D. R., Plummer, R., F., Berkes, F., Arthur, R.I., Charles, A. T., Davidson-Hunt, I. J., Diduck, A., Doubleday, N. C., Johnson, D. S., Marschke, M., McConney, P., E. W., Pinkerton, E. W. and Wollenberg, E. K. 2009. Adaptive co-management for social-ecological complexity. *Frontiers in Ecology and the Environment* 7:95-102.

Binder, C. R., Hinkel, J., Bots, P. W. G. and Pahl-Wostl, C. 2013. Comparison of frameworks for analysing social-ecological systems. *Ecology and Society* 18(4): 26. http://dx.doi.org/10.5751/ES-05551-180426.

Borrini-Feyerabend, G., Dudley, N., Jaeger, T., Lassen, B., Pathak Broome, N., Phillips, A. and Sandwith, T. 2013. *Governance of Protected Areas: From understanding to action*. Best Practice Protected Area Guidelines Series No. 20, Gland, Switzerland:IUCN. xvi + 124pp.

Brito, B., Laurent, M., Crystal, D., Nakhooda, S., Daviet, F. and Thuault, A. 2009. The Governance of Forests Toolkit, Governance of Forests Initiative, World Resources Institute, Amazon, Brazil.

Broekhoven, G., Savenije, H. and von Scheliha, S. (eds). 2012. *Moving forward with forest governance*. Tropenbos International, Wageningen, the Netherlands.

Chibisa, P., Ruzive, A. and Mandipa, C. T. 2010. The 2000-2004 fast track land reform program and biodiversity issues in the Middle Save Conservancy. *Journal of Sustainable Development in Africa* Vol. 12 (6): 74-100.

Chigumira, E. 2010. My land, my resource: Assessment of the impact of the fast track land reform programme on the natural environment, Kadoma District, Zimbabwe. *Livelihoods after Land Reform in Zimbabwe Working Paper 14*. Livelihoods after Land Reform Project. South Africa: PLAAS.

Contreras-Hermosila, A. 2011. People, governance and forests – The stumbling blocks in forest governance reform in Latin America. Forests, 2: 168 – 199.

Cotula, L. and Mayers, J. 2009. Tenure in REDD–Start-Point or After thought? International Institute for Environment and Development, Natural Resource Issues No. 15. http://www.iied.org/pubs/pdfs/13554IIED.pdf. (Accessed on 19 March 2015).

Ebeling, J. and Yasue, M. 2008. Generating carbon finance through avoided deforestation and its potential to create climatic, conservation and human development benefits. *Philosophical Transaction of the Royal Society* B 363: 1917–1924.

FAO. 2005. Best practices for improving law compliance in the forestry sector. FAO-International Tropical Timber Organization, FAO Forestry paper 145, Rome.

FAO. 2007. The management practices for the protection of forest reserves: the case of Kalahari Sand teak forest reserves in western Zimbabwe. Forest management working paper FM/31. Forest Resources Development Service, Forest Management Division. FAO, Rome.

Gambiza, J., Campbell, B. M., Moe, S. R. and Frost, P. G. H. 2005. Fire behaviour in a semi-arid *Baikiaea plurijuga* savanna woodland on Kalahari sands in western Zimbabwe. *South African Journal of Science*, 101(5-6): 239 – 244.

Giessen, L. and Buttound, G. 2014. Defining and assessing forest governance. *Forest Policy and Economics,* 49: 1-3.

Hill, R. and Katerere, Y. 2002. Colonialism and inequality in Zimbabwe. In Matthew, R., Hale, M. and Switzer, J. (eds) Conserving the peace: Resources, livelihoods and security. International Institute for Sustainable Development and IUCN, Manitoba.

Jiri, A. M., Mapuvire, G., Gumbo, D. J. and Katerere, Y. 2013. Getting Zimbabwe Ready for REDD+ Readiness. Info brief. BIO-HUB Trust, Mukuvisi Woodlands, Harare.

Judge, J.G. 1975. The Kalahari Sand forests of Rhodesia: Management Report. Forestry Commission, Bulawayo, Zimbabwe.

Kaufmann, D., Kraay, A. and Mastruzzi, M. 2010. The worldwide governance indicators: Methodological and analytical issues. Draft policy research working paper, Brookings Institution & World Bank.

Kishor, N. and Rosenbaum, K. 2012. Assessing and monitoring forest governance: A user's guide to a diagnostic tool. Program on Forests (PROFOR), Washington DC.

Lawson, S. 2012. 'Where next for forest governance reform?' in Guido, B., Savenije, H. and von Scheliha, S. (eds) Moving forward with forest governance, Tropenbos International, Wageningen, Netherlands.

Lockwood, M. 2010. Good governance for terrestrial protected areas: A framework, principles and performance outcomes. *Journal of Environmental Management,* 91, 754-766.

MA. 2005. *Ecosystems and human well-being: Synthesis*. Island Press, Washington, DC.

Macura, B. 2016. Measuring the effectiveness of conservation governance, policies and programmes in forest protected areas. Unpublished PhD thesis, Bangor University, United Kingdom.

McGinnis, M. D. and Ostrom, E. 2014. Social-ecological system framework: initial changes and continuing challenges. *Ecology and Society* 19(2): 30. http://dx.doi.org/10.5751/ES-06387-190230.

Mudekwe, J. 2007. The impact of subsistence use of forest products and dynamics of harvested woody species populations in a protected forest reserve in western Zimbabwe. Unpublished PhD dissertation, University of Stellenbosch, South Africa.

Nielsen, J.R. 2003. An analytical framework for studying: compliance and legitimacy in fisheries management. *Marine Policy* 27: 425-432.

Ostrom, E. 2007. A diagnostic approach for going beyond panaceas. *PNAS,* Vol. 104 (39): 15181-15187.

Ostrom, E. 1999. Self-governance and forest resources. CIFOR Occasional paper 20. CIFOR, Bogor.

Phelps, J., Guerrero, M. C., Dalabajan, D. A., Young, B. and Webb, E. L. 2010. What makes a 'REDD' country? *Global Environmental Change*, 20: 322-332.

Plummer, R., and D. Armitage. 2010. Integrating perspectives on adaptive capacity and environmental governance. Pages 1-19 *in* D. Armitage and R. Plummer, editors. *Adaptive capacity and environmental governance.* Springer-Verlag, Berlin, Germany. http://dx.doi.org/10.1007/978-3-642-12194-4_1.

PROFOR. 2011. *Framework for assessing and monitoring forest governance*. FAO, Rome.

Rahman, Y., Hartati, C., Maulana, M., Subagiyo, H. and Putra, R. A. S. 2014. Land and forest governance index: The performance of local governments in land and forest governance in Indonesia. Indonesia Center for Environmental Law and The Asia Foundation, Jakarta, Indonesia.

Ramcilovic-Suominen, S. 2012. Forest law compliance in the High-Forest Zone of Ghana: An analysis of forest farmers' livelihoods, their forest values, and the factors affecting law compliance behaviour. Finish Society of Forest Science, Helsinki.

Roosbroek, S. 2007. Rethinking governance indicators: What can quality management tell us about the debate on governance indicators? Paper presented at the EGPA conference: Permanent Study Group on Productivity and Quality in the Public Sector, Madrid, Spain, 19-22 September 2007.

Schusser, C., Krott, M., Movuh, M. C. Y., Logmani, J., Devkota, R. R., Maryudi, A., Salla, M. and Bach, N. D. 2015. Powerful stakeholders as drivers of community forestry – Results of an international study. *Forest Policy and Economics* (58): 92-101.

Scoones, I. and Matose, F. 1993. Local woodland management: constraints and opportunities for sustainable resource use. In: Bradley, P.N. and McNamara, K. (eds) Living with trees: policies for forestry management in Zimbabwe. World Bank Technical Paper 210, World Bank, Washington DC. 157-198.

Secco, L., Dare, R., Pettenella, D.M. and Gatto, P. 2013. Why and how to measure forest governance at local level: A set of indicators. *Forest Policy and Economics* 30: 1-15.

Umemiya, C., Rametsteiner, E. and Kraxner, F. 2010. Quantifying the impacts of the quality of governance on deforestation. *Environmental Science and Policy* 13: 695 – 701.

Vincent, V. and Thomas, R. G. 1960. *An agricultural survey of Southern Rhodesia: Part I: Agro-ecological survey*. Government Printer, Salisbury.

Viteri, C., and Cha´vez, C. 2007. Legitimacy, local participation, and compliance in the Gala´pagos Marine Reserve. *Ocean and Coastal Management*, 50: 253–274.

White F. (1983). *The Vegetation of Africa.* UNESCO, Paris.

Winberg, E. 2011. Participatory forest management in Ethiopia: Practices and Experiences. FAO subregional office for eastern Africa, Addis Ababa.

ZimStat, 2013. Zimbabwe population census 2012: National report. Population census office, Government of Zimbabwe, Harare.

Chapter Six

General discussion of the research findings: Putting the pieces together

6.1: FPA governance, conservation and livelihoods in Zimbabwe

Throughout this study, it was revealed that FPA governance is a key determinant of forest condition and local communities' livelihoods. Before the inception of colonialism, indigenous forests were under the ownership, control and governance of local people. The forests played a central role in the provision of livelihood requirements such as food, medicines, building materials, cultural and religious services among others. To guarantee the sustainability of these goods and services, traditional communities put in place elaborate governance arrangements that were enshrined in indigenous knowledge systems (IKS) that included rules of access and use of forest resources (Fabricius, 2004). The control instruments and mechanisms applied were based on shared norms, values and regulations that were based on community-specific customary laws (Counsell, 2009). These governance systems were credited for being fair, just and participatory, making them effective means to ensure stewardship of forest resources and livelihood sustenance (Maravanyika, 2012).

The traditional forest governance system collapsed due to colonial period social engineering and both forest condition and local communities' livelihoods suffered. Dietz *et al.* (2003) observed that locally evolved governance arrangements despite having sustained resources successfully over the years often fail when external forces interfere with them or when rapid change occurs. Whilst there are arguments in favour of their reinvigoration, section 3.4.1 shows that resuscitating these systems under contemporary conditions is complicated by societal conditions associated with population growth, market integration, technical and climate change. These make it difficult for traditional systems to resolve complex governance challenges obtaining in the protected forest sector. Although they may not be replicable in today's world, traditional systems had elements that may need to be incorporated into contemporary governance systems to avoid throwing the baby with the bath water.

With colonialism came the centralized, scientific, technocratic 'guards and fences' approach that favoured forest protection and commercial timber harvesting at the expense of local livelihoods (Mutekwa and Gambiza, 2016). The colonial governance system

dispossessed and excluded local communities from access and use of forest resources. The forests were gazetted and any activities on forest land was regulated by law enforced by the state through the Forestry Commission (FC). This saw most of the good governance principles not being applied (Chapter Three) resulting in local communities suffering both physical and economic displacement through eviction and restrictions that made it hard for them to pursue forest-based livelihoods (Brockington and Wilkie, 2015). It is not just in Zimbabwe's FPAs that the centralized system has impoverished local communities, but it has been blamed for causing increased vulnerability of forest resource-dependent communities worldwide (Armitage *et al.,* 2007). Chapter Two chronicles the types of exclusion that local communities have suffered under this system and their causes. These were legitimized by the enactment of unfair and discriminatory land and forest laws such as the Land Apportionment Act and the Forest Act. The colonial settlers and their timber companies had easy access into the forest to carryout commercial timber harvesting. By allowing access for some people whilst excluding others, the FPA centralized governance system distributed fortune and misfortune unevenly with local communities being impoverished by these arrangements. The FPA governance system of the colonial period was therefore associated with several ills that were an affront to principles of good governance. The main thrust was on restricting access rather than developing strategies to enhance long term sustainable utilization by local communities and regeneration. It became impossible for local communities wishing to make a living from forest resources to do so without breaking one law or another leading to FPA area related conflicts.

The achievement of independence in 1980 brought about several developments in relation to the governance of FPAs. The early 1980s saw the perpetuation of the conventional centralized system that marginalized locals as was the case during the colonial period. Attempts were made in the 1990s to introduce co-management in forests such as Gwaai, Gwampa and Mbembesi to empower local communities to make decisions pertaining to FPA resources conservation, access and benefit sharing. However, no real devolution of power was made, communities were allowed to access low value subsistence resources whilst FC retained control over commercial benefits from timber, tourism and grazing leases. Siry *et al.* (2015) obtained results from six countries in Asia and Africa that typify the same challenges. They established that forest tenure reforms were carried out but only transferred limited user rights to local levels whilst the state retained control over forests. The transfer of management rights was also rather limited and as a result local participants had only a limited role in

making management and harvesting decisions. In the allocation of forest rights, subsistence uses were favored over commercial uses, limiting income generating potential.

The interests of the parties in the co-management agreement were at variance with each other. The FC's intention was to enhance forest protection whilst locals saw it as an opportunity for livelihood improvement through involvement in governance activities. As it unraveled, the locals' involvement was a form of community control and manipulation by legitimizing already made decisions (Cornwall, 2008). Formal institutions governing FPAs remained unchanged and therefore the arrangements had no legal basis leading to willy-nilly flouting of the collaborative rules. Mapedza and Mandondo (2002) aptly confirmed the findings of this study by pointing out that powers over natural resources have remained centralized in the state and its institutions. The little power that was devolved remained at levels that were distanced from communities. Foresters also remained rooted in professional forestry where technical inventory based forest management plans continued to regulate the management activities and relationship between the state and local communities (Mohammed and Inoue, 2014). The arrangements also faced challenges of elite capture where the management committees were dominated by local professionals, traditional and political leaders of the area resulting in limited benefits of the arrangements accruing to local elites whilst the poor experienced increased hardships (Lund, 2015).

The year 2000 saw the implementation of the Fast Track Land Reform Programme which was triggered by the spontaneous invasion of commercial farms and state land including FPAs. This further collapsed the collaborative arrangements made in the 1990s as new people who had no understanding and respect of the rules governing resource access and use poured in. The invasions and occupation of FPA and other land were legitimized by the need to sustain livelihoods in a dying economy and to reclaim ancestral land lost to white settlers during colonialism. Most importantly, local people were making a clear statement that a paradigm shift was needed from the conventional, centralized and exclusionary FPA governance system to a more human-centred system where local impoverished people participate in forest decisions aimed at conserving forest resources whilst reducing poverty (Mutekwa and Gambiza, 2016).

Contemporary governance arrangements in Zimbabwe's FPAs are a cause for concern. There are multiple actors with land rights, economic, livelihoods, social, political and conservation interests. These divergent interests are difficult to reconcile complicating the required governance arrangements at forest level. Other contemporary governance

characteristics include low levels of communities' participation in forest management activities, lack of FC capacity to enforce rules, flouting of forest rules with impunity, actual benefits obtained by locals are well below their expectations, FC illegitimacy, unfair and contradictory policy and legislation among a myriad of other governance ills. This governance scenario at the forest level is a recipe for change. Armitage *et al.* (2012) argue that experiences around the world demonstrate that change is most likely in situations where there is conflict, institutional arrangements are weak and problems clearly remain unsolved. Despite the glaring signs for the need for change, forest managers still focus on shaping the centralized system back to its original form by labelling the local communities squatters that await eviction.

As established in this thesis, government ownership of FPAs has not stopped forest loss. In fact, the study has shown that large areas of state land such as FPAs is hard to maintain either through logistical challenges or due to governance and tenure problems. One policy alternative is to reform tenure and transfer rights to communities (Siry *et al.* 2015). Community management, although not without its own challenges, has been found to be effective, resilient and adaptable particularly if certain conditions are met. A key question that arise in relation to the findings of this research concerns the design of successful tenure reforms, the devolution of power and how to exercise it responsibly and how these can be achieved. This emanates from the observed problems of insufficient devolution of forest rights, the allowance of only limited use and management rights and the failure to create strong incentives to manage FPA resources sustainably. The transfer of rights often depends on additional requirements such as professional and technical expertise in carrying out forest inventories, ability to develop management plans and implementing them among other conditions (FAO 2011). These are conditions difficult to meet by local communities who also have very limited resources. Also if it is the government's intention to lift local communities out of poverty, then these people should be given access to resources of value.

Additionally, a lot of work has been done in developing an institutional analysis and development framework to analyze diverse institutional settings and complex interactions of individuals within communities including applications to forest resources (Ostrom, 2010). The framework has been applied in the analysis of multiple cases and identification of rules that result in the development of successful solutions by organized resources users. The tenure and policy design principles posited by Ostrom (2010) apply to Zimbabwe's FPAs. Boundaries for users, nonusers and forest resource rights holdrs should be clear, rights should

conform to local conditions, benefits and costs of use should be fair, resource users should participate in allocation decisions and they should be involved in monitoring the FPA resources. The challenge is how to meet these conditions under the existing regulatory framework, social, political and economic conditions.

Capacity building for both government and local forest users is necessary. The intention and moves by the FC to partake in the REDD+ program has potential to technically and financially leverage both the government and local communities through the payment for ecosystem services. Institutions required under REDD+ programs will require that tenure and other governance reforms take place. These may help to achieve sustainable FPA management but they do not guarantee it. To be effective, any form of governance arrangement need to have clear and legitimate rules regarding who has access and use rights to FPAs, monitoring and enforcement mechanisms with sufficient resources and sanctions for rule breaking. The involvement of local communities and other forest users in developing rules and their acceptance of those rules makes them more likely to follow them and to participate in monitoring and enforcement.

6.2: Whither Zimbabwe's FPA governance?

In this study, I have taken stock of FPA governance and its conservation outcomes. Results show the persistence of the conventional, top-down and centralized system despite the evidence that it drives access restrictions at the expense of local knowledge and wellbeing. Contemporary FPA governance challenges established in this study, human agency of the post-2000 period and international protected area governance trends point to the need for the formulation, adoption and implementation of new innovative FPA governance that aims to achieve biodiversity conservation, livelihoods sustenance, economic growth and climate change mitigation.

From the 1970s, FAO (1978) realized that local people have always used, relied on and managed natural resources and therefore were best positioned to conserve them. Then effort was put on establishing means and ways of harnessing local people's management abilities and knowledge to make forest conservation less disruptive to local livelihoods and more empowering to local people (Brosius *et al.,* 2005; Dressler *et al.,* 2015). This saw the emergence of community forestry to challenge the government-led regimes of industrial-oriented forestry management. Community forestry is an incremental social process of assisting impoverished communities to set priorities and make decisions for developing forest

resources in order to reduce livelihood vulnerability and improve forest conservation locally (Berkes, 2004; Dressler *et al.,* 2015). Community forestry has had several variants which include adaptive collaborative management or just adaptive co-management, adaptive governance, social forestry, resilience management, interactive governance, co-management among others. These approaches just vary in degree of community involvement rather than in kind and they share a similar ethos of small is beautiful, collaborative, empowering, efficient and effective (Dressler *et al.,* 2015).

In view of the FPA challenges identified in this study that include community exclusion, lack of participation in decision making, discriminatory rules of access, marginal benefits leading to community vulnerability and impoverishment, lack of compliance with FPA rules and multiple actors with diverse interests among others, I propose that the studied FPAs shift from the centralized top-down approach to the adaptive collaborative management (ACM) approach. This approach, according to Bryja (2014) is one of the most prominent management approaches to emerge in recent years. It is a process by which institutional arrangements and ecological knowledge are tested and revised in a dynamic, ongoing, self-organized process of learning-by-doing (Plummer *et al.,* 2013) and emphasizes iterative learning, flexibility and building adaptive capacity with the principle of nurturing diversity and fostering collaboration.

The ACM approach seems quite suited to address the governance challenges facing the studied FPAs if effort is made to implement it with a sustained commitment on the part of all the participants. ACM addresses the challenge of multiple actors underlying FPA governance (Section 5.6.1, Table 5.1) through fostering linkages and enhancing collaboration among different partners involved in governing a FPA. By providing opportunities for different actors to come together, ACM promotes shared understanding, exchange of perspectives and joint decision making (Folke *et al.,* 2005). Furthermore, ACM relates to the adaptive capacity concept by, for example, addressing issues of learning to live with uncertainty which is a factor in FPA as socio-ecological systems. ACM also embraces the premises of adaptive management (Armitage *et al.,* 2007) which acknowledges that the socio-ecological knowledge of FPAs is never complete and therefore needs to be expanded, revised and reflected upon through the process of learning-by-doing (Folke *et al.,* 2005). This iterative process of learning and adjusting decisions based on what has been learnt promotes adaptive management of FPAs in order to build knowledge and improve management over time in a goal oriented and structured process (Allen *et al.,* 2011).

The design and implementation of ACM should avoid pitfalls that have curtailed the successful performance of some participatory FPA governance projects. Attempts in the 1990s to implement co-management in Gwaai, Gwampa and Mbembesi forests (Chapter Two) failed because of among other aspects failure by Forestry Commission authorities to fully devolve power to actors and institutions at lower levels. The types of powers that need to be ceded include the power to create new rules or to modify old ones, make decisions about access to resources, implement and ensure compliance and adjudicate disputes (Agrawal and Rebot, *Forthcoming, Journal of Developing Areas*). Other pitfalls that need to be navigated when implementing ACM are elite capture, perpetuation of scientific, technical inventory based forest management planning. Elite capture may see the poor, women, members of ethnic groups failing to access benefits due to mechanisms put in place by institutions captured by the elite (Chomba *et al.,* 2015). Forestry Commission must also exercise real leadership, vision and motivation. ACM becomes possible through leadership, vision, establishment and maintenance of links through culture and management and high levels of motivation (Fabricius *et al.,* 2007). Designing and implementing ACM by avoiding these pitfalls improves the capacity of the FPAs to continue providing social and ecological benefits at the local level such as improvement of local communities' livelihoods, biodiversity and local empowerment (Chomba *et al.,* 2015).

6.3: Conclusion

Governance of FPAs is critical because it determines both conservation and livelihood outcomes. I undertook this study to characterize and collate its past and present characteristics and evaluate its impact on land cover change and local communities' livelihoods. In that context, I assessed how the conventional centralized command-and-control governance system of the colonial and post-colonial periods contributed to the different types of local community exclusion and forest loss and degradation in FPAs. This was meant to provide evidence of the quality of historical and contemporary governance and how it has performed in terms of conservation and livelihoods in order to contribute insights towards its reform. The results revealed that local communities suffered exclusion in the form of physical and economic displacement during both the colonial and post-colonial period as consequences of the scientific industrial forestry emphasized by the centralized top-down system at the expense of socio-economic requirements of locals and unfair and discriminatory regulatory

framework. This is consistent with work by Khadka (2009) who found that the poor, women, indigenous people and ethnic minorities were excluded from participatory forestry in Nepal.

On the impact of governance on land cover change in FPAs, remote sensed image analysis and governance assessment results revealed a statistically significant effect of governance on land cover change. The rate and amount of forest loss and degradation varied in tandem with the variation in governance quality. Forest loss was higher in forests with *in situ* inhabitants that those with *ex situ* inhabitants. Overall, centralized governance led to forest loss and degradation in four of the six study FPAs. The other two, Pandamasuie and Kazuma showed some signs of vegetation recovery from the 1990s to 2013.

The people exercised their agency and countered exclusion through the invasion of FPA since year 2000. This rendered dysfunctional any governance arrangements in the study FPAs. Contemporary governance in the study FPAs is characterized by unfair and contradictory policy and legislation that has become difficult to enforce, next to absent participation in decision making, limited capacity of Forestry Commission to enforce rules, lack of compliance with FPA rules and low levels of benefits against high expectations of significant monitory and non-monitory benefits.

The study approach offered a means for providing evidence of governance characteristics and its impact on conservation and livelihood outcomes that provide insight into potential relevant governance reforms. It shows that a shift is needed in the governance landscape of FPAs from the centralized control towards alternative forms of governance that emphasize participation and involvement of local communities if forest loss and degradation in Zimbabwe's FPAs are to be arrested and for livelihoods challenges to be addressed. The ACM can be a relevant alternative in this regard. This has the potential to address most of the governance ills affecting Zimbabwe's FPAs if it's designed and implemented with the full commitment of all relevant actors.

This governance approach should, however, avoid some of the pitfalls such as elite capture, corruption in benefit sharing, gender inequality and technocratic professional management approaches that have characterized some collaborative governance systems in developing countries further perpetuating marginalization and poverty amongst local communities. The Forestry Commission must also exercise visionary leadership and motivation. ACM becomes possible through leadership, vision, establishment and maintenance of links through culture and management and high levels of motivation. Designing and implementing ACM avoiding the highlighted pitfalls has the potential to

improve the capacity of the FPAs to continue providing social and ecological benefits at the local level such as improvement of local communities' livelihoods, biodiversity and local empowerment.

6.4: Limitations of this study and the future research agenda

The generalizability and application of this study's results to various settings is limited by the fact that the study issues are highly context-specific. Most forestry situations are unique in terms of their history, ecology and socio-economic and political contexts and therefore require governance designs that fit their contexts. In view of the fact that there is a general lack of in-depth empirical studies of Zimbabwe's FPAs in general and their governance in particular, it is hoped that this study is an eye opener to the secretive governance of Zimbabwe's FPAs and therefore an important contribution to the forest governance knowledge base. It also provides a basis for further research in the field of governance of FPAs. This is a task worth doing since it could contribute towards the long-term sustainability of the indigenous FPAs in north-western Zimbabwe.

The lack of historical FPA baseline governance and vegetation inventory data led to use and reliance on recall data and grey literature records particularly in Chapters Two and Three in order to characterize FPAs' governance in history and its impact on conservation and livelihoods outcomes. These data sources do not seem very reliable in capturing precisely the past since respondents' perceptions of governance principles application and forest condition might be considered as less objective data. Nevertheless, we took all the necessary steps to validate the data through the use of multiple data sources to improve the reliability of the data. When exploring the nature of contemporary governance in Chapter Five, interviews and questionnaire were relied on. Respondents at times tend to provide socially desirable answers (Macura, 2015). Measures to gain the respondents' trust were taken including clarifying research objectives, guarantying confidentiality and anonymity.

Budgetary constraints limited the study to a few FPA case studies in the north-western region of Zimbabwe and therefore can't claim broad FPA representativeness numerically and geographically. They also compromised on the in-depth quantitative investigation of the impact of contemporary FPA governance on local communities' livelihoods that might have significantly added to the value of this study. Furthermore, the practical limitations in the field of accessing hard-to-reach forest residents to collect data presented many challenges.

The poorly maintained forest road network on Kalahari sands made it difficult to traverse the length and breadth of the forest without a fit-for-the-purpose vehicle to reach the research sample design participants. The increased risk and fear of coming face-to-face with anyone of the big five made matters worse.

Additionally, some findings of the study may have been affected by the manner in which data were collected. The researcher is not fluent in Ndebele and Nambia, the two languages spoken by locals around the study forests. Translators were therefore used during focus group discussions and key informant interviews, situation that might have impacted on the flow of the interviews, discussions and the accuracy of the collected data.

The continuous growth of human pressure on FPAs threatening their present and future provision of ecosystem services and sustenance of livelihoods make their governance an increasingly important international issue. The government led command and control exclusionary governance has been the dominant FPA governance model that regulated their access and use until recently. This model has delivered fairly well ecologically but has performed poorly on the socio-economic front particularly in relation to local communities' livelihoods. The emerging collaborative adaptive governance systems also have their on toothing challenges. Further research is required to understand the complexity of human behavior and that of social and environmental systems to improve the effectiveness of collaborative adaptive systems and make FPAs deliver the triple environmental, socio-economic and climate mitigation benefits. There is need to investigate the readiness of local communities, the state and NGOs for future implementation of adaptive collaborative management system. This is important given the fact that there is insufficient information about adaptive collaborative management in non-Western contexts (Bryja, 2014).

There is also need for research to gain better understanding of how FPA authorities find, interpret and evaluate evidence from research studies, and how as well as if the information they obtain feed into their governance and management practices.

6.6: References

Agrawal, A. and Rebot, J. Forthcoming. Accountability in decentralization: A framework with South Asian and Western African cases. *Journal of Developing Areas.*

Allen, C. R., Fontaine, J. J., Pope, K. L. and Garmestani, A. S. 2011. Adaptive management for a turbulent future. *Journal of Environmental Management*, 92: pp1339-1345.

Armitage, D., Berkes, F. and Doubleday, N. 2007. Introduction: Moving beyond co-management. In: *Adaptive co-management: collaboration, learning, and multi-level governance*. (Eds.). Armitage, D., Berkes, F. and Doubleday, N. UBC Press, Vancouver, British Columbia, Canada. pp 1-15.

Armitage, D., de Loe and Plummer, R. 2012. Environmental governance and its implications for conservation practice. *Conservation Letters* **5.** pp 2012) 245–255

Berkes, F. 2004. Rethinking community-based conservation. *Conservation Biology* 18 (3), pp 621–630.

Brockington, D. and Wilkie, D. 2015. Protected areas and poverty. *Philosophical Transactions of the Royal Society B,* 370: 20140271. http://dx.doi.org/10.1098/rstb.2014.0271

Brosius, P., Tsing, A., and Zerner, C. 2005. Communities and Conservation: Histories and Politics of Community-Based Natural Resource Management. Altamira Press, New York.

Bryja, M. 2014. An evaluation of the potential for implementing adaptive co-management in the Waodami social-ecological system in the Ecuadorian Amazon. Unpublished PhD thesis, Rhodes University, Grahamstown, South Africa.

Chomba, S., Treue, T. and Sinclair, F. 2015. The political economy of forest entitlements: Can community forest management reduce vulnerability at the forest margin. *Forest policy and economics* 58: pp 37-46.

Cornwall, A. 2008. *Unpacking 'participation': Models, meanings and practices*. Oxford University Press, Oxford.

Counsell, S. 2009. Forest governance in Africa. Occasional paper 50. Governance of Africa's resources programme, South African Institute of International Affairs, Johannesburg.

Dietz, T., Ostrom, E. and Stern, P.C. 2003. The struggle to govern the commons. *Science* 302(5652): pp 1907–1912.

Dressler, W. H., McDermott, M. H. and Schusser, C. 2015. The politics of community forestry in a global age – A critical analysis. *Forest Policy and Economics* 58, pp 1–4.

Fabricius, C. 2004. The fundamentals of community-based natural resource management in *Rights, resources and rural development: Community-based natural resource management in Southern Africa,* Fbricius, C. and Koch, E., Magome, H. and Turner S. (Eds), Earthscan, London.

Fabricius, C., Folke, C., Cundill, G. and Schultz, L. 2007. Powerful spectators, coping actors, and adaptive co- managers: A synthesis of the role communities in ecosystem management. *Ecology and Society* 12(1): 29. (online) URL: http://www.ecologyandsociety.org/vol12/iss1/art29/

FAO. 1978. Forestry for Local Community Development. Food and Agriculture Organization of the United Nations, Rome.

FAO. 2011. Reforming forest tenure: Issues, principles and process, FAO Forestry Paper 165. Rome.

Folke, C., Hahn, T., Olsson, P., and Norberg, J. 2005. Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources*, 30 (1): pp 441-473.

Khadka, M. 2009. Why does exclusion continue? Aid, Knowledge and power in Nepal's community forestry policy process. Unpublished PhD thesis, Erasmus University, Rotterdam, The Netherlands.

Lund, J. F. 2015. Paradoxes of participation: The logic of professionalism in participatory forestry. *Forest Policy and Economics,* 60: 1-6.

Macura, B. 2015. Measuring the effectiveness of conservation governance, policies and programmes in forest protected areas. Unpublished PhD dissertation, Bangor University, UK

Mapedza, E. and Mandondo, A. 2002. Co-management in the Mapfungautsi state forest area of Zimbabwe: What stakes for local communities? Institutions and Governance Program, World Resources Institute, Washington DC.

Maravanyika, S. 2012. Local responses to colonial evictions, conservation and commodity policies among Shangwe communities in Gokwe, North-western Zimbabwe, 1963–1980. *African Nebula*, Issue **5**.

Mohammed, A. J. and Inoue, M. 2014. Linking outputs and outcomes from devolved forest governance using a Modified Actor-Power-Accountability Framework (MAPAF): Case study from Chilimo forest, Ethiopia. *Forest Policy and Economics* 39: 21–31.

Mutekwa, V. T. and Gambiza, J. 2016. Assessment of governance principles application in forest protected areas: the case of six state forests in western Zimbabwe. *International Forestry Review,* Volume 18(4): 466-484.

Ostrom, E. (2010). Beyond Markets and States: Polycentric Governance of Complex Economic Systems. *American Economic Review, 100,* 641-672. http://dx.doi.org/10.1257/aer.100.3.641.

Plummer, R., Armitage, D. R. and de Loe, R. C. 2013. Adaptive co-management and its relationship to environmental governance. *Ecology and Society* **18**(1): 21. http://dx.doi.org/10.5751/ES-05383-180121

Siry, J. P., McGinley, K., Cubbage, F. W. and Bettinger, P. 2015. Forest tenure and sustainable forest management. *Open Journal of Forestry* 5, pp 526-545.