INSTITUTIONS AND HUMAN MOBILITY IN AN AFRICAN RIVER FISHERY: A CASE STUDY OF FISHING CAMPS ON THE KAFUE FLATS, ZAMBIA

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[redacted]

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ABSTRACT

Fisheries in developing countries are coming under increased pressure as accessibility improves and more people seek better catches, higher prices and access to expanding urban markets. Evidence shows that institutional arrangements that have successfully regulated access to fish stocks over many generations are now proving ineffective as new entrants gain access and over-exploit the stocks. Over the past thirty years, exploitation of the floodplain fishery of the Kafue River in Zambia has increased markedly as more people settle in the area and "seasonal migrants" access the fishery during the flood season. The capacity to exclude new entrants is thus a key determinant of achieving sustainable use.

The purpose of this study was to determine how capacity (assets, capabilities and context) affects the performance of institutions (organised groups of actors) to effectively regulate access to the Kafue fishery. The design of the study was qualitative in nature, drawing on interviews and documentary analysis to identify capacity constraints and successes in the governance structures in two fishing camps on the Kafue Flats that differ in their accessibility. The semi-structured interviews involved 29 respondents from Shimungalu and Nyimba fishing camps on the Kafue Flats, Zambia. I compare the findings to provide insights into why regulation was effective at one site – Shimungalu – and not at the other–Nyimba.

The study revealed that the government's ability to effectively regulate access to and use of the fish resource is constrained by limited assets. The reality is that the government will not be able to acquire sufficient resources necessary to effectively regulate access to and use of the Kafue fishery on its own. Migrant fisher-folk use their assets and capabilities to establish a context that makes it difficult for them to be excluded, especially in fishing camps such as Nyimba, where the actors have low self-esteem and confidence, resulting in an inferiority complex and inability to enforce by-laws.

While there will always be capacity constraints in governance, the findings of this study expose an opportunity for the government and other stakeholders to strengthen their capacities when a nested system with polycentric governance (polycentricity) is understood and implemented. The situation in Shimungalu demonstrates that polycentricity strengthens horizontal and vertical links amongst groups of actors, improves connectivity, mobilises local resources, facilitates co-learning and provides opportunities to combat corruption.

Polycentricity represents a collective governance system in which all groups of actors involved in fisheries management on the Kafue floodplain fishery can interact across scales and levels under a general set of rules. It offers a solution because it enables organisations to fill institutional voids and configure the available assets and capabilities in ways that allow

them to meet the challenge posed by migrants while also promoting appropriate harvesting methods. It is suggested that further study should be conducted to deepen the understanding of establishing and operationalising a more formal nested system with polycentric governance in the management of common pool resources (CPRs).

Key words: *Capacity, CPR, Governance, Organisations, Polycentric Governance, Resilience.*

DECLARATION

This thesis contains no material that has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

Signed_____ Date__21/04/2016___

Sililo Agness Musutu

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DEDICATION

This thesis is dedicated to the Musutu family.

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ABBREVIATIONS AND ACRONYMS

ABAG	: Association of Bay Area Governments
ARB	: Air Resources Board
BAAQMD	: Bay Area Air Quality Management District
BCDC	: San Francisco Bay Conservation and Development Commission
CAMFA	: Conference for African Ministers, Fisheries and Aquaculture
CD	: Capacity Development
CHIP	: Civil Society Human and Institutional Development Programme
CPR	: Common Pool Resource
CRB	: Community Resources Board
DFID	: UK Department for International Development
DoF	: Zambia Department of Fisheries
ECDMP	: European Centre for Development Policy Management
ESD	: Education for Sustainable Development
FAO	: Food and Agriculture Organisation of the United Nations
FMC	: Fisheries Management Committee
FOCUS	: Focusing Our Vision program
FVMC	: Fisheries Village Management Committee
GMA	: Game Management Area
GoZ	: Government of the Republic of Zambia
IICBA	: International Institute for Capacity Building in Africa
IOM	: International Organisation for Migration
JICA	: Japan International Cooperation Agency

JPC	: Bay Area Joint Policy Committee
KFFA	: Kafue Flats Fishery Association
KFFSA	: Kafue Flats Fishery Sector Association
MUHREC	: Monash University Human Research Ethics Committee
NGO	: Non-governmental Organisation
OECD	: Organisation for Economic Cooperation and Development
PI	: Public Infrastructure
PIP	: Public Infrastructure Providers
RCEP	: Royal Commission on Environmental Pollution
SES	: Social-ecological System
SFLP	: Sustainable Fisheries Livelihoods Programme
UNDP	: United Nations Development Programme
UNESCO	: United Nations Educational, Scientific and Cultural Organisation
WWF	: World Wide Fund for Nature
ZAWA	: Zambia Wildlife Authority

CHAPTER ONE – INTRODUCTION

1.1 Overview

The purpose of this study was to gain insight into how capacity affects the performance of institutions in regulating access to a fishery such as the Kafue floodplain fishery and why entry is effectively regulated in some fishing camps and not others. The proposition that advances this study is that capacity constrains the ability of groups of actors, individually and collectively, to regulate entry into the fishery and thus to achieve the objective of a sustainable fishery. This proposition is based on the notion that regulating access to and use of the fishery are key determinants for a sustainable fishery on the Kafue Flats of Zambia.

This chapter serves as a background by providing a preview of the study context. It is made up of six sections. It begins with an overview of fisheries governance at global and local scales, and follows with a historical perspective of fisheries governance on the Kafue Flats of Zambia. The research problem, aim and research questions are also laid out in this chapter, as is the structure of the thesis.

1.2 Introduction

According to Nkhata et al. (2014: 9), aquatic systems, particularly rivers, lakes and wetlands, provide a variety of ecosystem services that change across the landscape, creating a template of opportunities for people to engage in and benefit from. Fish is one of these benefits. Approximately 50 million persons are employed in the catching sector and 210 million in the processing sector globally (Teh and Sumaila, 2013). In Africa alone, fisheries resources currently provide livelihoods to about 10 million people, benefits such as nutrition and food security for over 30% of the population and $4.3billion per year of revenues from international trade (Conference for African Ministers, Fisheries and Aquaculture, CAMFA, 2010). Fish and fisheries are therefore an important part of many societies and make important contributions to economic and social health and well-being in many countries and areas (Food and Agriculture Organisation of the United Nations, FAO, 2002).

However, these benefits are threatened as worldwide fish resources are being severely depleted. For instance, FAO (2010) pointed out that 53% of the world's fisheries are fully exploited and 32% are overexploited, depleted or recovering from depletion. There are many reasons for this unacceptable state of affairs (including unsustainable exploitation, unregulated access, illegal fishing practices, environmental degradation and climate change, amongst others) but the primary reason is "the way in which fisheries are managed" (Report

by the Royal Commission on Environmental Pollution, RCEP, 2004: 109), referring particularly to the failure of fisheries governance to regulate who has access to the common fish resources and how units (fish) are harvested (E. Ostrom, 1990; FAO, 2002). According to Béné and Neiland (2006), governance is about how people share decision making and how it affects their capacity to empower themselves and others. It involves actors that are drawn from, but also beyond, government (Stoker, 1998). In fisheries governance, these actors include fisher-folk, community/traditional leaders, scientists, regulators, fish traders and others who influence policies, local rules and practices.

In developing countries, people who fish for a living are known to be mobile, searching for better catches, higher prices and improved access to markets (Béné et al., 2007; Njock and Westlund, 2010). As competition increases and technologies change, the capacity of communities to regulate access is increasingly challenged, as is their ability to control methods of harvesting fish (Nkhata et al., 2009; Nunan, 2010). While there are many definitions of "capacity", it can be thought of as the "ability of people, organisations and society as a whole to manage their affairs successfully" (Organisation for Economic Cooperation and Development, OECD, 2006: 5).

Importantly, "capacity is not a passive state, but part of a continuously changing state of affairs" (Wigboldus et al., 2010: 4). While communities may in the past have had the capacity to regulate fisheries, under changed circumstances this may no longer be the case (Nkhata et al., 2009). The three core components of capacity that determine performance of the actors are assets, such as knowledge and staff, capabilities, ability to configure assets for the task at hand, and context, which may be enabling or disabling, for example motivation and cultural norms (Baser and Morgan, 2008; Wigboldus et al., 2010).

Zambia's fish resources are thus increasingly threatened as more people turn to fishing for their livelihoods, often through illegal fishing practices and uncontrolled access (open access system) to the fish resources, resulting in notable pressure on the resource (Haller and Merten, 2008; Kapasa, 2013). The purpose of this study was to gain insight into how capacity affects the performance of institutions in regulating access to a fishery and why entry is effectively regulated in some fishing camps and not others. I investigated the Kafue floodplain fishery located in the southern part of Zambia. This fishery attracts migrant fisher-folk from other parts of Zambia, where fish stocks have been depleted and people are now unemployed (Kapasa, 2013).

Control over these new entrants is normally exercised through institutions. Institutions have been referred to as the mechanisms, formal and informal rules and informal norms by which

people (actors) and organisations (groups of actors) interact with each other (North, 1990, 2005; Nkhata et al., 2009). In other literature, the word “institution” also refers to “organisations”, as an organisation is a more concrete expression of an institution in an identifiable location and with personnel and rule structure (Agrawal, 2008; Nkhata, 2014). In this study, the word “institution” refers to the organisations (groups of actors) – community-based management committees, government and traditional authorities – involved in the governance of the Kafue floodplain fishery. Migrant fisher-folk were also considered in this study as they are part of the complex social system of the Kafue floodplain fishery.

1.3 Fisheries Governance on the Kafue Flats: A Historical Perspective

The historical perspectives of fisheries governance on the Kafue Flats described in this section provide a preview of the study context. One major source of fisheries governance information presented in this section was obtained from the four-year research that was carried out by Tobias Haller and colleagues from 2001 to 2005. The research project investigated African inland wetlands, focusing on common property theory and New Institutionalism in economics, social anthropology and political science, dealing with institutional change and conflict (Haller, 2002). The main goals of the research are outlined below.

First, the project attempted to apply Elinor Ostrom's (1990) principles to empirical cases from five African wetland areas in an otherwise arid or semi-arid environment (the Internal Niger Delta in Mali, the Logone Floodplain in Northern Cameroon, the Pangani River System and Rufiji River in Tanzania, Okavango Delta in Botswana and the Kafue Flats in Zambia). Second, the project considered the destruction of these resources that were held and regulated in common, the changes in local institutions and the conflicts characteristic for these areas. According to Haller (2002), the five regions were chosen because most of the resources in these areas (fish, timber, pastures, wild products, wildlife, agricultural land) were being held as common property and were characterised by extreme seasonal variations in natural conditions throughout the year.

1.3.1 The Origins of Customary Care

The first inhabitants on the Kafue Flats are said to have been the Batwa fishing communities (Lehmann 1977), who were later joined by the Ila and Balundwe (Plateau Tonga). The Batwa groups controlled and fished on the Kafue River while the Ila and Balundwe fished in

the tributaries, ponds and oxbows on the Kafue Flats. During this pre-colonial era, fishing activities were regulated by traditional institutional arrangements of the Batwa, Ila and Balundwe people based on territoriality, membership, controlled timing of use, gear (different gender-related techniques such as baskets and spears – no nets were used) and rules of reciprocal access (Haller and Merten, 2008). These institutional arrangements were not designed to achieve sustainable use but rather for the leader (*mwami*), with guidance from the spirits (*mizhimo*) of the founding patrilineal ancestors, to be able to distribute goods and secure his position (Cutshall, 1980; Chabwela and Haller, 2010).

Nonetheless, traditional controls were strong. According to Haller (2007), the *mwami* broadened his power over the area by appointing monitors (*utamba*), who controlled tributary sections including ponds and oxbows thus providing a legitimate means for the *mwami* to distribute access to resources. At this time, there was a clear distinction of user groups for each section of the fishery. People seeking access to the fishery had to obtain permission to fish from the *mwami* and *utamba.* Failure to do so resulted in sickness, bad yields and catches as well as natural disasters and fire (Colson, 1970; Haller, 2007). Those violating rules set by the *mwami* and *utamba* would be punished by the ancestral spirits, attacking in the form of crocodiles and hippos, and with the issuing of fines by the traditional leaders (Haller and Merten, 2008).

During high floods, fishing was open to all members of the community as well as outsiders (though it was still possible to exclude outsiders and other resource users), but access was strictly coordinated, regulated and controlled between the time the floods began and receded and in the early dry season (Haller, 2007; Haller and Merten, 2008). The known breeding grounds for fish (*Tilapia* – bream) were strictly controlled and protected by the Batwa, and fishing was forbidden in those areas in the rainy season, from November to February (Haller and Merten, 2008).

These customary institutional arrangements were dismantled in the mid 1920s when the state (under colonial rule) took over control of all natural resources. Chiefs were introduced by the colonial powers in the Flats (and other places within the country) in order to establish "native authorities" and they were responsible for collecting taxes and dealing with local conflict resolution at the Native Authority Courts (Haller, 2002). During this time, the Kafue floodplain fishery was thought to be well stocked with fish and underused, according to colonial missionary sources (Smith and Dale, 1968; Subramaniam, 1992). The diagram below (Figure 1.1) depicts the historical timeline of fisheries governance structures on the Kafue Flats.

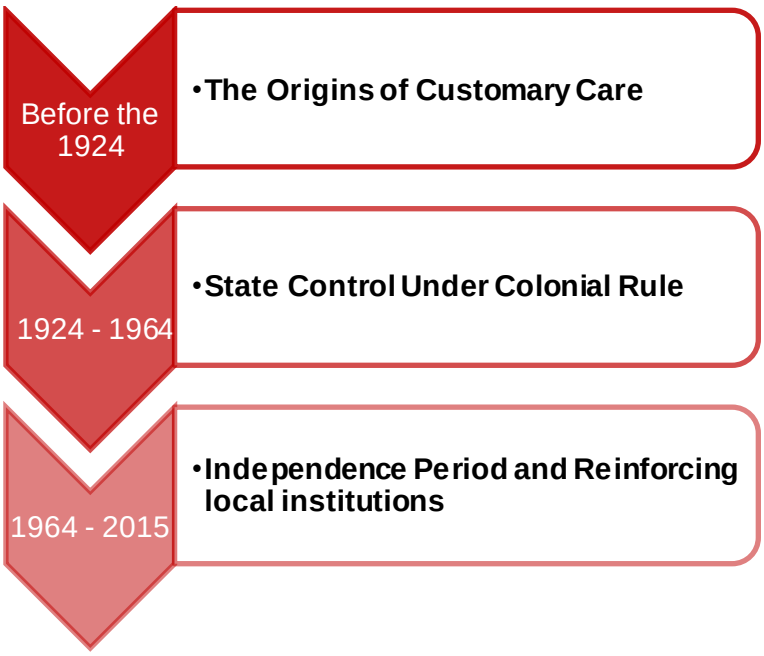

Figure 1.1: Historical timeline of fisheries governance structures on the Kafue Flats

Source: Own Presentation.

1.3.2 State Control Under Colonial Rule

Zambia (formerly Northern Rhodesia) came under British rule from 1924. During this period, management of wildlife and fisheries was assumed by government, which enacted the first fishery laws in the 1930s (LaMunière, 1969; Cutshall, 1980). The Kafue Flats was viewed as a potential source of food for the urban sector and, over time, the Batwa areas along the Kafue River were opened up to commercial Lozi fishermen who migrated from the western part of Zambia and introduced the use of nets. The Batwa population was too small (approximately 6,500 people) to resist this influx and technology change, and could only partly and informally maintain their rules of access (Haller and Merten, 2008).

Initially, for the Ila and Balundwe Chiefdoms where the migrant Lozi fisher-folk had settled, the migrants were not a threat to their access to the fisheries, as the Ila and Balundwe did not show a commercial interest in the fishery sector (Haller and Merten, 2008). However, with the increasing commercialisation of fishing and more people (from Northern Province and Lozi areas) turning to fishing as the country went through its first copper crisis in 1958 (LaMunière, 1969), the number of permanent villages and seasonal fishing camps increased and fish catches began to decline, thereby necessitating the introduction in 1962 of fishing laws for the Flats as well as the establishment of the Fish and Game Department (later, the

two functions were separated, resulting in the establishment of the Department of Fisheries, DoF) (Mortimer, 1965). The DoF was the only institution mandated to manage the fisheries resources. This role entailed sole responsibility for policing use of the resources, enforcing the fishing laws over extensive areas and monitoring activities in both the highly scattered fishing settlements (Musumali et al., 2009) on the Kafue Flats as well as the other fisheries in Zambia. With better control, catches improved between the 1960s and 1970s (Mortimer, 1965; Subramaniam, 1992). Since that time, the DoF (management) and the fishing laws (legislation) have gone through several changes (see Box 1.1).

Box 1.1: Fisheries legislation and management in Zambia before and after independence in 1964

Legislation

1962 – Establishment of Fisheries Conservation Ordinance (fishing laws).

1974 – Fisheries Conservation Ordinance was renamed to the Fisheries Act of 1974 following the removal of racial and discriminatory phrases that were in the Ordinance.

1994 – Fisheries Act of 1974 was revised. The new Fisheries Draft Bill sought to decentralise and devolve fishery management responsibilities from the DoF to local communities.

1998 – Fisheries Draft Bill was presented to parliament for ratification.

2007 – Fisheries Draft Bill was ratified by parliament and passed as the Fisheries Amendment Act of 2007.

2011 – The Act of 2007 was amended and renamed the Fisheries Act of 2011.

Management

1962 – Establishment of Department of Game and Fisheries under the Ministry of Lands and Natural Resources.

1974 – Department of Game and Fisheries was renamed the Department of Fisheries (DoF) and placed under the Ministry of Agriculture, Food, Fisheries and Cooperatives.

2006 –The Ministry of Agriculture, Food, Fisheries and Cooperatives was renamed the Ministry of Agriculture and Cooperative, and DoF was within the new Ministry.

2011 – Ministry of Agriculture and Cooperative was split into two and the DoF was changed to Ministry of Fisheries and Livestock. The other was called Ministry of Agriculture.

2012 – The two Ministries were merged into the Ministry of Agriculture and Livestock, and the DoF continued to operate withinthis Ministry.

2015 – Ministry of Agriculture and Livestock was split into two, the Ministry of Agriculture and the Ministry of Fisheries and Livestock, in September.

NOTE: In this study, "DoF" will be used as opposed to "Ministry of Fisheries and Livestock" because at the time of data collection, DoF had not yet been renamed the Ministry of Fisheries and Livestock.

Sources: Mortimer, 1965; Dodds and Patton, 1968; Malasha, 2007; Q-FM News, 2015.

1.3.3 Independence Period and Reinforcing Local Institutions

With Zambia's independence in 1964, the DoF was still well equipped with officers and infrastructure (Haller and Merten, 2008) and continued using the Fisheries Conservation Ordinance of 1962. In 1974, the racial and discriminatory phrases within the Fisheries Conservation Ordinance were removed and it was re-titled Fisheries Act of 1974 (Malasha, 2007). According to Malasha (2007: 8), "the new Fisheries Act, like the one before it, provided for the development of fishing, control of fishing, and registration (licensing) of fishers and boats. The act placed fishery management responsibilities in the national government with no provisions for community involvement".

Yet during the second economic crisis, between 1980 and 1990 (Subramaniam, 1992), people again turned to fishing as a source of income. Haller and Merten (2008: 708) observed that because of "…the shrinking resources the fishery department's laws were not implemented effectively; the statutory fishery institutions were hardly in place in the more remote areas; and by 2002, traditional institutions regulating access to the fisheries had been severely eroded". Access to the fisheries was thus then considered to be "open-access". Consequently, as competition for the resource increased between locals and migrants, isolated conflicts began to occur (Haller and Merten, 2008).

The Fisheries Act of 1974 was therefore revised to decentralise and devolve fishery management responsibilities from the DoF to the local communities (Malasha, 2007), even though it was not ratified until 2011. Responding to the need for decentralised authority and as well as to the growing conflicts, the DoF in Mazabuka District began to promote establishment of community-based management committees and by-laws. The introduction of the new institutional arrangements was intended to force the migratory fishermen to comply with local regulations. As noted by local residents in 2007, the introduction of these institutional arrangements led to improved fish stocks and catches and reduced the problems relating to seasonal migrant fishermen (Haller and Merten, 2008).

However, in an article on "Governance issues, potentials and failures of participatory collective action in the Kafue Flats, Zambia" by Chabwela and Haller (2010: 12), the authors stated that "the devolution of power has so far increased the bargaining power of local elites such as chiefs and of immigrant resource users both wanting to maintain the open access situation [in some fishing camps]". As such, "the failure to devolve power to invest local actors in an appropriate way by addressing the issue of property rights and how to manage resources within such rights has become an important factor in the Kafue Flats" (Chabwela and Haller, 2010: 12). Literature suggests that one way of addressing problems and

improving performance of individuals, organisations and societies in natural resource management is that of capacity (OECD, 2006). There is thus a need to gain insight into how capacity affects performance of institutions and their mechanisms in regulating access to the Kafue floodplain fishery and to explore why entry is effectively regulated in some fishing camps (Shimungalu) and not others (Nyimba).

1.4 The Research Issue

Literature, such as Béné et al. (2007) and Njock and Westlund (2010), indicates that fisher-folk in developing countries are known to often be highly mobile, moving in search of better catches, higher prices and improved access to markets. Even though the motivation for movement is generally the search for better catches and profits in new locations, it does create a potential issue of over-exploitation, resulting in challenges for fisheries management in terms of managing access to and use of the fisheries resources (Nunan, 2010). E. Ostrom et al. (1994) suggest that predictions of suboptimal use of the resource are likely to be correct when individuals withdraw scarce resource units from the same common pool resource, when they cannot communicate and establish governance systems that facilitate the establishment of agreed-upon rules and strategies and when no other authority has implemented and enforced rules.

Indeed, according to Béné and Neiland (2006: 1), "governance of fisheries – or the lack of it – is a central issue that affects the millions of people engaged in fishing activity, be that in large, industrial operations run mainly within or from developed countries – but also increasingly, from developing countries – or in smaller-scale, coastal or inland fisheries, operated largely in developing countries". Furthermore, the capacity of actors, individually and collectively, to regulate access and methods of harvesting fish is continuously challenged as competition increases and technologies change (Nkhata et al., 2009; Nunan, 2010). Thus, even though the devolution of natural resource management (co-management) responsibilities from the state to communities or local user groups has become a widespread trend that cuts across countries and resource sectors, it still faces significant challenges (Meinzen-Dick and Zwarteveen, 1998; Symes, 2006; Benkenstein, 2014).

Indeed, evidence shows that even those older institutional arrangements that had successfully regulated access to fish stocks over many generations are now proving ineffective as new entrants gain access to and over-exploit the stocks. Authors such as Phillipson assert that "it would seem relevant for future analysis to explore further the issues associated with developing new approaches to fisheries governance. Particular attention

might be given to the question of institutional change and the means of encouraging positive organisational development" (2002: 137).

1.5 Research Aim and Questions

The aim of the study was to gain insight into how capacity affects performance of institutions (organised groups of actors) in regulating access to the Kafue floodplain fishery and why entry is effectively regulated in some fishing camps, such as Shimungalu, and not others, such as Nyimba. Specifically, the study posed this question:

> What evidence is there and in what ways does capacity affect performance of institutions in regulating entry into the Kafue floodplain fishery on the Kafue Flats of Zambia?

The study, therefore, posed sub questions to help address the main question of the research. These questions include:

1. What are the implications of the way in which migrants are defined for control over access to the fishery?
2. Why do national and local institutions fail in regulating access in some places and succeed in others?
3. How can the effectiveness of governance of the fishery be improved?

1.6 Structure of Thesis

This thesis is organised into seven chapters. Chapter One presented the background to the study by articulating the importance of aquatic systems (fish and fisheries) in many countries, including Zambia. It has highlighted that benefits derived from these aquatic systems are under threat as more fisher-folk access these fisheries and as governance systems fail to regulate new entrants and the use of the resource. It also gives a historical perspective of fisheries governance on the Kafue Flats of Zambia. This chapter has thus introduced the issue under study as well as the aim and question for the study. This chapter further presents an overview of the structure of the thesis before proceeding to the second chapter, the literature review.

Chapter Two presents the literature review, which is based on the conceptual and theoretical framework that guided the study. Of particular importance have been concepts and theories of governance, capacity, capacity development and institutions, and their influence on

regulating new entrants (migrancy) and the use of a common pool resource such as a fishery. Also discussed here are fisheries governance approaches, including decentralised co-management systems and polycentric governance.

Chapter Three describes the methodology utilised in this study. It highlights the approaches used and the techniques employed in data collection and analysis. An overview of the paradigm is presented. A qualitative approach was used for this research, which included semi-structured interviews. The chapter also presents how trustworthiness of the research results was achieved. Ethical issues and the limitations of the study are also presented in this chapter.

Chapter Four provides a description of the study area. First, a description of the Kafue Flats of Zambia is given, highlighting the physical, socio-economic and fisheries governance contexts. The second section provides a description of the two study areas, Shimungalu and Nyimba fishing camps, located on the Kafue Flats. Lastly, the institutional arrangements involved in fisheries governance on the Kafue floodplain fishery are described.

Chapter Five presents the research results. These findings are based on the interviews conducted in Nyimba and Shimungalu as well as documents gathered during data collection. The chapter addresses the main research question “what evidence is there and in what ways does capacity affect performance of groups of actors in regulating entry into the Kafue floodplain fishery on the Kafue Flats of Zambia?” I also explain why entry is effectively regulated in Shimungalu and not in Nyimba.

The discussion of research findings is presented in Chapter Six. It particularly focuses on the research aim and questions, and draws from relevant literature. The conclusions and implications of the study as well as recommendations for future research and policy improvements are presented in Chapter Seven.

CHAPTER TWO – LITERATURE REVIEW

2.1 Introduction

The previous chapter served as an introduction to this study and gave an historical perspective of fisheries governance on the Kafue Flats of Zambia. The purpose of this chapter is to present the literature review based on the concepts and theoretical background that underpinned this study. Since a literature review allows the researcher to learn what has already been learned in that field of study, it is regarded as an essential step in most research (Babbie, 2011).

I start by considering the key concepts underpinning the study – governance, institutions, capacity and capacity development. The second section introduces the conceptual framework (capacity development) that was used in the study. Lastly, I provide an account of capacity, governance and institutions in fisheries, taking migrancy into consideration. Here, I highlight the need for governance reform and establish the relevance of nested polycentric governance for fisheries such as the Kafue floodplain fishery.

2.2 Key Concepts

2.2.1 Governance and the Concept of "Good" Governance

There has been a shift in natural resource management approaches from government to governance-based management approaches. The concept of governance emerged to describe a mode of governing that reflects collaborative approaches among government and non-government stakeholders from both the private sector and civil society (Howlett and Rayner, 2006). It "encompasses the role of public authorities in establishing the environment in which economic operators function and in determining the distribution of benefits as well as the relationship between the ruler and the ruled" (OCED, 1995: 14). Governance, according to Béné and Neiland (2006: 1), "is about politics and the way power is distributed between different actors within society". In this study, I adopt the Graham et al. (2003: ii) definition of governance, in that governance encompasses "the interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens or other stakeholders have their say".

Fundamentally, governance comprises five propositions (see Box 2.1), which are centred on creating the conditions for ordered rule and collective action between and within private sector and civil society (Stoker, 1998).

Box 2.1: The five propositions about governance

1. Governance refers to a set of [rules] and actors that are drawn from but also beyond government.
2. Governance identifies the blurring of boundaries and responsibilities for tackling social and economic issues.
3. Governance identifies the power dependence involved in the relationships between [rules] involved in collective action.
4. Governance is about autonomous, self-governing networks of actors,
5. Governance recognises the capacity to get things done, which does not rest on the power of government to command or use its authority. It sees government as able to use new tools and techniques to steer and guide.

Source: Stoker (1998: 18).

Although not an extensive list, the five propositions about governance suggested by Stoker (1998) describe some of the attributes of "good" governance which include participation from all stakeholders, strategic vision, rule of law and performance. The United Nations Development Program's (UNDP, 1997: 3) work on governance suggests that "good governance has many attributes"; it is, "among other things, participatory, transparent and accountable. It is also effective and equitable. And it promotes the rule of law. Good governance ensures that political, social and economic priorities are based on broad consensus in society and that the voices of the poorest and the most vulnerable are heard in decision-making over the allocation of development resources".

Table 2.1 shows the organisation and presentation of the principles for good governance by Graham et al. (2003), which is based on the attributes of good governance identified by the UNDP (1997).

Table 2.1: Five principles of good governance

The Five Good Governance Principles	The UNDP principles and related UNDP text on which they are based
Legitimacy and Voice	**Participation** – all men and women should have a voice in decision making, either directly or through legitimate, intermediate institutions that represent their intention. Such broad participation is built on freedom of association and speech, as well as capacities to participate constructively. **Consensus orientation** – good governance mediates differing interests to reach a broad consensus on what is in the best interest of the group and, where possible, on policies and procedures.
Direction	**Strategic vision** – leaders and the public have a broad and long term perspective on good governance and human development, along with a sense of what is needed for such development. There is also an understanding of the historical, cultural and social complexities in which that perspective is grounded.
Performance	**Responsiveness** – [polices] and processes try to serve all stakeholders. **Effectiveness and efficiency** – processes and [polices] produce results that meet needs while making the best use of resources.
Accountability	**Accountability** – decision makers in government, the private sector and civil society organisations are accountable to the public, as well as to institutional stakeholders. This accountability differs, depending on the organisations and whether the decision is internal or external. **Transparency** – transparency is built on the free flow of information. Processes, [polices] and information are directly accessible to those concerned with them, and enough information is provided to understand and monitor them.
Fairness	**Equity** – all men and women have opportunities to improve or maintain their wellbeing. **Rule of Law** – legal frameworks should be fair and enforced impartially, particularly the laws on human rights.

Source: Graham et al. (2003: 3).

Good governance frameworks would then refer to “new processes and methods of governing and changed conditions of ordered rule on which the actions and inactions of all parties concerned are transparent and accountable” (Tortajada and Biswas, 2013: 170). They would embrace “the relationships between governments and societies, including laws, regulations, institutions, and formal and informal interactions which affect the ways in which governance systems function, stressing the importance of involving more voices, responsibilities, transparency and accountability of formal and informal organizations associated in any process” (Tortajada and Biswas, 2013: 170). A weak governance system is characterised by high corruption, poor law enforcement, lack of transparency, ineffective policy controls, lack of property rights, biased (no or little) stakeholder participation, social exclusion, lack of trust in authorities, inequitable growth and absence of a well-defined governance structures (Zamahani, 2014). Thus, building a good governance framework by using attributes (in addition to organisational connectedness) such as autonomy, information sharing and nesting organisations is critical to eradicating corruption within governance structures and improving governance systems.

2.2.2 Understanding Institutions

According to Hodgson (2006: 1), “the use of the term institution has become widespread in the social sciences in recent years, reflecting the growth in institutional economics and the use of the institution concept in several other disciplines, including philosophy, sociology, politics, and geography”. In response to this wide use of the concept across disciplines, different scholars have defined institutions differently, depending on the need and complexity that lies behind understanding the interactions of issues under study (E. Ostrom, 2005). Box 2.2 provides some of the definitions of institutions proposed by different scholars.

Box 2.2: What are institutions?

1. Settled ***habits*** of thought ***common*** to the generality of men (Veblen, 1919).
2. ***Collective action*** exercised by ***different types of organisations*** (*family, corporation, trade union, state)* in ***control of individual action*** (Commons, 1924).
3. ***Habits of a group*** or the ***customs of a people*** (Hamilton, 1932).
4. Convenient term for the more important among the widely prevalent, ***highly standardised social habits*** (Mitchell, 1950).
5. ***A set*** of ***socially prescribed patterns*** of ***correlated behaviour*** (Bush, 1986).
6. ***Mental constructs*** (Neale, 1987).
7. ***Rules of the game*** (North, 1990).
8. ***Norms*** that ***regulate*** relations ***among individuals*** (Parsons, 1990).
9. ***Prescribed or proscribed patterns*** of ***correlated behaviour*** (Tool, 1993).
10. ***Sets of rules of the game*** or ***codes of conduct*** defining ***social practices*** (Young, 1994).
11. ***Formal organisations, patterns of behaviour***, negative ***norms*** and ***constraints*** (Coriat and Dosi, 1998).
12. ***Conventions, rules of action***, embedded in ***social structure, locally specific*** (Krätke, 1999).
13. ***Constitutional rule systems*** for society, ***collective choice rules*** governing different kinds of ***organisation***, ***operational rules of organisations*** (E. Ostrom, 1999).
14. ***How the game is played*** (Nelson and Sampat, 2001).

Source: Adapted from Parto (2005).

From this overview organised by Parto (2005), it is evident that definitions of institutions include formal and informal laws, rules, norms and strategies that structure the pattern of interactions and behaviour of actors as well as organisational entities and their collective choice rules that prescribe patterns of interactions and behaviour. For instance, North (1990: 3) defines institutions as “the rules of the game in a society, or more formally, are the humanly devised constraints that shape human interaction” and “reduce uncertainty by providing a structure to everyday life”. Institutions include “both ‘formal’ rules such as constitutions and laws enforced by the state and ‘informal’ constraints such as ‘codes of conduct, norms of behaviour, and conventions” (North, 1990: 36).

Zucker (1983:1) believes that “organizations are the preeminent institutional form in modern society. They organize and structure the daily activities of most people”. Indeed, Hodgson

(2006: 10) points out that, "as North acknowledged, it is possible for organizations to be treated as actors in some circumstances and generally to be regarded as institutions". North (In Khalil, 1995: 446) further suggests that "organizations, in the sense of societies at large, would perform better if they adopt rules or, more elementally, constitutions which protect property rights as well as enhance private incentives with regard to activities with high positive externalities".

As such, in this study, organisations as institutions refer to the organised groups of actors and their established formal and informal mechanisms that structure human interactions and behaviour. In addition, Cleaver (2012: 8) suggests that institutions are "arrangements between people which are reproduced and regularized across time and space and which are subject to constant processes of evolution and change". Such an understanding is pertinent for this study because the Kafue floodplain fishery is spatially extensive, variable over time and subject to change as new entrants seek access to the fishery.

2.2.3 The Concept of Capacity

The concept of "capacity" lacks a broadly accepted definition. Instead, this concept has many different meanings and interpretations, as each actor both views capacity from his stance as well as emphasises different aspects of it (UNDP, 1998; McKinsey 2001; Morgan, 2006). It is "then found to be a multifaceted and dynamic concept that encompasses many elements and exists at various levels" (Wigboldus et al., 2010: vii). Table 2.2 shows examples of different definitions of capacity (Walther, 2010).

Table 2.2: Examples of definitions of capacity

Definitions	Reference
Capacity is the ability to perform appropriate tasks effectively, efficiently and sustainably.	Grindle and Hilderbrand (1995: 34)
Capacity is the combination of people, institutions and practices that permits countries to reach their development goals.	World Bank (1998)
Capacity is defined as the ability of individuals and organisations or organisational units to perform functions effectively, efficiently and sustainably.	UNDP (1998: 5)

Capacity is defined as the organisational and technical abilities, relationships and values that enable countries, organisations, groups and individuals at any level of society to carry out functions and achieve their development objectives over time.	Morgan (1998: 2)
Capacity is the ability of an organisation to function as a resilient, strategic and autonomous entity.	Kaplan (1999: 16)
Capacity is defined as the abilities, skills, understandings, attitudes, values, relationships, behaviours, motivations, resources and conditions that enable individuals, organisations, networks/sectors and broader social systems to carry out functions and achieve their development objectives over time.	Bolger (2000: 2)
Capacity is the abilities, vision, values, relationships, resources, efforts and conditions that enable actors (individuals, groups, organisations, [rules], countries) to perform specified functions or achieve specified objectives effectively, efficiently and sustainably.	Choritz (2002: 25)
Capacity is a set of attributes that help or enable an organisation to fulfil its missions.	Eisinger (2002: 117)
Capacity is defined as the ability of individuals, institutions and societies to perform functions, solve problems, and set and achieve objectives in a sustainable manner.	UNDP (2006: 5)
Capacity is understood as the ability of people, organisations and society as a whole to manage their affairs successfully.	OECD (2006: 5)
Capacity is that emergent combination of attributes that enables human system to create development value.	Morgan (2006: 8)
Capacity is the emergent combination of attributes, assets, capabilities and relationships that enable a human system to perform, survive and self-renew.	Morgan (2006: 15)

Source: Adapted from Walther (2010).

Despite the fact that capacity has several definitions, those definitions presented above all reflect two important attributes: the ability to 1) do something and 2) achieve specified collective goals effectively and sustainably. As such, capacity in this study will refer to the ability of organisations (institutions) within society as a whole to perform specified functions or achieve specified objectives effectively, efficiently and sustainably (Choritz, 2002; OCED, 2006). However, capacity is not developed in a vacuum; it must be rooted in a broader development objective – in a national development strategy, a plan for economic, social empowerment, or an initiative with a particular theme – to be useful (UNDP, 2009). In the context of this study, it can be understood as developing and sustaining the ability to manage access to and use of the fishery with the intention of achieving sustainable use. This process is referred to as capacity development.

2.2.4 The Concept of Capacity Development

Capacity development (CD) as a concept has attracted a great deal of attention since the 1990s. Lusthaus et al. (1999) point out that the term emerged in the 1990s as an aggregate of many other development approaches such as technical cooperation, capacity building and capacity strengthening. Yet unlike these approaches, CD stressed the importance of ownership and process, and thus became the popular approach to development (Lusthaus et al., 1999). But, like “capacity”, CD has several definitions. For instance:

> Capacity development refers to the improvements in the ability of public sector organisations, either singly or in cooperation with other organisations, to perform their tasks. (Hilderbrand and Grindle, 1997: 34)

> Capacity development is a continuing learning and changing process. It emphasises better use and empowerment of individuals and organisations. And it requires that systematic approaches be considered in devising capacity development strategies and programmes. (UNDP, 1997: 3)

> Capacity development is the process whereby people, organisations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time. (OCED, 2006: 12)

> Capacity development is a locally driven process of learning by leaders, coalitions and other agents of change that brings about changes in socio-political, policy-related, and organisational factors to enhance local ownership

for and the effectiveness and efficiency of efforts to achieve a development goal. (Otoo et al., 2009: 3)

In looking at these definitions it is clear that CD is a process. It requires the "availability of resources and the efficiency and effectiveness with which societies [as well as organisations] deploy those resources to identify and pursue their development goals on a sustainable basis" (Otoo et al., 2009: 3). Also, "it is important to bear in mind that CD is fundamentally about change and transformation – individual, organisational, societal" (Bolger, 2000: 2). FAO (2006) and Wigboldus et al. (2010) suggest that the core characteristic of CD is that it can exist at different levels and relate to different dimensions at those levels, that is, individual, organisational and system levels (see Figure 2.1).

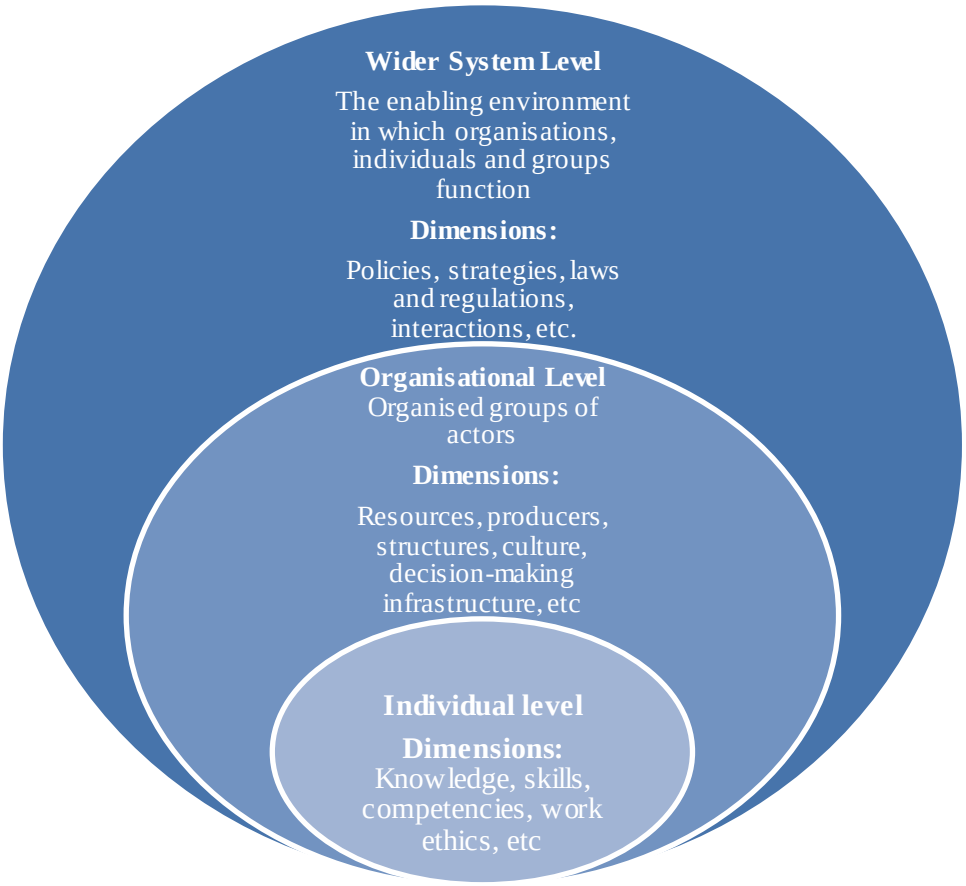

Figure 2.1: Levels and dimensions at which capacity occurs

Sources: FAO (2006); UNDP (2009); Wigboldus et al. (2010).

The Individual Level

This level in the CD process refers to individuals as social or organisational actors, such as fishermen, small-holder farmers and government officers, and the way their skills or abilities are harnessed or strengthened to contribute to the realisation of development objectives (Bolger, 2000). Capacity at individual level refers to the will and ability of an individual to set objectives and to achieve them using his/her own knowledge and skills (Japan International Cooperation Agency, JICA, 2004). In other words, this level refers to the skills, experience and knowledge that allow each person to perform (UNDP, 2009). Capacity at individual level is thus a fundamental element to the overall development of capacity within a system, as it includes, among other factors, the knowledge, skills, value, attitude, health, awareness, competencies and work ethics of individuals (Lusthaus et al., 1999; JICA, 2004; FAO, 2006; Matachi, 2006).

However, literature suggests that CD should not solely focus on the individual level. The OCED (2006: 7), for example, stipulates that "capacity development involves much more than enhancing the knowledge and skills of individuals. It depends crucially on the quality of the organisations in which they work. In turn, the operations of particular organisations are influenced by the enabling environment – the structures of power and influence and the [rules in use] – in which they are embedded". Similarly, UNDP (2009) suggests that experience shows that development projects focusing narrowly on individuals without giving adequate attention to organisational issues and broader processes of empowerment or relevant factors in the enabling environment are at risk of not realising all the potential benefits.

The Organisational Level

Capacity at the organisation level will determine how individual capacities are utilised and strengthened (Matachi, 2006). Organisations are seen as processing systems that change individual and system capacities into organisational results (Eele, 1994; Van Diesen, 1996; Lusthaus et al., 1999). According to Gbla and Rugumamu (2003), they establish goals, structure work, define authority relations and provide incentives and disincentives that shape the behaviour of those who work within them. Organisational capacity involves groups of individuals bound by a common purpose, with clear objectives and the internal structures, processes, systems, staffing and other resources needed to achieve them (World Bank, 2005). Furthermore, developing capacity at organisational level also extends to the management of relationships between the different organisations and sectors, such as

community, public, private and government (Civil Society Human and Institutional Development Programme, CHIP, 2007). Béné and Neiland (2006: 5) highlight that "although governance in the sense of self-organization can be found at three different levels – interpersonal, interorganizational, and intersystemic – the term itself is often limited to the second level, i.e., interorganizational".

Elements on which the organisational capacity is based include human resources (capacities of individuals in organisations); physical resources (infrastructure, facilities, equipment, materials, etc.) and capital; intellectual resources (organisational strategy, strategic planning, business know-how, production technology, program management, process management, inter-policy and organisational linkage); organisational structure and management methods that affect the utilisation of the resources (human, physical intellectual assets) such as organisational culture, incentive and reward system and leadership of managers (Lusthaus et al., 1999; JICA, 2004; UNESCO-IICBA, 2006). These have been collectively referred to as "assets" in capacity development literature (Baser and Morgan, 2008; Wigboldus et al., 2010).

The Wider System Level

The wider system level involves capacities of the society (individuals and organisations) as a whole (Fukuda-Parr et al., 2002). The UNDP (2009; 2011) points out that the system level refers to the enabling environment, which includes the political, social, economic, policy, legal and regulatory systems within which organisations and individuals function. While Lusthaus et al. (1999: 7) highlight that the system level "requires consideration of all contextual elements as well as the linkages between them", the authors admit that "what it sometimes lacks is focus. The vastness of the elements under consideration sometimes makes this approach unwieldy while the high level of abstraction can result in vague language. Since the concept itself is broad and encompasses everything, it is unclear where one starts in a system change effort".

2.3 The Conceptual Framework: Capacity Development

Conceptual frameworks for CD have advanced in recent years (Bolger, 2000). Miles and Huberman (1994: 18) define a conceptual framework as "a visual or written product that explains, either graphically or in narrative form [or both], the main things to be studied – the key factors, concepts, or variables – and the presumed relationships among them". In this study, I used the framework (Figure 2.2) suggested by Wigboldus et al. (2010: 4) to help

interpret the "constantly changing picture of interactive capacity assets, capabilities and capacity". In this sense, capacity is a property of social-ecological systems that is reinforced through application (Engle, 2011; Hinkel, 2011). It can remain latent until the required assets (equipment or money, for example) are available and the context conditions enable their application. Performance emerges when "competencies, collective capabilities, assets and relationships" (Baser and Morgan, 2008) are activated, often because an individual or group is motivated by opportunity. Feedback from performance focuses and promotes the endogenous process of capacity building, directs acquisition of assets and improves alignment of context with the endeavour further enhancing performance.

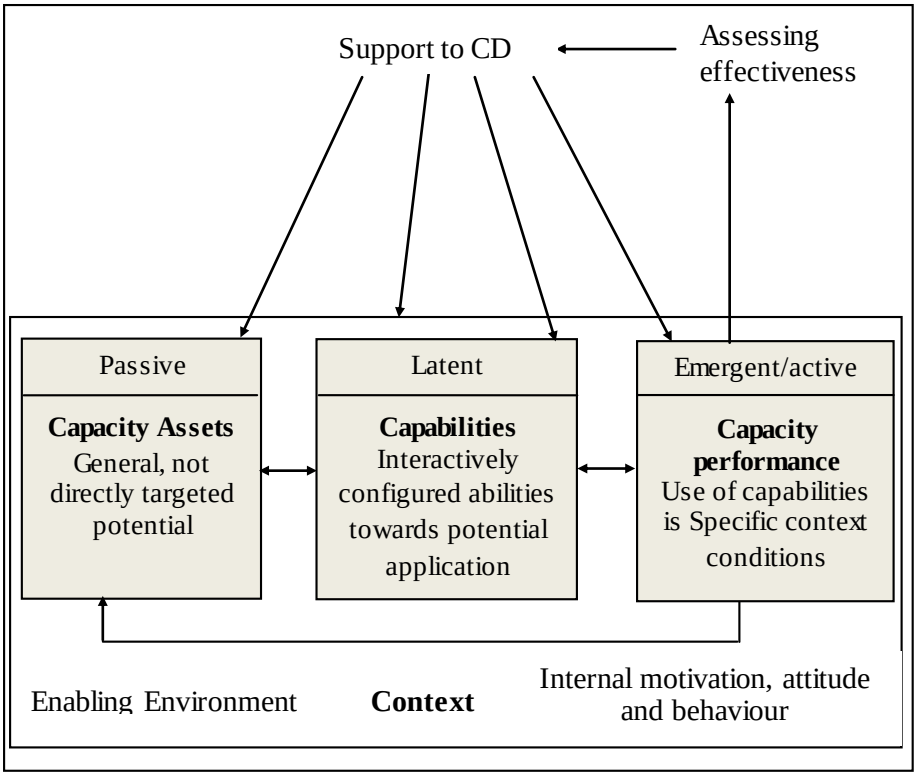

Figure 2.2: The capacity development

Source: Wigboldus et al. (2010: 7).

In terms of this CD framework, three predetermined codes, capacity assets, capabilities and context (Baser and Morgan, 2008; Wigboldus et al., 2010), were used to suggest how capacity affected performance of institutions (the government, traditional authorities and community-based management committees) in regulating access to the Kafue floodplain fishery of Zambia and why entry and use of the fish resource is effectively regulated in some

fishing camps and not others. Capacity assets relate to ingredients, recipes and knowledge about how to use different ingredients in general (Wigboldus et al., 2010). These assets can be tangible and/ or intangible resources, for example networks, funds, equipment and information, operating at group as well as individual levels. As such, CD depends to some degree on the ability of the human system to attract resources in the form of development funding, buildings, operating costs, equipment, information and location (Baser and Morgan, 2008). A capability can be defined as the collective skill or aptitude of an organisation or system to carry out a particular function or process either inside or outside the system that enables the organisation to do things and to sustain itself (Baser and Morgan, 2008). Finally, context can be described as "the political, social and institutional landscape within which actors struggled to make their way" (Baser and Morgan, 2008: 6). Context regulates the realisation of potential capacity and the further development of capacity. It includes factors such as political, cultural and social norms that affect attitudes, behaviour and motivation.

2.4 Capacity, Governance and Institutions in Fisheries

2.4.1 Defining Fisher-Folk Migration

Migration is considered to be a dimension of mobility that takes many different forms. Based on the Sustainable Fisheries Livelihoods Programme (SFLP) field surveys in West and Central Africa, Njock and Westlund (2010) suggest that migrant fisher-folk take the following forms of migration: international, internal, short-term, seasonal, long-term, permanent, contractual and stop-over migration (see Box 2.3). Similarly, Samba and Faye (2006) and Randall (2005) identified three forms of fisher-folk migration: permanent, seasonal and circular migration.

Box 2.3: Forms of fisher-folk migration

1. **International or trans-boundary migration:** Migration that takes place when fishing populations, in the search of a better well-being, cross national borders. Such migration is usually longer-term but can also be short-term.
2. **Internal migration:** Migration that takes is limited to within the borders of a country. It takes place between fishing settlements within the same country in order to follow fish stocks or to take advantage of certain facilities or fish prices, during particular periods of the year or over a longer term.
3. **Short-term migration:** Migration that lasts for a few weeks but less than a fishing season.
4. **Seasonal migration:** Fishing people, sometimes including family members, who stay in foreign fishing settlements for one or two seasons and then return home for a certain amount of time.
5. **Long-term migration:** Fishing people who settle abroad for several years but who always eventually return to their home country, independent of the length of their stay abroad.
6. **Permanent migration:** Second or third generation fishing people who end up being assimilated into the local population and, in most cases, also take the host country's nationality.
7. **Contractual or circular migration:** Migration that is motivated by an employment contract that has been formally established in the country of origin. The duration of the contract may be for one or several years and the fisher makes visits to his home country during this period.
8. **Stop-over migration:** Migrants who intend to continue their migration but who make a shorter or longer stop in a place to recuperate or reorganise their travel.

Sources: Randall, 2005; Samba and Faye, 2006; Njock and Westlund 2010.

It is important to note that fisher-folk migration, for many centuries now, has been an integral part of these fishers' lives, as is one of the strategies that they use in order to secure livelihoods (the UK Department for International Development, DFID, 2004; Njock and Westlund, 2010). Through migration, people (such as the fishers) have been able to escape insecurities and poverty as they move in response to opportunity (DFID, 2004). In this case, opportunity may include better fish stocks when these are depleted in the place of origin, better marketing outlets and social services (such as schools, and hospitals), easier access

to and cheaper inputs (for example, gear, and fuel) and the possibility to earn more money (Njock and Westlund, 2010).

Migration can bring both benefits and adverse impacts to livelihoods of fishing communities because while it offers people opportunities, it may also increase vulnerability for those who migrate, stay behind and those in the destination communities (Ellis, 2003; DFID, 2004). For instance, the International Organisation for Migration (IOM) (2014) stated that migrant fisher-folk (Ghanaian fishermen) established in Senegal have improved fish conservation techniques and health practices, including reducing the use of mosquito nets and burying the dead far from water sources in the fishing camps. Similarly, in his study in Nigeria, Fregene (2007: 4) observed that "Ghanaian fishermen are more experienced in the art of fishing and equipped in modern fishing inputs compared to Nigerians. Therefore the movement of their skill coupled with efficient fishing inputs to harvest the abundant fisheries resources in the Nigerian marine waters ensures their reaping high returns on their skills".

Yet while migrants may bring various social-economic benefits and skills to the host communities, the integration of migrants (fishers and others) is not always easy. Even though migrants could contribute to local economies, they may also be competing for jobs and resources with individuals in the destination communities (Njock and Westlund, 2010). Fisheries governance is then commonly challenged by its limited capacity for the monitoring, control and surveillance of water bodies (Benkenstein, 2014). Thus, fisheries are at risk of being overharvested as migrancy increases.

Indeed, Nunan (2010: 778) notes that "the issue of gaining, or securing, access to fisheries when moving to a new area is not significantly touched on in the literature but could be of concern, particularly where licenses and permits are needed". However, critics such as Alison et al. (2012) argue that even though strengthening fisheries governance through clarifying exclusive individual or community rights of access to fishery resources result in greater efficiency and incentivise investment, the fishery governance reforms commonly fail. They suggest this to be the case because of the failure to take into account other sources of insecurity in people's lives that are unrelated to the state of fishery resources yet cause migration (Alison et al., 2012). They argue that "assistance from other sectors in solving some of fishing communities' most pressing non-fishery problems would make it easier for them to solve their fishery-related ones" (Alison et al., 2012: 25). To this end, De Haan (1999) has emphasised the importance of socio-cultural institutional arrangements in determining who may migrate and from where.

Ultimately, Fregene (2007: 14) suggests that "the traditional systems of regulating access to fish resources and the capacity of the fishing fleet have also collapsed. In areas where they still exist, they are not as effective and are helpless in the face of invasion from migrant fishermen". As a result, fishing in many African countries, particularly in inland freshwater and near-shore coastal fisheries, has been characterised by development of "attributes, assets, capabilities and relationships" (Figure 2.2, Wigboldus et al., 2010) that improve the ability to compete for fish and thus result in unsustainable harvesting (Benkenstein, 2014). This reality is worsened by the degradation of ecosystems, which are important for breeding, nursery, feeding and growth of fish; excessive fishing efforts; climate change and improved fishing technologies, such as motorised boats and modern fishing gear (such as nylon nets, long lines) (Fregene, 2007; Benkenstein, 2014).

2.4.2 Fisheries Governance Reforms: Learning From The Past

"Fisheries governance is largely identical to people management [governance] as it is only through influencing people that one reaches the fish" (Symes, 1996, In: Kooiman and Bavinck, 2005: 22). In most African countries, including Zambia, governing of common pool resources such as fisheries, forests and wildlife has undergone institutional and legislative changes, owing to shifts from traditional management systems to state management systems. These changes can often be dated from the colonial to the post-colonial times. Consider, for instance, the work of Thomas (1996), who mentions that locally developed institutional arrangements in the Hadejia Jama'are floodplain of Northern Nigeria were dismantled as the colonial rulers (state) took over control and issued licences for commercial fishermen as a form of re-regulation. In the post-colonial era, acknowledgment of the limits of centralised fisheries governance efforts, increased number of fishers and erosion of traditional institutional arrangements in regulating access to and use of fisheries underpinned the move towards a more decentralised governance approach (Kassibo, 2000; Fregene, 2007; Malasha, 2007; Haller and Merten, 2008; Njock and Westlund, 2010, Benkenstein, 2014). Decentralisation commonly took the form of co-management and became a means of achieving better governance and more efficient utilisation of local resources (Njock and Westlund, 2010). Decentralisation is a type of governance reform that "aims to strengthen the potential of customary management to protect both the local environment and the stakes and rights of resource-users while improving the legitimacy of state involvement in fisheries management through more inclusive and transparent decision-making processes", according to Evans et al. (2011: 1). In such a system, fishing communities with assistance from state departments in charge of fisheries establish local

fishing committees. Traditional authorities (or leaders) also are expected to play an important role in the management of fisheries.

However, literature shows that in many fishing communities, including where part of the population dynamic is characterised by high mobility and migrants, the design of systems for redistribution of equitable and exclusionary access rights through co-management arrangements is a particular challenge (Allison and Badjeck, 2004; Béné and Neiland, 2004). For instance, Kassibo (2000), who examined the role of traditional management systems with regard to access, resource exploitation and conflict resolution in the Delta of Niger, revealed that under the decentralisation reform, the traditional institutional arrangements were dismantled and transformed by powerful local (traditional) leaders and state administrators. According to Kassibo (2000: 86), "these traditional leaders used the legitimate authority delegated through the decentralisation process to appropriate all the top positions in these committees". As such, Kassibo reports that the lack of careful evaluation of power relations of traditional authorities and other organisations within the communities involved has been at the root of failure of this decentralised system, leading to a situation where access, resource exploitation and conflict resolution have not been effectively managed.

In another example, the devolved management system in the United Kingdom fisheries to incorporate fishermen's management organisations was also met with challenges. Symes (1995: 29) identified three areas of weakness in the governance reform: "a lack of clear objectives, an illogical system of decision making and a fragmentation of management responsibilities". He further notes that the failure of management to provide an effective means of upward transfer of knowledge and expertise led to a significant gap between fishermen's management organisations and the regulatory bodies (Symes, 1995). He thus suggests that there is need for the strengthening of fishermen management organisations within the Common Fisheries Policy system.

Similarly, Nunan et al. (2015: 203) in an analysis of inland fisheries communities and co-management in East Africa (Kenya, Tanzania, and Uganda) and Southern Africa (Malawi) noted that "...many fisheries worldwide are managed through a co-management arrangement, involving users and governments working together", but "while there are examples of supportive and cooperative relations between these structures, there are more examples of inharmonious relations" (p210). In both East Africa and Malawi, the co-management systems have taken up a government to community (top–down) approach and failure of these systems has arisen from issues regarding power relations, gender relations and norms and kinship (Nunan et al., 2015). Issues concerning who collects and keeps fish

levies, who enforces regulations and issues sanctions and who permits migrant fishers to fish from an area have challenged the effectiveness of co-management systems and created opportunities for either accepting or demanding bribes by co-management structures – government officers, traditional authorities and local community-based management committees (Nunan et al., 2015). Without clearly defining the roles, responsibilities and relations between the government, local committees and traditional authorities (Nunan et al., 2015), the "fishers committees can be co-opted by influential local fishers or traders who benefit from illegal fishing practices", thus "patrols and enforcement may be undermined by corruption or weak support from fisheries inspectors, and law enforcement authorities may render the fishers committees powerless" (Benkenstein, 2014: 3). In an example of such inefficiency or corruption, Benkenstein (2014) demonstrates that in Mozambique the local committees (community fisheries councils) collect fees for fisheries permits and submit them to central fisheries authorities for financing patrols. Although part of these fees is supposed to be remitted to the local committee, numerous committee reports have indicated that these funds are not received (Benkenstein, 2014).

Indeed, Benkenstein (2014: 3) highlights that "one of the primary challenges for African fisheries governance is how to ensure that the co-management systems that have been established can be made more effective and sustainable, and independent of the donor financing and support that have played a key role in their development". Njock and Westlund (2010) suggest that better integration of native and migrant fishers in fisheries governance reforms calls for assessments of the role of governments and relationships between native and migrant fishers.

Summary

The capacity of governance structures within a co-management system depends on the resolution of certain key issues, including a more comprehensive knowledge base, better representation of stakeholder interests, the involvement of civil society and common action (Symes, 1995; 2006). While co-management continues to be seen as the appropriate way forward in most situations, it still faces significant challenges (Symes, 2006; Benkenstein, 2014). For instance, the failure of governance systems such as co-management to regulate new entrants and the use of the fish resource increases the risk of fisheries being overharvested as migrancy increases.

In co-management systems of governance, problems are further exacerbated when each group of fishermen and the committee are isolated from each other. In terms of corruption

and malpractice, it would help if committees from different locations were able to expose these issues within a larger group. This system would enable one area to draw support for anticorruption efforts or failure to honour obligations from other groups, either at the same level or from other levels within the hierarchy of governance. In the current situation, perpetrators escape sanctioning because of the strong positions of those who are corrupt. Further, decentralisation as currently conceived leads to vertical links that separate different areas and their fishers. This structure weakens rather than strengthens horizontal links amongst groups of actors. It also inhibits rather than facilitates working together and co-learning, and imposes multiple demands on government rather than helps to mobilise additional assets. Chabwela and Haller (2010: 13) thus conclude that "it is therefore important to create a platform on which all the stakeholders can organise and present their demands, and where they can be recognised as owners of the governance process". Establishing a new governance reform such as a nested system with polycentric governance, as suggested in literature (for example, V. Ostrom et al., 1961; V. Ostrom, 1972; E. Ostrom, 1990, 2005, 2010; Adler, 2005; Schoon et al., 2015), would strengthen horizontal and vertical links so that malpractice could be exposed and controlled more easily. It would also improve local governance thus reducing reliance on government.

Effectively, this study sought to gain insight into how capacity affects performance of institutions (community-based management committees, traditional authorities and government) in regulating access to the Kafue floodplain fishery of Zambia. According to UNDP (2011), understanding broad social system within which organisations function sets the overall scope for capacity development. As such, this study also seeks to examine why entry and use of the fish resource are effectively regulated in some fishing camps and not in others. The study was thus conducted to provide insight into the success and failure of devolved governance systems on the Kafue floodplain fishery of Zambia in regulating new entrants and use of the fish resource, and to consider how polycentric governance may be strengthened.

2.5 Conclusion

This chapter has presented a review of literature based on underlying theoretical constructs of capacity, governance and institutions and how these are operationalised in fisheries management. The literature has highlighted that fisheries are at risk of being overharvested as migrancy increases and traditional governance systems have been transformed into a governance system that is not inclusive and in which rights are ignored. It has thus exposed

constraints in the co-management approach to governance that is widely used in fisheries management. Authors have thus called for reform that will lead to more effective and sustainable fisheries governance, better control of access to and use of the fish resource and overcoming the issues arising from decentralised co-management systems. A widely recognised governance system in literature is a nested system with polycentric governance. In the next chapter I describe and justify the research methodology used in this study.

CHAPTER THREE – RESEARCH METHODOLOGY

3.1 Introduction

The aim of this study was to gain insight into how capacity affects performance of institutions in regulating access to the Kafue floodplain fishery and why entry is effectively regulated in some fishing camps, such as Shimungalu, and not others, such as Nyimba. This chapter presents the methodology I used to undertake this study. I consider research design, sampled population, techniques that were employed during data collection and how the collected data was analysed. Limitations of this study are highlighted, and the measures I took to ensure trustworthiness and adhere to ethical considerations are addressed.

3.2 Research Methodology

3.2.1 Research Paradigm: Interpretive

To quote Bryman (2004: 453), "a paradigm is a cluster of beliefs and dictates which for scientists in a particular discipline influence what should be studied, how research should be done and how results should be interpreted". It serves to define the "basic belief system or worldview that guides the investigation" (Guba and Lincoln, 1994: 105). Thus, research methods and interpretation of results will depend on the philosophical approaches and preconceptions about ontology (nature of reality) and epistemology (the way the researcher comes to know that reality), as well as metatheoretical (theoretical lenses that provide direction to the research in a particular field of study), methodological (how to go about finding out whatever it is that you believe, you know or can come to know) and axiological (the place of values in the research process or ethical issues need to be considered) concerns (Guba and Lincoln, 1989, 1994; Schwandt, 1994; West and Turner, 2000; Bezuidenhout et al., 2014).

Ontology is concerned with questions such as: "What is the form or nature of reality?" or "What is there that can be known?" (Chinn and Brewer, 1993; Cohen and Manion, 1994; West and Turner, 2000). Two ontological positions – realism or idealism – can be taken up. Smith and Darlington (1996: 14) point out that "realism argues that we perceive the world as it really is, that cognition is a relation between subject (the perceiver) and object (the perceived), that the existence of the object does not depend upon the subject perceiving it". The idealism, in contrast, holds that reality is shaped to some degree by our minds and social context and cannot be known independently (Sciarra, 1999). The idealism approach

was adopted in this study, as it suggests that "reality is fluid and subjective and is created by human interaction" (Bezuidenhout et al., 2014: 34).

The epistemological position refers to the study of knowledge, dealing with the nature of knowledge and the different ways of knowing. It poses questions such as: "What counts as knowledge" and "What are the limits of knowledge?" (Bezuidenhout et al., 2014: 23); "How can we be sure we know what we know?" (Guba and Lincoln, 1989: 83) and "How do people know?" (Kuhn, 2001: 1). In social science research, knowledge can either be acquired through an inductive or deductive logic. Inductive logic involves building knowledge from the bottom up through observations of the world, which in turn provide the basis for developing theories or laws (Ritchie, 2013). Deductive logic is a top–down approach to knowledge – it starts with a theory from which a hypothesis (proposition or research goal) is derived and is then applied to observations about the world. The hypothesis (proposition or research goal) will then be confirmed or rejected, thereby strengthening or weakening the theory (Ritchie, 2013). In this study, I used deductive logic.

With regard to metatheories, Hjørland (2005: 5) defines this concept as "...theories about the description, investigation, analysis or criticism of the theories in a domain". The metatheoretical position therefore refers to exploring the theoretical lenses that provide direction to the research in a particular field of study (Bezuidenhout et al., 2014). In examining the various definitions of metatheories, one can recognise that good research should be built on a sound theoretical base. By definition, theories are general and provide a comprehensive set of statements or propositions that explain different aspects of some phenomenon (Hagan, 1993; Senese, 1997; Babbie, 1998). These statements or propositions can be further developed into a "meaningful explanatory framework" (Padgett, 1998: 58), commonly referred to as a conceptual framework. In this study, I adopted the use of the CD framework suggested by Wigboldus et al. (2010:4) to describe how "capacity assets, capabilities and context" affect the performance of institutions to regulate access to and use of the Kafue floodplain fishery.

Axiology focuses on the place of values in the research process (West and Turner, 2000). It asks the important question of whether values can be suspended in order to understand, or whether values mediate and shape what is understood (Bezuidenhout et al., 2014). Heron (1996) suggests that axiological skills can be demonstrated by being able to articulate one's values as a basis for making judgements about what research one is conducting and how one goes about doing it. The measures I took to ensure trustworthiness and values (ethical considerations) are discussed in sections 3.7 and 3.8.

Methodology addresses the issue of how we go about finding out whatever it is that we believe we know or can come to know (Guba and Lincoln, 1989, 1994; Schwandt, 1994). The methodology chosen depends on what one is trying to do rather than a commitment to a particular paradigm (Cavaye, 1996). As such, the methodology needs to be carefully selected to ensure that it complements the particular phenomenon under study, as different phenomena can involve the use of different research approaches (methodologies), as different modes of research allow us to understand different phenomena and for different reasons (Deetz, 1996). By focusing on the phenomenon under examination, the appropriate methodologies (quantitative or qualitative) for enquiries can be selected (Falconer and Mackay, 1999). For this study, I selected a qualitative approach to address the proposition under study, i.e. capacity constrains the ability of institutions to regulate entry into the fishery and thus to achieve the objective of a sustainable fishery.

In summary, research paradigms can be characterised through their ontological, epistemological, metatheoretical, methodological and axiological positions. Research is governed by three paradigms, such as positivism, interpretivism and critical realism. This study is positioned in the interpretivism paradigm in order to understand how capacity affects the performance of institutions to regulate access to and use of the Kafue floodplain fishery. The interpretive paradigm, according to Bezuidenhout et al. (2014), seeks to understand and describe meaningful social action and experiences. It centres on the way in which human beings make sense of their subjective reality and attach meaning to it (Pope and Mays, 2006). Following this paradigm, participants in this research were approached in their natural environment as opposed to a laboratory setting.

3.2.2 Research Method: Qualitative Approach

Research method is described as a systematic approach to the research process. It includes stages of planning, structuring, execution, population, sampling, data collection and analysis (Burns and Grove, 2003; Polit and Beck, 2012). There are two types of research methods, qualitative and quantitative, which differ in the form of data collection, analysis and presentation. Myers (2009: 8) explains that “qualitative research is an in-depth study of social and cultural phenomena and focuses on text whereas quantitative research investigates general trends across population and focuses on numbers”. Qualitative approaches pursue a deeper understanding of the human experience, and involve non-numerical examination of phenomena, using words instead of numbers (Rubin and Babbie, 2001; Marlow and Boone, 2005). As such, qualitative approaches to data collection involve studying phenomena in their natural settings and attempting to make sense of, or to

interpret, these phenomena in terms of the meanings people bring to them (Denzin and Lincoln, 2000). By using a qualitative approach, I sought to gain insight into the social and cultural contexts within which people live (Myers, 2009) and the complexities and differences of the worlds understudy (Philip, 1998). This research method was thus suited to this study.

Adopting a qualitative approach entails obtaining rich in-depth information on the phenomena under study by using "soft data to get rich data" (Domegan and Fleming, 2007: 24). This qualitative data can be obtained from observations, interviews, focus group discussions, documents and texts (Myers, 2009), or combinations of these. In this study I used interviews and documentary analysis to collect the data.

3.3 Research Design

3.3.1 Comparative Case Study Design

A case study is an empirical inquiry that investigates a contemporary phenomenon in-depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 2009: 18). The purpose of a case study design is to look intensely at a small pool of participants or an individual and draw conclusions only in that specific context about that group or participant (Becker et al., 2005). Babbie and Mouton (2001: 279) point out that qualitative research designs commonly focus on "a small number of cases to be studied" to gain an in-depth understanding across and within contexts. Although Stake (2000) uses the terminology "collective case study", Merriam (1998) and Yin (2003) highlight that this approach is also referred to as "multiple case studies, cross-case studies, comparative case studies, and contrasting cases". For this study I adopted the terminology "comparative case study", because a comparative case study may be chosen to try to replicate insights gained from individual cases or to represent contrasting situations (Yin, 2003). This approach was necessary because I sought to compare and contrast two fishing camps thus gain a rich and comprehensive picture concerning contrasting situations (Yin, 2003).

I selected the Kafue Flats for this study because it is one of the largest floodplains in Zambia and is known to support an abundance of natural resources. The Flats are centrally located within Zambia. Some areas within the Kafue Flats are easily accessible from major roads but a large part of the system is remote and less connected to services from government and other agencies. Because fish is important as food and nutrition security in rural and urban households (Longley et al., 2014) in Zambia and is also a source of income for many Zambian households, overfishing is increasingly directing fishers to the more remote places

where there are still fish stocks, such as the Kafue Flats. Sustaining the fish stocks in the long-term depends on the ability of local actors and government to control access. My decision to carry out this study on the Flats was further influenced by a preliminary scoping exercise, which was carried out from 29th September to 04th October, 2014, in Zambia. During this time, I had meetings with key informants from the Department of Fisheries (DoF), WorldFish Center Zambia and World Wide Fund for Nature (WWF) Zambia. It is from these meetings and subsequent discussions that I became aware of the necessity to control access. Because fishing camps differ in ease of access and ability to regulate access, I decided to conduct a comparative case study as this would yield insights into why entry is effectively regulated in some fishing camps (Shimungalu) and not others (Nyimba). These fishing camps are both located on the Kafue Flats.

3.3.2 Selection of Participants: Snowball Sampling

I adopted the use of a commonly used sampling technique in qualitative research known as snowball or chain referral sampling. The method yields a study sample through referrals made among people who share or know of others who possess some characteristics that are of research interest (Biernacki and Waldorf, 1981). In other words, participants in the study provide suggestions of others who also fit the population parameters of the study, and who could and might want to participate in the research (Bezuidenhout et al., 2014). Simply put, snowball sampling is carried out in two steps. The first step is to identify a few key informants (participants), who then identify other participants who are suitable and willing to take part in the study, who further identify other participants, and so on. Key informants should be observant, reflective members of the community of interest who know much about the culture and are both able and willing to share their knowledge (Campbell, 1955; Tremblay, 1957; Seidler, 1974; Bernard, 2002).

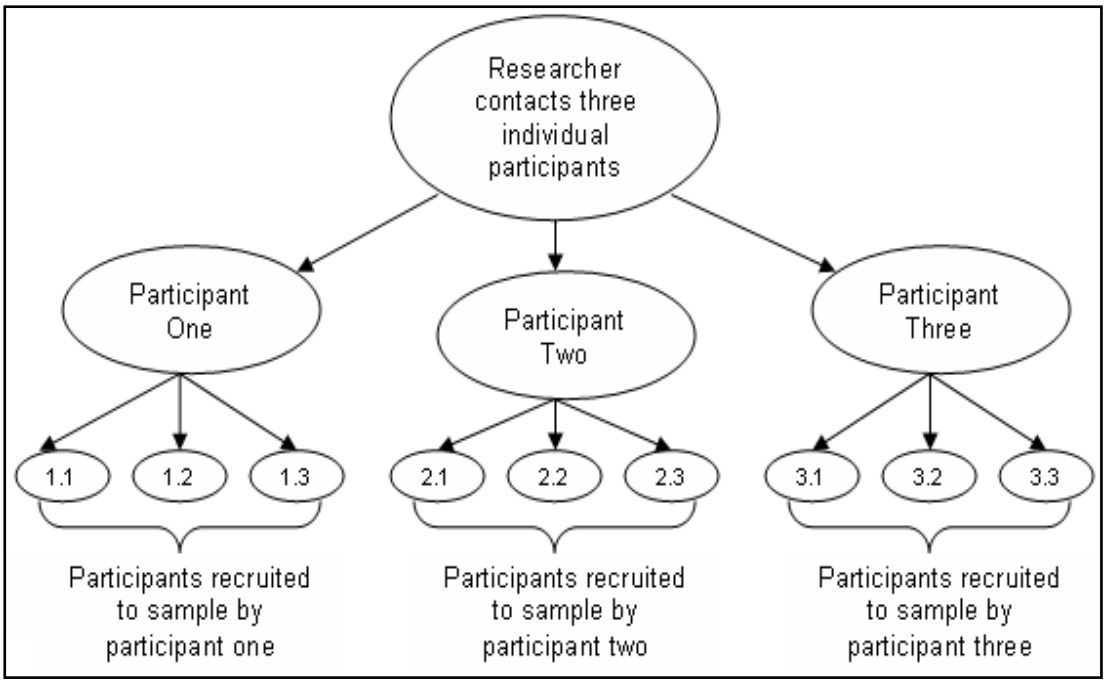

Figure 3.1: Snowball sampling

Source: Gliner and Morgan (2000).

I identified four categories of participants: traditional authorities, fisheries village management committee members, resident fisher-folk and district government officers, and sought advice from knowledgeable persons in each category concerning which persons were appropriate to participate in the study. However, it is important to note that the first point of contact was with participants from the District DoF in both study areas. This approach is well suited to snowball sampling because it has been shown to be an effective technique, not only for locating sensitive populations (Biernacki and Waldorf, 1981) but also for locating (recruiting) more isolated individuals who may not be part of any formal organisation (Blair-Loy, 2003), as was the case with the resident fisher-folk who were not part of the community-based management committees.

Rubin and Babbie (2001) explain that the study population is that aggregation of elements from which the sample is selected. Hence, sampling is the process of choosing from a much larger population, a group about which a generalised statement is made, thus the selected part represents the total group (Leedy, 1993). As such, the sampled population were interviewed because they were better suited to address the aim of the study, that is, to gain insight into how capacity affects performance of institutions in regulating access to the Kafue fishery, and why entry is effectively regulated in some fishing camps (Shimungalu) and not others (Nyimba).

3.4 Qualitative Data Collection Methods

By definition, data collection is the process involving the use of the most appropriate method(s) to systematically collect information, to a specific standard, with integrity, and the purpose is to address the research problem (Polit and Beck, 2012). Factors including resources, time, travel, cost, confidentiality and anonymity should be taken into account in all phases of planning, implementing and evaluation of the data collection process (Polit and Beck, 2012). One type of data collection, qualitative data collection, usually focuses on sources of data such as interviews and documents (Merriam, 1998). In-depth semi-structured interviews were thus the primary source of data collection in this study and documentary sources were the secondary sources of data. These data collection techniques were adopted to gather information to address the research aim and questions stated in Chapter One of this thesis.

3.4.1 Interview Design and Procedure

In-depth interviews were the primary sources of data collection in this research. An in-depth interview, according to Bezuidenhout et al. (2014), is a qualitative data collection method that enables the researcher to learn more about the views, opinions and beliefs about a specific phenomenon by posing questions to participants. It provides a means of collecting data in its natural context, which is suitable for the interpretive approach to research (Blanche et al., 2006). In-depth semi-structured interviews were used to ensure that emergent themes, information and ideas from the interviewees (participants) were recorded and pursued. The interview questions moved from a broad to a narrow focus as cues emerged from the interviewees. In so doing, I was able to follow up on the leads that the interviewee provided before I returned to the prepared interview questions.

Before the interviews were conducted, I gained access to the communities and identified participants with the assistance of gate keepers such as the District DoF officers, senior village headmen and chairpersons of the committees. Gate keepers are individuals or community members in positions of official or unofficial authority (Mack et al., 2005). These influential individuals or organisations are of importance when negotiating access at multiple entry points of the study area (Johnson, 1975; Bell, 2003; Marshall and Rossman, 2006). Permission from relevant traditional and government authorities was obtained with the help of an Explanatory Statement and Consent Form (See Appendix II and III) from Monash University, to adhere to ethical requirements. The interview process started with the identified DoF officers. Thereafter, traditional leaders and community members were

interviewed in order to obtain a better understanding of the context and underlying issues in the study areas.

After the participants were identified by either the District DoF officers or senior village headmen or chairpersons of the committees, I approached the participant in person. I did so as it presented an opportunity to brief the participants on the research using the Explanatory Statement, obtain consent using the Consent Form and to either set a date for the interview or conduct it at that point. Verbal consent for the use of an audio recorder was also obtained from the interviewee beforehand. Interviews were conducted in the local languages – Tonga, Bemba, Nyanja and English – as I am able to speak these languages. The interviews were face-to-face, thus observations of the interviewee's non-verbal signs were noted as "*actions speak louder than words".* Field notes were also taken during and after the interview session. On average, the interviews lasted between 20 and 40 minutes. The interviews were conducted at several locations under the shade of a tree.

Figure 3.2: Chatting with a participant under a tree before commencing the interview. This approach (familiarisation) is used to reduce tensions that can arise when a stranger asks questions.

Twenty nine were interviewed (Table 3.1). With a small sample it is not reasonable to suggest that data saturation had been achieved. However, I continued sampling until I began to hear repetition and redundancy in the themes or patterns in the data and no new information was obtained with new informants. It is important to note that officers from Zambia Wildlife Authority (ZAWA) were not interviewed in Shimungalu because this area

does not adjoin a conservation or Game Management Area (GMA), as is the case with Nyimba.

Table 3.1: Categories and numbers of participants

Category of Participants	Nyimba	Shimungalu
Village headmen	4	3
Fisheries committee members	5	7
Fishermen	2	4
District government officers:		
DoF	1	1
ZAWA	2	-
Total	14	15

3.4.2 Documentary Analysis

Documentary analysis was conducted prior, during and after the field research visit. I used this method to collect background information, gain insight into the context for each site and to understand the theoretical aspects of the phenomena under study. Ultimately, this method was to enable me to understand how capacity affects performance of institutions in regulating access to the Kafue fishery and why entry is effectively regulated in some fishing camps and not others. Documentary analysis refers to the systematic collection, reviewing and evaluating of documents – soft and hard copy – in order to elucidate meaning (Bowen, 2009). Documents convey important and useful information that can be effectively used as data (Berg, 2001). Documentary sources for this study included journals and books together with political speech transcripts, meeting minutes, government reports, community documents and newspaper articles. Documentary analysis was important for this study because it illustrated the context in which research participants operated through providing historical insight, a means of refining interview questions based on new insight of the phenomenon and a way of tracking change and development (Bowen, 2009).

3.5 Data Analysis

In data analysis, two objectives should be met: to get a “feel” for the data and to test the “goodness” of the data (Uma, 2003). These procedures are done through reducing the volume of raw information, sifting significance from trivia, identifying significant patterns and

constructing a framework for communicating the essence of what the data reveals (De Vos et al., 2011). According to Straus and Corbin (1998), the researcher is considered an instrument of the research process. Data analysis is therefore dependent on his or her analytical skills and creativity so that meaning and the relationships in the data can be interpreted to gain an understanding of the phenomenon under investigation (Straus and Corbin, 1998). In this study, I used content data analysis to gain meaning for the information I collected. The two major stages of content data analysis are discussed below.

3.5.1 Organising the Data

The first step was to prepare and organise the collected data. Because I used an audio recorder to collect raw data during the interviews, this step involved "transcribing the raw data that [had] been collected into written text before the data [was] analysed" (Bezuidenhout et al., 2014: 236). This transcription was done by first translating the interviews that were conducted in local languages such as Tonga, Bemba and Nyanja to English. Esposito (2001: 570) explains that translation is "the transfer of meaning from a source language to a target language". During this process, I replayed the interview audios and re-read the transcripts to ensure accuracy of the translations and transcriptions, and in the process developed an early familiarisation with the data. However, since not all the raw data was relevant to this study, the transcribing process was guided by the research aim and questions (Bezuidenhout et al., 2014).

For easier retrieval and identification, the transcribed data was then organised into manageable sets by marking them according to the categories of participants for each study area. During this stage, all identifying information was removed from the data and alphanumeric codes were allocated to each participant to ensure confidentially and anonymity.

3.5.2 Coding

In a qualitative study, coding of data refers to the careful scrutiny of data and taking note of all the relevant and meaningful sections and items (Maree and Van der Westhuizen, 2007). The process is very time consuming and is considered to be one of the most difficult steps in qualitative research (LaRossa, 2005; Bezuidenhout et al., 2014). According to Nieuwenhuis (2007), coding refers to marking a segment of data with symbols, descriptive words (as well as phrases) or unique identifying names.

For this study, I adopted the use of two forms of coding, line-by-line and axial coding. In using these forms of coding, I read through the transcribed texts and documents line-by-line while marking certain words and phrases that were relevant to this study (Bezuidenhout et al., 2014). I specifically looked for words that related to the key concepts underpinning this study – capacity, institutions and governance. Phrases and words to do with "migrancy" were also highlighted during this process. Furthermore, phrases describing reasons why entry is effectively regulated in Shimungalu and not Nyimba were highlighted. These phrases and words were then grouped according to categories of concepts and then compared to identify connections and relationships across the categories. I then interpreted the coded data and drew conclusions, which were presented after revisiting the research aim and questions.

3.6 Limitations of the Study

The sample size can be considered to be a limitation of this study, as the study had a sample of 14 and 15 participants from Nyimba and Shimungalu respectively. The members of the Fisheries Village Management Committee (FVMC) or Fisheries Management Committee (FMC) were from different locations within the Nyimba and Shimungalu fishing zones. As a consequence, this fact, together with financial and time constraints, allowed for a limited number of participants to be interviewed. In qualitative research, however, the focus is not the sample size but rather the quality and depth of the information obtained. Literature on qualitative research methods (for example, Boswell and Cannon, 2011; Bezuidenhout et al., 2014) further highlights that it is only necessary to continue sampling until a point of data saturation occurs. While it was not possible with such small samples to ensure that data saturation had been achieved the commonality of the themes among respondents suggests that the key issues had been identified.

Another limitation of the study relates to the accessibility of the two fishing camps. Nyimba is remotely located and can only be accessed via water. However, with the assistance of gate keepers, the DoF officers and community leaders, I was able to hire a "banana boat" (a motorised craft) to get to Nyimba. Despite the close proximity of Shimungalu to Mazabuka town, bad road infrastructure increased the time it took me to reach the camp. Similarly, the roads from Monze town to the harbour leading to Nyimba were also in bad condition.

3.7 Trustworthiness in the Study

The overarching term that is used for validity and reliability in qualitative research is "trustworthiness", which may be divided into credibility, transferability, dependability and confirmability (Lincoln and Guba, 1985). To promote credibility (internal validity) in this study, I adopted the following techniques:

- The research methods adopted in this study, in-depth semi-structured interviews and documentary sources, are established and recommended methods in qualitative research methods literature. This combination of research methods increased credibility, as more than one research method was used to collect data, thus reducing biasness and the chance for errors to be made (Lincoln and Guba, 1985; Collis and Hussey, 2003; Shenton, 2004).
- Prior to field research, I undertook a scoping exercise in order to develop an early familiarisation with the key informants, done from 29th September to 04th October, 2014, in Zambia.
- This research was peer reviewed by two supervisors appointed by Monash South Africa with research experience in social science research. According to Shenton (2004), the critical perspective that such individuals (peers) provide may allow for assumptions made by the researcher to be challenged, whose closeness to the project frequently inhibits his or her ability to view it with real detachment.

In this study I sought to use a comparative case study to develop insight into how access to fisheries could be regulated, with the intention of being able to consider the wider implications and transferability of my findings, both within the floodplain as a whole and to other fisheries in Zambia. Transferability, also referred to as external validity, is the degree to which the results and analysis can be applied beyond a specific research project (Lincoln and Guba, 1985; Collis and Hussey, 2003; Shenton, 2004). As such, boundaries of the study need to be conveyed to the reader before any attempts at transference are made (Cole and Gardner 1979; Marchionini and Teague, 1987; Shenton, 2004). Table 3.2 highlights how the issue of transferability was addressed in this study.

Table 3.2: Achieving transferability

Transferability Issue	**Response**
The number of organisations taking part in the study and where they are based.	I identified and conducted interviews with four groups of actors, including traditional authorities (village headmen), community-based management committee members (FMC or FVMC), community members and District government officers (from the DoF and ZAWA). These groups of actors were based in two study areas, Shimungalu and Nyimba, on the Kafue Flats of Zambia.
The number of participants involved in the fieldwork.	I interviewed a total of 29 participants; 14 from Nyimba and 15 from Shimungalu.
The data collection methods that were employed.	I applied a qualitative field research approach involving in-depth semi-structured interviews and documentary analysis.
The number and length of the data collection sessions.	On average, each of the 29 interviews lasted between 20 – 40 minutes.
The time period over which the data was collected.	In the field, data collection commenced from 21st April – 15th May, 2015. Prior to this period, I undertook a preliminary scoping exercise from 29th September to 04th October, 2014, in Zambia. Documentary analysis has been an on-going process, which started in August, 2014.

Source: Adapted from Shenton (2004).

Dependability (reliability) refers to the quality of the process of integration that takes place between the data collection method, data analysis and the theory generated from the data (Lincoln and Guba, 1985; Collis and Hussey, 2003; Shenton, 2004). In order to address dependability more directly, the processes within the study should be reported in detail, thereby enabling a future investigator to repeat the work. As overlapping methods can be used (Shenton, 2004), I applied the use of overlapping methods of data collection – in-depth interviews and documentary analysis – to ascertain whether the findings of this study are dependable. In addition, a detailed research design and its implementation have been described in the section above to allow the study to be repeated.

Confirmability (objectivity) in this study refers to how well the data collected supports the findings and interpretation that I made (Bezuidenhout et al., 2014). By providing a detailed description of methods and research design, I was able to allow for others to scrutinise this study, as "a detailed methodological description enables the reader to determine how far the data and constructs emerging from it may be accepted" (Shenton, 2004: 72).

3.8 Ethical Considerations

Ethics, "in relation to social research…refers to the moral deliberation, choice and accountability on the part of researchers throughout the research process" (Edwards and Mauthner, 2002: 16). May (2001) points out that ethical decisions should not be based on what is advantageous to the researcher, project or sponsor, but on what is right and just for the range of actors involved (including researchers, research funder, participants and possibly society as a whole). Given the significance of ethics and ethical decisions in research, I followed the steps described below to ensure that this study was ethically sound.

Before commencing field data collection, ethical clearance was sought and obtained from the Monash University Human Research Ethics Committee (MUHREC) (see Appendix I – MUHREC Approval CF15/871 – 2015000391). The study was categorised as a "low risk study", indicating that the study posed no risks to participants and that participation did not result in distress.

As a sign of respect, I sought and obtained consent from the traditional and community leaders first before conducting interviews in both study areas. I did so with the assistance of the District DoF officers. Furthermore, a Consent Form and Explanatory Statement were used to explain the study to and gain the consent of the participants. For participants who were uncomfortable with the use of English, the study was explained in their local language, Bemba, Nyanja or Tonga. During these processes, participants were made aware of their right to decline participation in this study at any time. I also provided the participants who requested a copy of Explanatory Statement with my contact details.

All interviews were captured using an audio recorder. Even though the Consent Form indicated that this would be the case, verbal permission was also sought from each participant prior to the commencement of their interview. Furthermore, during data analysis, issues of anonymity and confidentiality were addressed. For instance, I solely transcribed all the raw data and in the process coded all identifying information of the participants using

alphanumeric codes, which did not represent the sequence in which the interviews were performed.

3.9 Conclusion

This chapter has outlined the research paradigm, research methodology, research design, techniques for data collection, data analysis and issues regarding data trustworthiness. The research paradigm and data collection techniques for this study include interpretive paradigm, comparative case study and qualitative approach using in-depth semi-structured interviews and documentary sources. Further, the chapter also described the techniques adopted by this study to ensure trustworthiness. Furthermore, the research adhered to all ethical considerations as prescribed by the MUHREC. The next chapter provides a description of the Kafue Flats and the two study areas, Shimungalu and Nyimba fishing camps.

CHAPTER FOUR – STUDY AREA

4.1 Introduction

In this chapter, I provide a description of the Kafue Flats, focusing on the location, climate topography, socio-economic background and the fisheries sector in the first section. The second section provides a description of the two study areas, Shimungalu and Nyimba, located on the Kafue Flats, and of the institutional arrangements and differences between these areas.

4.2 The Kafue Flats

4.2.1 Location, Climate and Topography

The study was conducted on the Kafue Flats, located centrally in southern Zambia, between Itezhi-Tezhi in the West and Kasaka in the East (Figure 4.1). The Flats cover about 6,500 km^2 between latitudes 15°20'-15°55'S and longitudes 26°-28°E (Nyimbili, 2006) and are extensive areas of wetlands and floodplains (WWF Zambia, 2004). The area has two National Parks (Blue Lagoon and Lochinvar), which are Ramsar sites, and a Game Management Area (GMA), (Nkhata, 2005).

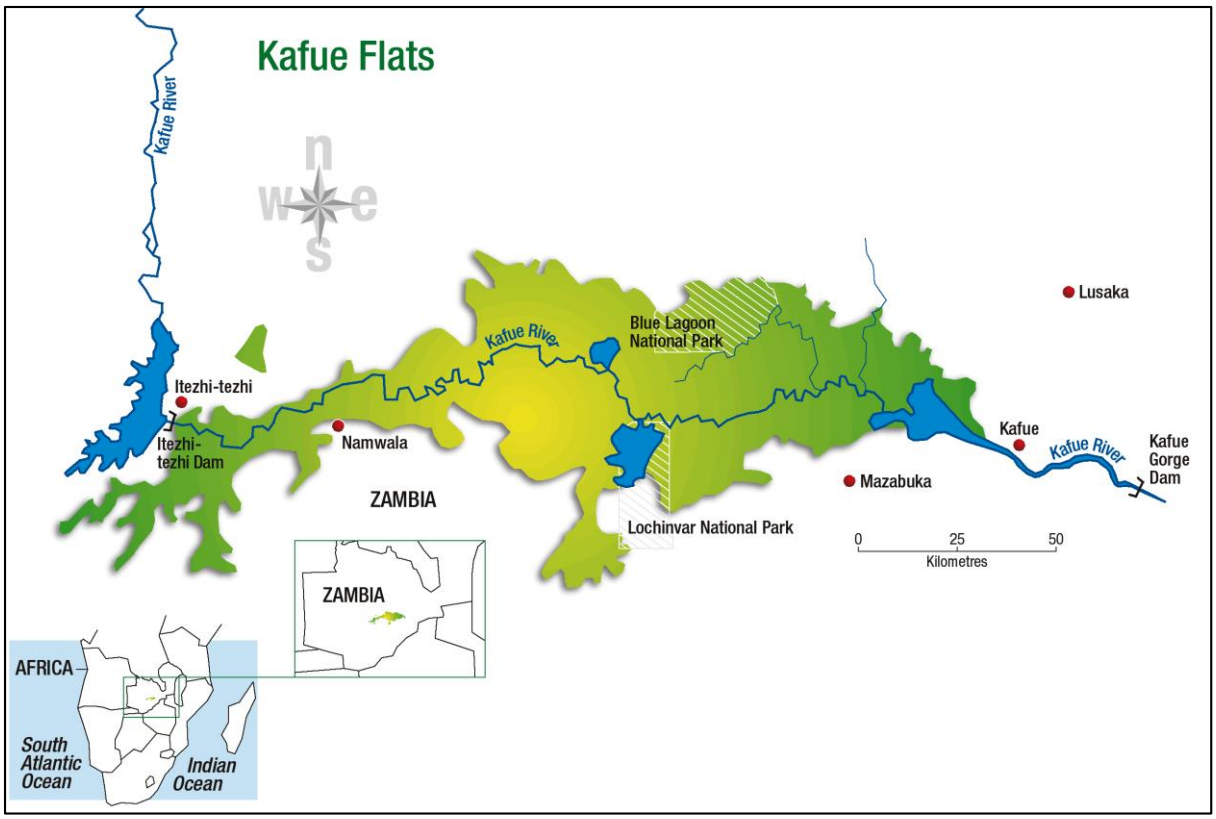

Figure 4.1: Map of the Kafue Flats

Source: WWF Zambia (2004).

The Kafue Flats has an average minimum and maximum temperature of 25°C and 35°C respectively. The area receives little rainfall, averaging between 700 and 800mm (Haller, 2012) during the rainy season from November to April. The Flats are sustained by the Kafue River (a major tributary of the Zambezi River), which provides most of its water. However, the natural flooding regime of the Kafue Flats and the Kafue River have changed considerably since the construction and operation of two dams in the 1970s, first at Kafue Gorge downstream of the flats, and later at Itezhi-Tezhi upstream of the flats (Minderhound, 1980). These dams were constructed to generate hydroelectric power for both local use and export, "but now the two dams have created a permanently flooded area" (Mumba, 2003: 4). These changes have affected the normal functioning and productivity of the wetlands and livelihoods of local people dependent on the Flats (Knaap der Van, 1994; WWF Zambia, 2004; Haller and Merten, 2005). Nonetheless, the unique Kafue Flats wetland landscape of grasslands, lagoons and reed beds supports a diversity of wildlife (WorldFish Center Zambia, 2008).

4.2.2 Socio-economic Background

The Kafue basin as a whole is important for Zambia's industrial and socio-economic sectors. Even though the basin covers only around 20% of the total land area of Zambia, almost half of the country's population depend on it directly or indirectly, and is site to a large concentration of mining, industrial and agricultural activities (Schelle and Pittock, 2005). The Kafue Flats, which are part of the Kafue basin, are home to approximately 1.2 million people, representing 9% of Zambia's total population (Zambia Central Statistics Office, 2013).

The Kafue Flats are very valuable to the economy and well-being of locals because they offer services and support to industries as well as communities in many parts of the country (WorldFish Center Zambia, 2008). These services include water supply, livestock production, fishing, farming, hunting and tourism (Jeffery, 1993). The majority of people living on these Flats make their living from fishing, cattle herding, agriculture (mainly small-scale) and employment in industries located on the Flats (WWF Zambia, 2004; WorldFish Center Zambia, 2008). According to WWF Zambia (n/d), the fisheries of the Kafue Flats are one of Zambia's most productive wild fisheries, supplying both urban and rural markets fisheries.

4.2.3 Fisheries Sector

Zambia has 11 major fisheries divided between two river basins, the Congo and Zambezi basins. The Kafue floodplain fishery falls within the Zambezi basin. .A total of 67 species of fish have been recorded in this fishery (WWF Zambia, 2004), with the most abundant species including *Serranochromis andersonii, S. machrochir, S. anguticeps, Tilapia rendalli* and *Clarias gariepinus* (Nyimbili, 2006). In the entire Kafue River basin, the fish productivity is greatly influenced by the extent to which the floodplain is inundated by floodwaters as well as the annual cycle of flooding and drying (Chapman et al., 1971). Most of the fish species spawn during the rainy season, from November to April in Zambia, when there is an abundance of food brought about by increase in water and oxygen levels (Nyimbili, 2006; Chimba and Musuka, 2014).

Fishing in Zambia is currently governed by the Fisheries Act of 2011. The Act provides:

> For the appointment of the Director of Fisheries and fisheries officers and provide for their powers and functions; promote the sustainable development of fisheries and a precautionary approach in fisheries management, conservation, utilisation and development; establish fisheries management

> areas and fisheries management committees; provide for the regulation of commercial fishing and aquaculture; establish the Fisheries and Aquaculture Development Fund; repeal and replace the Fisheries Act, 1974; and provide for matters connected with, or incidental to, the foregoing. (Government of Zambia, GoZ, 2011: 383)

While the Fisheries Act of 2011 accords the overall authority on fisheries in Zambia to the minister and the director of the DoF, it creates the legal context for decentralisation (co-management) to involve fisheries management committees (GoZ, 2011; Madzudzo et al., 2014). However, Malasha (In: Madzudzo et al., 2014: 8) suggests that, "while the decentralization policy offers opportunities to make development planning more responsive to local needs, it had left the role of traditional authorities unresolved".

The Fisheries Act also provides for the development of restrictions such as closed seasons, prohibited fishing areas and fishing gear and licensing of fishers to control access to fisheries (Jul-Larsen et al., 2003). The Act stipulates that fishing is closed from 1st December to the last day of February, as this is the breeding season for fish. Furthermore, fishing is prohibited throughout the year in water bodies that fall under protected areas such as National Parks and GMAs, which, in the context of this study, include the Chunga and Lwato Lagoons. Persons who fish or intend to fish are required by law to register and obtain a fishing license from the District officers of the DoF. The Fisheries Act also specifies the kind of fishing gear and methods to be used for commercial and artisanal fishing.

Fishing in Zambia is dominated by artisanal fishers using traditional vessels (WorldFish Center Zambia, 2008), as is the case on the Kafue Flats. Fishing gear on the Kafue floodplain fishery include gill nets, draw/seine nets, long lines, baskets and traps, as fishing is mainly small scale (Jul-Larsen et al., 2003). According to the Fisheries Act of 2011, permitted mesh sizes include 76mm gillnets for general fishing and monofilament nets of mesh size not less than 4.75inches (120mm) and 25mm (gear trail) for sardine and Kapenta (a small sardine) fishing. On the Kafue floodplain fishery, dugout canoes are the main modes of transportation for the fishers. Other types of boats include "banana" boats (fibreglass) and motor boats (Haller, 2013; Kapasa, 2013).

The improved markets (demand) for fish and fish products has led to the increase of fishers and fish traders into the Kafue Flats (WorldFish Center Zambia, 2008), especially around March and April, when the fish ban is lifted and flooding starts to decline. Lungu and Hüsken (2010: 12) note that "fishing activity is even higher due to the influx of unlicensed fishers from village communities and other fisheries in Zambia, who migrate to the Kafue Flats in

search of employment or settlement". The high influx of fisher-folk has also been due to the proximity of the Flats to urban areas, the pursuit for better fish catches and because fishing effectively performs a safety net function in the Kafue floodplain for disenfranchised households that have migrated into the area. These migrations often occur because of the area's "open access" nature and weak management regimes, as well as the requirement for low start-up capital and the fact that there is no need for prior experience to start fishing when compared to other professions, such as farming (WWF Zambia, 2004; Ngoma, 2010). As a result of increased harvesting and fishing pressure, the catch rates were said to have declined over the years, from 37 kg in 1981 to 18 kg per boat per day in 1993 (WWF Zambia, n/d). Also, as stocks of large fish decline, people increase their fishing efforts, and tend to use smaller nets to catch smaller species, particularly "*Brycinus lateralis* and juvenile breams" (Chimba and Musuka, 2014).

In addition to the increased harvesting and fishing pressure resulting from the influx of migrant fisher-folk, it is important to note that factors such as the increased extension of the area covered by an invasive aquatic weed, the "Water hyacinth", commonly referred to as the "*Kafue weed*" or "*Javani*", as well as the changing environment have also had an effect on the fish populations in the Kafue Flats (Kapasa, 2013; Bbole et al., 2014; Chimba and Musuka, 2014). The alien invasive species, red-claw crayfish, *Cherax quadricarinatus*, introduced into the Kafue River by local fish farmers, and Nile tilapia, *Oreochromis niloticus,* that escaped from Zambia Sugar Estate (Nakambala Fish Farm) have further affected the natural biodiversity of fish and perhaps irreparably damaged the fishery (Wise et al., 2007; Kapasa, 2013; Bbole et al., 2014).

In summary, the Kafue floodplain fishery is under mounting pressure from migrants and from growing demand that directs a shift from subsistence to commercial operations. This increased use places the management of access to the fishery as a key determinant of sustainable use.

4.3 Description of Study Areas: Nyimba and Shimungalu Fishing Camps

The Kafue Flats has at least 11 major permanent fishing camps on the floodplain, each supporting 500 or more fishers (Chabwela and Haller, 2010). In addition, large temporary fishing camps are established during the dry season, and these can be occupied by more than 900 households (Haller and Merten, 2008). This study focused on two fishing camps, Nyimba and Shimungalu, located on the Kafue floodplain within the Kafue Flats (see Figure 4.2). The main criteria that determined selection of these camps were the differences in their

accessibility and the fact that they both experienced pressure from "outsiders" who sought to gain access to the fishery.

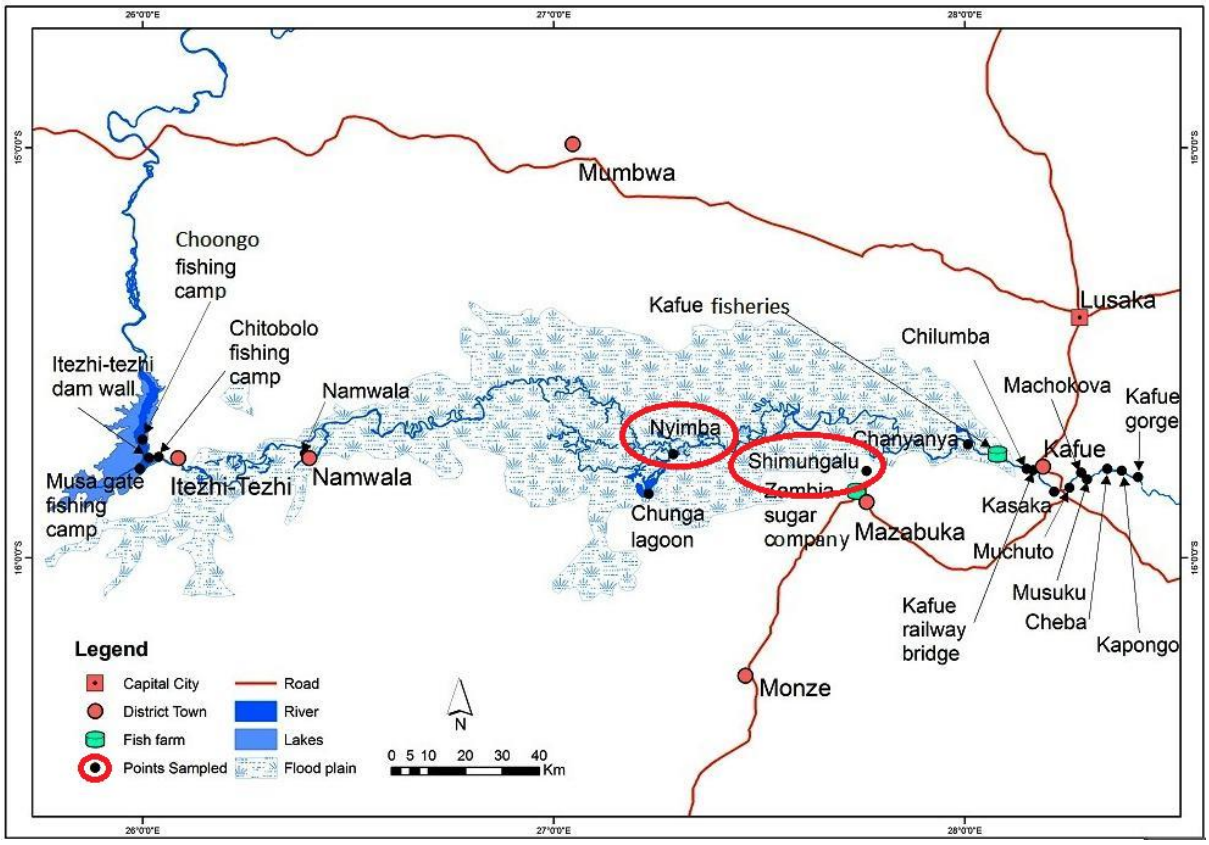

Figure 4.2: Map of the Kafue Flats highlighting the location of Nyimba and Shimungalu fishing camps

Source: Adapted from Bbole et al. (2014).

4.3.1 Nyimba Fishing Camp

Nyimba fishing camp is a permanent settlement situated on the northern side of the Kafue River. This area shares borders with the Lochinvar National Park and Chunga Lagoon, an important breeding area for fish (WorldFish Center Zambia, 2008). Nyimba is located in the chiefdoms of Chief Choongo and Chief Hamusonde (Interview 4G). It comprises a long stretch of linear housing units consisting of a variety of building materials, ranging from blocks, mud and sticks to dry stalks covered by thatched and corrugated iron sheets (WorldFish Center Zambia, 2008). The camp can only be accessed via water transport (WorldFish Center Zambia, 2008). It is approximately 62km from Monze town to the harbour

in Lochinvar National Park and 15km on water from the harbour to Nyimba fishing camp. For the purposes of this research, it is classified as a “hard-to-reach” site.

This fishing camp is one of the biggest permanent settlements within the Kafue Flats (WorldFish Center Zambia, 2008). Ethnic groups in this camp are highly diverse, consisting of Tonga, Ila, Batwa, Balundwe, Lozi and Bemba. The Batwa were the initial settlers in Nyimba (Interview 11N; 3N). The camp comprises of five areas: Ba Tonga, Sikafuswa, Musumali, Ma Bembabemba and Ma Lozilozi, and each has its own headman (Interview 11N). The average population of Nyimba is estimated at 2000 people. However, when it receives migrant fishers and fish traders between April and December, the population doubles to about 4000 (WorldFish Center Zambia, 2008).

4.3.2 Shimungalu Fishing Camp

Shimungalu fishing camp is a permanent settlement located on the southeastern region of the Kafue Flats (see Figure 4.2). Fishing in Shimungalu is mainly artisanal, as is the case in Nyimba. “Artisanal” fishing refers to the level of technology being employed by the fishermen, but often also includes economic and social overtones and is regularly equated to “Small-scale fisheries” (World Fisheries Trust, 2008). Shimungalu is under the chiefdom of Chief Mwanachingwala (Interview 4G). The ethnic groups in this camp are highly diverse; however, the major ethnic groups are the Tonga, Ila, Bemba, Lozi and Lenje. The camp comprises three areas: area one under Headmen Sondo, area two under Headman Mwembe and area three under Headman Chimuka (Interview 10S).

The camp is adjacent to the Kafue River and houses are predominantly constructed of mud, with roofs of grass thatch, sticks, blocks and dry stalks covered by thatched and corrugated iron sheets. The population is said to be between 1500 and 2000 people (Interview 2S). The camp is close to major roads and transport networks; it is approximately 15km from Mazabuka town and can be accessed via road and water transports. In the context of this research, it is an “easy-to-reach” site and has better prospects for support from the DoF. Shimungalu, like Nyimba, receives migrant fishers and fish traders seeking to gain access to the Kafue fishery.

4.4 Institutional Arrangements Operating on the Kafue Floodplain Fishery

A social-ecological system (SES) such as Kafue floodplain fishery “is an ecological system intricately linked with and affected by one or more social systems...where individuals [or

groups of individuals] have intentionally invested resources in some type of physical or institutional infrastructure to cope with diverse internal and external disturbances" (Anderies et al., 2004: 3). Figure 4.3, adapted from Anderies et al. (2004), illustrates the social systems (institutional arrangements) operating in Shimungalu and Nyimba as well as their interactions.

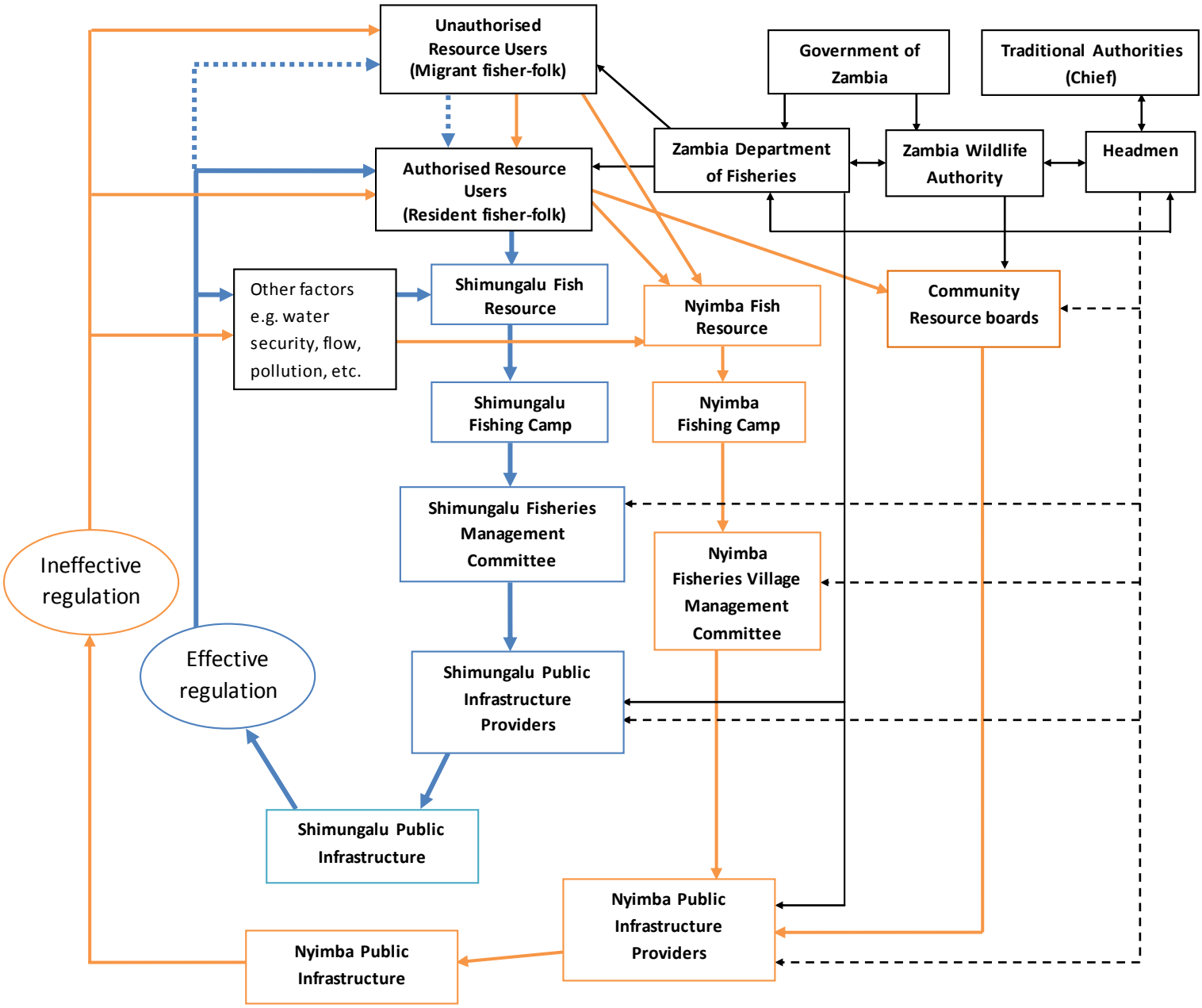

Figure 4.3: Illustration of the institutional arrangements and differences between Shimungalu and Nyimba. The government, traditional authority and fishing camps are distinguished by different colour arrows.

Source: Adapted from Anderies et al. (2004).

Shimungalu fishing camp, illustrated in blue, supports authorised resources users who rely on the fish resource for their livelihood. The authorised resource users are the resident members of Shimungalu fishing camp who claim to have legitimate rights to access the fish resource. These authorised resources users established a Fisheries Management Committee (FMC), with the help of the Department of Fisheries (DoF) to govern access to and use of their fish resource. The FMC membership includes traditional authorities (all headmen and village secretary) and elected members (chairman, treasurer, secretary, trustees, members and scouts). Representatives from neighbouring villages and District fisheries officers from the DoF often join the meetings. Because Shimungalu is located near the town of Mazabuka, support from the DoF is more easily accessed.

Additionally, traditional authorities play important roles in fisheries governance in both Shimungalu and Nyimba because these areas of land are under customary tenure. The chiefs are responsible for managing their entire chiefdom, interpreting government policy, mobilising the people for development projects and resolving individual and community disputes (Kapasa, 2013). Because the chiefs are not always present, they select senior and section headmen to oversee the chiefdoms on behalf of the chiefs. The section headmen report to senior headmen, who then report to the chief. The headmen are responsible for distributing settlement areas to newcomers, granting access to the fishery, monitoring fishing activities for both the local community and outsiders and resolving conflicts in the camps (Interview 2S, 1N).

In Shimungalu, the FMC, officers from DoF and traditional authorities constitute the "Public Infrastructure Providers [PIPs]" (Anderies et al., 2004). They draw up the by-laws (Public Infrastructure, PI) that guide fishing and the behaviour of fisher-folk at Shimungalu, ensuring that they conform to national policy and legislation. In addition, the PIs include physical and social human-made capital (Anderies et al., 2004). The PIPs are responsible for provisioning the personnel (including fishery scouts), equipment and facilities required for effective enforcement of by-laws and regulation of access and use of the fishery.

The authorised resources users in Nyimba fishing camp, illustrated in orange, have also established a Fisheries Village Management Committee (FVMC) with representation from the traditional authorities (three headmen out of the five headmen are part of the FVMC) and elected members (chairperson, vice chairperson, secretary, vice secretary, treasurer and five trustees). The committee, together with the DoF and Community Resources Board (CRB) established by ZAWA, constitutes the PIPs. Like the PIPs in Shimungalu, those in

Nyimba draw up by-laws (PI) and are supposed to share the responsibility of governing access and use of the resource.

The PIPs in the Shimungalu have been able to effectively regulate new entrants while those in Nyimba have not been able to do so. The reasons for this difference are explained in the following chapter.

4.5 Conclusion

The social and physical features of the Kafue Flats were described in the first section of this chapter, since the sites of the two case studies are located on the Flats. The socio-economic background and description of the fisheries sector within Zambia including the Flats were also provided. The second section presented a description of the two fishing camps, Nyimba and Shimungalu, and the relevant institutional arrangements involved with fisheries governance. Institutionally, the sites are very similar in their system of governance, yet one succeeds in effecting control while the other does not. This research is directed toward developing an understanding of why this is so and how the situation can be remedied so that both sites enjoy effective governance and control access. The results of the research are presented in the next chapter.

CHAPTER FIVE – RESULTS

5.1 Introduction

In this chapter, I present the results of this study. The intention of my research was to gain insight into how capacity affects performance of institutions in regulating access to the Kafue fishery and why entry is effectively regulated in some fishing camps, such as Shimungalu, and not others, such as Nyimba. The proposition at hand is that capacity constrains the ability of groups of actors, individually and collectively, to regulate entry into the fishery and thus to achieve the objective of a sustainable fishery. The results presented in this chapter are based on a qualitative field research approach involving in-depth interviews of 14 selected respondents from Nyimba and 15 from Shimungalu fishing camp on the Kafue Flats of Zambia. This comparative case study was supported by documentary analysis and field notes. The chapter has been divided into six main sections.

The first section gives a brief description of how the respondents in the two study sites defined people seeking to gain access to the fishery (migrant fisher-folk) and illustrates how migrants justify their right to fish. It also describes the illegal fishing practices migrants seek to use on the Kafue Flats fishery and investigates their ability to compete with locals. In the second section, the ability of local institutions to regulate access is addressed. This section is sub-divided into two sections: licensing as a regulatory instrument and harnessing local institutions. The third section considers the national government's ability to regulate access, highlighting the capacity attributes that constrain or promote effective regulation. The fourth section offers an interpretation of both the success and failure of polycentric governance on the Kafue Flats fishery. The fifth section presents a summary of the research results based on three predetermined attributes of capacity development: capacity assets, capabilities and context (Baser and Morgan, 2008; Wigboldus et al., 2010) for each group of actors (nest) within a polycentric governance system. The last section offers the conclusions that I have drawn from this chapter.

5.2 Contextualising Migrant Fishers

As stated in Chapter One, the study sought to investigate the implications of how migrants are defined for control over access to the fishery. I thus asked the respondents in the two study sites how they defined people seeking to gain access to the fishery (migrant fisher-folk). The study revealed that respondents in the two fishing camps define migrant fisher-folk in different ways. The ways in which residents refer to migrants provide insight into how

resident fishers interact with and perceive migrant fisher-folk. For this reason, it is important to understand these interactions between resident and migrant fisher-folk in the two study sites, Shimungalu and Nyimba fishing camps.

In Shimungalu, the resident fisher-folk refer to migrant fisher-folk as "*Ba Lendo*" (visitors). These migrants are said to come from Luapula Province in Zambia and other camps within the Kafue Flats to take up fishing in Shimungalu because they had depleted their fish resources. Respondents noted:

> We call migrants fishermen *Ba Lendo.* Because we are close to town, foreigners don't come here a lot. They are scared of immigration officers. (Interview 2S)

> Here, these fishermen who come from these other areas we call them *Ba Lendo*…They come from Kafue, Luapula Province and sometimes even from these villages nearby here. (Interview 4S)

> Migrant fishermen come from the North of the country; in Luapula Province because they have depleted their fish resource in those areas, so they feel here there is still fish that they can actually capture. (Interview 1S)

In Nyimba, migrant fisher-folk had several terms, with the common ones including "*Ba Mwachusa*" (foreign migrant) or "*Ba Bemba*" (Bemba-speaking migrants from Northern or Luapula provinces). Collectively, these migrants are referred to as "*Ba Mulumbu*" (migrant fisher-folk). In addition, respondents mentioned that fish traders, poachers and ex-criminals frequent the area. The fish traders buy fish from the local fisher-folk. The poachers and criminals are said to illegally hunt, kill or capture wild animals found in the GMA as well as Lochinvar National Park. With time, these individuals were said to take up fishing when they stayed in the area for a longer period of time. The diversity of migrant fisher-folk was captured in the following responses:

> These migrant fishermen have many names because of the different tribes found here in Nyimba. But, mostly the foreigners who come here to fish we call them *Ba Mwachusa*. Other fishermen from outside here but are Zambians like us are mostly from Luapula Province, so we call them *Ba Bemba.* All of them, whether a he is a fishermen from Congo or a Zambian, we call them *Ba Mulumbu*. (Interview 1N)

> We've had an influx of especially Bembas because most of the fisheries in the Northern have been depleted; there is no fish. (Interview 9N)

> Sometimes, traders who stay here for a long time start killing fish; they become fishermen as well. (Interview 3N)

> Sometimes you don't know whether someone is a fisherman or poacher because you will see him pass in the road (Kafue River), and catching fish. Again, you will see him killing Hippos and then he goes to hide in the far-off grasslands. A lot of illegal activities happen in Nyimba. (Interview 7N)

> …but sometimes these migrants come with instruments like guns and start killing *babboko* (Hippos). This place we stay in is like a hidden place and the police are far. Some of these people are criminals or ex-convicts. (Interview 1N)

These statements show that resident fisher-folk in Shimungalu and Nyimba refer to migrant fisher-folk differently. Although the migrants are generally from Northern and Luapula provinces, as they are said to have depleted their fish resources, because Nyimba shares borders with the Lochinvar National Park and GMA and is remotely located, this camp also attracts poachers, criminals and ex-convicts.

5.2.1 Migrants Justify Their Right to Fish

The manner in which migrants seek to justify their right to fish makes it difficult for resident fishers to exert control over migrant fishers. Respondents stated that migrants were of the view that:

> There is no one who can refuse his friend to catch fish. (Interview 1N)

> ...fish is for everyone. (Interview 2S)

> …we have the right to fish in any waters…one Zambia one nation. (Interview 3N)

> *Fya ba Sata, bakateka* (these things are for Sata, the President). (Interview 1N)

Thus although the "migrant" status does not confer rights to fish, migrants use such statements to try to forcefully gain access to the fishery.

5.2.2 Illegal Fishing Practices

Not only are migrant fisher-folk moving onto the Kafue flats, it was suggested by respondents in Nyimba and Shimungalu that migrants want to use prohibited draw/seine nets made from potato sacks called "*Chikukula*" (plural *Vikukula)* and mosquito nets, and prohibited methods such as driving fish into stationary nets or monofilament nets or traps referred to as "*Kutumpula*" (singular *Katumpula*) or "*Sensa*". Other destructive methods include "*Buyeelo*" (making barriers to catch fish), "*Mupota*" or "*Futukuza*" (dragging the net around the water to catch fish) and "*Miono*" or "*Myono*" (using baskets "*Matumba*" to trap fish):

> In Nyimba fishing camp, bad fishing techniques are not allowed. No one is allowed to:- (a) Use Chikukula net to catch fish (b) Use Matumba (Miono) basket to trap fish (c) Use Futukuza method to catch fish (d) Make barriers (Buyeelo) to catch fish (e) Catch fish by Kutumpula method. (Nyimba by-laws: 4).
>
> No person shall be allowed to use any of these systems. Kutumpula, Myono, Mukwekwe. (Shimungalu by-laws: Article 12.1)
>
> These migrants use the same illegal fishing methods that caused their fish resource to be depleted when they come to fish in the Kafue River. (Interview 1S)
>
> These outsiders (migrant fishermen) come with their own bad fishing methods. They cause a lot of confusion. (Interview 1N)
>
> Some of these illegal fishing systems we [resident fisher-folk in Nyimba] didn't know them. The Bembas brought them from Luapula like baskets and other bad fishing methods. (Interview 7N)

As the influx of migrant fisher-folk continues to increase on the Kafue Flats, the floodplain fishery is at risk of being overharvested, as migrants are said to use illegal fishing gear and methods. There is thus a clear need to establish a new form of fisheries governance to effectively regulate new entrants and use of the resource on the Kafue floodplain fishery and in other fisheries.

5.2.3 Ability to Compete

With the influx of migrants and use of illegal methods to catch more fish, fishing has become more competitive. Documentary analysis and respondents in Nyimba illustrate how access to assets such as money, fishing equipment, transport and education has made migrants both more competitive and difficult to control:

> The local fishers are not able to compete with the migrants, who have better fishing gear and higher income and capital. As competition over the limited fishery resources intensifies, the poorer fishermen resort to fishing with small mesh size nets. (Document 1, DoF Internal Report)

> It is difficult to rule over people with money. Migrant fisher-folk come here with money. They buy their way through the community. What can you do? (Interview 1N)

> When they (migrant fishers) come here they come with money and they find us who don't have money. You can imagine the difficulty there. How can you even tell them what to do, how will they listen to what we have to say? (Interview 6N)

> Migrants engine their boats, unlike the locals who mainly use canoes... Sometimes they even hire young men from the community to help them fish. (Interview 11N)

> These outsiders come here with an attitude that we "*Ba Batwa*" are not educated and cannot rule or control them. (Interview 5N)

> You know when someone is coming from outside of the country, someone who's gone to school and they find a villager like me there is a way in which they look at you. (Interview 6N)

Migrants use their assets to establish a situation that makes it difficult for them to be excluded; especially in fishing camps such as Nyimba where the groups of actors seem to have low self-esteem and confidence, resulting in an inferiority complex (see Section 5.5 below).

5.3 Ability to Use Local Institutions to Regulate

Local institutions and their management mechanisms are critical in the governance of natural resources such as fisheries. The resource users at grass-root level are represented in these local institutions. Understanding in what ways capacity affects the performance of these local institutions and their management mechanisms in regulating entry into the Kafue floodplain fishery on the Kafue Flats of Zambia is important in addressing the main question of this study.

5.3.1 Licensing as a Regulatory Instrument

The licensing process employed by the DoF should support local institutions in managing fisheries, as it is the only agency authorised to issue licences and makes these licences specific for a person, a fishery and a season, as evidenced in the following quotes:

> DoF is the only authority that issues licenses. The traditional authorities cannot issue licenses. (Interview 4G)

> Fishing licenses are site-specific. When a fisherman gets a fishing license it indicates which fishery he/she can fish. A fisherman with a fishing license from Luapula is not entitled to fish on the Kafue fishery. For a fisherman to fish on another fishery he/she has to buy a license for that fishery but he/she can't have more than one license at a time. (Interview 4G)

> Details on the licenses include name, license number, fishery, fishing village, NRC [National registration card] number and date of validity. (Interview 4G)

> The fishing license is valid for a fishing season. Fishermen have to buy the licenses every year. The fishing season is open from 1st March to 30th November. (Interview 4G)

Although one quote above suggests that the licence is specific for a “fishing village”, this observation is incorrect. The DoF records the village of origin of the person obtaining the licence (which may or may not be a fishing village). It does not in any way authorise a person to claim rights at village scale, which is the purview of the traditional authority. Because the DoF issues licenses for a fishery, it is conceivable that a person could obtain a licence and fish without the consent of local fishers and traditional authorities. However, as such a person would need to secure “right of access” by approaching these authorities, it

can be argued that local authority has the power to regulate entry of migrants to a fishery. This view gains support from the following quotes:

> Even though DoF issues licenses for people to fish in a fishery, DoF has no say on which fishing camp people can settle and eventually fish in. The person has to obtain permission from the headmen of that fishing camp to settle in that camp. Then he can fish in that area. (Interview 4G)

> When a person comes to our camp, from another fishing camp, we first want to see his fishing license, if his really a fisherman. Two, we will want to see his transfer letter from his headman, because when someone comes without a transfer letter and license, then we won't allow him to stay here and fish. We tell him to go back where he came from. (Interview 3S)

> Before you start fishing we are supposed to see your fishing license. So if the person doesn't have a fishing license, we tell him to buy one and then after he does, we tell him our by-laws. (Interview 4S)

The headmen exert considerable influence on the efficacy of the licensing process. As one respondent from Nyimba suggested, the headman can, without consultation and perhaps even through accepting a bribe, choose to grant a migrant with a fishing licence the right to reside in a camp and thus to also fish:

> ...these immigrants would bribe the headmen. Then they would be allowed to settle here or even in the grasslands. (Interview 7N)

The observations presented in this section suggest that under the prevailing licensing process, the DoF:

- Operates from the principle that all citizens and legal immigrants in good standing have a right to secure a licence to fish;
- Does not formally acknowledge preferential rights for people who have been associated with the fishery over many generations;
- Is not required to determine the desirability of issuing licences for a particular fishery; and
- Relies on the integrity and support of the traditional authority to indirectly regulate access to the fishery by applying its authority in controlling the right to reside on land.

In this light, it is evident that regulating access to a fishery at camp level will be strongly determined by the strength of local institutions and the capabilities of local people to enforce them.

5.3.2 Harnessing Local Institutions

In Nyimba and Shimungalu, by-laws have been established in consultation with the Fisheries Act of 1974 which was ratified in 2011 and renamed to the Fisheries Act of 2011. The by-laws were established by community committees with assistance from the DoF. A respondent pointed out:

> Both fishing camps have village committees which set out by-laws, respectively, in consultation with the National Fishery Act. DoF does not sit in all the meeting that the committees have, but they interpret the Fisheries Act – its goals and objectives – so that as they come up with the by-laws, they are in-line with the targets and goals of the Fisheries Act. (Interview 1G)

The by-laws in Nyimba were formulated in September 2005 "to prevent bad fishing methods and to regulate life in the fishing camp". Shimungalu's by-laws were established in the 2002 but were amended in August 2014.

Nyimba

The by-laws in Nyimba make provision for local control over new entrants:

> Any new fisherman coming into Nyimba fishing camp should ask for permission from headmen to avoid crowding in camps which finishes fish radically. (Nyimba by-laws: 6)

However, the feeling in Nyimba among locals is that control is not effective, as customary controls are weak and people have low self-esteem. Under these conditions, the confidence of and assets available to the migrants enable them to gain access to the Kafue fishery by engaging with corrupt headmen and people from the same tribe, relatives or past migrants who had been accepted into the communities. Respondents expressed their feelings in the following statements:

> …you will find that a Lozi chap has been appointed as headman. So if you are Lozi also, it becomes difficult for you to stop another Lozi fellow who is coming today to fish. (Interview 11N)

> …the person coming may be a relative; in fact they may be sending information there because they have overfished these other areas. So they will be telling them that move out of there, maybe here we can survive. (Interview 11N)

> …the migrants of nowadays, going by what I have observed from these past few years up to this year maybe, you'll find that the very migrants, they may bring other migrants from their places of origin and when those people come, they don't even take them to the village headmen so that the headmen can know to say that we have such a person who's come for the first time in this area. Instead, they just keep them in their homes and they start doing their daily activities. (Interview 3N)

> Foreigners have the right to fish in the area if they have the right documentation, if they have been cleared by immigration and have licenses from the Department of Fisheries. There is no clause in the Fisheries Act that has prohibited that sector of people. People coming from different parts of the country have the right to fish as long they have licenses. The Act is silent on who has the authority in a certain fishing camp. The Act has little influence on the ethnicity of people fishing in an area, so whether international or local. The by-laws do address these issues but with difficulty. (Interview 3G)

The migrant fisher-folk take advantage of the manner in which the fisheries legislation implies that the fisheries are "open access" as well as the weak control at camp level. For example, one respondent in Nyimba observed:

> After a lot of noise, they [migrant fisher-folk] will sink into the community. Members of the community are no longer motivated to take action; *tuma tamba che* [we just watch them]. (Interview 1N)

The customary controls in Nyimba, while no different in their fundamentals from those in other camps such as Shimungalu, have not been effectively implemented. The local fisher-folk in Nyimba seem to have low self-esteem in the presence of migrants and little confidence in their ability to regulate access to the Nyimba fish resource. The realities of

weak leadership and corruption suggest a need for stronger intervention from central government (see Section 5.5 below).

Shimungalu

In Shimungalu, migrant fisher-folk are not able to gain access to the fish resource without authorisation. They are not able to do so because the local fisher-folk in Shimungalu have high self-esteem and confidence in their ability to regulate access to and use of their fish resource. The following quote illustrates that the right to live in an area provides the first means for controlling access:

> No fisherman from outside Shimungalu fishing zone should start fishing or build a house without permission from the village headman. (Shimungalu by-laws: Article 12.1)

Respondents further explained that in Shimungalu, where customary controls are effective, migrants are told to either comply with the by-laws or leave the area:

> When they (migrant fisher-folk) come here we tell them our by-laws, us here we want when someone comes that person has to follow the way we work. We don't want to finish the fish; we want even tomorrow our child to find the fish. (Interview 2S)

> In Shimungalu, fishermen don't use the fishing methods we have forbidden. If someone uses the bad methods we will send a call out for him, when he comes we tell him that this method we don't allow and he has to stop there and then. If he feels we telling something he doesn't want to do, he will pack up and leave. He knows that if we catch him using bad methods again we will take him to court and chase him, so he just leaves. (Interview 4S)

In Shimungalu, even though the population is drawn from a number of tribes, the strict enforcement of by-laws and sense of community make it difficult for migrants to engage with the local fisher-folk and use their assets to buy their way into the community through access to the traditional and community leaders:

> We have a mixture of tribes here; all the 72 languages are present in this fishing camp. When people from this fishing camp go fishing and see people they are not familiar with, they report to the FMC or headmen. We mobilise and go out to catch those people. (Interview 4S)

Even though the migrants that try to gain access to the Shimungalu fish resource have the same attitude as those in Nyimba and consider the fishery to be "open-access", the local fisher-folk in Shimungalu effectively regulate access to and use of their resource. For instance, respondents said:

> When a visitor comes here saying that the fish is for everyone and uses bad fishing methods, we chase him because he has to follow our laws not his own. We have the power according to our by-laws. (Interview 2S)
>
> "When visitors are stubborn and don't want to change, we tell them to leave this village if they don't want to change and follow our by-laws. (Interview 7S)
>
> Even if people come here and say the fish is for everyone, we don't allow them to fish. This is our village, it's our water, and we don't allow them. And they will pass and go. (Interview 10S)

The respondents from Shimungalu illustrated their sense of empowerment through their ability to configure their assets and capabilities. They felt confident in the support they could draw from the government and traditional authorities, which motivated them to take ownership of their resource and to regulate access to and use of the Shimungalu fish resource.

Summary

Migrants use the notion of "citizenship" rather than "belonging" as justification for access to the fishery, while at the same time not acknowledging the legitimate role of traditional authorities. They tend to justify their actions by suggesting that all natural resources are God-given ("*fya kwa lesa ifi*"), and that "we are all Zambians, how can you tell us how to fish?" (Interview 5N; 6N). These statements corroborate the findings of Haller and Merten (2008) and Chabwela and Haller (2010).

These attitudes stem from the fact that ownership of all natural resources such as land, water, fisheries, forestry and wildlife in Zambia is vested under the custodian of President of the Republic of Zambia on behalf of the people, according to the Land, Water, Wildlife and Forestry Acts. This situation is worsened when interpretation of the fisheries legislation encourages a perception that the fisheries are "open access fisheries", as illustrated by the following quotes:

> Many fishers have migrated to the Flats because it is open access with little monitoring and good access to markets. (Document 2, DoF Consultation Report)

> From the government perspective, all the fisheries are open access meaning every Zambian has the right to fish if they have a permit [license]. Traditionally, the local people in the area have the right to fish. This causes conflicts especially with the Bembas because they are rough and imposing people. (Interview 1G)

It is clear that the political, social and cultural environments strongly influence the behaviour of both the migrants and the local fisher-folk. The migrants often use such environments to their advantage by treating the locals as uneducated and therefore not capable of being able to use the assets they have (including government) to exert authority over them. This advantage was manifest in Nyimba, where the local fishers and community at large were not able to configure the assets and collective capabilities available to them, particularly (traditional and national government) to counter migrants entering the fishery illegally and fishing using illegal methods (or gear). In contrast, in Shimungalu the community was able to configure its assets and capabilities such as traditional and national government and nearby groups of fishers to effectively counter the threat of new entrants.

5.4 National Government's Ability to Regulate

This study sought to understand how capacity affects the performance of national government's institutional arrangements in regulating access to and use of the Kafue floodplain fishery. The DoF is the government department responsible for managing all fisheries in Zambia. In this section, I consider whether the DoF can be effective in this role, given the resources it has at its disposal.

Capacity Constraints

Documentary analysis and responses from the DoF officers who were interviewed provide insight into how capacity constrains the effectiveness of the DoF. The main constraints affecting the performance of the DoF are those regarding financial resources, human capital and equipment. These sentiments were expressed in the following statements:

> Funding has been a major problem. When the fish ban comes, there no resources, no logistics and that has become a big hindrance to implement the law. (Interview 2G)

> Officers make budgets for the next five years in advance. Within this period the allocated budgets cannot be changed. The government then divides the amounts into each year. The government is supposed to release the funds every month but this is not the case; the inflow of money changes depending on the funds available in Lusaka. Sometimes the funds don't come in at all. (Discussion with Two Respondents, Field notes)

> The staff ratio to fishers is in excess of 1:900 which is way beyond the ratio of 1:300 that seems to be a standard for effective extension service delivery. (Document 1, DoF Internal Report)

> Unfortunately at the moment we are like understaffed. We are only two officers looking at forty fishing camps. (Interview 1G)

> There is only one person charged to undertake extension activities and under research there just two officers as opposed to the needed eight. There is no division between extension and research. Officers just shift, when there is extension they all do it, when there is research, just like that. (Interview 4G)

> "We are unable to enforce the Act due to the lack of appropriate equipment to oversee the fishing methods, low staffing levels and also funding. We don't have the financial resources needed to undertake these programs. (Interview 4G)

> We are unable to enforce the Act due to lack of appropriate equipment. How can you go to these villages on islands with spoiled boats? (Interview 4G)

A respondent further claimed that the non-payment of allowances after work has been carried out is a major de-motivating factor among government officers:

> You find that people work but are not given allowances. The provision of allowance is quite cardinal; we need that one for our officers to be motivated. The zeal has been dampened so much, you find a scenario were people have the desire to work and when they get into the field the find the conditions are really bad and that de-motivates them. (Interview 2G)

In addition, one respondent felt that legal provisions, particularly penalties, were adversely affecting performance of the DoF:

> I wish the law enforcement agencies like the Fisheries Act could be strengthened because I look at it as a very weak Act. The penalties are not strong enough to deter people from doing their illegal activities. They say even if I'm caught, I'm just going to pay, it won't be so bad. (Interview 2G)

The reality is that the DoF will not be able to acquire sufficient resources to effectively regulate access to and use of the Kafue fishery on its own. It has to recognise and make better use of the available local resources (the resident fisher-folk, traditional authorities, community based-management committees and other government agencies). For example, notwithstanding its limitations, in Shimungalu, the DoF has recognised and made better use of the available local resources and capabilities by continuously working and establishing support networks with the traditional authorities and FMC to strengthen local institutional arrangements, implement by-laws and enforce subsequent penalties for breaking the by-laws. With time, the DoF has been able to earn the trust of the traditional authorities and FMC and build strong relations with them. Additionally, the FMC through the DoF is able to acquire help from other government agencies such ZAWA to apprehend migrant fisher-folk who are in possession of weapons, such as guns. In this way, the DoF has been able to bring additional resources into managing the fishery, which has resulted in effective regulation of access to and use of the resource in Shimungalu and surrounding camps:

> The Fisheries officers really helped us, we [committee member] never used to trust and listen to them a long time but now we do. (Interview 2S)

> A long time ago we [headmen] used to think the Fisheries officers were our enemies, even our neighbours used to also think so. After we were taught we stopped thinking of them as enemies. We used to wonder why the Fisheries officers don't have nets but they refuse us from catching fish using bad methods. Then we thought, what causes them to say such things when they are not competing to catch fish like we do. That's when we realised that they were actually helping us, so that's when we decided to learn from them and we also taught our fellow fishermen. (Interview 6S)

> Otherwise we [DoF] have been going in the fishing camps, sensitising them of what they are supposed to do and not to do and that's how we initiated the Fisheries Management Committees. We work with the committees so that they can manage their resources...Although we have the Fisheries Act that

> governs the entire Zambian Fisheries, the government felt that a policy should be put in place in all the fishing camps so that we come up with Fisheries Management Committees and by-laws. So that when we are not there, they are able to manage their fisheries. (Interview 1G)

> When we hear or see a migrant fisherman with a gun we first inform the Fisheries officers then they will inform the ZAWA officers. When the Fisheries officers and ZAWA officers come, we show them where that fisherman is. The ones who have guns are mostly fishermen who work for soldiers, or police men. Those ones even kill animals as they are fishing. So far we have only found two or three these kinds of fishermen, mostly they go deep in the Flats. (Interview 7S)

In Nyimba the situation is quite different. Because it is so remote, it takes more time and resources for the DoF to carry out extension activities. The findings of this study suggest that success in Shimungalu arose out of intensive engagement. The DoF has not been able to engage with the same intensity with the relevant actors at Nyimba and so it has been difficult to build strong partnerships with the FVMC, traditional authorities and community members. Respondents from Nyimba noted:

> The government has forgotten us because we are far from them. (Interview 4N)

> The government and its laws are always changing, but for us here [Nyimba] when they change, we don't know that they have changed. So you find that we remain in the old system without knowing that things have changed. These officers don't come here to tell us. Even when you send for help from them, they take long to respond. Sometimes you *call* them and find that their boat or engine is damaged, so they won't be able to come here. (Interview 1N)

> These officers don't want to visit us here [Nyimba]. For us who have been here for a long time, the Fisheries officers who were here a long time and these ones who are here now are very different. A long time ago, the officers used to help us all the time, they used to teach us all the time, for example, when visitors come you are supposed to do like this, fishermen are supposed to fish like this. Now these Fisheries officers of nowadays are always in their offices, when they come here it is just to sell the fishing licenses. (Interview 6N)

Furthermore, documentary analysis and respondents also revealed that, at times, communication, coordination and collaboration between the DoF and ZAWA in Nyimba have not been effectively administered:

> ZAWA has worked well with the Department in enforcement of the seasonal fishing ban but at times is seen to overrule fishing permit issuance by demanding that entry permits take precedence in designated fishing areas. It is also common practice that ZAWA at times enforces the fishing ban regulation without participation or sanctioning from the Department of Fisheries and lends itself to questions and queries. (Document 1, DoF Internal Report)

> When arrested by ZAWA, fishers claim that they lack representation from the DoF, yet fisheries department enjoy revenue from licensing. At the same time there are no formal structures for resolving conflict regarding fishing boundaries as the interaction between ZAWA and DoF is considered poor leaving a fisherman vulnerable to arrest by ZAWA. (Document 2, DoF Consultation Report)

> Worse is that, there is no marked boundary between fish breeding grounds and open fishing areas in Chunga Lagoon [Nyimba area] and this is one of the sources of conflict between fishers and ZAWA and Fisheries officers. (Document 2, DoF Consultation Report)

> So we [ZAWA] need again to collaborate better with fisheries (DoF). We don't know their plans and how they work with communities. (Interview 3G)

> It is difficult to enforce the Fisheries Act every other time because of security reasons. So we bring on board ZAWA but sometimes they don't want to work with us. They always expect to get something from every program. So that's where issues of manpower and the financial inadequacies of the Department of Fisheries affect the dissemination of the Fisheries Act. (Interview 4G)

The study further revealed that the attitudes to and styles of policing and perceptions of power imbalances create conditions that affect the motivation of both fisher-folk and the DoF personnel to work with ZAWA in Nyimba. Responses suggest that ZAWA was not viewed favourably as its representatives misuse their weapons and instil fear in the fisher-folk in Nyimba. Respondents explained:

> Locals have a very bad attitude towards the Fisheries officers because they don't normally move around with guns. In comparison to ZAWA officers, Fisheries officers are less regarded than the ZAWA officers because they (ZAWA officers) have guns and misuse them to inflict fear and subdue the fishermen. (Interview 4G)

> .The problem is that Fisheries officers do not have a lot of power because we are in the area of the Park. So they pull each other with the Park authorities (ZAWA). They don't work well together. When they enter or cross the Kafue River, they will be in the Park. Even when you are fishing there, it is illegal. The Park authorities have more power. (Interview 1N)

Summary

The DoF does not have the capacity to engage effectively with actors at the more remote stations. As it will not likely be able to improve its assets and capabilities in the foreseeable future it has to find a way of bringing other assets as well as capabilities to bear in fisheries management. It has to make more effective use of local assets and capabilities, as it has been able to do in Shimungalu and the assets and capabilities of other actors, such as the traditional authorities, FMCs or FVMCs and ZAWA. It has to consider how it can bring about a configuration of assets and capabilities that empower people in remote locations to assume ownership and responsibility and act collectively in fisheries management. It needs to find a way of replicating the success of Shimungalu across the Kafue floodplain fishery and beyond.

5.5 Polycentric Governance: Success and Failure

When people who share a resource, such as fish, network with other groups and learn together, they configure their collective assets and capabilities in a way that empowers them to "claim" the resource, support each other in giving effect to the by-laws they establish and manage use of the resource. Such a system that involves horizontal and vertical linkages between groups (nests) of actors has been referred to as polycentric governance (e.g. V. Ostrom et al., 1961; V. Ostrom, 1972; E. Ostrom, 1990, 2005, 2010; Adler, 2005; Schoon et al., 2015).

In polycentric governance systems, devolution of authority to the various decision making centres in the network enables actors to self-organise while at the same time allows them to

draw support from higher levels – in this study, the government and the traditional authorities. Because self-organisation confers legitimacy to the rules and regulations that actors develop in their efforts to manage the fishery, polycentric governance should empower them in their efforts to manage a fishery. The FVMC (or FMC) is an important node (nest) within the polycentric governance system for fisheries on the Flats. Communities in Shimungalu and Nyimba have established FVMC (or FMC) and have drawn up by-laws with assistance from DoF and that are in-line with the Fisheries Act.

Shimungalu

In Shimungalu, the responses indicated that local governance is strongly dependent on a support network that includes the FMC, DoF, traditional authorities, resident fishers and neighbouring villages. For instance, FMC respondents in Shimungalu emphasised the role of the DoF in their success. They acknowledge that there was a time when regulation at individual and communal level was not successful, and people were exploiting the fishery in ways that were not sustainable. However, with the help of the DoF, they were able to establish a FMC and by-laws to regulate access to and use of the resource. Such views were captured in the following quotes:

> Fish catches reduced when we used to use *Chikukula*…a lot of us had such kind of nets. So we had a meetings with *Ba Fisheries*, we said this kind of nets should not be used here. So we started with people in this village, you can't refuse your friend to use something you are using. So we removed such nets and in one year we saw an improvement. That's when we realised that this was a good thing. Then *Ba Fisheries* suggested we make a management committee and by-laws, we did just that. (Interview 2S)

> In 1999, before 2000, we (headmen and three other fishermen) went with the Fisheries officers to Siavonga for workshops. From there we went to Lusaka West for fisheries workshops. Other fishermen came from Zambezi to show us how they catch fish. So that's how the Fisheries officers helped us to come up with our FMC. So before the FMC, we had bad fishing methods in Shimungalu, now we have stopped all that, we are trying to protect our fish. We have completely stopped from that time. So that's why we are trying to stop people who come here with bad methods. (Interview 3S)

> ...some try to scare us with guns, like the one we caught a few days ago, he was using *Chikukula*...so we took the fisherman and his boat to the government because he was trying to take advantage of us. (Interview 2S)

The traditional authorities have also been supportive assets to the FMC. The FMC draws from these authorities, with the headmen providing leadership. The headmen also act as a law enforcement agency, thus ensuring that the fisher-folk who break the by-laws are punished accordingly. Respondents indicated that the headmen in Shimungalu worked with the other groups of actors such as the DoF and the committee:

> The headmen are always in the Committee. They are not elected, they are always part of the committee, we [FMC] work hand in hand with them. (Interview 2S)

> When the FMC just started, us the headmen had to encourage the people in this fishing camp to start following the by-laws. (Interview 7S)

> When a visitor, *Mulendo*, comes, he is supposed to see the village secretary first and then he'll be taken to the headmen. After we [village secretary and the three headmen] interview the person and check all the documents to check that everything is correct, we call the committee, even though we are also in the committee, to tell them that we have a visitor and his documents are here…then we sit with the committee to decide on the matter. (Interview 3S)

> In this village [Shimungalu] we all work together, so even if visitors come in numbers, two, three or more, they won't manage because we work together with the headmen. (Interview 5S)

> From the time we were forming the FMC with help from our District Fisheries Officers, we, the headmen, have been continuously encouraging our people to use the correct fishing gear. The people who were stubborn we told that if they don't want to change, they should leave this village because we don't allow destructive methods of fishing. (Interview 7S)

> We, the *Sibbukus* [headmen], don't allow any fishermen to catch the small fish. Using methods like *Chikukula* and so on, we don't allow. When we hear that a person has come from outside Shimungalu fishing zone and is catching fish, sometimes using *Chikukula*, we send our scouts to go and capture him. We don't want our fish to finish, more children are still being born, and they

> won't find the fish, they will find it has finished. This is why we the headmen have to be strict with our *Lamulo* (by-laws), when people break the law they have to be punished according to our laws. (Interview 7S)

Respondents suggest that implementation of the by-laws has been effective:

> Visitors have reduced nowadays because of the by-laws we follow. So visitors feel restricted and go to fish in other areas. (Interview 5S)

> So the ones that don't listen eventually end up in problems because when we find them using bad methods we catch them and take them to the Law. We call our fisheries officer to show them what we have found because our by-laws say that if find a *Chikukula* you remove it and burn it. The owner is given a warning and if he repeats we chase him out of this place. (Interview 3S)

In Shimungalu, regulation of access to and use of the resource is effective because the local institutional arrangements are integrated and function well – they have effectively configured their collective capabilities. The traditional authorities know what their responsibilities are and they perform accordingly. The commitment and leadership from the traditional authorities and DoF in strengthening the autonomy of the FMC in Shimungalu has encouraged the resident fisher-folk to take ownership of their resource, and stay committed and motivated to regulating access to and use of their resource. The words "our" and "we" were frequently used in the interviews conducted in Shimungalu, denoting a sense of ownership and collective accountability:

> If *we* allow visitors to use bad fishing methods, they will finish *our* fish. (Interview 5S)

> …*we* are citizens of this village…where are *we* going to go if *we* finish this fish of *ours*. (Interview 2S)

> *Our* role in managing the Shimungalu fishery is to stop people from using illegal fishing methods….*we* are trying to protect *our* fish for the future of *our* children. (Interview 3S)

> When *we* see that they are a lot of fishermen fishing, *we* don't allow visitors to fish here. *We* tell them to go to fish somewhere else. *We* are afraid that the fish might finish if they are a lot of fishermen fishing. These visitors just want to come here to fish and then go back to their villages. But this is *our* home if they finish *our* fish what *we* will eat, what will *our* children eat? (Interview 10S)

Respondents explained that the FMC in Shimungalu includes volunteer scouts amongst other members. Scouts are in charge of conducting patrols and monitoring who was fishing and how fishers harvested from the resource. They use "register books" to verify the identity of unknown persons found fishing in the area. The scouts further rely on tip-offs (sometimes via phone calls) from resident fishermen who come across unfamiliar fisher-folk and fisher-folk using illegal methods. The fisher-folk who are captured by the scouts are charged by the FMC and the money obtained from the charges is divided amongst the volunteer scouts. This incentive maybe one of the motivational factors encouraging the scouts to stay committed to regulating who has access to and use of the resource. Respondents explained:

> We have a register of the people in this village. That's what we use when we go on patrols if we find someone we don't know. (Interview 2S)

> We are more than 20 scouts because some of the people come to help when we need their help. When our friends go fishing at night and find people fishing using illegal methods like *Vikukula*, they make a *phone call* to one of the scouts and we mobilise the other scouts and go after them. (Interview 13S)

> Being a scout is by volunteering…when we catch someone using illegal methods, he is charged for breaking our by-laws and so on, so that's the money we divide amongst ourselves. (Interview 13S)

The FMC in Shimungalu has further taken a wider view of governance and has extended its influence in fishery management by engaging with the neighbouring fishing camps – Nanga, Ngongolo and Chinyaka. The chairmen of the FMCs or other representatives from the neighbouring fishing camps attend meetings in Shimungalu, enabling them to draw on support from the FMC in Shimungalu. This move has resulted in a more consistent approach to fishery governance and contributes to compensating for the asset limitations in the DoF. Respondents from the neighbouring villages pointed out:

> In Nanga camp we started working with Shimungalu FMC last year when we saw that too many people were using *Vikukula*. They came to our village and helped us form a FMC. We adopted by-laws from Shimungalu FMC. (Interview 1SNVN)

> When we catch the fishermen using *Vikukula* and we call the people in Shimungalu so that they come to get them. All the villages around the area

> work with the committee in Shimungalu. Shimungalu is the biggest fishing camp here; it is our station. (Interview 2SNVC)

> This year we have had a lot of problems with *Ba Lendo* coming to fish in our area and using bad fishing methods. When we see a boat that we don't know, we know that they are visitors. So we follow and catch them. When we catch these people we bring them to Shimungalu. (Interview 3SNVN)

Networking in polycentric systems enables learning. Strong communities rely heavily on their capacity to exchange information and engage in discussions, thus allowing them to build on existing knowledge. The transfer of knowledge and information helps the actors to understand what is required of them, what is happening and how to participate in the governance of their fishery. In other words, constructing a collective identity reinforced by social learning and collective action in management is vital to fisheries governance.

In Shimungalu, the FMC collaborated with the DoF to foster social learning and internal and external dialogue by holding public meetings at a place they refer to as "The Parliament" to educate stakeholders about by-laws and good fishing practices. The stakeholders included community members and representatives from neighbouring camps. The public meetings are scheduled to take place once every two months. In the following quotes, social learning is denoted by words such as "teach", "learn", and "educate":

> All the people in this Shimungalu know the by-laws and the good fishing practices through the public meetings we have. Every two months we have a public meeting. (Interview 9S)

Figure 5.1: Fisheries officer and committee members talking in “The Parliament”

> We have three sections in Shimungalu and each section has a headman. The Fisheries Management Committee brings everyone together. Through it we *learn* a lot of things, for example we *learn* what is happening in all three sections, good fishing methods and so on. The committee is doing a great job. (Interview 10S)
>
> A long time ago when our committee wasn’t as effective as it is now, the committee used to be silent when people are fishing using illegal nets. Then the Fisheries officers used to come here to *teach* us how to catch fish properly, and how we should manage our fish so that our children have fish in future. That’s how we *learnt* and started *teachin*g our friends. (Interview 8S)
>
> We have by-laws and we *educate* our fellow fishermen who are not in the committee. (Interview 5S)

Additionally, equipment, in particular fishing vessels (including boats made from fibreglass and engine boats), is an important asset particularly for monitoring purposes. It can either constrain or facilitate local governance. The respondents explained that most fishermen in their communities had dugout canoes (canoes made from a hollowed tree trunk). However, for monitoring purposes, they needed a much larger boat, either a “banana” (fibre glass) or engine boat (motorised boat), to ensure personal safety as a number of scouts or individuals can go on patrols together. In Shimungalu, a respondent noted that community members

lend their boats to the committee and sometimes the DoF officers also assist the committee with an engine boat when is it available. One respondent observed:

> We take the same group which we have in our FMC, since we have a lot of members, and we ask for transport from our friends with banana boats to go on the water to check for visitors. At times we even use the engine from the DoF during our patrols when it is fine. (Interview 5S)

Through networking and expanding its influence, the FMC in Shimungalu has been able to make connections, draw on new assets and capabilities, experiment, learn and build enduring, mutually beneficial relationships with the other groups of actors. By configuring its assets, it has been able to implement a form of polycentric governance that has enabled regulation of the fishery.

Nyimba

In Nyimba, the situation is markedly different, even though they have the many of the same assets and opportunities for strengthening local governance and expanding their influence to neighbouring fishing camps. For example, Nyimba has an additional opportunity to strengthen local government because it has a Community Resource Board (CRB). ZAWA established the CRB with several communities in the area, including Nyimba. The "revenue (50%) obtained from the selling licenses and safari hunting is shared amongst the communities through the CRB" (Interview 3G). As such, the CRB oversees the management of natural resources such as wildlife within the GMA to the benefit of the local communities. In this sense, Nyimba is better resourced than Shimungalu. However, the FVMC does not generate income and thus cannot offer economic benefits to the fishing communities. Even though the same community leaders who are in the FVMC are also part of the CRB, the CRB management focus has been on wildlife. And, despite acknowledging the opportunity and need for collaboration, it has not taken up a supportive role for managing the fishery and other resources:

> So ZAWA, earlier on, had groupings or community groups called Community Resources Boards. So when the fisheries department came in to constitute their Fisheries Village Management Committees, it was like a clash. So harmonisation between the two was a little bit tricky. You would find that probably the same people belonging to CRB will be the same people belonging to FVMC and the benefits really coming out of these FVMC has not

> been forthcoming. Harmonisation between the Community Resources Boards and Fisheries committee has been a little bit tricky. (Interview 4G)

> So to protect the interest of wildlife, we [ZAWA] encouraged communities living within those areas to elect members of the community who seat in the CRB secretariat and this CRB has technical committees. Through the CRB the community employed, within the community, young men and women as village scouts who we have trained and are empowered to enforce the Wildlife Act…So our emphasis has mainly been on the wildlife side of things but the communities need to look at the natural resources in general. So through this same structure [CRB], this is where we can strengthen these other relationships so that the CRB can look at these other resources like fish and so on and so forth. (Interview 3G)

Nyimba also has another agency, "the Neighbourhood Watch group", which was established to ensure that the area is safe as "a lot of illegal activities happen in Nyimba" (Interview 7N). Surprisingly, even though the watch group mainly looks at safety issues, a respondent noted "sometimes the neighbourhood watch group helps us [the committee] monitor the fishery" (Interview 1N). However, the respondent further acknowledged that "migrants are difficult. They make it difficult for our committee and the neighbourhood watch group to work".

Respondents from the FVMC in Nyimba stated that they have received no or little support from the DoF in the past few years as the fisheries officers do not service or visit the area anymore. A respondent stated:

> Fisheries Officers of nowadays are desk officers; they no longer come to here to inform us of the new laws or train us. So we don't know if what we are doing is right or if the law has changed. (Interview 4N)

Respondents believe that the traditional authorities have also not helped them, even though traditionally, all fisher-folk pay money every year ("*Mpaizyo*") to the headmen ("*Sibbuku*"). Respondents in Nyimba indicated that headmen had a tendency to abuse their position by accepting bribes from migrants. As such, internal dialogue is blocked by corrupt headmen who take bribes from migrants and do not communicate with the committee:

> It is not all the headmen, but some headmen. So some immigrants come and buy their way through the same corrupt headmen. (Interview 6N)

> So last time people from Namalyo came, even people from other villages, for meetings but nothing was resolved because of the headmen. So after that we just stopped. (Interview 1N)

> When complaints are raised during meetings, the headmen don't listen because of the bribe. (Interview 5N)

> Also the headmen do not communicate with the committee. Not all of the headmen are in the committee. (Interview 7N)

One of the respondents referring to an incident at Nyimba further pointed out that the chief tries to intervene when officers arrest fishermen who are said to work for a headman. Even though the chief cannot exclude fishermen from being prosecuted once they have been arrested by the officers, he tries to use his influential position to negotiate terms under which the arrested fishermen could be released. The respondent noted:

> ...the chief came to talk to me [officer], to negotiate terms under which the caught fishermen could be released. He said that why don't you just remove those bad sections which are not recommended. Just because one of the fishermen we caught was working for one of his headmen. (Interview 3G)

The responses indicate that in Nyimba authority lies with the traditional authority who in some instances are undermining the FVMC's and the DoF's efforts to manage the fishery. As a result, members of the FVMC in Nyimba indicated that they felt powerless as the headmen and the DoF in Nyimba have not been "supportive assets" for local governance of the fishery. The responses show that the respondents from the FVMC still expected the government to give them power even though, as with Shimungalu, the FVMC has autonomy (within a nested system) and could assume responsibility for establishing, enforcing, monitoring and implementing by-laws. It was quite clear that the members of the FVMC feel they are unable to take action without stronger intervention from higher level, the DoF, who can bring pressure to bear on the tribal authority so that corruption is eliminated and a more supportive regime is established. Until this happens, it is unlikely that the FVMC will be motivated to align its potential assets and capabilities, and work together with the other groups of actors. Committee members and resident fisher-folk in Nyimba indicated that they are no longer motivated to take action. This attitude was captured in the following interviews:

> For the committee to have power, it has to come from the government, the Fisheries officers. We have failed to give ourselves power because of the money issues. (Interview 7N)

> Since the committee doesn't have a lot of power from the government, there is nothing we can do. (Interview 7N)

> This committee is just a *committee on the mouth* because the Fisheries officers haven't come with force. They should see how we are working, and give us power. That's why the committee has weaknesses. (Interview 5N)

> Some of these migrants arrive at the place where the committee is not there. By the time the committee goes to see these people, you find that the migrant has already seen the headman of that area. So if a committee member tries to harass or talk to the person, the headman will back up the migrant. This makes it difficult for the committee to work. (Interview 7N)

> Also the headmen do not communicate with the committee. Not all of the headmen are in the committee. Three-quarters of them are not in the committee. The headmen have a lot of power. So when migrants come here, they pay the headmen and start working. Since the committee doesn't have a lot of power from the government, there is nothing we can do. That's why we are weak. (Interview 7N)

> So you may find that the headmen act as if they are the chiefs, when they are the eyes of the chief. So you may find that they have their own rules, the headmen, which they want people to be following. As a result, it becomes hard for us to interact well. They are a lot of misunderstanding here and there especially when we try to have meetings. You find a situation whereby people complain about migrants coming here and using whatever methods of fishing they want to but the headmen don't listen because they take bribes from the migrant fishermen. So our strength would finish. People just gave up. (Interview 3N)

> To be frank, people in this community have given up. Even the committee has given up; they are not all that motivated to take action against migrants. (Interview 3N)

The sense of being powerless has also had other consequences. Responses indicate that members of the FVMC are also among those who contravene the by-laws:

> People know the by-laws, but you know when people who are teaching (Fisheries officers) don't come, or come once a year, you won't have the power to check if something is working or not. (Interview 7N)

> The problem that has led to the non-functioning of the by-laws is that members of the committees are also perpetrators [someone who commits an illegal act] of the law, they practice illegal fishing. However, illegal fishing is mostly associated to immigrants. (Interview 4G)

However, a respondent suggested that with help from the government (DoF), the FVMC would be able to implement and enforce the by-laws:

> The laws are there but the outsiders don't follow them. They follow for a short while but start to break the laws. We (committee) have tried to call for meetings so that these individuals follow the laws but they don't get followed for long. Motivation to fight wrong practices is still there but we need help from the government. They should assist us with ensuring that the consequences to wrong actions by outsiders are implemented. We haven't managed to do it ourselves; we have failed to take control and take action against the outsiders who break the laws. (Interview 4N)

An actor's motivation and positive attitude are required for fisheries governance, particularly when that actor has responsibilities granted through the traditional authority. A headman interviewed in Nyimba seemed to be disillusioned and not movitated to take action as he pointed out that the Fisheries officers are those who hold power over Nyimba's fishery and that they did not have by-laws; instead, they use the Fisheries Act. The headman does not seem to recognise his role as a "traditional leader" and the exsistence of the by-laws. This view is captured in the following interview:

> Here we (headmen) use the Fisheries Act that is given to us by the Fisheries officers. We follow the laws that the Fisheries officers give us. We don't make our own laws. So when migrant fishermen come to this area they are supposed to bring themselves here, to see the Headmen or senior Headman. Some do this but most of them do not reach here. The ones who reach here, we send them to the Fisheries officers to get fishing licenses and for them to get laws which will help us work together. The Fisheries officers are the ones with the power over this fishery. They are the ones who can help us manage it or we can help each other to address the problems we have here. (Interview 8N)

Further, success in fisheries governance requires collaboration and, as shown in Shimungalu, sharing equipment (particularly boats) for policing and monitoring. In Nyimba, a

respondent complained that resident fishers who have “banana” boats are not willing to lend their boats to the committee members, thus making monitoring difficult:

> People have personal boats but people are not willing to use their boats for community activities such as monitoring the fishery. Therefore if the community had a boat for the community, it would help with the community surveillance. (Interview 5N)

This observation suggests that in Nyimba the sense of being a collective is very weakly developed – so much so that the perceived solution for surveillance is purchasing a boat rather than strengthening and sharing in the network in ways that would enable access to more boats.

Summary

The results revealed that the groups of actors (the DoF, traditional authorities and FMC) in Shimungalu have been able to effectively regulate new entrants and use of their resource by configuring their capacity assets and capabilities, thereby creating a context that enables self-regulation. These assets include support networks, incentives, monitoring epuipment (boats), mobile communication, collective identity and action and by-laws. By configuring these assets the traditional and community leaders in Shimungalu have developed high self-esteem and confidence in their collective capability to regulate new entrants’ access to and use of their fish resource. In Nyimba, even though they have the many of the same assets and opportunities for strengthening local governance, the groups of actors have not been able to configure their assets and use their collective capabilities. To worsen the situation, the DoF and traditional authorities have not been supportive assets. The lessons learned from Shimungalu have not been learned in Nyimba. Indeed, because the only links between Shimungalu and Nyimba are through the DoF, co-learning between the camps is constrained.

Overcoming capacity constraints would require the DoF to establish and implement a collective system of governance through nesting and polycentric governance. The evidence suggests that without a nested system with polycentric governance across the Kafue Flats, the multiple groups of actors have not been able to communicate, learn and draw from each other. Shimungalu is an example of how networking can expand influence and support fisheries governance in neighbouring fishing camps. By implementing a formal nested system with polycentric governance, the DoF can use Shimungalu as a “pilot” to extend to

other camps across the Kafue Flats. They could do so by mobilising the multiple groups of actors, thereby creating opportunities for the multiple groups of actors to learn, communicate and draw support from each other. Fishing camps like Nyimba can be linked into a multi-centred (polycentric) system in which other groups, such as Shimungalu, are able to configure capabilities at wider scale to pressure the traditional authorities to conform. By strengthening groups of actors at lower levels, reliance on the constrained resources of government can be alleviated.

For the DoF to implement a nested system with polycentric governance across the Kafue Flats and empower the lower level groups of actors, the behaviour and attitudes of the corrupt traditional authorities have to change, which will require government (political) pressure. The DoF has to teach and persuade the traditional authorities that in a polycentric system of governance, the traditional authorities and the other groups of actors have some autonomy but they still have to conform to a set of rules. Actors who do not perform accordingly can be sanctioned by other actors and held accountable for their actions. Also, a nested system with polycentric governance will create a further opportunity for the multiple groups of actors to perceive the resource as a common resource, not as individual fisheries. The latter is important because when a resource is shared, what happens in one camp will eventually affect the other camps.

5.6 Summary of Results

The results are summarised in Table 5.1 below. The table highlights how capacity affects performance of groups of actors in regulating access to the Kafue fishery based on three predetermined attributes of capacity development – capacity assets, capabilities and context – and why entry is effectively regulated in some fishing camps (Shimungalu) and not others (Nyimba).

Table 5.1: Summary of results

CAPACITY ATTRIBUTES	KEY FINDINGS	NYIMBA	SHIMUNGALU
		MIGRANT FISHER-FOLK	
	Names of migrant fisher-folk	Migrant fisher-folk are referred to as: "*Ba Mwachusa*" (foreign migrant); "*Ba Bemba*"(Bemba-speaking migrants from northern or Luapula provinces); and "*Ba Mulumbu*" (migrant fisher-folk.	Migrant fisher-folk are referred to as"*Ba Lendo*" (visitors).
Assets	Fishing equipment and methods	Migrant fisher-folk want to use the same destructive fishing gear and methods that caused their fish to deplete at their places of origin.	Migrant fisher-folk want to use the same destructive fishing gear and methods but are not allowed to do so.
	Money, transport and education	Assets make migrants competitve and confident in their ability to gain access to the fishery within the Nyimba fishing zone.	Migrants are unable to use their assets as the traditional and community leaders have high self-esteem and confidence in their ability to regulate access to and use of their fish resource.
Capabilities	Capability to enagge	Migrants use assets available to them to engage with corrupt headmen, and fellows from the same tribe, relatives or past migrants who had been accepted into the communities.	Even though the population is drawn from a number of tribes, the strict enforcement of by-laws and sense of community make it difficult for migrants to engage with

Context	Internal atitudes and behaviour	Migrants are considered to be stubborn. They treat the locals as uneducated and therefore not capable of being able to use the assets they have (including government) to exert authority over them. They use the notion of "citizenship" rather than "belonging" as justification for access to the fishery while at the same time not acknowledging the legitimate role of traditional authorities.	the local fisher-folk and use their assets to buy their way into the community through the traditional and community leaders.
GOVERNMENT PERSPECTIVES			
Assets	Financial resources and eqiupment	Insufficient funds for operations and equipment.	Same.
	Human capital	Insufficient staff at implementation level.	Same.
	Legal provisions	Weak penatlies for fishers who break the laws.	Same.
	Support networks	Weak support networks between the DoF, FVMC, traditional authorities and ZAWA.	Strong support networks between the DoF, FMC, traditional authorities and ZAWA.
Capabilities	Capability to relate and to attract resources and support	Unable to utililse local (FVMC and traditional authorities) resources and draw support.	Able to attract and utililse resources and support from local groups of actors (FMC and traditional authorities).

	Capability to carry out technical tasks, service delivery and logistical tasks	Assets made it difficult to service Nyimba, which is remotely located.	Shimungalu is easier to access, and thus service is easier to carry out.
Context	Internal motivation, behaviour and attitude	Limited resources affect movitional of the DoF officers. Attitudes and styles of policing and perceptions of power imbalances create conditions that affect the motivation of both fisher-folk and DoF personnel to work with ZAWA in Nyimba.	Limited resources affect movitional of the DoF officers but strong support networks have helped the officers stay motivated.
COMMUNITY PERSPECTIVES			
Assets	Support networks	Weak support system agmonst from the FVMC, traditional authorities and DoF.	Strong support system agmonst FMC, traditional authorities, government and neighbouring villages.
	Incentives	Three committees (FVMC, CRB and Neighbourhood Watch group). CRB offers incentives for participation but the FVMC does not.	One committee (FMC). FMC scouts recieve incentives for participation.
	Epuipment	Monitoring is restrained as resident fisher-folk are not willing to lend their banana boats to the committee members.	Resident fisher-folk and the DoF lend their boats to scouts for monitoring purposes.
	Mobile communication	Mobile network is scarce; only certain points have network (field notes).	Mobile network is easily accessible.
	Collective identity and	The resident fisher-folk, FVMC	Resident fisher-folk, FMC

	action	and traditional authorities act independently. No collective identity and action.	and traditional authorities in Shimungalu have constructed a collective identity reinforced by social learning and collective action that enables them to act collectivelly towards the goal of effectively regulating access to and use of their resource.
	By-laws	Unable to implement and enforce by-laws.	Able to implement and enforce by-laws because of strong support networks and volunteer scouts.
Capabilities	Capability to enagge and commit by taking ownership of the resource	Weak sense of ownership, expecting the DoF officers to take responsibility.	Assumed ownership of their resource both individually and at community level.
	Capability to adapt and self-renew through internal dialogue and communication	Mistrust and lack of communication between the committee and some headmen. Three out of the five headmen are part the committee.	Internal dialogue and communication are facilitated through public meetings. High trust and committiment to work together. All three headmen and village secretaries are part of the committee.
Contexts	Internal motivation	Not motivated, disillusioned.	Highly motivated.
	Internal behaviour and attitude	Low self- esteem and confidence resulting in inferiority complex.	High self-esteem and confidence.

The results presented in the table above highlight the importance that should be given to "configuring assets and capabilities". The situation in Nyimba demonstrates that having assets is not enough if institutions cannot configure their capabilities to become mutually supportive. In Shimungalu the local institutions and government were able to configure their capabilities, creating a favourable context, which enabled the locals to take ownership of their resource and self-regulate.

5.7 Conclusion

This chapter dealt with the research results of the study based on in-depth, semi-structured interviews with respondents from two study sites, Shimungalu and Nyimba fishing camps, on the Kafue Flats of Zambia. The results highlight that migrants create contexts that make effective regulation difficult for fishing camps such Nyimba that have weak governance systems. The ability to use local institutions depends on the relevant actors' ability to configure their assets and capabilities to create contexts that enable effective regulation of new entrants and use of their resource. The groups of actors in Shimungalu have been able to this and effectively regulate access to and use of their resource while the groups of actors in Nyimba have been unable to do so. As a result, those in Nyimba have not been able to bring pressure to bear on the traditional authorities to support the FVMC and DoF so that corruption can be prevented.

Assets constrain the national government's ability to regulate the fishery. It has to therefore discover a way of using the assets it has, together with those that other groups of actors, to more effectively manage the fishery. It has to be able to configure assets and capabilities to establish a collective approach to governance for the multiple camps across the Kafue Flats.

A polycentric system approach to governance is a way of devolving authority, decision-making and strengthening and configuring assets and capabilities. The results for Shimungalu show that a polycentric governance system can connect actors and promote experimentation, communication, collaboration and learning at different scales. It can effect these changes at one camp to spread to multiple camps across the Kafue floodplain fishery. The chapter that follows discusses the findings of the study and operationalising polycentric governance within the context of existing literature.

CHAPTER SIX - DISCUSSION

6.1 Overview

In this chapter I discuss the findings based on existing literature and draw conclusions. The chapter is divided into five sections. In the first, I consider decentralisation and co-management on the Kafue floodplain fishery. In the second I discuss the complex polycentric nature of the Kafue floodplain fishery and thus how capacity (assets, capabilities and context) has affected the performance of the institutions. Then, in the third, I consider how polycentric governance promotes resilience in social-ecological systems such as the Kafue floodplain fishery. In the fourth section I illustrate how polycentric governance might be designed and operationalised across the Kafue floodplain. Lastly, I draw conclusions.

6.2 Introduction

The Zambian Fisheries Act of 1974 was revised to decentralise and devolve fishery management responsibilities from DoF to local communities, even though it was not ratified until 2011 (Malasha, 2007). Responding to the granting of authority to decentralise management and growing conflicts, the DoF in Mazabuka District began to promote the establishment of community-based management committees and by-laws for the Kafue floodplain fishery.

The central assumption of community-based management committees in natural resources management is that local people will be able to manage lands and natural resources through locally devised rules and procedures, as communal property (E. Ostrom, 1990). However, Nagendra and E. Ostrom (2012: 104) caution that this approach can fail when efforts to "decentralise governmental arrangements do not recognise the importance of complex, polycentric arrangements and are based on a presumption of a single government at one level taking charge of a policy arena, ignoring the existence of many vibrant self-governed institutions [organisations and their governance mechanisms]".

6.3 The Complex Polycentric Nature of the Kafue Floodplain Fishery

The Kafue floodplain fishery is spatially complex, involving many fishing camps distributed along more than 100km of a river system, some of which are easily accessed while others are remote. To access the latter by boat can take considerable time. Further complexity is

added by the seasonal nature of the fishery and the attraction it offers for people from outside of the area, who complicate the definition of who can and cannot claim access to the resource. This issue is further complicated by the fact that although the fishing licence specifies a fishery, such as the Kafue floodplain, it does not specify where in the system the person can fish. Access to a fishing camp is thus also governed by local traditions and rules which, as this study shows, can be undermined by corrupt officials. This complexity inevitably leads to local groups making many decisions that affect their own and the wellbeing of others who are dependent on the greater shared resource – the floodplain fishery. These factors interact to bring about a complex system of governance involving multiple groups structured horizontally (spatially) and vertically with the traditional authorities and with the DoF and ZAWA at the highest levels. It is thus a nested system with polycentric governance.

As this study has shown, however, capacity constrains the performance of institutions. This study shows that while both Shimungalu and Nyimba fishing camps had "a repertoire of potential solutions to unforeseen problems and unpredictable variations" (Engle, 2011: 648), one was successful because it could co-configure its own assets and capabilities with those of neighbouring fishing camps, the traditional authorities and DoF, whereas the other was not. Contributing to the sense of being powerless amongst institutions in Nyimba were persistence of the 'tradition of headmen being able to distribute goods and to secure their positions' (Cutshall, 1980; Chabwela and Haller, 2010), an inability to secure effective participation from the traditional authorities and being remote, meaning that a weakened DoF was not motivated to engage either on its own, or together with other parties in government, with sufficient commitment to be able to effect reform. However, the DoF serving at the highest level within the nested system is accountable for requiring conformance from the traditional authorities. It cannot expect the lower levels to achieve success without support.

This study resonates with other studies that suggest that the concept of capacity is related to other similar concepts such as vulnerability and resilience (Engle, 2011). For fishing communities to be resilient in the face of threats, such as those posed by migrants, they must commit to investing the energies and resources required to configure the current assets and capabilities toward building and sustaining long-term relationships. It is through the exchanges that occur in such relationships that capacity assets and capabilities are enhanced and remain relevant. Nkhata et al. (2009) suggest that networking among stakeholders builds and sustains trust, commitment, respect, leadership and shared norms, which provide a foundation for governance. Co-configuration of assets and capabilities

among multiple parties requires trust. As trust evolves from an actor's past experience, current interactions and expectations (Nkhata et al., 2009), it cannot be achieved in the absence of sustained relationships. The fishers in Shimungalu have been able to sustain relationships by fostering internal and external dialogue and building trust and commitment amongst community members and between the FMC and DoF officers and regulate the fishery. Nyimba has failed because it has not been able to construct and sustain relationships among the parties. To a large extent, this is a consequence of the inability of the DoF to exert sufficient influence to stop corruption.

The European Centre for Development Policy Management (ECDMP) (2008: 8) has stressed the need to "encourage leadership to help groups work together" because "at the core of effective capacity development is endogenous energy, motivation, commitment and persistence". But leadership is an emergent property. As Avolio (2007: 31) observed, "leadership is a function of both the leader and the led and the complexity of the context". Thus because the context of fisheries management on the Kafue Flats involves multiple parties and is complex, it requires a formal approach to governance, an approach that enables self-organisation at local level, incorporates a property rights regime that empowers legitimate users to act authoritatively (Schlager and E. Ostrom, 1992) and facilitates expression of leadership and the harnessing of local energy and knowledge.

Furthermore, literature suggests that governance for sustainability in social-ecological systems (SES), such as the Kafue floodplain fishery, requires "crafting long-enduring institutional arrangements" (E. Ostrom, 1990). After several case studies, E. Ostrom and her colleagues (1990) suggested "eight design principles illustrated by long-enduring common pool resources" (see Box 6.1). These principles are also embedded in the works of Garrett Hardin (1968), James Wilson (1977), Robert Wade (1987), Anderies et al. (2004), and many other scholars. Extending these design principles to the fishing camps on the Kafue Flats provides an opportunity to strengthen the governance systems by enabling local groups to counter the entitlement migrants express based on the terms of the fishing licence.

Box 6.1: Eight design principles illustrated by long-enduring CPR

1. **Clearly defined boundaries:** Defining who can withdraw common resources and who cannot. This feature makes the resources "common property" of insiders but does not allow "open access" to outsiders.
2. **Congruence between appropriation and provision rules and local conditions**: Appropriation rules that restrict time, place, technology, and/or quantity of resources withdrawn, where these rules are tailored to local conditions.
3. **Collective-choice arrangements**: Collective choice rules that allow most individuals affected by rules to participate in any modification of these rules.
4. **Monitoring:** Monitoring of compliance, where the monitors are accountable to the local resource appropriators. Self-enforcement by group members is a critical feature of most successful solutions, and usually works better than attempts to enforce rules passed by an outside government that is ill-equipped to enforce these rules.
5. **Graduated sanctions for non-compliance:** Where the severity of sanctions depends on the severity and context of the offense.
6. **Conflict resolution mechanisms**: Access to rapid, low-cost arenas to resolve conflict among uses and between users and officials.
7. **Minimal recognition of the right to organise**: By a national or local government.
8. **Nested enterprises**: For larger common pools, the presence of governance activities organised in multiple layers of nested enterprises.

Source: E. Ostrom (1990).

The term "common pool resource" (CRP) refers to "a natural or man-made resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use" (E. Ostrom, 1990: 30). A CRP is thus a resource that is shared, owned or used by a group of people (collective), for instance fisheries, groundwater basins and irrigation systems. Thus collective action that supports co-ordinated responses to the challenges of excludability and subtractability is fundamental in the management of the use of CPRs (Wade, 1987; Berkes, 1989; E. Ostrom, 1999; Burger, 2001; Araral, 2009; Poteete et al., 2010). Collective action emerges when a group of actors and individuals sharing a resource, for example a river or a lake, view the resource as a common resource and clearly define the boundaries of the resource. These conditions must

hold for users and outsiders to recognise legitimate group members, the area to which users have rights and the perimeter that users protect from incursions. When these conditions are not met, the resource exists *de facto* as open access (Tucker, 1999). The system of governance evidenced from this study shows that when a collective is able to claim ownership of the shared resource (as demonstrated in Shimungalu), it is better able to recognise legitimate group members and exclude those who are not. It also shows that when a collective cannot do this, such as in the case in Nyimba, it is not able to exclude new users. In this case, the FVMC and by-laws provide a basis for assuming ownership responsibilities but are not sufficiently explicit, thereby weakening the FVMCs.

Also important in the management of access to and the use of CPRs are the other design principles suggested by E. Ostrom (1990): congruence between appropriation and provision rules and local conditions, collective-choice arrangements, monitoring, graduated sanctions for non-compliance, conflict resolution mechanisms, minimal recognition of the right to organise and nested enterprises. However, drawing from a study carried out on freshwater fisheries in southern Africa, Jul-Larsen et al. (2003) highlight that the social-political and ecological dynamics of the societies and lakes studied are quite complex. According to them, "this complexity is not fully captured either by the assumptions underlying model-based management approaches exemplified by Common Property [pool] Theory, or by neo-institutional framework underlying much of the co-management approaches" (Jul-Larsen et al., 2003: 83). The reason lies in the fact that the governance of complex (and sometimes large) SESs requires management approaches that engage actors at different scales and levels, interacting under a set of rules (E. Ostrom, 2009; Heikkila et al., 2011). Ostrom's design principle on nested enterprises deals with the latter, as it highlights the need to establish "organized multiple layers of nested enterprises", where "smaller-scale organizations tend to be nested in ever larger organizations'' (E. Ostrom, 2005: 269). It seeks to address the emerging issues for larger CPRs where the presence of governance activities are organised in multiple layers of nested enterprises (E. Ostrom, 1990). The term "nested enterprises" refers to "interrelated (sometimes hierarchical) organizational components that take on complementary sets of responsibilities" but "vary to suit the nature of the CP resource and its context" (Tucker, 1999: 5).

For a large CPR, such as the Kafue floodplain fishery with multiple groups of actors, although migration is a problem that is felt at every camp on the Kafue Flats, the management of migrants cannot be left simply to each individual camp; the consequences of doing so are evident in Nyimba. Governance mechanisms designed at any single level and scale cannot provide complete and effective solutions for the overarching challenges that

arise in CPR systems (such as fisheries, forestry, water resources) (Nagendra and E. Ostrom, 2012).

However, it must be noted that in the governance of complex systems, nesting institutions is not enough. It requires polycentric institutions (Nagendra and E. Ostrom, 2012) that are structured in such as way – vertically and horizontally (nested) – as to retain directive control from government (in this study), while providing opportunity for negotiation of rules by local user groups. They also "improve the fit between knowledge, action, and social-ecological contexts in ways that allow societies to respond more adaptively at appropriate levels" (Lebel et al., 2006: 19). It is this responsibility for "direct control" that has failed governance in Nyimba where the need is for the DoF to use national government influence to stop corruption. This observation emphasises the fact that the DoF has to understand that its role needs to be more comprehensive than licensing, prosecution and extension; it has to have the courage to bring about reform through exerting pressure on local government. It also needs to establish a collective system of governance that will facilitate interdependencies between groups of actors at different scales and levels. This may be an opportune time for government to consider establishing a more formal nested system with polycentric governance of fisheries on the Kafue Flats and beyond.

6.4 Polycentric Governance and Resilience

Resilience is defined as the "capacity for a system to survive, adapt, and flourish in the face of turbulent change and uncertainty" (Fiksel, 2007: 27). Change is a feature of complex SESs. Anticipating and managing the implications of change helps to confer resilience on a system. In Shimungalu, exploitation was destroying the resource with potentially disastrous consequences. The introduction of a form of polycentric system of governance has contributed to managing the threat and positioning the residents to be better able to anticipate and respond to change. However, no matter how well Shimungalu manages its use of the resource, success ultimately depends on how successful other fishing camps are, because the resource (fish) is mobile and stocks can be depleted by the actions of others. The implication here is that resilience requires a polycentric approach to governance that includes multiple (all) fishing camps who draw from the same stock and whose activities jointly determine sustainability.

The key components of nested polycentric governance systems include: dispersal of political authority, separately constituted bodies, overlapping jurisdictions, providing of opportunity for enhanced learning and experimentation, increased self-governing capacity of local

communities and increased cross-scale linkages between horizontal and vertical levels of organisations (Acheson, 1988; Berkes, 2002; E. Ostrom, 2005; Cash et al., 2006; Huitema et al., 2009). Nested systems with polycentric governance are thus regarded as mechanisms that increase the capacity of institutional arrangements where decisions are made by diverse sets of actors linked across different organisational units (McGinnis, 1999; E. Ostrom, 2005; Andersson and E. Ostrom, 2008). A nested polycentric approach to governance (polycentricity) "is a governance system in which there are multiple interacting governing bodies with autonomy to make and enforce rules within a specific policy arena and geography" (clearly defined boundaries) (Schoon et al., 2015: 226). The "notion of bounded autonomy implies that autonomous actors pursue their interests within the parameters of a common goal, self-organizing to address emerging challenges" (Araral and Hartley, 2013: 14). Autonomy refers to the ability of local resource users to devise their own formal and informal rules, norms and strategies for the governance of natural resources without being challenged by non-local units (E. Ostrom, 1990; 2005). Because the Kafue floodplain fish can be understood as a resource shared by many fishing camps operating under different traditional jurisdictions accountable to central government, it has different scales of organisation that need to interact vertically and horizontally while retaining autonomy; it requires a polycentric governance system.

Early theoretical work on polycentric governance revealed that metropolitan areas that were characterised by a mixture of very large- medium- and small-scale organisations (groups of actors) outperformed those served by very large or very small units alone (McGinnis, 1999). Furthermore, polycentric systems, such as those illustrated on a small scale by Shimungalu, and its drawing in of other fishing camps to constitute collective governance, tend to enhance innovation, learning, adaptation, trustworthiness and levels of cooperation of participants and result in the achievement of more effective, equitable and sustainable outcomes at multiple scales (E. Ostrom, 2010; Toonen, 2010). Empirical studies indicate that polycentric governance systems are more resilient and adaptable to change because issues from a range of geographic scopes can be managed at different levels and, owing to a high degree of overlap and redundancy, they are less vulnerable (E. Ostrom, 2005; Huitema et al., 2009). Important in the context of this study is the fact that in polycentric systems, there is "recourse to central mechanisms to resolve conflicts" and "political jurisdictions should function in a coherent manner with predictable patterns of interacting behaviour" (V. Ostrom et al., 1961: 831–32). In Nyimba, the political jurisdictions do not function in a coherent manner with predictable patterns of behaviour, and people feel they have no recourse to mechanisms for conflict resolution. Until this situation changes, moves toward establishing a polycentric system of governance and sustainability will be compromised.

Schoon and colleagues (2015) use examples drawn from other scholars to describe the mechanisms by which polycentricity enhances resilience of ecosystem services (Table 6.1). This evidence supports the contention that the DoF should consider establishing polycentric governance at the scale of the floodplain fishery.

Table 6.1: Mechanisms by which polycentricity enhances resilience of ecosystem services

Mechanism	**Example**	**Source**
Provides opportunities for enhanced learning and experimentation	Collaboration between local organisations and state governmental units in the lobster fisheries of Maine	Acheson, 1988
Broadens participation across scales	Local and regional water governance where polycentric institutions and/or organisations facilitate participation by a broad range of actors and the incorporation of local, traditional and scientific knowledge	Neef, 2009; Murtinho and Hayes, 2012
Improves connectivity in governance	Nested cross-scale linkages with higher levels of governance in the Seri fisheries of Gulf of California	Basurto and E. Ostrom, 2009
Creates modularity	Linked but separate legal systems in former British colonies allow for a common evolution of the recognition of aboriginal rights while rooted in each context by each country's legal institutions	Havemann, 2001
Improves the potential for response diversity	Where institutional failure occurs at the national and international level, local-level conservation actions can provide functional redundancy by, for instance, protecting species through assisted migration, protection of migration corridors and other place-based actions	Rohlf, 2001

Builds in redundancy that can minimise and correct errors in governance	The United States federal government's capacity to protect endangered species in cases where local efforts prove ineffectual	Nagle and Ruhl, 2002

Source: Schoon et al. (2015).

6.5 Operationalising Nested Polycentric Governance

Pahl-Wostl et al. (2012) suggest that the understanding of polycentric needs to be refined, in terms of identifying how power is distributed across actors and spatial levels and how different governance modes act in concert under various circumstances (contexts). The first step is establishing a model of how the nested system with polycentric governance would work within a clearly defined geographical setting, such as the Kafue floodplain fishery, and by taking into consideration the multiple groups of actors at different scales and levels. Such a system is depicted in Figure 6.1.

A nested polycentric governance system includes both a horizontal and vertical dimension to co-ordination, building on social capital and enabling co-ordination at the relevant scale (Araral, and Hartley, 2013). This governance assumes an organisational structure where many centres of independent actors mutually order their relationships under a general system of rules (V. Ostrom, 1972). Although such systems include different levels (such as national government and fishing village committees), the model does not represent a down–top or top–down approach. Instead, it represents a collective governance system in which all groups of actors involved in fisheries management on the Kafue floodplain fishery can interact across scales and levels under a general set of rules.

Each fishing camp has a FVMC. When some of these are grouped (nested) to collaborate, as in Shimungalu, they would form a Kafue Flats Fishery Sector Association (KFFSA). These Associations would nest with others to constitute the Kafue Flats Fishery Association (KFFA). Fishers in a village would be represented in the FVMC, which would be represented in the KFFSA, which, in turn, would be represented in the KFFA. Membership of the nests can include appropriate representatives from the DoF, ZAWA, other government departments and the traditional authority. And, because of the importance of connectivity for learning in polycentric systems, membership can also include NGOs such as WWF Zambia, who can bring new perspectives and assets to fishery governance and management.

Araral and Hartley (2013) have illustrated how polycentric governance operates in the San Francisco Bay Area. The San Francisco Bay Area comprises nine counties and 151 municipalities and is geographically constrained by the Pacific Ocean, multiple inland water bodies and the surrounding mountainous terrain (Araral and Hartley, 2013). Through the Association of Bay Area Governments (ABAG), groups of actors within a region work together. On another scale, the Bay Area Air Quality Management District (BAAQMD) regulates stationary sources of air pollution, and is overseen by a board of representatives from all nine regional counties. There is also an Air Resources Board (ARB), which as the state-level regulator works with local authorities to develop emissions assessments and targets. In response to growing public concern about environmental sensitivity at waterfronts and coastal wetlands in 1965, the California Legislature commissioned the formation of the San Francisco Bay Conservation and Development Commission (BCDC) (BCDC, 2007 In: Araral and Hartley, 2013). There is also a metropolitan body addressing water quality, the Regional Water Quality Control Board (Araral and Hartley, 2013). These organisations work together under the umbrella of two collective bodies, the Bay Area Joint Policy Committee (JPC) and the Focusing Our Vision (FOCUS) program (Araral and Hartley, 2013). These authors further indicate that "in the absence of the Department of the Environment" (government department in-charge of environmental and natural resource management) "due to inadequate funding and tepid political support", these "organisations have filled the institutional void" (Araral and Hartley, 2013: 20). It is also important to note that this polycentric governance system has been achieved with the involvement of multiple stakeholders, such as businesses and NGOs (Araral and Hartley, 2013).

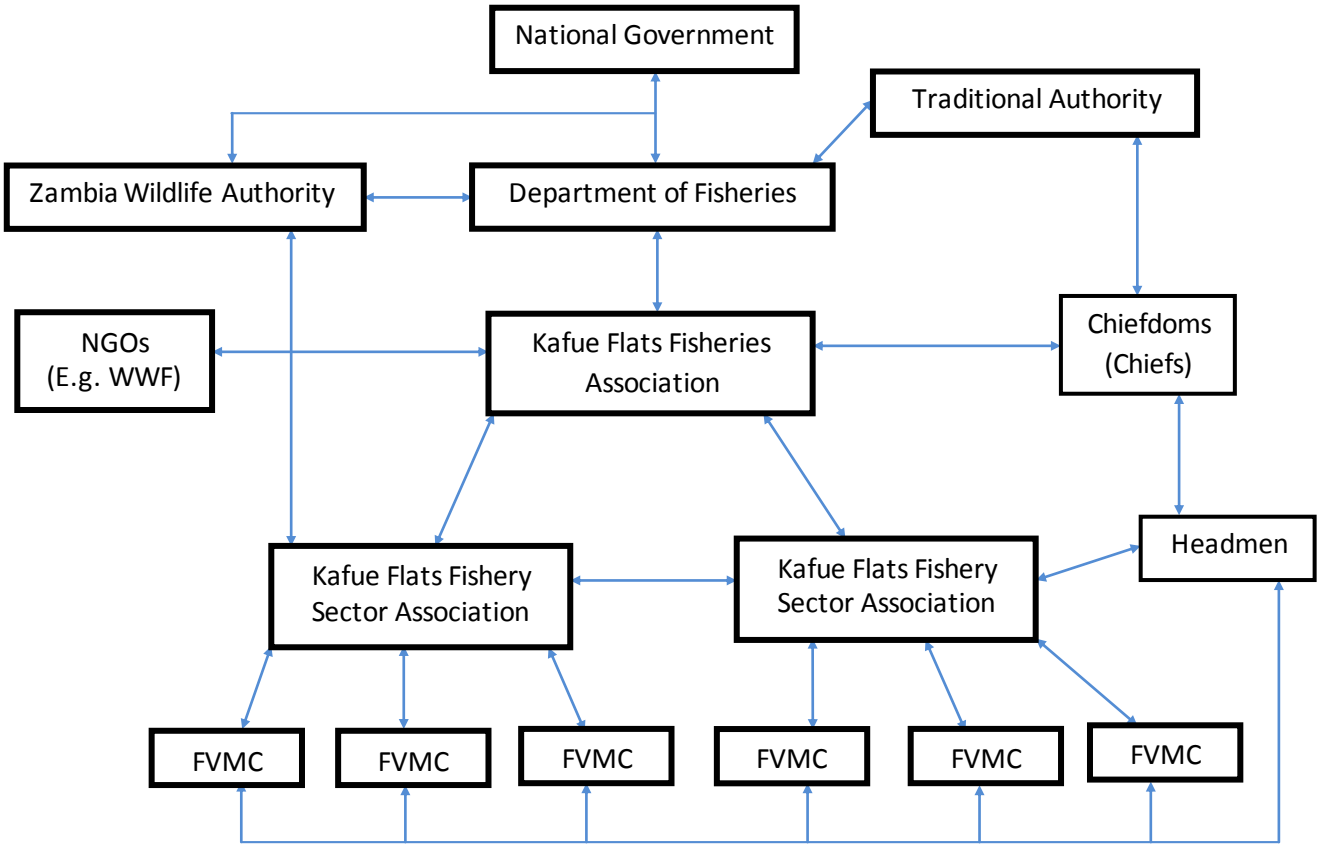

Figure 6.1: Polycentric governance system for the Kafue floodplain fishery

Source: Own Presentation.

Nagendra and E. Ostrom (2012) and Gruby and Basurto (2014) explain that allowing actors sharing a resource to form smaller-scale collective units (such as the FVMC, KFFSA and KFFA) encourages face-to-face discussion, promotes the achievement of common understanding and spreads the costs of conservation across resource owners and/or users. In polycentric governance, actors can learn from and imitate the most successful models adopted by their neighbours without waiting for approval from some overarching authority or majority (Pennington, 2012). "The minimal recognition of rights to organize leads to a situation in which a variety of approaches to similar problems are available at all times" (Tarko, 2014: 7). Brondizio et al. (2009) explain that a broadly inclusive system with governance at multiple smaller scales provides opportunities for experimentation at more localised levels, creating natural experiments for trying different policies and mechanisms. According to Ricketts (2000), as actors exit and enter different institutional designs, the signals generated by such decisions may facilitate a process of institutional learning, which affects the system as a whole. Indeed, "polycentric systems have overlapping units, information about what has worked well in one setting can be transmitted to others who may

try it out in their settings" (E. Ostrom, 2005: 183). In this case, the FVMC, KFFSA and KFFA create opportunities for groups of actors in remote fishing camps to experiment, learn and draw support from groups of actors. The social capital that groups of actors and individuals can create by linking with each other, with governmental and NGO actors at diverse levels, is essential for effective feedback, learning and for crafting of new and better governance solutions (E. Ostrom and Ahn, 2009).

On a wider scale, establishing interlinked scale-collective units in a nested polycentric governance system broadens participation across scales and improves connectivity in governance (Schoon et al., 2015). Drawing from a study on polycentric governance and climate change, Adler (2005), for example, suggests that creating polycentric institutional arrangements helps to fulfil the matching principle in international law that problems involving multiple levels (such as global, national, regional, and small scales) should involve contributions at each of these levels. Falk et al. (2009) who studied rural water supply reforms in southern Africa, suggest that improving participation and connectivity in a polycentric governance system depends on the right combination of statutory and customary enforcement mechanisms, an assertion that is supported by the failure of Nyimba and the success of Shimungalu in regulating access. According to their study, increasing polycentric governance in water management regimes requires that operational and monitoring functions are largely devolved to the local level while the state retains some degree of control and assumes a role as facilitator. Instituting polycentric governance and re-defining its role as a facilitator might help the DoF address the negativity expressed by staff. Particularly, "increasing legitimacy and accountability through pushing the decision-making authority (and responsibility) down to the lowest local level possible, benefits monitoring and enforcement (of locally designed and implemented) rules" (Schoon et al., 2015: 234).

The OCED (2015) in a recent study on stakeholder engagement for inclusive water governance give a clearer view of how stakeholder engagement can be established and mapped amongst multiple groups of resource users. According to the OCED,

> Proper stakeholder engagement requires thorough identification of the actors to be engaged within and outside the 'water box', as well as a good understanding of their core motivations. Knowing who is responsible for what and at which level is a first step towards understanding the stakeholder 'landscape' and identifying redundancies and gaps in the institutional framework that impact policy coherence and sector performance. (2015: 70)

With proper stakeholder involvement, the multi-level governance groups are able to escalate bigger problems and share information with the other scales as they are vertically (nested) and horizontally structured (OCED, 2014, 2015). Access to (new) information is crucial and is a source of power, thus institutions are important because they determine how information flows to different social groups (Agrawal, 2008; Nkondo et al., 2009).

Polycentric systems elevate the capacity of multi-level actors to develop a robust frame of knowledge and information on which they can rely (Araral and Hartley, 2013). Earlier literature also suggests that how well information flows within institutions, among institutions and between institutions and their environment influences access to new information (Craik, 1972; Uwadia, 1990). The managers in nested polycentric governance have to establish a formal reporting system, framework (criteria of the things to be reported) and documentation to ensure that a data base is created. These factors are important because the ability of organisations (institutions) to respond to new knowledge depends on whether they have access to new information and whether they have the will and capacity to act on that information (McLain and Lee, 1996). Knowledge also plays a role in ensuring local empowerment and raising awareness of the needs of particular groups within a collective (Ospina and Heeks, 2010). This understanding is illustrated in Shimungalu, where drawing in other fishing camps into a “Sector Association” has enabled new villages to access and respond to new information. And, perhaps, had Nyimba been organised as a Sector Association with participation in a Kafue Flats Fishery Association, it may have been able to bring the necessary pressure on the traditional authorities to improve support and stop corrupt practise.

Effective management requires that societies do more than merely acquire knowledge; they must also change their behaviour in response to new understandings about how the world works (McLain and Lee, 1996). For a nested system with polycentric governance to work on the Kafue floodplain fishery, the groups of actors have to be able to align their behaviour towards the collective goal of achieving a sustainable fishery at a scale much larger than individual villages. V. Ostrom (1999: 382) explains that “rules are intended to constrain some forms of behaviour and facilitate other forms of behaviour. By acting with reference to rules an individual can anticipate how others may be expected to act so that human beings may maintain orderly relationships with one another.” Other authors such as Dale (1991) and Fox (1991) point out that actors, and their institutions have to be convinced that it is in their best interest to engage in long-term, collective action that maintains or improves the system's overall integrity and productivity for them to develop environmentally sound management behaviour. Shimungalu illustrates how connectivity has promoted understanding that it is in

the best interests of a group of fishing villages to act collectively to protect the integrity of the resource and also of their traditions that assist in managing access. However, to achieve this success at the scale of the Kafue floodplain fishery will require political (government) and NGOs' appreciation for the need to implement a polycentric form of governance.

Schoon et al. (2015: 234) state that "a polycentric approach has been suggested to confer connectivity, modularity, response diversity and functional redundancy that can foster preservation of key SES elements in the face of disturbance and change". Building in a degree of modularity is considered important for preserving overall resilience of SESs (Levin, 1999) because it improves ability to adapt to a changing environment so that system integrity is less affected by sudden changes or failure in parts of the system (Pahl-Wostl, 1995; Pahl-Wostl et al., 2007; E. Ostrom, 2001, 2010). Schoon et al. (2015), indicate that modularity and connectivity in a nested polycentric governance system can be demonstrated when broader levels of governance get involved after local levels collapse and fail. Citing instances of how the United States Federal Government steps in to protect endangered species when local level efforts are ineffective, the authors are able to demonstrate how modularity of a system allows governance bodies to reduce exposure to failures and losses (Schoon et al., 2015). In this instance, the involvement of NGOs (for example, WWF Zambia and WorldFish Center Zambia) could be necessary in broadening levels of governance, as "NGOs are not only stakeholders in governance, but also a driving force behind greater international cooperation through the active mobilisation of public support for international agreements" (Gemmill and Bamidele-Izu, 2002).

Inputs by local resource users and national and regional governments create possibilities for response diversity and build redundancy that can minimise and correct errors in governance, as management regimes characterised by distribution of power and coordinated governance structures have higher performance (Pahl-Wostl et al., 2012; Schoon et al., 2015). In addition, Nagendra and E. Ostrom (2012) suggest that as the governance system continues to develop, actors can, and do, craft a diversity of rules that help them overcome the problems, including free-riding, by deciding who is included and must contribute resources, and who is excluded and how to exclude them. Actors are also said to devise rules that specify allowable forms of access and use and methods for monitoring behaviour and sanctioning violators of rules and ways of resolving conflict (Nagendra and E. Ostrom, 2012). The application of these rules and methods is exemplified in the success of Shimungalu and reinforces the need to establish a formal nested system with polycentric governance of fisheries on the Kafue Flats and beyond.

6.6 Conclusion

This chapter presented the findings of this study in light of existing literature. In many ways, Shimungalu can be understood as “an experiment” at a small scale within the floodplain. This camp illustrates the potential of polycentric governance to develop and enforce the rules required to promote sustainable use of the fish resource. It is successful in doing so as it enables the available assets and capabilities to be configured in ways that allow it to meet the challenge posed by migrants but also of promoting appropriate harvesting methods. Nyimba also provides lessons about polycentric governance, particularly about participation from broader levels of governance. As Araral and Hartley (2013: 20) showed in San Francisco Bay Area, there are solutions for situations where there is an “absence of the Department of the Environment [the DoF in the case of this present study] due to inadequate funding and tepid political support”. Polycentric governance offers a solution because it enables other organisations to fill the “institutional void”. The findings of this study expose an opportunity for the DoF and other stakeholders. In the context of the Kafue system and many other fisheries in Africa, while there will always be capacity constraints in governance, these can be mitigated and success achieved when polycentric governance is understood and implemented. The final chapter provides the conclusion, recommendations of the study and suggestion for further study.

CHATPER SEVEN – CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

In this chapter, I present the conclusions and implications of the study and make recommendations for further research to improve understanding of fisheries governance.

7.2 Conclusion and Study Implications

The purpose of this study was to gain insight into how capacity affects performance of institutions in regulating access to the Kafue fishery and why entry is effectively regulated in some fishing camps, such as Shimungalu, and not others, such as Nyimba. I used three components of capacity, assets, capabilities and context, to interpret interviews with the groups of actors. I demonstrate the merit of this approach in explaining why regulation is effective at Shimungalu and not at Nyimba. The study was based on the premise that the capacity of groups of actors to regulate access and methods of harvesting fish is continuously challenged as competition increases and technologies change (Nkhata et al., 2009; Nunan, 2010). Scholars have suggested that failure arises when governance mechanisms that have successfully regulated who has access to the common resources (fish in this study) and how units (fish) are harvested prove ineffective as new entrants gain access and over-exploit the stocks (E. Ostrom, 1990; FAO, 2002). For fishing communities to be resilient in the face of threats, such as those posed by migrants, they must commit to investing the energies and resources required to configure their assets and capabilities toward building and sustaining long-term relationships that provide a foundation for effective governance.

Mobilising resources and committing to investing energies requires a formal approach to governance, an approach that enables self-organisation at local level, incorporates a property rights regime that empowers legitimate users to act authoritatively (Schlager and E. Ostrom, 1992) and facilitates expression of leadership and the harnessing of local energy and knowledge. A widely recognised collective system of governance is a nested system with polycentric governance (polycentricity). Araral and Hartley (2013: 1) argue that "the idea of polycentricity is an idea whose time has come because of its powerful implications for the discourse on post-governance". Indeed, governance of complex SESs such as the Kafue floodplain fishery requires institutional diversity "embodied in multi-level, multi-purpose, multi-sectoral, and multi-functional [nests] of governance" (Araral and Hartley, 2013: 1). The nests of governance in a polycentric system have a certain degree of autonomy but still collaborate with others on specific issues, thus allowing experimentation and learning

amongst the stakeholders. Polycentricity is an approach that helps configure assets and capabilities to achieve synergy while requiring each nest to fulfil its responsibilities.

The polycentric system of governance evidenced from this study in Shimungalu shows that when groups of actors are empowered so that they are able to claim ownership of their allocation of a shared resource, they are better able to recognise legitimate group members and exclude those who are not. The co-configuration of assets and capabilities enables them to shape the context in which the fishery operates. It brings about and sustains mutual accountability among groups drawn from different camps, their institutions, traditional leadership and government. This accountability enables enforcement of by-laws and facilitates the shift in attitudes and behaviours of the fisher-folk in ways that build their capacity to regulate access and use by both local people and new entrants. However, for a nested system with polycentric governance to work on the Kafue floodplain fishery, the groups of actors have to be able to align their behaviour towards the collective goal of achieving a sustainable fishery at a scale much larger than individual fishing camps; the failure to regulate in Nyimba demonstrates the consequence of not doing so. Collective sustainable fishing will require greater commitment to institutional reform.

This research suggests that the government (DoF) should consider establishing a collective system of governance (polycentricity) that will facilitate interdependencies between groups of actors at different scales and levels across the Kafue floodplain fishery. Doing so would allow nests that may be struggling to control and regulate fishing in their area to draw support from other nests to effect change. Nyimba, for example, would be able to use the polycentric approach to draw in support from the traditional authority in Shimungalu and further afield in its efforts to control corruption. Such an approach would also help alleviate the capacity constraints that currently debilitate government's efforts to manage the fishery. This study thus illustrates the merits of defining a polycentric governance approach not by individual camps but by the resource and its users, as has been suggested by a number of authors (Wade, 1987; Berkes, 1989; E. Ostrom, 1999; Burger, 2001; Anderies et al., 2004; Araral, 2009; Poteete et al., 2010; Schoon et al., 2015). When one establishes the boundary of an SES as wider than "a camp," groups of stakeholders start to see that their success depends on the success of others; they start to act as a collective, they develop collective identity and they strive for common goals (Wade, 1987; Berkes, 1989; E. Ostrom, 1999; Burger, 2001; Anderies et al., 2004; Araral, 2009; Poteete et al., 2010; Schoon et al., 2015). Where there is motivated, strong leadership and support, as is the case in Shimungalu, it is possible for local people to act in support of each other over a wider scale than just their individual camp. If government is able to create the conditions that will provide the opportunity for the multiple groups of actors across the Kafue floodplain fishery to interact

horizontally and vertically within nested system with polycentric governance(collective system), it will be better able to mobilise local resources and create platforms for stakeholders to learn, communicate and draw support from each other. Therefore, this may be an opportune time for government to consider establishing a more formal nested system with polycentric governance of fisheries on the Kafue Flats and beyond.

7.3 Recommendations

Based on the findings of the study, I offer the following recommendations for improving fisheries governance on the Kafue Flats and beyond and for further study.

7.3.1 Recommendations for Policy

In line with the research results presented in Chapter Five and the discussions in the preceding chapter, the study offers the following recommendations with a view to improving fisheries governance on the Kafue Flats and beyond:

- Formal recognition of local authorities in the Fisheries Act. As evidenced in this study, migrant fisher-folk take advantage of the manner in which the fisheries legislation implies that the fisheries are "open access" and exploit the weak control at camp level. The government should strengthen the Fisheries Act of 2011 to support and formally legitimise the role of the local authorities in fisheries management. Government could thus review the legislation with a view to: 1) ensuring that fisheries cannot be regarded as "open access" resources, 2) defining conditions under which a migrant can access a fishery and 3) establishing a polycentric approach to fisheries governance.

- Capacity at all levels constrains, and is likely to continue to constrain, the effectiveness of governance of the fishery. This research illustrates the potential to alleviate the problem by introducing a polycentric approach to governance at the scale of the floodplain fishery. It is recommended that the DoF acting with all other stakeholders should: 1) develop an understanding of polycentric governance and its role in managing the floodplain fishery, 2) design and implement polycentric governance and 3) apply lessons learned to other fisheries in Zambia.

- Literature suggests that the fishery governance reforms commonly fail to take into account other sources of insecurity in people's lives that are unrelated to the state of fishery resources yet still cause migration (Alison et al., 2012). It is thus

recommended that "assistance from other sectors in solving some of fishing communities' most pressing non-fishery problems would make it easier for them to solve their fishery-related ones" (Alison et al., 2012: 25). However, the responses in this study suggested that fisher-folk migrate because they have depleted their fish resource in their places of origin. In a speech presented by Ichiro Nomura, FAO Assistant Director General for Fisheries at the State of World Fisheries and Aquaculture (SOFIA) in Rome, he noted, "while recovery of depleted stocks is urgent, it is just as important to avoid depleting still-healthy stocks in the first place by matching fishing efforts to what these stocks are capable of supporting" (2005). This is an important aspect that the government and other stakeholders may want to consider and act on.

7.3.2 Action Research to Promote the Introduction of Polycentric Governance on the Kafue Floodplain

Although the research endeavoured to cover many aspects in this study, it is worth mentioning that it falls short of providing some insights that could broaden and deepen the understanding about how capacity affects performance of institutions in regulating entrants and use of the fish resource. As such, the following suggestion that is made for future study:

- The evidence provided in this thesis points to the importance of creating a nested system with polycentric governance across the Kafue Flat fishery. Emphasis should be placed on the need to shift "from 'causal' approaches, seeking to *cause* change in others to 'enabling' orientations where efforts are made to *enable* people to implement the principles of ESD [Education for Sustainable Development] and respond to the environmental challenges they face from their own context" (Taylor, 2014: 2). Future study should thus consider deepening the understanding of establishing and operationalising a formal nested system with polycentric governance in a river basin context, considering the dynamics of multi-level and multi-scale groups of actors.

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APPENDICES

Appendix I: Ethics Approval Certificate

MONASH University

Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

This is to certify that the project below was considered by the Monash University Human Research Ethics Committee. The Committee was satisfied that the proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research* and has granted approval.

Project Number:	CF15/871 - 2015000391	
Project Title:	Institutions and Human Mobility in an African River Fishery: A Case Study of Shimungalu Fishing Camp in the Kafue Flats of Zambia	
Chief Investigator:	Assoc Prof Bimo Nkhata	
Approved:	**From:** 26 March 2015	**To:** 26 March 2020

Terms of approval - ***Failure to comply with the terms below is in breach of your approval and the Australian Code for the Responsible Conduct of Research.***

1. This research was approved with a Waiver of Consent under Chapter 2.3 of the National Statement.
2. The Chief investigator is responsible for ensuring that permission letters are obtained, if relevant, before any data collection can occur at the specified organisation.
3. Approval is only valid whilst you hold a position at Monash University.
4. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by MUHREC.
5. You should notify MUHREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
6. The Explanatory Statement must be on Monash University letterhead and the Monash University complaints clause must include your project number.
7. **Amendments to the approved project (including changes in personnel):** Require the submission of a Request for Amendment form to MUHREC and must not begin without written approval from MUHREC. Substantial variations may require a new application.
8. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
9. **Annual reports:** Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
10. **Final report:** A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
11. **Monitoring:** Projects may be subject to an audit or any other form of monitoring by MUHREC at any time.
12. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

[redacted]

Professor Nip Thomson
Chair, MUHREC

cc: Ms Sililo Agness Musutu

Monash University, Room 111, Chancellery Building 3e
24 Sports Walk, Clayton Campus, Wellington Rd
Clayton VIC 3800, Australia
Telephone: +61 3 9905 5490 Facsimile: +61 3 9905 3831
Email: muhrec@monash.edu http://intranet.monash.edu.au/researchadmin/human/index.php
ABN 12 377 614 012 CRICOS Provider #00008C

Appendix II: Explanatory Statement

MONASH University

EXPLANATORY STATEMENT

Project: Institutions and Human Mobility in an African River Fishery: A Case Study of Shimungalu and Nyimba Fishing Camp in the Kafue Flats of Zambia

Chief Investigator's name: Prof Bimo Nkhata
Department of Social Sciences
[redacted]

Student's name: Sililo Agness Musutu
[redacted]

You are invited to take part in this study. Please read this Explanatory Statement in full before deciding whether or not to participate in this research. If you would like further information regarding any aspect of this project, you are encouraged to contact the researchers via the phone numbers or email addresses listed above.

What does the research involve?

The aim of this study is to gain insight into how capacity affects performance of groups of actors (institutions) in regulating access to the Kafue fishery and why entry is effectively regulated in some fishing camps such as Shimungalu and not others such as Nyimba. The study involves you participating in an interview that will last for approximately 20 to 40 minutes. The interview will be audio recorded. Your identity will remain confidential. If you wish, you may request a copy of the transcribed interview script to be provided to you for confirmation before being included in the research findings. Interviews will be conducted in a location convenient to you.

Why were you chosen for this research?

I am seeking the views of stakeholders (such as District government officers, traditional authorities and members of the community-based management committees) to better understand how capacity affects performance of groups of actors (institutions) in regulating access to the Kafue fishery and why entry is effectively regulated in some fishing camps such as Shimungalu and not others such as Nyimba. Your contact details were obtained from the Department of Fisheries, Lusaka Office, and World Wide Fund for Nature Zambia during a preliminary scoping exercise from 28th September – 04th October, 2014.

Source of funding

This research is funded by Lloyds Register Foundation.

Consenting to participate in the project and withdrawing from the research

The consent process involves signing a consent form prior to the interviews. This explanatory form is for your storage but I will return the consent form once you have signed it. Being in this study is voluntary. You are under no obligation to consent to participation and if you agree to participate, you may withdraw at any stage or avoid answering questions which you are not comfortable with. A decision to withdrawal will not disadvantage you in any way.

Possible benefits and risks to participants

There are no foreseeable risks associated with the study. However, the resultant benefits that will accrue from this research will be helpful in improving institutional arrangements of the study communities.

Confidentiality

All aspects of the study, including results, will be completely confidential. All reference to the participants in the transcribed interview notes will be anonymous with actual contact information held separately. No findings will identify any individual. Reference of the interviewees will be by date, place of residence, and title.

Storage of data

Data collected will be stored on Monash South Africa premises in a locked filing cabinet for 5 years from the time of data collection. This is in accordance with the University's regulations. Within this period, you may request a copy of the collected data. Also, the researchers (chief investigator and I) will have access to the data. After the 5 year period of data storage, the data will be destroyed in accordance with the stipulated Monash University guidelines.

Use of data for other purposes

A report of the study will submitted for publication within the 5 year period mentioned above, but individual participants will not be identifiable in such a report.

Results

If you would like to be informed of the aggregate research finding, please contact Sililo Agness Musutu [redacted]. The findings are accessible for 5 years.

Complaints

Should you have any concerns or complaints about the conduct of the project, you are welcome to contact the Office of the Academic President, Monash South Africa:

Hester Stols,
Research Coordinator,

Office of the Academic President,
Monash South Africa,
144 Peter Road, Ruimsig.

[redacted]

Thank you,

[redacted]

Professor Bimo Nkhata

Appendix III: Consent Form

MONASH University

CONSENT FORM

NB: This consent form will remain with Monash University researcher for their records.

Project: Institutions and Human Mobility in an African River Fishery: A Case Study of Shimungalu and Nyimba Fishing Camps in the Kafue Flats of Zambia

Chief Investigator: Dr Bimo Nkhata

I have been asked to take part in the Monash South Africa, a campus of Monash University, research project specified above. I have read and understood the Explanatory Statement and I hereby consent to participate in this project.

I consent to the following:	Yes	No
I agree to be interviewed by the researcher	☐	☐
I agree to allow the interview to be audio-taped	☐	☐
I agree to make myself available for a further interview if required	☐	☐
The data that I provide during this research may be used by the researcher in future research projects including publications and conferences	☐	☐
	☐	☐
	☐	☐

Name of Participant _____

Participant Signature _____ Date _____

Appendix IV: Interview Guide

A. Migrancy

1. It seems migrancy is an issue in the some fishing camps, is it the case here?
2. Who would you consider to be a migrant fisherman?
3. Who has the right to fish in this area? Do the migrant fishers have the right to fish in this area?
   Why so?
4. Do you allow migrants to settle in this area? What do they have to do to be allowed to settle in this camp or fish here?

B. Roles and Responsibilities

1. Who do you think is responsible for managing this fishery?
   Why?
2. Do you have a role in managing the fishery? What are your responsibilities as a member of the Fisheries Management committee (or headman or government officer)?
3. Does the Fisheries Management committee (or headmen or government) have any system that it uses to help in regulating new entrants and use of the resource?
   Explain.

C. Governance

1. In your opinion, is the Fisheries Management committee (or headmen or the government) able to regulate who fishes here?
   How come?
2. What stops you from or helps to take action?
3. How motivated do you think people are in this system? Why so?

Are there any other issues that we haven't yet discussed or observations you would like to make relating to why some camps regulate access while others are not able to do so?

Appendix V: Permissions and Changes Sought

Permission to Use Map of the Kafue Flats (Figure 4.1)

4/14/2016 Print

Subject:	RE: Permission to Use Kafue Flats Map
From:	Nyambe Nyambe (nnyambe@wwf.panda.org)
To:	sililoagness_musutu@yahoo.com;
Date:	Thursday, February 18, 2016 12:12 AM

Hi Agness!

Sorry for the late reply. Yes, you can use the map. It is in the public domain. You can access it online as well, so you can reference accordingly. Many thanks and best wishes, NN

From: Sililo Agness Musutu [mailto[redacted]
Sent: Friday, February 12, 2016 1:10 PM
To: Nyambe Nyambe
Subject: Permission to Use Kafue Flats Map

Good afternoon,

How are you doing?

I would like to seek permission to use the attached map (I believe it was generated by WWF Zambia) for my thesis which is based on the fisheries sector on the Kafue Flats

Looking forward to your positive response.

Kind regards
Sililo Agness Musutu
MPhil (Integrated Water Management)
Water Research Node
Monash South Africa
P/Bag X60
Roodepoort, 1725
South Africa

about:blank 1/1

Permission to Use Map of the Kafue Flats (Figure 4.2)

4/14/2016 Print

Subject: Re: Use of Kafue Flats Map

From: [redacted]

To: [redacted]

Date: Monday, February 15, 2016 8:49 AM

Dear Ms. Musutu,

I have granted you permission to use the map on condition that you cite the source of the map in your document and any subsequent publications were the map will appear. Kindly send me a copy of the Thesis when done as well.

I wish you well.

Regards

On Fri, Feb 12, 2016 at 1:19 PM, Sililo Agness Musutu [redacted] wrote:

> Good afternoon Sir,
>
> I would like to seek permission to use the Kafue Flats map in the attached document - *Hybridization between non-indigenous Oreochromis nilotus and native Oreochromis species in the lower Kafue River and its potential impacts on fishery*- (page 218, Figure 2) for my thesis which is based on the fisheries sector on the Kafue Flats.
>
> Looking forward to your positive response.
>
> Kind regards
> Sililo Agness Musutu
> MPhil (Integrated Water Management)
> Water Research Node
> Monash South Africa
> P/Bag X60
> Roodepoort, 1725
> South Africa

--
Ian Bbole
Aquaculture Researcher
[redacted]

about:blank 1/1

Change of Thesis Title

MONASH University

Sililo Musutu [redacted]

Change of Thesis Title Confirmation -25874616 MUSUTU, SILILO AGNESS

MIGR Candidature [redacted] 27 April 2015 at 06:34
To: [redacted]
Cc: Bimo Nkhata [redacted], Hester Stols [redacted]

Dear Sililo,

I wish to confirm that your thesis title is now updated in the system and you can view this change via WES

If we can be of any further assistance, please don't hesitate to contact the MIGR Candidature team on 9905 3050.

Kind regards,

Leah

Monash University Institute of Graduate Research
Chancellory Building D, 26 Sports Walk
Monash University VIC 3800, Australia
[redacted]
Website: www.monash.edu/migr
Campus map: www.monash.edu.au/campuses/clayton/
CRICOS Provider No. 00008C
Working Monday – Friday 9am – 5pm

Supervision Changes

MONASH University

Sililo Musutu [redacted]

Variation - Supervision Changes - ARTS - 25874616 MUSUTU, SILILO AGNESS

MIGR Candidature [redacted] 16 October 2015 at 05:44

Cc: Bimo Nkhata [redacted] Charles Breen [redacted], Downsborough Linda [redacted] Hester Stols [redacted]

16-Oct-2015

Student Name:	Ms Sililo A Musutu
Student ID:	25874616
Degree:	Master Of Philosophy
Attendance Type:	FT
Department:	South Africa School Of Social Sciences

Dear Ms Musutu,

Your application requesting for Supervision Changes has been reviewed and it has been approved.

The new arrangements are effective from: **12-Oct-2015**

You can monitor your enrolment and scholarship (where applicable) details including your thesis submission date, scholarship end dates, milestone due dates, etc. via the Web Enrolment System (WES).

As a research student you are required to contact your supervisor/s on a regular basis to discuss your research. At least once per fortnight for full time students, or once a month for part-time students.

Please familiarise yourself with the code of practice for supervision of research students, which can be found in the Doctoral Information Handbook at http://www.monash.edu.au/migr/research-degrees/handbook/chapter-five/5-2.html

In some cases a change in supervision can lead to delays in progress while the new supervisory arrangements are put in place. These delays can be used as grounds for an extension to enrolment or scholarship, if required in the future. We hope any disruption will be minimal and wish you well with the timely completion of your research under the guidance of your new supervisor/s.

Your supervision details are as below:

Supervisor Role	Supervisor	Percentage
Main Supervisor (Principal Supervisor)	Prof Charles Breen	75%
Associate Supervisor	Ms Linda Downsborough	25%

If we can be of any further assistance, please don't hesitate to contact the MIGR Candidature team on (03) 9905 3050.

Kind regards,

Leah

Monash University Institute of Graduate Research
Chancellory Building D, 26 Sports Walk
Monash University VIC 3800, Australia
[redacted]
Website: www.monash.edu/migr
Campus map: www.monash.edu.au/campuses/clayton/
CRICOS Provider No. 00008C
Working Monday – Friday 9am – 5pm