

**PROPERTY RIGHTS AND BENEFIT SHARING: A CASE STUDY OF THE BAROTSE  
FLOODPLAINS, ZAMBIA**

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## ABSTRACT

The study sought to expose the underlying complexity of benefit sharing of ecosystem goods and services among multiple actors, using the Barotse Floodplains located in Zambia as a case study. This was based on the premise that an appreciation of theories on property rights has not been adequately used to understand and implement benefit sharing arrangements for natural resources governance.

The study involved developing a conceptual framework as an analytic tool to better examine the complexity of benefit sharing from the perspective of bundles of property rights. Benefit sharing was conceptualized as the creation and regulation of relationships between decision making and benefit distribution processes. This framework highlighted the role of rights at the operational and collective levels in enforcing allocation of ecosystem goods and services as well decision making processes among actors.

The design of the study was descriptive, longitudinal and qualitative. The temporal dimension of the study was between 1936 and 2012 categorized according to eras that were defined by existing benefit sharing authority – traditional, state and collaborative. Data collection techniques used in the study included in-depth interviews and documentary sources. Thematic analysis using QSR NVIVO software was used for coding and data analysis.

The study revealed an overwhelming variation of benefit sharing outcomes between eras as a result of varying configuration of bundles of property rights. The variation in eras illustrates a critical relationship between the establishment and enforcement of bundles of property rights and benefit sharing outcomes. This consequently provides insights into the consequences of failing to recognize, establish and enforce bundles of rights in benefit sharing arrangements. In this way, the case study illustrates how property rights offer a theoretical perspective through which to better understand benefit sharing arrangements involving socio-ecological systems. This is especially the case in contexts in which utilization of a shared ecosystem services is susceptible to externalities that make governance difficult and complex.

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## CHAPTER ONE

### BACKGROUND TO THE STUDY

#### 1.1. Introduction

This study sought to expose the underlying complexity of benefit sharing of ecosystem goods and services among multiple actors. This was based on the premise that an appreciation of theories of property rights is necessary for the successful design and implementation of benefit sharing arrangements for natural resources especially in developing countries where the majority of the population relies on ecosystem system goods and service as a primary source of livelihood. Although the study sought to understand the complexity and dynamics of benefit sharing of ecosystem goods and services in the context of wetlands, the scope of the study was limited to fisheries occurring on the Barotse Floodplains as a case study area. In this study benefit sharing is conceived as the creation and regulation of relationships between actors that takes into account accountability, participation and responsibility in decision making and benefit allocation processes (Nkhata et al., 2012c).

The issue of who is involved in decision making and benefit allocation processes involves a consideration of property rights (Ostrom, 1990). Property rights refer to the claim to a resource and the capacity of the collective to support that claim. In essence, property rights describe relationships between participants in relation to a shared ecosystem. It is argued that the establishment and enforcement of bundles of property rights influence the effectiveness of benefit sharing arrangements. Long term secure and well defined bundles of property rights provide an incentive for resource users to manage the resource sustainably, while incompletely defined and distributed property rights create ambiguity and conflict in resource utilization (Ostrom, 1997).

This chapter serves as a background to the case study by providing an overview of trends in environmental governance and benefit sharing in developing countries. The chapter consists of the following sections: wetlands as social ecological systems; history of benefit sharing

approaches for social-ecological systems in Africa; statement of the research problem; aims and objectives of the study; and, finally, the structure of the dissertation.

## **1.2. Wetlands as social-ecological systems**

This section aims at situating wetlands as social-ecological systems. But before then, it is important to understand the role of wetlands in human livelihoods, especially for rural communities in developing countries. The majority of households in Africa operate on marginal monetary economies based on semi-subsistence livelihoods (Bakema et al., 2009). Often the primary concern of rural households in these economies is to meet self-sufficiency in terms of food, water and fuel energy. Wetlands provide a wide range of social, economic and ecological benefit--especially in Africa where large sectors of the national economies are based on natural resources (Ahmed et al., 2008)--as they simultaneously provide multiple uses for rural communities, a seasonal cycle for fishing, livestock grazing, agriculture and non-wood forest product exploitation (Bakema et al., 2009).

Social ecological systems (SES) are systems that consist of both biophysical and social components (Janssen and Ostrom, 2006). The social component consists of the institutional infrastructure developed by humans that is embedded in the network of social relationships. Integration of social ecological systems is based on the preposition that the interaction between the two systems affects management outcomes of the ecosystem (Mahonge, 2010). Social ecological systems can thus be perceived as comprising multiple interactions between individuals responding to ecological feedbacks in order to attain social and environmental benefits from the system (Pomeroy, 1999).

The interaction between social and ecological systems occurs on several scales, which can be spatial or temporal. The ecological scale varies according to geographical area in which the system occurs and the period during which units of population in an ecosystem interact. The range between individual species to groups of species provides the basis for levels of organizations (Cumming et al., 2006). Sociological scales on the other hand are represented by the nature of social structures, from individuals to organizations, that incorporate norms, rules, policies and laws (Berkes, 2006). Ecological systems are structured by processes and feedbacks

including human influences that occur as a result of the interaction between organisms and their environment (Cumming et al., 2006). These constant interactions create dynamic ecological feedbacks in which humans influence and are influenced by ecological processes.

Wetlands are considered as classic examples of social-ecological systems. Wetlands have a unique physical trait of being seasonally or partially dominated by water, which results in cyclical alternation of aquatic and terrestrial landscape depending on the water regime of the system (Adger and Luttrell, 2000). This transitional nature of wetlands as ecosystems, bordering terrestrial as well as aquatic systems, leads to multiple uses that provide support for diverse livelihood options for local communities. This consequently adds complexity to the uses and human interactions that constitute the social component. This multi-resource characteristic results in the coexistence of communal, individual and state rights to resources.

It is becoming increasingly recognized that environmental problems arise due to the failure of institutions to regulate demands of social actors for ecosystem system goods and services (Kalikoski et al., 2002). As a result, several researchers are investigating the links between social systems and ecological systems in order to improve management of natural resources (Kalikoski et al., 2002, Bromley, 1991, Mahonge, 2010, Nkhata et al., 2008). Property rights offer a theoretical lens through which to understand the complexity and dynamic nature of social interactions among collaborative actors and how these interactions influence and are influenced by ecological feedbacks (Nkhata et al., 2012b, Ostrom, 1997). An analysis of the configuration of bundles of property rights to resources provides a unique opportunity to better understand complexity and dynamic nature of sharing of ecosystem system goods and services.

### **1.3. History of benefit sharing approaches for social-ecological systems in Africa**

This section aims at providing an overview of the development of benefit sharing approaches leading to contemporary theoretical discourse. In discussing the history of benefit sharing approaches, it is important to note that the concept of benefit sharing has notions that strongly advocate the increased participation of local communities in the conservation of natural resources and their involvement in the allocation of gains accruing from natural resource systems (Nkhata and Breen, 2010c). In discussing the history of benefit sharing approaches, the section is

structured as follows: firstly, traditional conservation of natural resources characteristic of the pre-colonial period; fortress type conservation of natural resources characteristic of colonial and post-colonial period; community based conservation of natural resources. This is meant to highlight the prevailing paradigm for governance of natural resources that influences benefit sharing.

Very little is written about conservation approaches in the pre-colonial era. This has often led to a romanticization of conservation practices by most contemporary commentators on conservation practices (Murombedzi, 2003). While it is true that low population densities, simple technologies and immobile populations contributed to relative ecological integrity, it is also true that specific knowledge of the resources by local communities as well as local adaptive systems of extraction resulted in sophisticated mechanisms for regulation and conservation of natural resources (Huong, 2011). It is generally accepted that in the pre-colonial era, a close relationship between conservation and social organization existed that highlighted the unity between society and nature (Murombedzi, 2003). For this reason, governance of resources was closely tied to the norms, values and culture of the people.

Discourse on conservation approaches in Africa can be traced to the early 19<sup>th</sup> century when ideas and policies emerged as result of the rapid decline of wildlife for hunting (Buscher, 2005). Colonial Governments in Africa sought to curb this by establishing nature reserves based on the North American model of separating communities from nature (Murombedzi, 2003). This was eventually formalized through the endorsement of the London Conference of 1933 that brought into effect the protection of fauna and flora through protected areas. To a large extent this rationale was motivated by elitist and colonial reasoning that aimed at reserving Africa's wild nature for the utilization of colonial settlers (Hulme and Murphree, 1999). This culminated in protectionist and coercive conservation policies in the 1950s and 1960s referred to as "fortress conservation". The main elements of fortress conservation included the establishment of protected areas, exclusion and limitation of management rights and the strict enforcement of rules through barriers (Buscher, 2005).

Other than the prevailing political reasoning at the time, research and ideological reasoning further cemented fortress type conservation. Garrett Hardin's provocative article in *Science*

magazine (1968), 'The tragedy of the Commons' greatly influenced research and practice at the time. The main argument proposed by Hardin's piece was that the inevitable outcome of scarce resources held in common is ultimate degradation due to the self-seeking behavior of local users who wish to receive as much benefit from the resource and bear as little as possible of the costs resulting from the degradation of the resource (Ostrom, 1990). This line of reasoning informed, by ideology and prevailing theoretical discourse, placed the central government at the center in planning and national development especially in developing countries that were eager to emulate the growth patterns of western national states (Agrawal and Ostrom, 1999).

In the late 1970s, a new paradigm started to emerge that was meant to counter the exclusion of local communities in the management and conservation of natural resources. This is referred to as "community based conservation" (Mahonge, 2010). This conservation paradigm argues that conservation goals should be implemented through strategies that emphasize the role of local communities in decision making about the management of natural resources (Murphree, 2004). This period corresponded with the post-colonial period, during which a large number of African states gained independence from colonial Governments (Murombedzi, 2003). The shift in approach to the conservation of natural resources was driven by several factors: firstly the limited financial and institutional capacity to enforce and protect protectionist conservation. This was evident by the still degrading natural resources during fortress conservation making it necessary to rethink the approach (Hulme and Murphree, 1999). The recognition of inadequacies of the state as the ideal agent of development fell in tandem with the fall of ideologies such as socialism as a political and economic system. Socialism is a social theory that places central Government at the center of social organization and industry (Brown, 2003). It was thus necessary to rethink the approach.

Secondly, emerging scholarship on common property in the early 1990s highlighted cases in which socially designed institutional arrangements induced cooperative behavior among resource appropriators and hence avoided the 'tragedy of the common' predicted by Hardin (Wade, 1988, Balland and Platteau, 1996, Ostrom, 1997, Agrawal, 2001). This resulted in policy shifts that were aimed at incorporating local communities in the management and conservation of natural resources (Agrawal, 2001). Community based conservation incorporates three main principles:

(1) allowing communities residing near protected areas to participate in management decisions and the formulation of land use strategies; (2) transferring management rights over natural resources; and (3) devolving benefit sharing processes to local communities (Buscher, 2005). This ‘new’ conservation approach has manifested in several forms, including: Integrated Conservation and Development Projects; Community Wildlife management; Community Based Natural Resources Management and Co-management; Integrated Water Resources Management (IWRM) and Joint Forest Management (JFM), all of which focus more on managing social relationships than the resources per se (Natcher et al., 2005).

This focus has been incorporated into several regulatory frameworks at multiple institutional scales as critical components in the governance and management of natural resources. The Convention on Biological Diversity (CBD) adopted in 1992, for example, aims at promoting sustainable utilization of non-human genetic resources through fair and equitable sharing of benefits arising from the utilization of natural resources (Morgera and Tsioumani, 2010). Reducing Emissions from Deforestation and Forest Degradation (REDD+) is another example: it employs economic value gained from the reduction of Green House Gas (GHG) emissions from deforestation and land degradation as benefits accruing to state and local communities in order to mitigate climate change (Peslett, 2011). The Millennium Ecosystem Assessment in 2005 generated massive policy enthusiasm for the role of ecosystem goods and services in supporting human well-being. This has the effect of propelling the concept of equitable sharing benefits derived from the ecosystem to other sectors such as pharmaceutical, oil, mineral and genetic resources (Nkhata et al., 2012c).

In the more than three decades of implementing conservation approaches that incorporate local communities in decision making and benefit sharing processes, a number of criticisms has emerged. This is fuelled by the underperformance of the approach, leading to many authorities in the conservation discourse calling for a reverse to a style of conservation in which enforcement is separate from local communities (Buscher, 2005). These criticisms generally fall into two lines of arguments: the underperformance of conservation approaches that devolve management and benefit sharing processes is not due to the impracticality of the concept but rather to the poor implementation of the concept (Berkes, 2004). This is in regard to the inadequate devolution of

decision making and authority from the central Government to local communities. In addition, high levels of corruption prohibit effective processes in community based conservation (Buscher, 2005). The second argument holds that the twin objectives of conservation and development should be delinked as the mixed objective does not achieve either objective well (Murphree, 2004).

In line with the first argument, it is asserted that the extent to which conservation approaches can be effective enough to result in equitable and efficient sharing of benefits from the ecosystem requires an understanding of the nature of the interrelations between people communities and institutions at multiple levels (Berkes, 2004). This is according to the rationale that ecosystems goods and services accumulate to beneficiaries through complex system of societal, norms, rules and organizations' processes that manifest in the form of institutions (Nkhata et al., 2012b). Evidence from empirical research suggests that the poor performance of conservation approaches is due to insufficient understanding of the nature and substance of the social exchanges that involve multiple interest groups and that underlie benefit sharing approaches (Agrawal and Ostrom, 1999).

#### **1.4. Statement of the problem**

Despite several decades of implementing various benefit sharing arrangements, the performance of these approaches varies significantly both spatially and temporally (Murphree, 2004, Nkhata and Breen, 2010c, Shackleton and Campbell, 2000). The performance of benefit sharing approaches in Southern Africa has been constrained by the struggle to establish enduring institutions for the governance of natural resources (Collomb et al., 2010, Nkhata et al., 2012b). Among the problems associated with this are: lack of downward and horizontal accountability to and between local stakeholders; inappropriate type and mismatch of benefit with conservation of natural resources; dominance of one actor over another; inadequate transfer of management rights to non-state actors (Bwalya, 2008, Murphree, 2004, Nkhata and Breen, 2010c). The problems associated with benefit sharing implementation can be summed up as a result of inadequate understanding of the specific dynamics and complexity through which benefit sharing occurs (Agrawal and Ostrom, 1999). This has resulted in policy prescriptions that aim at devolving decision making and benefit sharing processes, entailing rhetorical strategies with

often ineffective results. In this sense the enthusiasm of policy and practice towards devolved benefit sharing arrangements has run ahead of research into how it actually works (Marshall, 2008).

The large scholarship on common pool resources has demonstrated that property rights offer a useful theoretical lens for examining social interactions among collaborative actors (Nkhata et al., 2012b, Schlager and Ostrom, 1992). This research, built over three decades, has provided a useful perspective for explaining the social order that governs human behaviour. Attention to existing theories on property rights draws a focus to the specific rights and capacities occurring in action domains at different levels of human organization (Schlager and Ostrom, 1992). Hanna et al. (1996) describes property rights as the structure of rights to resources through which individuals control use of the resources and their behaviour towards each other. It is argued that existing theories of bundles of property rights have not been adequately incorporated in the design and implementation of existing benefit sharing typologies (Agrawal and Ostrom, 1999, Nkhata et al., 2012b).

It is in this light that this study sought to assess the relationship between establishment and enforcement of property rights and the outcomes of benefit sharing arrangements insofar as they affect fisheries on the Barotse floodplain in the Western Province of Zambia. This was based on the rationale that an appreciation of theories of property rights is necessary for the successful design and implementation of benefit sharing arrangements for natural resources, especially in developing countries where the sharing of natural resources remains a contentious issue.

### **1.5. Objectives of Research**

The main objective of the study was to assess the relationship between bundles of property rights and benefit sharing outcomes on the Barotse floodplains.

The specific objectives of the study were:

- To develop a conceptual framework for the analysis of benefit sharing arrangements for fisheries on the Barotse Floodplains;

- To assess the influence of access and withdrawal rights on benefit sharing arrangements on the Barotse Floodplains;
- To assess the influence of management rights on outcomes of benefit sharing arrangements on the Barotse Floodplains;
- To provide recommendations for policy and future research.

## **1.6. Structure of the dissertation**

The dissertation is made up of six chapters. The following chapter (Chapter Two) provides a description of the study area. Firstly, a country profile for Zambia is given highlighting the social, economic and physical context before focusing on the Barotse Floodplain as the study area.

Chapter Three aims at constructing the conceptual framework of the study. The conceptual framework is used as an analytic tool for assessing the relationship between property rights and benefit sharing. The concepts included in this chapter include: environmental governance, benefit sharing, collective action and property rights.

Chapter Four presents the research design and methodology. This chapter highlights the methodology used and the techniques employed in data collection and analysis.

Chapter Five presents the study's results and interpretation of the results in relation to the conceptual framework of the study. Chapter Six explores the implications of the findings of the research for theory and practice. It concludes by providing recommendations for future research.

## **CHAPTER TWO**

### **STUDY AREA**

#### **2.1. Introduction**

This chapter provides background information on the study area, so highlighting the context in which the study was undertaken. The chapter is structured as follows: the first section provides the national context, focusing on geographical, socio-economic and administrative features of the country. The second section focuses on Western Province, in which the study area, the Barotse Floodplain, is located. The third section presents the socio-economic history of the Barotse Floodplain, outlining the development of the Lozi system of Government.

#### **2.2. National Context**

Zambia is located in Sub-Saharan Africa, between 8° and 18° South latitude and 22° and 34° East longitude according to the Greenwich meridian. It covers a total area of 752,614 square kilometers and is situated on the great Central African plateau, with elevation ranging between 900 meters above sea level to 1500 meters. The average altitude is 1200 meters above sea level. The landlocked country is surrounded by eight neighboring countries: the Democratic Republic of Congo, Tanzania, Malawi, Mozambique, Botswana, Namibia and Angola (Figure 2.1). Administratively, the country is divided into ten Provinces and 89 districts (the number of districts increased from 73 to 89 as of 2012 in line with government's decentralization policy and improved service delivery) at the time the study was conducted (GRZ, 2011c). The study area lies in Western Province, with its provincial headquarters in Mongu.

Zambia experiences a sub-tropical climate characterized by three distinct seasons: the hot-dry season from mid-August to November (26-36° C); the rainy season from November to April (27° - 34° C) and the cool dry season from April to mid-August (13 - 26° C). Annual rainfall ranges from 600 mm to 1000 mm/year with a north-south gradient. The southern part experiences the lowest rainfall, having an average of 700 mm/year, while the northern part is the wettest, with an average of 1000 mm/year. The variation from north to south is influenced by the El Nino Southern Oscillation (ENSO) that brings drier conditions in the wet months in the south while in

the north it brings wetter than average conditions (Flint, 2009). Rainfall is also affected by the Inter-Tropical Convergence Zone which oscillates between the northern and southern tropics annually bringing rain between November and April and leading to variation in the amounts of rainfall between rainy seasons (GRZ, 2011c).

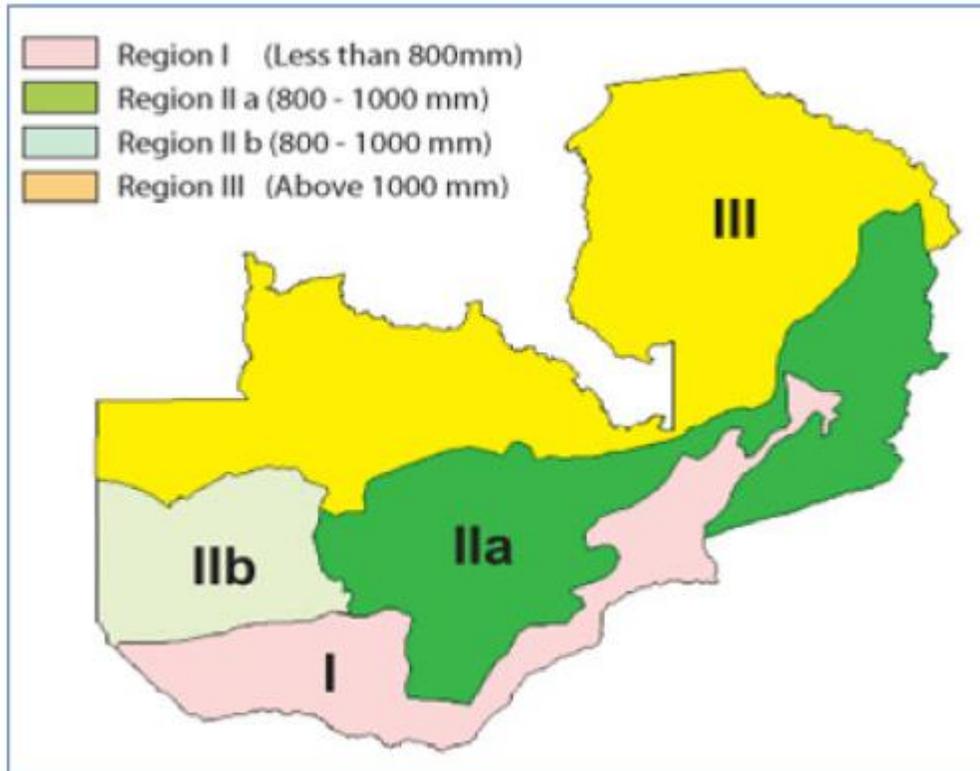
Climate patterns in Zambia can be divided into regions referred to as ecological zones or regions I, II and III (Figure 2.2). Region I includes the southern parts of the Western and Southern Provinces and receives the lowest rainfall amounts (about 800 mm) with frequent droughts and water scarcity. It is therefore considered to be the most vulnerable region (Flint, 2009). Region II includes the plateau zone of Central, Eastern, Lusaka and Southern Provinces. The study area is located in Region II and receives average rainfall amounts of between 800 mm to 1000 mm (GRZ, 2011c). Region III is situated on the Central African Plateau and covers Northern, Muchinga, Luapula, Copperbelt and North Western Provinces. Region III has the highest amount of rainfall of over 1200 mm with the longest rainy season on average. This region covers the majority of the land mass of Zambia -40.6 million hectares (IUCN, 2003).

Zambia is encompassed by two large river basins, the Zambezi and the Congo. The Zambezi covers two-thirds of the country along the south-central area while the Congo covers the northeastern part (GRZ, 2011c). All river systems in Zambia discharge their waters into these two basins. The main river systems in Zambia include the Zambezi, Kafue, Luangwa, Luapula and Chambeshi. A large proportion of Zambia falls within the Zambezi River Basin via the Kafue, Luano and Luangwa rivers (Pollard and Cousins, 2008). The Barotse Floodplain is located in the portion referred to as the Upper Zambezi, the portion between the source of the Zambezi and the Victoria Falls (Halls, 1997). The country also has three major natural lakes and one man-made lake: these are the Bangweulu, Mweru and Tanganyika while the man-made lake is the Kariba (IUCN, 2003). All these bodies of water are important for uses ranging from hydro-electric power generation, to fishing, irrigation and tourism.



**Figure 2.1:** Map showing Zambia and her neighbors. Source: GRZ (2011b)

According to the 2010 census report, the population of Zambia has grown to 13 million from 9.9 million, representing an annual growth rate of 2.8% (CSO, 2012). It is projected that by 2015 the population will increase to 15.5 million at the current growth rate (GRZ, 2011b). This represents one of the fastest growing populations in Sub-Saharan Africa. Although a large proportion of the population reside in rural areas (over 60%), trends show high rural to urban migration particularly in the Lusaka and Copperbelt Provinces. People seeking job opportunities in urban areas (GRZ, 2011c), have led to Zambia becoming one of the highly urbanized countries in Sub-Saharan Africa (CSO, 2012).



**Figure 2. 2:** Agro-ecological Zones in Zambia based on rainfall patterns. Source: GRZ (2011c)

The major economic drivers for Zambia include mining, agriculture, manufacturing and tourism, with mining as the largest contributor to Gross Domestic Product (GRZ, 2008). The mining sector was the major source of employment in the 1990s, accounting for 95 percent of export earnings and government revenue (SADC and ZRA, 2007). However, due to the drop in copper prices on the international market, the contribution of copper to GDP has fallen drastically, dropping from 7% to 9% between 2005 to 2008 (GRZ, 2008). The volatility of the copper price has led to the re-alignment of priorities, with agriculture related industries and rural development sectors given greater emphasis in Government budget allocation (CSO, 2012, GRZ, 2011b).

Land in Zambia is currently governed by the Land Act of 1995. The Act distinguishes two types of land tenure systems in Zambia: customary land tenure and leasehold land tenure. Land falling under the category of customary is administered according to local custom and generally held in common with the chiefs having regulatory roles. While individual members of the community have use rights and even alienation rights – for instance, the right to transfer use -- no monetary

transactions can take place (Adams, 2003). Individuals own the land for as long as they wish, subject to conforming to social norms (Van Loene, 1999). Although customary land accounts for 94 percent of the total land mass in the country, its administration in terms of use, transferability and duration varies according to local customs (Metcalf, 2006b). It should be noted that land under customary tenure can be alienated as state land, through the President, subject to consent from the local traditional authority (Adams, 2003). The area studied during this research is governed as customary land under the authority of the Barotse Royal Establishment (BRE).

Land under leasehold tenure is acquired by obtaining a lease for a period not exceeding 99 years granted by the President through the Commissioner of Lands. This is under certain conditions; that the tenant pays rents, has exclusive possession and abides by terms stipulated in the lease agreement (GRZ, 2008). Land under leasehold tenure accounts for 6 percent of the total land area of Zambia (Van Loene, 1999), and is mostly concentrated along the line of rail following historic alienation of land by colonial white settlers acquiring prime land (Metcalf, 2006a). Recently, there is increased conversion of land from customary to leasehold tenure in order to increase the security of rights of land owners as a way of empowering citizens (Adams, 2003). Over the years, there has been a growing call to reclassify land categories so as to include land reserved for public interests (GRZ, 2008).

A significant proportion of land is allocated to protected areas such as National Parks, Game Management Areas and Forest Reserves. Approximately, eight percent of Zambia is designated as national parks with a further eight percent as forest reserves (Metcalf, 2006b). Wildlife in National Parks and game Management Areas is under the jurisdiction of the Zambia Wildlife Authority (ZAWA) while forests in Forest Reserves are under the jurisdiction of the Forestry Department. The land in National Parks is designated as state land while the land in Game Management Areas is under customary tenure, though the ZAWA has to be consulted for any land allocation by traditional leaders (GRZ, 2001). The Barotse Floodplain includes a portion of the West Zambezi Game Management Area, Liuwa National Park and the Barotse Floodplain Important Bird Area (IUCN, 2003).

The primary environmental threats to wetlands include dam development, pollution, habitat loss and human settlement (GRZ, 2001). Activities associated with human settlements include

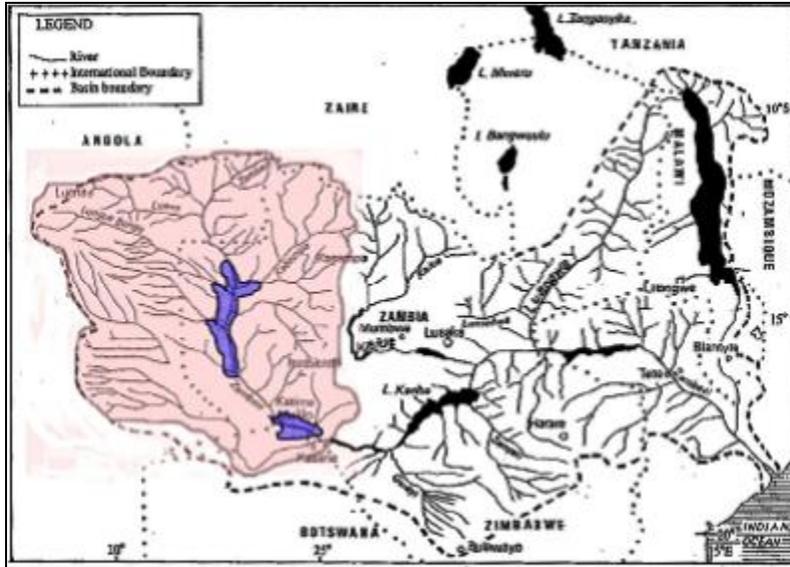
agricultural practices, overgrazing and over settlements. Over 30 percent of Zambia's wetlands are in the Southern, Lusaka and Central and Eastern Provinces (IUCN-ROSA, 2006). It is estimated that 20 percent of wetland degradation is due to dam development, pollution and eutrophication. Comparatively, the Kafue Wetland system is the most environmentally disturbed system due to dam development and eutrophication (Mumba and Thompson, 2005). The Upper Zambezi River Basin on which the Barotse Floodplain is located is regarded as free flow as there are no artificial dams to regulate the flow (Flint, 2009). Wetland degradation through habitat loss caused by siltation, deforestation and water abstraction account for 40 percent of degradation (GRZ, 2001). Other critical issues that affect conservation of wetlands in Zambia include the institutional sectoral approach, socio-economic context and population dynamics (IUCN-ROSA, 2006).

### **2.3 The Barotse Floodplain**

The Barotse Floodplain – locally known as the Bulozhi- located in the Western Province of Zambia ( $13^{\circ} 50' S - 22^{\circ} 45' E$ ,  $16^{\circ} 40' S - 23^{\circ} 45' E$ ), is formed as the Zambezi River re-enters Zambia after passing southward through Angola (IUCN, 2003). The floodplain falls under the portion of the Zambia referred to as the Upper Zambezi River - that portion between the source of the Zambezi and the Victoria Falls (Flint, 2009). Although the exact extent of the plain is not easy to determine as occasionally inundated area are fed by other catchments, it is estimated that it extends between 15 km to 45 km across and 160 km in length, reaching coverage of 5,500 km<sup>2</sup> and with a maximum flooded area of 10,750 km<sup>2</sup> (Timberlake, 2000). It is the second largest wetland in Zambia and is one of Africa's greatest wetlands (Pollard and Cousins, 2008).

The Barotse Floodplain occurs in the Kalahari Basin, which covers a large portion of the subcontinent from the equator down to South Africa's North West Province (Society, 2008). As such the floodplain is largely composed of deep Kalahari sands with scattered outcrops of clay reaching a depth of up to 30 m (ConcernWorldWide, 2008). This results in water logging in the rainy season and dryness during the rest of the year making the floodplain a large storage basin that discharges water to surrounding areas (Flint, 2009).

The area has an average elevation of 1000 m that gradually slopes from 1200 m in the north – in the Congo Zambezi divide – down to 900 m in the south near the Victoria Falls. The topography of the landscape influences the general direction of major rivers on the plains (Society, 2008).



**Figure 2.3:** Zambezi Basin shaded in mauve showing Upper Basin extending North to South and the Barotse Floodplain shaded in Blue. Source, Flint (2008).

The Barotse Floodplain is located in Agro-ecological zone II of Zambia, which receives average rainfall amounts varying between 800 mm to 1000 mm. Average temperatures in the wet season range between 20° and 22° C while in the cold and dry season can be as low as 15° C. The hot season reach lows of 22.5° to a maximum of 27.5° C (GRZ, 2011c). The rainy season stretches from October/November to March while the cold season lasts from May to August, within the hot season extending from August to October (MTENR, 2007). The onset of annual flooding varies and tends to occur between December and March although the northern part of the floodplain inundates earliest. The maximum flood level occurs in April, after which flood waters gradually recede between May and July (IUCN, 2003).

The Upper Zambezi in the floodplain region is considered an active riverine system. This means that, for the most part of the year, ground water discharges into the main channel while in the dry season it loses water to surrounding areas. This is on account of the water table dropping so low

that the main river channel loses to the floodplain (Flint, 2009). Since the Zambezi pours substantial quantities of water into the region as it enters, the floodplain acts as a sponge filtering nutrients and minimizing run-off. Due to the low gradient of the area, this also has the effect of giving rise to huge amounts of sediment load and coarse particles, which provide nutrients for fish spawning (Flint, 2008).

The Barotse Floodplain covers four of six districts in Western Province including Mongu, Kalabo, Lukulu and Senanga. These districts are estimated to contain fewer than 225,000 people, with the administrative office located in Mongu (CSO, 2012). However, traditionally, the province is divided into administrative units -- equivalent to districts -- known as *silalos*. Administratively, the floodplain falls under dual administration -- that of the Barotse Royal Establishment under the rule of the *Litunga* (king or paramount chief) -- and his advisors -- and the Government of Zambia through provincial and district line ministries (IUCN, 2003). Although the use of floodplain resources was in the past managed according to traditional systems, today formal control over natural resources has been passed over to central and provincial government. However, the Barotse Royal Establishment still maintains great influence over use patterns and the regulation of natural resources (WetlandAction et al., 2007).

The predominant ethnic group on the plains is the Lozi people also known as the “plains” or “water people” under the rule of the *Litunga* through the Barotse Royal Establishment (BRE). Other ethnic groups include Mbunda, Nkoya, Lutana, Illa, Tonga and Luvale (CSO, 2012). Their main livelihood strategies combine crop farming, cattle keeping, fishing and natural resource exploitation. (IUCN, 2003). Of the total arable area in Western Province, 10% is comprised of floodplain farming systems (GRZ, 2011c). The main growing season in the floodplain is between November and April with the major crops being maize, rice, sweet potatoes and vegetables. This is practiced on gardens sites on the plains (WetlandAction et al., 2007). Cattle is pastured in the floodplain, managed under a system of transhumance that moves from the floodplain to adjacent uplands during flooded months and moves back after floods recede (IUCN, 2003).

Fisheries are an important sector in Western Province concentrated on the floodplain. It is estimated that half of the population are involved in fishing activities (ConcernWorldWide, 2008). The floodplain hosts about 80 different species of fish of which bream, tilapia, minnows,

bottlenose and barbel constitute the majority of the catch (IUCN, 2003) The main fishing season is during the dry months between May to December after floodwaters recede. During flooded months fish move from the main river channels into the wetlands where they spawn before the height of the floods (WetlandAction et al., 2007).

#### **2.4. Social – political history of Western Province of Zambia**

The Lozi Kingdom, traditionally referred to as Barotseland and now officially known as the Western Province of Zambia- has occupied the Barotse Floodplain since the late 18<sup>th</sup> century. The first Litunga of the Lozi Kingdom was Mboo Muyunda, who it is said expanded the rule of the kingdom by sending his brothers and sisters to surrounding areas to establish Lozi rule on his behalf (Lewanika, 2002). The Buluzi Floodplain – as it was often referred to then -- became the centralized point of authority in the heart of the most productive core of the kingdom (Gluckman, 1960). The conquered tribes were assimilated in the Lozi culture, those who lived in the Barotse Floodplain considered themselves a ‘chosen people’, a function of the Lozi hegemony that justified the Lozi ruling class (Caplan, 1968).

In 1890, King Lewanika (1878-84, 1885 – 1916) signed the Lochner Concession, thereby placing the kingdom under the protection of the British South Africa Company. The move was meant to protect the kingdom from internal enemies as well as the Ndebele from the south (Gluckman, 1960). The implication of the treaty was that the kingdom lost its autonomy as it now became a British protectorate. However, compared to other tribal groups in the region, the kingdom considered itself a privileged territorial unit under British administration so long as its special status was recognized (Caplan, 1968). The decades that were to follow under the reign of several Litunga, including, Yeta III (1916 – 45), Imwiko (1945 – 48) and Mwanawina II (1948), saw the kingdom strive to retain its original political influence and find its place within the context of regional political change (Flint, 2008). It should be noted that within the context of these events, the colonial Government was quick to assure the Lozi ruling class of its special status by restoring earlier prerogatives and privileges. However, this came at the cost of the Litunga approving and convincing surrounding chiefs of the benefits of the federation of Southern and Northern Rhodesia (currently Zimbabwe and Zambia respectively) (Caplan, 1968). The

Federation of Rhodesia and Nyasaland was eventually created in 1953, joining the colonies of Northern Rhodesia, Southern Rhodesia and Nyasaland.

Mwanawina II's support for the federation ran contrary to the interests of those of his subjects who opposed the federation. Mwanawina's support was based on the assurance that the special status of Barotseland would be enshrined in the constitution of the federation; opposition to the federation would mean the loss of the support and protection of the Crown (Gluckman, 1960). The disparity between the interests of the people and those of the Litunga resulted in the isolation of the ruling class from their subjects. This would lead, during the early 1960s to the majority of the subjects siding with the African nationalists who were calling for independence (Caplan, 1968). The ruling class of Barotseland favoured its special status but meanwhile the freedom fighters, led by the militant United National Independence party (UNIP) (Clarence-Smith, 1979), called for independence.

The federation was finally disbanded in 1963 (Caplan, 1968). Fearing uproar from African Nationalists, the British avoided supporting the separation of Barotseland from Northern Rhodesia. The Litunga and his advisors wanted the status of Barotseland to remain even after independence if Barotseland was to remain an integral part of Northern Rhodesia (Nawa, 1990). Discussion over enshrining the special status of Barotseland in the constitution would fail, with a compromise reached in a formal treaty signed on 18<sup>th</sup> May, 1964, between the British, Barotse and Northern Rhodesian Governments (Caplan, 1968). The treaty was called the Barotseland Agreement of 1964, its main purpose being to formalize Barotseland's position within Zambia and repealing the earlier Lochner Concession. To this end Barotseland became an integral part of Zambia with traditional rights reserved by the Litunga over local Government matters, including natural resources. Zambia became independent on 18<sup>th</sup> October, 1964 as a newly independent state under the leadership of the UNIP part with Dr. Kenneth Kaunda as Republican President.

Tension within the ruling party would have a strong bearing on the Barotseland Agreement in the years to come. Following 1966, most of the Lozi members of UNIP who were instrumental in rallying support for UNIP in Barotseland were removed from the party several reasons (Caplan, 1968). This development, coupled with the lack of development in the area caused a great deal of discontent in Barotseland. Talks of secession of Barotseland from Zambia soon started to arise in

the province, which were seen as opposing the ‘One Zambia, One nation’ slogan built on the socialism ideology of the country that aimed at establishing a classless society.

A number of legislative reforms led to a change in the autonomy of Barotseland: firstly, the enactment of a bill in 1969 cancelled the Barotseland Agreement and its attachment. The Barotse Agreement is an agreement that was signed between the Prime Minister of Northern Rhodesia and Barotseland thereby incorporating it as part of the newly independent Zambia in 1964 (Nzila, 1987). The implication of the cancellation was the reduction of the powers of the traditional authority in Western Province (tan Barotseland). The bill reduced the relative autonomy of the province bringing it on a par with the other provinces in Zambia.

## **2.5. Conclusion**

The chapter provided a description of the social, economic, physical and political features of the study area. This was aimed at providing the context in which the study was conducted. The Barotse Floodplain provided, it is claimed, a unique case to understand benefit sharing within multiple governance process involving multiple institutional actors.

## CHAPTER THREE

### THE CONCEPTUAL FRAMEWORK

#### **3. 1. Introduction**

This chapter constructs a conceptual framework based on benefit sharing and property rights theory for use when analysing sharing arrangements of fisheries on the Barotse Floodplains. The first part of the chapter is dedicated to highlighting the main concepts and definitions central to this study. The concepts presented in this section include: governance, environmental governance, collective action. The second part presents the conceptual framework. This framework is designed to facilitate the analysis of the case study of the Barotse floodplains and is founded on the relationship between the establishment of bundles of property rights in benefit sharing arrangements and sharing outcomes thereof.

#### **3.2. Concepts and definitions**

##### ***3.2.1. Governance***

A good starting point when conceptualizing environmental governance is to distinguish government, governance and management. Government is the formal and central exercise of authority through a vertical relationship between actors whereas governance refers to the exercise of authority by actors other than the state. Therefore governance is the regulation and oversight of formal and informal interactions between actors meant, ideally, to create opportunities and solve social problems (Reed and Bruyneel, 2010, Lemos and Agrawal, 2006). Governance as a process can be established or implemented at any level of human interaction whether it is local, national or global to establish particular regime structures or processes (Nkhata and Breen, 2010a).

Management on the other hand is defined as a process through which actors implement coordinated and focused organizational actions (Nkhata et al., 2008). This conceptualization makes management a targeted effort born from governance processes meant to plan, organize and control human actions in response to feedbacks from systems such as ecological systems

(Schlager and Ostrom, 1992). Management is about targeted action; governance is about sharing of rights and responsibilities through collective agenda setting (Berkes, 2010).

Expectations about ‘good’ governance regimes are shaped by a number of principles applicable at all levels of governance. These include, among others: legitimacy, accountability, transparency and inclusiveness (Graham et al., 2003). Legitimacy refers to the validity that is bestowed on an individual or institution to govern that can be drawn from multiple sources, such as: acceptance by stakeholders of the entity to govern as well as statutory instruments that devolve authority to lower levels of governance or democratic processes that confer on them the authority to exercise the authority (Lockwood et al., 2010). Legitimacy is concerned with the question of who is entitled to make rules and how such authority is generated. The ability of any governing body to create and regulate interactions between actors depends on the extent to which its authority is accepted or legitimate (Campbell and Shackleton, 2001).

Accountability refers to measures that compel cooperating partners to allocate and accept responsibility for actions and decisions that they make as well to demonstrate these measures to other actors to whom they are accountable (Lockwood et al., 2010). Accountability is critical in governance as it influences the effectiveness of the decision making processes by determining the credibility and legitimacy of the process (Graham et al., 2003). Accountability can either be vertical or horizontal. Vertical accountability can either be bottom-up or top-down, the former referring to scenarios where lower level organizational units are made to account for their decisions and actions to higher levels of organizations. In contrast, top-down accountability refers to higher level units accounting for their actions to lower organizational units -- this may be done to create legitimacy for the decisions (Lockwood et al., 2010). In many of the governance processes, evidence suggests that accountability is mostly a one-sided process, upward to national and local Government with limited downward accountability to communities (Agrawal and Ribot, 1999).

Horizontal accountability refers to measures that require actors to be accountable laterally to partners within the same organizational level. In most governance processes, vertical accountability tends to overshadow horizontal accountability (Lockwood et al., 2010). In order to curb this state of affairs, it is important to establish clear lines of authority and responsibilities

that clearly define the interests and rights of different cooperating partners (Nkhata and Breen, 2010a, Lockwood et al., 2010).

Transparency refers to the flow of information in governance processes as a prerequisite for accountability in decision making processes (Nkhata and Breen, 2010a). It entails that clarity and reasoning behind each decision is given through the availability of information to stakeholders affected by the decision (Lockwood et al., 2010). Transparency is based on the premise that the more informed non state actors can be, the more meaningful the role they can play in governance processes. The flow of information should occur in well-defined channels of communication both within and outside organizational structures (Pope, 2005). Transparency from the perspective of actors includes connotations of integrity, honesty and leadership that should be exhibited by the actors to cooperating partners (Lockwood et al., 2010).

Inclusiveness in governance processes refers to the creation and implementation of opportunities for stakeholders to participate and influence decision making processes (Lockwood et al., 2010). This concept in part includes aspects of participation and shared governance. Participation is the process through which cooperating partners are involved in decision making on matters that affect them (Silitshena and Masacorale, 1999). Through participation, legitimacy among cooperating partners is created for subsequent decisions and actions. Shared governance denotes the sharing of authority and responsibilities among cooperating partners (Lockwood et al., 2010). Inclusiveness is implemented through decentralized governance approaches – discussed in the section that follows – that are meant to take into account respective stakeholder interests. To ensure inclusiveness in governance processes, organizational units should incorporate values, inputs and interests that reflect the diversity of the stakeholders (Lockwood et al., 2010).

### ***3.2.2. Environmental Governance***

Environmental governance refers to sets of regulatory processes or mechanisms through which actors – either the state, communities or non-Governmental organizations -- influence each other's actions and outcomes (Lemos and Agrawal, 2006). Environmental governance is therefore a multi-level process that regulates actors' actions, interactions and the potential outcomes thereof (Buscher, 2005). This is not to imply that governance is implemented by an

entity external to the actors but, rather, the structures and processes are set up by the actors and these enable them to define, accept or reject alternative environmental agendas (Nkhata and Breen, 2010c). In this manner, governance can be exhibited and institutionalized at every level of human interaction whether local, national or global. In its simplest form, environmental governance provides the means of social coordination that enables collective decision making and ordered rule (Nkhata and Breen, 2010b).

The nature or forms in which environmental governance is implemented are shaped by three main trends or drivers: (1) globalization, (2) emergence of market instruments, and (3) movement to less centralized forms of governance (Sonnenfeld and Mol, 2002). Globalization denotes an interconnected world across societies, space and economies resulting in multiplicity, diversity and interdependence among societies (Lemos and Agrawal, 2006). Consequently, globalization has the effect of increasing demand for natural resources through market expansion, increased waste production, as well as the free movement of energy and materials (Sonnenfeld and Mol, 2002). This broadens the range of challenges at national level and subsequently adds pressure on national resources to respond to these problems (Batterbury and Fernando, 2006). In order to counter the problems caused by globalization, environmental governance takes the form of international regulatory frameworks or regimes. Typical examples include the United Nations Framework Convention on Climate Change (UNFCCC) meant to address climate change and the United Nations Convention on Combating Desertification (Lemos and Agrawal, 2006).

Arising from the decline of the state as a prime agent of environmental governance has been the emergence of market-focused instruments. Market instruments offer an alternative to centralized regulatory control by providing utilization of the market for exchanges and incentives that encourage environmental compliance (Nelson et al., 2009). Market focused instruments aim at achieving environmental positive outcomes by attaching an incentive to costs and benefits associated with environmental strategies (Lemos and Agrawal, 2006). The term 'market' does not necessary imply that all market instruments are market based, since some instruments are built on bilateral negotiated agreements between individual actors or groups of sellers and buyers (Wunder, 2007). The rationale for market focused instruments is based on assumptions about the

self-interested behavior of economic agents (Agrawal and Lemos, 2007). There is a broad range of market focused instruments including voluntary instruments, eco-taxes, and certification. The adoption and popularity of market focused instruments differs by sector and locality. The motivation towards these instruments rests on the general dissatisfaction with regulatory policy instruments. However, there is a lack of expertise and general skepticism among private companies for market instruments for fear of losing economic competitiveness (Lemos and Agrawal, 2006).

The loss of faith in the state as a reliable agent of change has led to a drastic shift away from centralized forms of governance to more inclusive governance forms especially in developing countries. The causes of this shift are several: economic stress on state Governments imposed by international markets as well as a decline in aid flows; limited institutional capacity in national Governments; and emerging economic forces that challenge the economic and political capacity of national states (Batterbury and Fernando, 2006). This turn towards more inclusive governance was incorporated in Agenda 21 of the Rio Conference on Environment and Development 1992 as the subsidiarity principle (Berkes, 2010). The subsidiarity principle asserts that decisions should be made at the lowest level of governance that is most affected by the outcome of the decision (Marshall, 2008). It is argued that less centralized governance systems enhance competition among lower administrative units, leading to competition and so creating greater efficiencies; it also promotes accountability and participation by making decision making closer to those affected by governance; and lower level administrative units provide place-specific knowledge about the resource (Sonnenfeld and Mol, 2002, Buscher, 2005).

Research on decentralized environmental governance reveals a variety of conclusions regarding the meaningfulness and effectiveness of these governance reforms, ranging from those that have been highly successful to those that have effected little change in decision outcomes (Pomeroy, 1995). As a result, leading scholars have suggested hybrid forms of environmental governance that take into account the strengths and weaknesses of that state as well as communities (Ostrom, 2001, German, 2010, Agrawal and Lemos, 2007).

### ***3.2.3. Devolution, decentralization and co-management***

Benefit sharing entails the involvement of all stakeholders – especially local communities - in decision making processes. The degree to which these stakeholders are incorporated in governance processes forms the basis for concepts on devolution, decentralization and co-management. The section that follows outlines the similarities and differences in these concepts, according to the literature.

Discourse on devolution, decentralization and co-management often take these as synonymous concepts without paying attention to their subtle difference (Berkes, 2010). Devolution signifies changes in authority structures entailing the transfer of rights and responsibilities to user groups at the local level (Agrawal and Ostrom, 1999). The concept of devolution has connotations of social justice as it aims to transfer decision making processes to those most affected by the decision -- a move which is perceived as empowering non-state actors (Agrawal and Lemos, 2007). Devolution is differentiated from other forms of environmental governance by its transfer of rights and responsibilities to local user groups that have autonomy in decision making processes (Berkes, 2010).

Decentralization refers to the reorganization of social institutions in which power is exercised. It seeks to transfer power closer to those most affected by the exercise of power at lower levels of Government (Agrawal and Ostrom, 1999). Although the Government still has a large influence in decision making, it provides for enhanced participation of local communities (Meinzen-Dick and Knox, 1999). Decentralization is categorized into two groups, democratic decentralization and administrative decentralization. Democratic decentralization refers to the transfer of management rights and responsibilities to lower level actors who have relative autonomy in decision making processes (Larson and Soto, 2008). Administrative decentralization, on the other hand, refers to the transfer of rights and responsibilities from the central Government to a branch within the Government structure but usually outside the state's central location (Berkes, 2010). An example of administrative decentralization would be the transfer of management rights from central Government to an arm in the local Government (Berkes, 2010). In essence, decentralization leads to a shift in how lower levels of the administrative hierarchy relate to those

at the higher levels. In addition, it enhances horizontal relationships between decision makers and their constituents (Larson and Soto, 2008).

Ideally, co-management denotes a governance arrangement in which rights and responsibilities for resource management are shared equally between the Government and the user groups (Sen and Nielsen, 1996, Carlsson and Berkes, 2005). Therefore, in co-management scenarios, social actors such as state and communities define and negotiate fair sharing of management functions and responsibilities for a given area or set of natural resources (Carlsson, 2003, Pomeroy, 1995). The term 'management' in co-management refers to the regulation of use and the improvement of the resource (Schlager and Ostrom, 1992). According to this approach, local communities are seen as equal with Government in decision making processes and this relation is often endorsed by a formal agreement such as a Memorandum of Understanding (Berkes, 2010). This fact marks a distinction from concepts such as devolution: in the case of the former, the state develops a partnership with other stakeholders such as communities specifying respective functions, rights and duties regarding management of the resource (Sen and Nielsen, 1996). Although the basic idea of co-management involved a two-link relationship between Government and local users, over the years, the concept has evolved into a more complicated relationship in which a number of relationships or networks are established involving multiple actors operating at different scales with relative autonomy (Berkes, 2004). These networks are usually referred to as nested (Schlager and Ostrom, 1992).

Nested governance refers to multi-level governance implemented through large inclusive organizational units that emerge from small more exclusive units: these self-organize without losing their autonomy (Marshall, 2008). In most literature the term 'nested governance' is used to refer to the same concept as polycentric governance (Berkes, 2004, Marshall, 2008). The terms are two sides of the same concept in that polycentric governance refers to governance structures with multiple and overlapping centers of authority thereby connecting different levels of organization and communication (Schlager and Ostrom, 1992). The value of the concept of nested governance lies in the line of reasoning it gives for the nature of relationships between organizational units such as state and community groups. Local decision making is critical but should not exist independent of other levels, as drivers originating from other governance levels

have an impact on options at local level (Berkes, 2010). Marshall (2008) further argues that nesting lower level units rather absorbing or sidelining them helps lower level actors to overcome problems of trust in higher levels of organization not to fail them. In addition, individuals are more likely to have greater trust in organizational units that they have created and in which they maintain management rights (Ostrom, 1990).

Implied in the concept of decentralized environmental governance are issues concerning who should receive management rights and what the nature of the organization is. Two main concerns are raised in the literature: (1) what should be the role of traditional authorities, and (2) what is the effect of creating user group institutions (Larson and Soto, 2008)? In the pre-colonial era, community development programs relied on existing traditional local structures that were rooted in customs and norms (Murombedzi, 2003), by contrast, contemporary decentralized forms of environmental governance build on new organizational structures in the form of user groups associations (Lemos and Agrawal, 2006). The effectiveness and sustainability of user groups associations lies in the initial process of establishing the user groups and the reasons for starting them. Cases in which the user groups are initiated through donors or non-government organizations often result in top-down control and upward accountability rather than the real participation of local communities (Larson and Soto, 2008). Therefore key factors in establishing community user groups lie in identifying relevant stakeholders and clarifying the roles of traditional leaders and members of the executive committee (Buscher, 2005). Failure to define the mandates of traditional authorities and user group committees can often lead to ineffective management of the resource (Larson and Soto, 2008). In cases where user group associations and traditional authorities have overlapping mandates, this can result in competition rather than cooperation (Kumangwelo, 2000).

#### ***3.2.4. Collective action***

Many of the approaches that have influenced and shaped governance of natural resources have depended on how collective action was conceived by scholars (Hardin, 1968, Olson, 1965, Ostrom, 1990). This section presents an overview of how collective action is conceived in the literature.

Collective action is defined as actions taken by a group or on its behalf in achieving a perceived shared agenda of a defined group (Meinzen-Dick et al., 2004). These actions can either be undertaken through formal means as through established groups or informally through social networks (Meinzen-Dick and Knox, 1999). Collective action is often referred to as a public good due to the difficulty of exclusion of the benefit from those who do not participate in the collective effort (Adger and Luttrell, 2000). Hence a temptation always exists for individuals not to participate and yet still receive the collective benefit. For example, users who appropriate from a shared resource such that their actions are spatially interconnected with the difficulty of excluding other users from the resource face the challenge of organizing, thereby changing the situation from one in which appropriators act independently to one in which appropriation yields higher joint benefits through coordinated actions (Ostrom, 1990, Meinzen-Dick and Knox, 1999). The switch from independent actions to dependent actions requires collective action, which can be a serious matter.

Various theories explain how collective action can be initiated and sustained (Olson, 1965, Hardin, 1968, Ostrom, 1990, Ostrom, 1997). Three theoretical models are dominant when discussing this dilemma: the “tragedy of the commons” proposed by Garret Hardin (1968); the prisoner’s dilemma game; and “the logic of collective action” (Olson, 1965). Common to all these theories is the suggestion that individuals appropriating from a shared resource system are trapped in an inexorable process of destroying their own resource through their profit maximization nature and their inability to cooperate with each other (Ostrom, 1990). This has led to recommendations by some that external authorities, such as the state, impose sets of institutions, while others have recommended private property regimes as the optimum form of overcoming these dilemmas (Ostrom, 1997).

Over the past decades, the literature on common property has shown evidence that there are highlight conditions in which appropriators can self-organize to overcome their collective action dilemmas (Ostrom, 1997). To a large extent, the difference between the early theories for overcoming collective action problems and the contemporary theories results from the difference in modeling the behavior of appropriators using a shared resource. The early models saw appropriators as wealth maximizing users or solely rational individuals whose actions are solely

motivated towards maximizing their individual benefits or outcomes (Ishihara and Pascual, 2009). Emerging theoretical understanding now poses a holistic model for understanding individuals in a collective action situation that assumes rationality but also superimposes a social and institutional structure over these actions (Ishihara and Pascual, 2009).

This latter model mixes the almost robotic maximizing seeking behavior characterized in earlier literature with sociological views that regards individuals as constructed by social norms and customs (Ishihara and Pascual, 2009). The model was first proposed by Granovetter (1985) and is referred to as the social embeddedness concept. The combination of utility maximization behavior – referred to as ‘under socialization’ -- and the influence of social structure on the behavior of individuals suggests that individuals do take purposive actions in attaining optimum gains within an ongoing social and institutional structure (Kahan, 2002).

If the argument that rational individuals pursue self-seeking gains within societal structures is accepted, the logical inquiry that follows is why do individuals feel compelled to act in this manner? Theories on reciprocity help to explain this. Reciprocity theory draws evidence from “public good” experiments and asserts that individuals are moral and emotional reciprocators that are driven by honor and altruism to contribute to a collective action even without material incentives (Kahan, 2002). In this regard, individuals reciprocate the behaviors of others to contribute towards the collective good and refrain when it is perceived that others are shirking (Kahan, 2002). However, this attribute of cooperating varies across individuals with the disposition to cooperate expressed as multiple equilibrium rather than uniform distribution of free riding behavior across a population of appropriators (Kahan, 2002).

Reciprocity further draws attention to the importance of trust as a natural social incentive for cooperation. It is argued that trust among appropriators strengthens individuals’ inclination towards contributing to a collective good when it is believed that others are doing so as well (Kahan, 2002). In collective actions, situations expressed as an “assurance game” in game theoretical terms, where optimal benefit is achieved only through cooperation, trust among appropriators plays a critical role (Ostrom, 1990, Kahan, 2002). Consequently, individuals that share norms that reduce self-maximization through guile and instead encourage trust will be

more able to agree on resource appropriation rules with reduced enforcement costs (Leathers, 2008).

Other concepts used to further understanding on how collective action is initiated and sustained include common knowledge, group identification and information networks (Ishihara and Pascual, 2009, Henry, 2011, Mosimane et al., 2012) that subsequently culminate in social capital. In this sense, social capital provides a stock variable in which collective action can be constituted and facilitated (Meinzen-Dick et al., 2004). Following Meinzen-Dick et al (2004), institutions are seen as embodying collective action that is a direct flow of social capital. In this sense institutions will lower transaction costs for repetitive actions and reduce uncertainty among participants (Ishihara and Pascual, 2009). Studying institution using collective action theory helps to analyze institutional dynamics and to understand how institutions are developed, changed and sustained over time (Heltberg, 2002).

#### *3.2.4.1. Collective Action Problems*

Individuals appropriating from a shared resource face two kinds of problems that require collective action: (1) provisions, and (2) appropriation (Meinzen-Dick and Knox, 1999). Decisions regarding appropriation govern users' demands for flow units generated by the common pool resource while decisions regarding provision concern the protection or enhancement of the supply of flow units generated by the common pool resource system (Blomquist et al., 1991). The nature of these problems will depend on the values of underlying parameters, such as the value and predictability of the resource units, cost of enforcement and the ease of monitoring (Ostrom, 1990). The manner in which institutional arrangements approach appropriation and provision problems affects the distribution pattern of benefits accruing from the system, in this case study, the wetlands system (Ostrom, 1990).

Appropriation problems occur in the form of assignment problems, stock externalities and technological externalities. Assignment problems relate to the distribution of flow units spatially and temporally as well as restrictions in quantity of demand (Blomquist et al., 1991, Ostrom, 1990). Due to the variation in the distribution of flow units in the resource system, institutional arrangements must assign users spatially and temporally in a socially acceptable manner

(Ostrom, 1990). Allocations in quantity restrictions refer to complications regarding (i) allocation of quantity equally across users or on the basis of history or need (ii) synergy of allocations with available flow resource units (Blomquist et al., 1991).

Externalities in stock pertain to the effect of users' current activities on the future state or availability of the flow units (Blomquist et al., 1991). Problems with stock externalities emerge from rent dissipation activities that consequently reduce the value of a resource as a result of excessive utilization (Ostrom, 1990). Due to the interdependence of users in a common pool resource system, increased use of the resource may increase the cost of appropriation in future periods not only for user(s) whose actions generated them but for others as well (Blomquist et al., 1991).

Technological externalities refer to the effect of users' appropriation technology on each other (Blomquist et al., 1991). To get around this problem, institutional arrangements use rules to specify technological use and actions allowable depending on the technology of the appropriator (Ostrom, 2001). When appropriators perceive the assignment of access rights and costs to be unfair or inappropriately enforced, this can affect their willingness to participate in provision activities (Ostrom, 1990).

Provision problems occur from inadequate investment in the construction, maintenance and protection of the common pool resource system (Blomquist et al., 1991). Provision problems may occur on either the supply or the demand side of appropriation. Construction failures on the supply side represent opportunities to make long term investment in capital infrastructure (Ostrom, 1990). Since long term investment in the common pool resource system requires collective contributions, failures in the development of the resource could be due either be a lack of coordination of contributions of labor and capital or there being none at all (Blomquist et al., 1991).

Demand side provision may present regarding the protection or regulation of use of the common pool resource (Blomquist et al., 1991). Rent dissipation of common pool resource systems will lead to demand side protection problems (Ostrom, 1990). Protection of the resource requires

coordination in monitoring, enforcement and sanctioning of institutional rules (Blomquist et al., 1991).

Maintenance failures on the other hand, are a result of insufficient investment in the maintenance of the common pool resource system resulting in the degradation of the resource (Blomquist et al., 1991). These may be as a result poor determination in the level and type of maintenance that will sustain the system. Given that an investment in the maintenance of the resource affects the future rate of appropriation, collective decisions about these activities are difficult to make, especially with the incentive to free ride (Ostrom, 1990). The extent to which a group of appropriators will invest in the maintenance of a common pool resource depends on the discount rates they place on the resource (Ostrom, 1990). Discount rates refers to the value placed on future benefits (Ostrom, 1990).

### **3.3. Constructing the Conceptual Framework**

The section aims at constructing the conceptual framework by highlighting key concepts and attributes underpinning the study. It should be noted that there is no framework that can address the complexity and dynamic nature of benefit sharing arrangements. However, a systematic examination of the bundles of property rights is helpful in mapping the actors involved in the allocation of ecosystem goods and services as well as the decision making processes.

The framework is used as an analytic tool with which to better examine the complexity of benefit sharing from the perspective of bundles of property rights. The major concepts included in the framework include: environmental governance, benefit sharing, property rights and benefit sharing outcomes. The section starts by defining a concept is and the rationale for developing a conceptual framework. This is followed by developing the framework by way of highlighting key concepts that form the analytic framework.

A concept is an agreed expression or meaning that is given to a term in order to represent a phenomenon. Concepts are social constructs meant to facilitate communication and expression of agreed meaning (Babbie, 2014). An attribute is a reflection of the variable characteristics of a concept that serves to indicate the presence or absence of the phenomenon that the concept represents (Ostrom, 2001). The process of specification and mutual agreement on meaning of

terms in research is referred to as conceptualization (Babbie, 2014). Some scholars use the terms ‘variable’ and ‘value’ interchangeably with ‘concept’ and ‘attribute’ respectively (Ostrom, 2005). In this way a concept or variable is a logical set of attributes.

A conceptual framework is a representation of the relationships between concepts and their attributes in the research undertaken (Babbie, 2014). A conceptual framework may also be considered as a ‘mind map’ for the research that identifies the key concepts, variables and attributes in order to facilitate systematic analysis of a social phenomenon (Ostrom, 1990, Babbie, 2014). The conceptual framework forms the basis for data collection and analysis as a form of testable theory linking the concepts (Ostrom, 2005).

For purposes of this study, governance structures refer to the organizational units of institutions that embody the means of governance. Governance structures create legitimacy and provide the means of enforcing operational and collective level actions (Meinzen-Dick and Knox, 1999). These structures have multiple sources, including the state, traditional authority and community groups. Based on the definition of governance as the regulation of social relationships between actors occurring at multiple levels, an overlapping relationship between these structures is assumed (Lemos and Agrawal, 2006).

### ***3.3.1. Benefit sharing***

Benefit sharing has multiple meanings and dimensions depending on the field in which it is applied (Schroder, 2000). Benefit sharing in the ethical sense highlights questions of justice and who should access and benefit from a gain as conceived in the United Nation Educational, Scientific and Cultural Organization (UNESCO) Universal Declaration on Human Genome and Human Rights adopted in 1999 (Schroder, 2000, Peslett, 2011). Over time, the concept has evolved into discourse in other sectors such as oil, pharmaceuticals, genetic resources, forests, fisheries and climate change policy (Nkhata et al., 2012c). A departure is therefore made from definitions that are rooted in ethical considerations to institutional considerations that focus more on access and use of natural resources (Peslett, 2011). Discourse on benefit sharing under the Convention on Biological Diversity’s (CBD’s) Framework Convention on Climate Change under

the United Nations (UNFCCC), entered into force on 21 March 1994, offers a useful distinction between these definitions.

Benefit sharing is conceived as having two dimensions: firstly, the allocation or sharing of benefits – monetary or non-monetary -- among defined actors, and secondly, decision making processes regarding the resource system (Nkhata and Breen, 2010c). These two dimensions are important elements of benefit sharing conceived as an implementation of environmental governance (Agrawal and Ostrom, 1999). The first dimension denotes aspects of social accountability and responsibility in directing gains -- monetary or non-monetary -- from a natural resource system to defined actors through socially – or mutually- designed mechanisms (Nkhata et al., 2012c). The emphasis on mutually designed mechanisms is meant to highlight the potential for these mechanisms to be designed by all parties involved, the state, market actors and local communities, to reflect the interests of all (Reed and Bruyneel, 2010). This dimension of benefit sharing highlights two very critical aspects of the sharing of ecosystem goods and services: (1) all actors, but especially local communities, should benefit from the resource by virtue of generating or bearing the cost of living near the resource system, and (2) all actors should be involved in the allocation or distribution of the benefit (Jepson and Whittake, Environment and History, Jones and Murphree, 2004, Lewis and Alpert, 1997, Nkhata and Breen, 2010c).

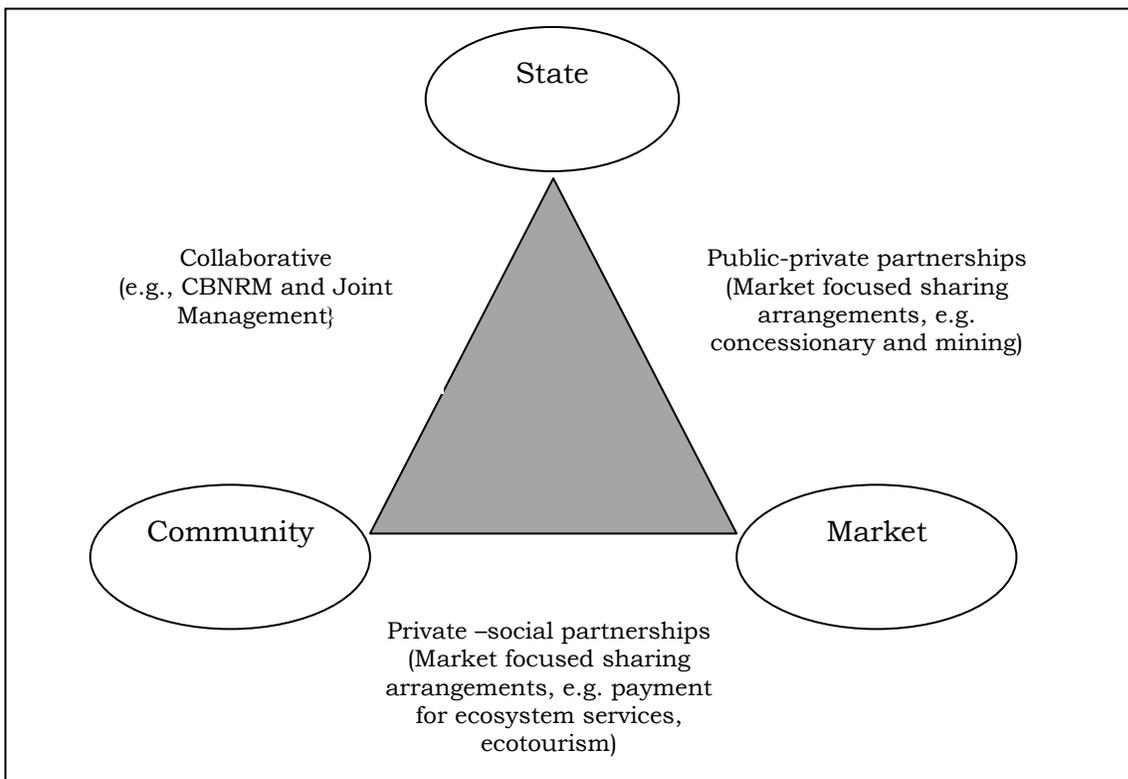
The second dimension of benefit sharing – and the one more explored -- pertains to the involvement of all actors in decision making processes (Agrawal and Ostrom, 1999). This refers to the involvement of non-state actors in decision making processes through devolution, decentralization and co-management approaches as alternative environmental governance systems (Lemos and Agrawal, 2006). The shift to more inclusive forms of governance that incorporates all actors in decision making processes is motivated by research on common property and decades of prescribing alternative forms of governing natural resources (Berkes, 2010).

In this study benefit sharing is conceived as the creation and regulation of relationships between actors that takes into account accountability, participation and responsibility in decision making and benefit distribution processes. This definition underpins two critical aspect of benefit

sharing: Firstly, who benefits and who is involved in the allocation of ecosystem goods and services; and secondly who is involved in decision making processes regarding the benefit. Effective benefit sharing processes should create and enforce both of these dimensions (Nkhata and Breen, 2010c). These processes should be implemented taking into account governance processes of participation, accountability, transparency and shared governance (Lemos and Agrawal, 2006).

### 3.3.1.1. Typologies of Benefit Sharing Arrangements

Based on trends and drivers that shape the terrain of environmental governance approaches discussed in section 3.2.2., a typology of benefits sharing arrangements is presented. Benefit sharing arrangements can be conceived as involving three social arenas in which actors interact to influence sharing outcomes (Figure 3.1). In discussing the different benefit sharing arrangements, focus is placed on three elements: the types of benefit that arise; the actors between whom the benefits are shared; and the formal and informal rules that govern how benefits are shared (Peslett, 2011).



**Figure 3.1;** Social arenas in which benefit sharing occurs. Adapted from: Lemos and Agrawal, 2006; Nkhata et al, 2012

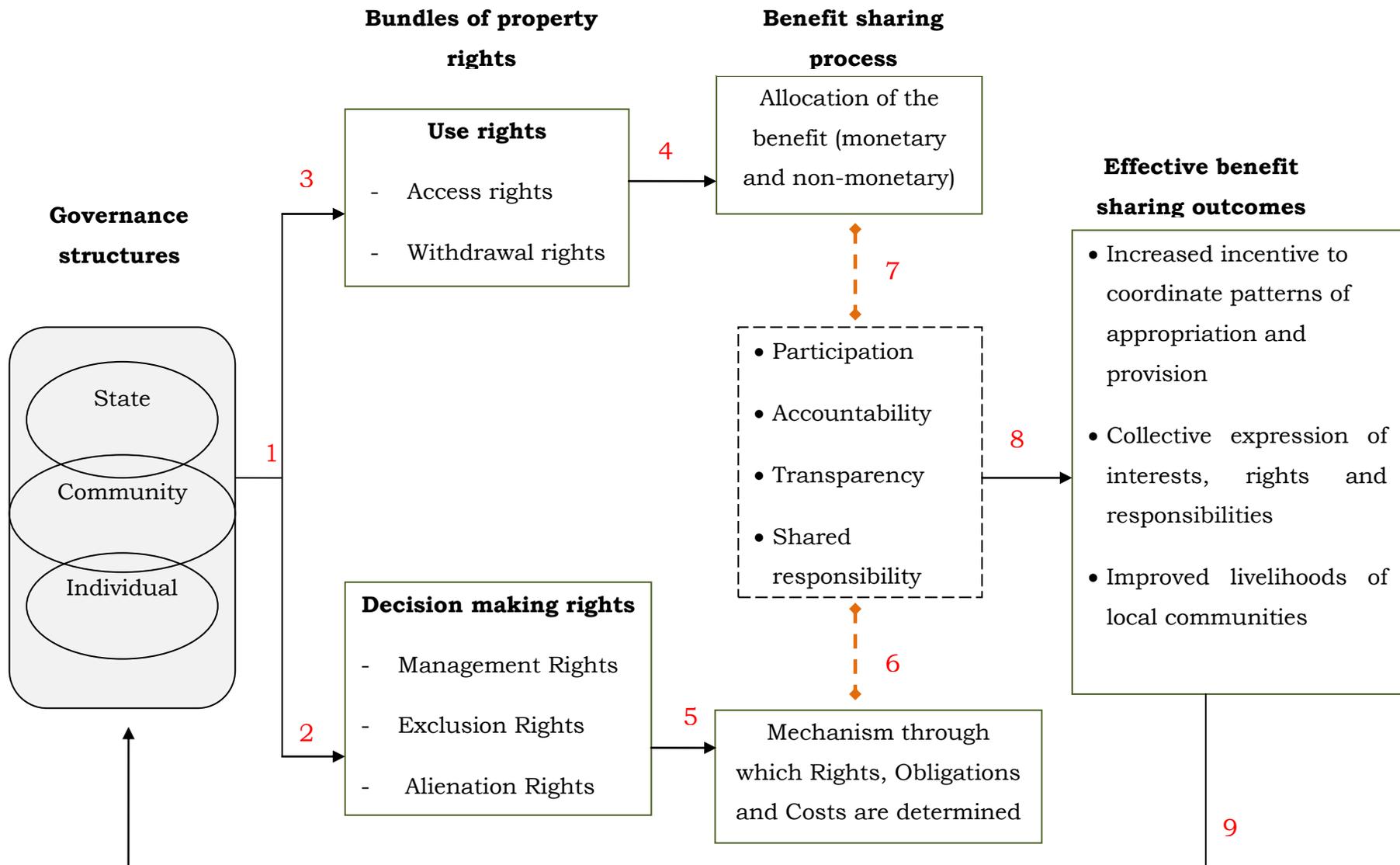


Figure 3.2: Conceptual framework for the study. Adapted from Edwards, et al, 1999; Ostrom, 2001; Nkhata et al, 2010

#### *3.3.1.1.1. Collaborative Benefit Sharing Arrangements*

Ideally, collaborative or co-management benefit sharing regimes aim to establish partnerships between the state and constituent stakeholders such as local communities. In these cases, the state arbitrates over conflicting interests at national level while practical management decisions and negotiations among competing actors are handled at local level in line with the principle of subsidiarity (Mearns, 1996). Examples of approaches that incorporate elements of collaborative benefit sharing strategies include Community Based Natural Resources Management (CBNRM), Integrated Water Resources Management (IWRM) and Joint Forest Management, among others (Nkhata et al., 2012c). The central theme in these approaches revolves around the involvement of local communities in the management of natural resources, leading to enhanced commitment and compliance with sustainable utilization of natural resources (Pomeroy, 1999).

Anticipated benefits in collaborative arrangements focus on the involvement of local communities in the allocation of ecosystem services and management of associated returns (Nkhata et al., 2012c). Hence the ‘benefits’ can either be non-monetary such as access and use of ecosystem goods and services or monetary returns accruing from the resource system. The returns in the case of CBNRM in the wildlife sector of Zambia, as an example, occur in the form of revenue from consumptive and non-consumptive use of wildlife that is shared among collaborating actors according to rules incorporated in agreements (Mearns, 1996). In such cases, the accruing economic benefit is seen as a major incentive for sustainable use of natural resources. The rationale is that increasing the economic rent for sustainable land use practices such as conserving wildlife or forests reduces the motivation to appropriate unsustainably or shift to destructive livelihood options (Jones and Murphree, 2004).

Rules governing benefit sharing can either be formal or informal. Collaborative benefit sharing arrangements are characterized by rules in the form of strong statutory instruments that guide relationships between lower and higher level institutional actors (Nkhata et al., 2012c). Following Nkhata et al (2012), rules governing benefit sharing in collaborative sharing arrangements are too prescriptive and seem to support national and/or international agendas that are often alien to the collaborating local actors. Furthermore, analysis of literature on co-management approaches (Turner, 2004, Haller and Merten, 2008, Nkhata and Breen, 2010c)

indicates that rules guiding these arrangements focus more on the rules of engagement between government departments and local communities and less on the sharing at community level resulting in dilemmas such as elite capture.

In collaborative benefit sharing mechanisms, benefits are shared between the local community, Government department or agency responsible in that sector, and the central Government (Nkhata and Breen, 2010c). Different variations exist in which local governance institutions link with community based institutions in the co-management processes (Shackleton and Campbell, 2000). However, research shows the high dominance of government actors as one of the main implementation challenges in collaborative sharing processes: this therefore limits the adaptive process between management and governance (Nkhata and Breen, 2010c, Nkhata and Breen, 2010b). In addition, these benefit sharing arrangements pay little attention to differentiated access and control among the perceived beneficiaries (Nkhata et al., 2012c).

#### *3.3.1.1.2. Market Oriented Benefit Sharing Arrangements*

Market oriented arrangements have taken prominence due to the increased recognition of the importance of ecosystem goods and services to human well-being (MEA, 2005). Essentially, market oriented benefit sharing arrangements aim at rewarding actors responsible for the provision of ecosystem services by providing economic incentives as a way of promoting sustainable management of ecosystems (Nkhata et al., 2012b). Approaches that incorporate market oriented sharing arrangements include Clean Development Mechanisms (CDM), Payment for Ecosystem Services (PES) and Reducing Emissions from Deforestation and forest Degradation (REDD).

Although benefits in market oriented arrangements may include improved institutional performance as a result of implementing such arrangements, strictly speaking, the envisaged benefits to be shared are the economic incentives from the provision of ecosystem services (Peslett, 2011). By providing the economic incentives, market oriented mechanisms aim to address market failures that fail to capture the economic value of ecosystem services such as climate regulation, water purification or flood control (Nkhata et al., 2012c). However, Nkhata

et al (2012a) assert that, in their form, market oriented benefit sharing arrangements limit the range of benefits focused on and merely reduce them to inducements for the community.

Rules usually occur in the form of agreements or contracts between producers and buyers of ecosystem services. Common to the rules are issues relating to additionality (payment must secure an environmental service that would not have occurred in the absence of payment) and conditionality (conditional performance according to defined criteria) (Nelson et al., 2009). Although broader frameworks exist through international law, variation may occur in terms of implementation due to differences in national legislation and context (Wunder, 2007).

In terms of the actors involved, market oriented benefit sharing arrangement may involve the local community as “producers” with the national Government and private sector institutions or international bodies as “buyers” of the ecosystem goods and service (Peslett, 2011). At national level, different existing institutions or new institutions may perform functions related to funding and compliance, although this may differ depending on whether the schemes are implemented directly with the producer community through projects or through national departments (Peslett, 2011). At the local level, through community based institutions and local Government, decisions are made regarding sharing of benefits and allocation of activities. Examination of some of the PES approaches in literature (Wunder, 2007, Nelson et al., 2009) indicates that the major challenge is in ensuring commitment and compliance of community members to the rules in the agreements.

### ***3.3.2. Property Regimes***

As a starting point to conceptualizing property right regimes, it is important to distinguish between common property and common pool resources. Broadly stated, common pool resources refer to a natural or man –made resource system such that the difficulty of exclusion is not trivial and substitution from the resource reduces its available stock (Ostrom, 1997). Such a resource can have either formal and/or informal rights that control its utilization. Reference of a resource as “property” aims to identify it as a reservoir of flow units (ecosystem goods and services or gains) to which a claim or right may be attached (Edwards and Steins, 1998). Resource regimes are contrasted on the basis of the type of right holder. Hence a distinction is made between the

following: (1) open access, no use right attached to any actors; (2) common property, use rights to a resource are shared collectively and are exclusive to a defined group of people; (3) private property, use rights are owned and held by individuals or companies; (4) public property, use rights are held in trust by the state.

These sources of enforcement comprise what are referred to as property right regimes (Meinzen-Dick and Knox, 1999). A regime refers to the decision making arrangements that prescribe the conditions for access and control over the range of benefit arising from the resource system (Edwards and Steins, 1998). Therefore a common pool resource can either be under open access, common property, private property and state property or a combination of all these property regimes (Edwards and Steins, 1998).

Under an open access regime – also referred to as *res nullius* -- no individual or groups of individuals have the authority to restrict access to the resource. It essentially denotes the lack of ownership or control, with access for potential users being free and unregulated (Heltberg, 2002). Resources under open access are eventually depleted due to their non-exclusivity. Furthermore, under this regime, the resource is characterized by divisibility which means the use by an individual reduces the amount available to others (Meinzen-Dick and Knox, 1999). There are situations in which poorly regulated use rights can lead to situations resembling open access, as in the case of poorly protected national parks or forest reserves in which local communities perceive it as legitimate to encroach in these areas (Heltberg, 2002).

Common property (*res communes*) regimes refer to rights that are held collectively by a defined group of individuals. Common property comprises resources that are collectively owned, such as fisheries, forests, irrigation systems and pasture. Rights of use and access are vested in the tribe, committee, village, or clan (Di Gregorio et al., 2008). Common property regimes are further categorized into unregulated common property and regulated common property. Unregulated common property refers to resources where access is restricted on the basis of membership while regulations for the conservation and management of the resource do not exist. Such resources are at risk of degradation in cases where the resource cannot support demand due to increased population pressure and expansion of markets (Heltberg, 2002). Regulated common property on

the other hand has regulations or rules for both access and conservation and these are implemented (Agrawal, 2001).

Private property refers to situations in which access and use rights are vested in the individual. In private property, an individual holds the full set of rights, which include the right to access and use, to exclude others, management, and the right to transfer ownership to another individual (Heltberg, 2002). It has been argued that private property provides the highest form of motivation among regimes for the individual or company-holding the rights -- to use and manage the resource efficiently (Edwards and Steins, 1998). As such, early scholars on the commons strongly advocated for private property rights as the only way to avoid the ‘tragedy of the commons’. However, research has shown evidence of cases in which self-organizing institutions managed natural resources as common property (Ostrom, 1990).

State property regime (*res publica*) resources are formally held under state ownership for which the state or through its agencies enforces access and conservation (Heltberg, 2002). The state is said to hold access and use rights on behalf of its citizens. Examples of state property in the context of natural resources management include National Parks and Forest Reserves. The majority of resources under state property in developing countries were converted from common property to state property under colonial and post-colonial Government (Murombedzi, 2003). However, poor enforcement of access and conservation rules in state property can resemble open access, especially where the state has limited capacity and surrounding communities do not feel obliged to comply with regulations restricting access and use.

### *3.3.2.1. Property rights*

Property rights are defined as “the capacity to call upon the collective to stand behind one’s claim to a benefit stream” (Bromley, 1991). Property rights are a product of society and are meant to form expectations and duties as individuals interact. A holder of a property right expects other individuals to allow him/her to act in a particular manner according to the right as well as to prevent other members of society from interfering with his actions (Schlager and Ostrom, 1992). Thus property rights involve the relationship between the claimant (right holder) and other members of a defined group as well as the institution that reinforces the claim by

prescribing their respective duties and privileges with regard to a resource (Di Gregorio et al., 2008).

Property rights in the context of research on the commons are categorized in two groups: collective choice rights and operational level rights (Schlager and Ostrom, 1992). Collective choice rights are meant to influence or change operational level actions and therefore allow right holders to participate in the definition or modification of operational level rules. Rules refer to the collectively agreed and enforceable prescriptions that require, forbid or permit specific actions (Ostrom and Schlager, 1992). Operational level rights are rights that are exercised in everyday activities and are prescribed by operational level rules (Adger and Luttrell, 2000).

The relationship between property rights and rules offers a deeper way of understanding the complexity and dynamic nature of property right regimes. Rules can be described as institutional statements that prescribe the opportunities, and constraints that create expectations about individuals' behavior (Agrawal, 1992). In this way rights are a product of rules such that for every right that authorizes a particular action, a rule exists that stipulates how and who should exercise that right. In short, rules stipulate how rights are implemented (Ostrom, 2001).

As with property rights, rules occur at the two levels, operational and collective. Operational level rules – boundary and authority rules -- are concerned with influencing how individuals exercise their rights at operational level. For example, authority rules can specify the type of fishing gear to be used in a particular locale thereby prescribing how an individual exercises withdrawal rights. Collective level rules are concerned with influencing or modifying operational level activities. For instance, changing the types of fishing gear or authorized actions is a collective level right that is exercised by those authorized to participate in their modifications. Collective level rules include position, scope, aggregate, information and payoff rules. A position rule sets the criteria for who should participate in collective level activities.

**Table 3.1: Summary of operational and collective level rules**

Rules	Description
Boundary rules	These define the interactions between actors by stipulating the characteristics of the participants.
Authority rules	Prescribe the actions that participants must and must not do and the justification for the action
Position rules	These rules differentially affect the responsibilities and capacities of those in positions
Scope rules	These affect the outcomes that are allowed, mandated or forbidden
Aggregation rules	Stipulate how individual outcomes are transformed into final outcomes
Information rules	These rules affect the kind of information that is available or forbidden
Payoff	These define the costs and benefits of actions and outcomes

*3.3.2.2. Bundles of Property Rights*

Table 4.1 describes four categories or bundles of property rights: access and withdrawal, management, exclusions, and alienation (Schlager and Ostrom, 1992). The bundles of rights correspond to various ownership positions depending on the combination of rights held. Use of bundles of property rights as an analytic tool helps to conceptualize beyond mere presence or absence of a property right but rather a number of different bundles of rights (Meinzen-Dick and Knox, 1999). In this way, an individual or group of individuals may have only a portion of bundles of rights while others have the full spectrum of rights; also, other actors may hold overlapping use and decision making rights over a specific resource (Di Gregorio et al., 2008). This method also addresses some of the shortcomings noted by some researchers in distinguishing between access and the right to access (Leach et al., 1999, Nguyen, 2006).

Rights of access and withdrawal are operational choice rights whereby access is the right to enter a defined resource (Ahmed et al., 2008). Individuals holding rights of access have the authority to enter a resource subject to meeting rules that describe the criteria (Ostrom, 2001). Boundary rules (Table 3.2.) specify the requirements that individuals must meet to exercise these rights. For example fisher-folk may be required to obtain a fishing license or to be a member of a village before entering a fishing group (Ostrom, 2001). Essentially, access rights provide the link between the authorized individual to a defined resource from which to appropriate (Ostrom, 1990).

Withdrawal rights refer to the authority to obtain or harvest products from a defined resource. In exercising withdrawal rights, a right holder must observe rules that prescribe how an individual withdraws from the resource -- such rules are categorized as authority rules (Adger and Luttrell, 2000). The need for enforcement of withdrawal rights is based on the premise that limiting the number of appropriators through access rights is not enough, there should be rules that limit appropriation as well (Ostrom, 1990). Individuals who have access and withdrawal rights may not have rights authorizing participation in collective choice actions. This forms the distinction between operational and collective level rights (Meinzen-Dick and Knox, 1999).

The right to management is a collective choice right that enables the right holder to define operational level actions. Management refers to regulation of use patterns as well as improvement of the resource (Adger and Luttrell, 2000). For example, a group of fisher-folk who develop a management plan that limits the various types of fishing methods to specific areas are exercising rights of management for the fishery. Individuals who hold management rights have the authority to determine how, when and where withdrawal and access to the resource may occur (Schlager and Ostrom, 1992).

Exclusion and alienation are collective level rights and are the highest forms of rights in the bundle of rights. Exclusion rights refer to the authority to exclude other users by setting a criterion for access to and withdrawal of the resource (Ostrom, 2001). For instance, fishers who limit fishing within specific fishing groups to only males who reside in a particular community are exercising exclusion rights. The right of alienation permits the holder of the right to transfer

collective level rights in part or fully to another individual or group of individuals. This may be through selling or leasing the rights such that he/she can no longer exercise authority over the resource (Ostrom, 2001, Ostrom et al., 1988).

**Table 3.2: Bundles of property rights and associated ownership positions (Agrawal and Ostrom, 1999, Ostrom, 2001).**

Bundles of property rights and associated ownership positions (Agrawal and Ostrom, 1999, Ostrom, 2001).					
Property right	Description	Ownership positions			
		Owner	Proprietor	Claimant	Authorized user
Access and Withdrawal	The right to enter and extract products from a defined resource	X	X	X	X
Management	The right to participate in regulating internal use patterns and to transform the resource through modification of the rules	X	X	X	
Exclusion	The right to determine who will have access rights and how the rights may be transferred	X	X		
Alienation	The right to sell and/or lease collective choice right	X			

Depending on the combination of operational and collective level rights that individuals hold, it is possible to distinguish four classes of ownership positions or property right holders (Table

3.3.) (Schlager and Ostrom, 1992). Authorized users include appropriators who have the right to both enter and extract from a defined resource but do not have collective level rights (Ostrom, 2001). Although the bundles of rights were presented individually, in reality the possession of one right may not imply the possession of another. For instance, withdrawal rights would not be meaningful without the right of access. In many common property settings, authorized users lack the authority to devise methods for appropriation or exclusion of others from exploiting the resource (Agrawal and Ostrom, 1999, Ahmed et al., 2008).

Individuals or groups with the right to participate in defining operational rules are referred to as 'claimants'. Claimants have the same rights as appropriators, with the additional right to participate in designing use, coordinating appropriation, and the provision of use patterns (Schlager and Ostrom, 1992). They cannot, however, exclude others from exploiting the resource or transfer collective level right to other users (Adger and Luttrell, 2000). 'Proprietors', on the other hand, have in addition to operational level rights the authority to set the criteria for exclusion. They do not, however, have the authority to transfer rights to other users (Ahmed et al., 2008).

Individuals who possess the full range of bundles of property rights are referred to as 'owners'. This is the most secure ownership position (Schlager and Ostrom, 1992). It is asserted that this position creates the highest incentive to coordinate use patterns as well to invest in the improvement of the resource (Adger and Luttrell, 2000). In most common property settings, especially traditionally managed commons, alienation rights are vested in the traditional authority (Agrawal and Ostrom, 1999).

One of the prime arguments for attention to property rights is that the configuration of rights determines the structure of incentives that appropriators face. Well defined and secure property rights provide an incentive structure for individuals through assuring them that the benefit accruing from the resource will not be reaped by other users (Meinzen-Dick and Knox, 1999, Ostrom, 1990). As a result, local appropriators have greater interest in resolving appropriation and provision problems. Appropriation problems refer to problems affecting utilization of the resource, such as restrictions on the appropriate technology to use, spatial and temporal restrictions, and quantity restrictions. Provision problems refer to challenges in maintaining and

protecting the productivity of the resource (Blomquist et al., 1991). Without the rights to regulate and exclude others from exploiting the resource, local appropriators cannot maintain the integrity of the resource (Meinzen-Dick et al., 1997).

An important difference is that between the owners who have the full set of property rights and other users who do not have the right to alienate the resource: it is often discussed in the literature. It is argued that the rights of alienation and exclusion are critical for the efficient use and investment in the resource (Schlager and Ostrom, 1992). In short, owners and proprietors, due to their vested interests in the resource, have lower discount rates of future benefits (Ostrom, 1999). The term “discount rates” refers to the value attached to benefits expected in the future compared to the immediate benefit from the resource (Ostrom, 1990). Place and Hazel (1993) and Agrawal and Ostrom (1999), show from a number of case studies that there is a significant difference between “proprietors” and “owners” in the level of investment decisions and productivity.

Claimants and authorized users are more likely to invest in formulating withdrawal rights that coordinate harvesting activities as well as access rights (Schlager and Ostrom, 1992). It is postulated that claimants have greater incentives to invest in the management of the resource although these are weaker than the incentives of owners and proprietors (Adger and Luttrell, 2000). However, this varies depending on the extent to which claimants perceive capturing the benefit of coordinating their activities (Schlager and Ostrom, 1992). It is generally agreed among scholars that limiting access alone through defining authorized users does not suffice to eliminate a high discount rate. Often authorized users who are fortunate enough to gain access accelerate their rate of use and threaten the sustainability of the resource. Hence it is generally accepted that the minimum ownership position for sustainable management of a shared resource is that of claimant (Blomquist et al., 1991, Agrawal and Ostrom, 1999).

Bundles of property rights in this study are categorized in two groups, use rights and control rights (Edwards and Steins, 1999). Use rights include rights of access and withdrawal while control rights include rights of management, exclusions, and alienation. To recap: access and withdrawal rights are operational level rights that influence the daily activities of resource users. Management, exclusion and alienation rights are collective level rights that determine who and

how operation level rights are modified, exclusion criteria, and the transfer of rights respectively (Schlager and Ostrom, 1992). In the conceptual framework (Figure 3.2), use and control rights influence two dimensions of benefit sharing: (1) allocation of ecosystem goods and services among defined actors; and (2) decision making processes in benefit sharing arrangements. It is argued that for effective benefit sharing outcomes, institutional arrangements should establish and enforce both use and control rights (Nkhata and Breen, 2010c, Ostrom, 1999, Schlager and Ostrom, 1992).

Benefit sharing outcomes refer to envisaged positive outcomes from effective benefit sharing arrangements. A number of criteria are advocated for evaluating institutions' outcomes, including allocative efficiency, social equity, balanced reciprocity, sustainability, stability, adaptability, and fairness. The use of multiple indicators to assess outcomes is recommended (Edwards and Steins, 1999). In this study benefit sharing outcomes are evaluated according to the following indicators: incentives of local appropriators to coordinate patterns of provision and appropriation, level of collective expression of interests, rights and responsibilities (Ostrom, 1990). The conceptual framework highlights two critical relationships underpinning the study; that the creation and enforcement of use rights influence modalities for allocation of ecosystem system goods and service among defined actors; that the creation and enforcement of control rights influence decision making processes in benefit sharing arrangements.

### ***3.3.3. Factors influencing the establishment of property rights regimes for common property resources***

A number of factors influence the establishment of property rights regimes for common property resources (Wade, 1988, Ostrom, 1990, Balland and Platteau, 1996) . Based on a synthesis of various empirical works, Agrawal (2001) comprehensively highlights a summary of key factors (Table 3.3) (Agrawal, 2001). This section aims to highlight five critical factors.

Characteristics of the resource system include features such as well-defined boundaries of the resource, accurate assessment of riskiness and predictability of the resource (Agrawal, 2001). Characteristics of the resource influence the costs of monitoring, sanctioning and self-organizing, since an undefined or large resource system involves greater costs in monitoring and sanctioning

appropriators (Ostrom, 1997). Predictability is affected by mobility and the storage attributes of the resource system (Blomquist et al., 1991). Mobility of a resource unit refers to its ability to be stationary (for instance, forests and pasture) or non-stationary (for instance, fish, migratory animals and running streams) in a resource system.

Storage is an attribute of a resource system and refers to its physical ability to store or collect resource units, for appropriators to utilize the resource unit when needed (for instance, ground water reservoirs and irrigation systems) (Blomquist et al., 1991). As noted in the literature (Ostrom, 1999, Ostrom, 2001, Nkhata et al., 2012b) attributes of common pool resources have a significant effect on performance variables of collective action, hence there cannot only be two typologies of benefit sharing arrangements as ideal strategies sharing an ecosystem's good and services.

**Table 3.3: Summary of key factors influencing establishment of effective property right regimes for common property resources (Adapted from Agrawal, 2001)**

Abbreviations: Wade, R.W. (1994); Ostrom. E.O. (1990); Baland and Platteau, B&P (1996); and Arun Agrawal (2001) – AA.

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*1. Resource system characteristics*

- Small size (RW)
- Well defined boundaries (RW, EO)
- Low levels of predictability (AA)
- Storage possibility of benefits (AA)
- Predictability (AA)

*2. Group characteristics*

- Small size (RW, B&P)
-

- 
- Clearly defined boundaries (RW,EO)
  - Shared norms (B&P)
  - Past successful experiences – social capital (RW, B&P)
  - Appropriate leadership – young, familiar with changing external environments, connected to local traditional elite (B&P)
  - Interdependence among group members (RW, B&P)
  - Heterogeneity of endowments, homogeneity of identities and interests (B&P)

3. *Institutional arrangements*

- Rules are simple and easy to understand (B&P)
- Locally devised access and management rules (RW, EO and B&P)
- Ease in enforcement of rules (RW, EO,B&P)
- Graduated sanctions (RW, EO)
- Availability of low cost adjudication (EO)
- Accountability of monitors and others to users (EO, B&P)
- External environment

4. *Technology:*

- low cost exclusion technology (RW)
- Time for adaptation to new technologies (AA)
- Low levels of articulation with external markets (AA)
- Gradual change in articulation of markets (AA)

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## 5. *State*

- Central Government should not undermine local authority (RW, EO)
  - Supportive external sanctioning institutions (B&P)
  - Appropriate external sanctioning institutions
  - Appropriate levels of external aid to compensate local users for conservation activities (B&P)
  - Nested levels of appropriation, provision, enforcement and governance (EO)
- 

Characteristics of the group include, size of the group, economic and social heterogeneity and social norms (Agrawal, 2001). Considerable debate has existed regarding the optimal levels of group size required for successful common property institutions (Ostrom, 1990, Agrawal and Goyal, 1997). However, it is increasingly being recognized that medium sized groups perform better than larger groups in regards to sustaining collective action through the ease of information flow and monitoring (Agrawal and Goyal, 1999, Andersson and Agrawal, 2006). In the same vein, considerable debate regarding different types of heterogeneity (cultural, economic and political) and their relationship with equity and sustainability have been noted (Wade, 1988, Ostrom, 1990, Balland and Platteau, 1996) and although there are substantive research gaps in this relationship, an important inference is the critical role of institutions in shaping resource governance outcomes, since they are influenced by inequalities (Andersson and Agrawal, 2006).

The importance of institutional arrangements in natural resource governance is well established in the literature of the commons (Ostrom, 1990, Agrawal, 2001, Heltberg, 2002). Relative consensus regarding attributes of institutions' arrangements exist pertaining to the simplicity of rules, graduated sanctions, locally devised rules and low cost dispute resolution mechanisms (Ostrom, 1990, Balland and Platteau, 1996). In his paper, Agrawal (1992) argues that all successful institutions must create and enforce rules at four operational levels: resource utilization, monitoring, sanctioning and arbitration. It is worth noting that, although the above stated attributes of institutions provide optimal likelihood for enduring and equitable institutions,

prescriptions of rules occurring in institutions produce different outcomes and hence need to be analyzed in the context that they are implemented (Agrawal, 2001, Nkhata et al., 2012b). The implication for policy research on benefit sharing approaches is the requirement to understand the dynamics of institutions and how there are constantly defined and redefined in the face of externalities from the resource systems and social-economic changes.

Critical to understanding the performance of common property institutions is their contingent and configuring nature. This refers to the external environment in which appropriators organize themselves and how their collaborative behavior is influenced by the broader environment, such as state laws and changes in market and technology (Agrawal, 2001). As an enabling condition, self-organizing groups should have the authority to devise and enforce their own rules with minimal challenges from central Government (Ostrom, 1990). This not only provides legitimacy but also provides ease of conflict resolutions in day to day disputes (Schlager, 2004). In many cases, cooperative approaches to benefit sharing, such as co-management, are not successful due to the poor relationship between state and local communities (Nkhata and Breen, 2010c). Hence understanding of institutional behavior in regulating individual user incentives can provide a starting point for understanding the relationship between state and local communities.

### **3.4. Conclusion**

The purpose of this chapter was to construct a conceptual framework for analysing benefit sharing arrangements on the Barotse Floodplain. The conceptual framework is founded on the relationship necessary, when establishing of bundles of property rights in benefit sharing arrangements, which will result in sustainable sharing outcomes. This consequently underpins the main objective of the study. In Chapters 5 and 6 the conceptual framework will be used to interpret the research findings and their implications for theory and practice.

## CHAPTER FOUR

### RESEARCH DESIGN AND METHODOLOGY

#### 4.1. Introduction

This chapter presents the methodology employed in the study. The significance of methodology to research is undeniable as it is central to the production of data on the basis of which theory is accepted or rejected. The chapter is structured as follows: firstly, there is an overview of the research paradigm underpinning the research; secondly, the dimension of the research is presented, highlighting the purposive, temporal consideration of the research; thirdly, the methodology that was employed in data collection and analysis is described; fourthly, there is ethical consideration of the study.

#### 4.2 Research Paradigm

A research paradigm refers to the model of understanding reality and how knowledge and observation is shaped and captured (Babbie, 2014). A research paradigm is composed of and differentiated into three aspects: ontology, epistemology and axiology (Wahyuni, 2012). Ontology is concerned with the nature of reality. For the researcher, ontological considerations involve taking a position regarding the perception of how things are and how they work (Scotland, 2012). Ontologically, a research project may assume one of the following positions: reality and its interpretation exist externally from social actors (objectivist or realist); reality is dependent on social actors and assumes that individuals contribute to social phenomenon (subjectivist or nominalist) (Wahyuni, 2012).

Epistemology is concerned with the generation and understanding of knowledge in a manner that is considered acceptable and reflects reality (Scotland, 2012). In other words, epistemology addresses what constitutes reality and what it means to know reality. On the basis of epistemology, research paradigms can be differentiated according to the following assumptions of knowledge: only observable phenomena can generate knowledge – this paradigm focuses on causality and generalization; observable phenomenon studied within a context(s) can generate knowledge; knowledge can be generated from subjective meanings and is aimed at inquiring into the motivation of each actor for an action (Wahyuni, 2012). Axiology, which is concerned with

the ethical considerations of the research, encompasses the role of values and the stance of the researcher in relation to the subject(s) being studied.

**Table 4. 1** Summary of philosophical assumptions of interpretivism. Source: Wahyuni (2012).

<b>Philosophical consideration of interpretivism paradigm</b>	
<i>Fundamental belief</i>	<i>Interpretivism</i>
<i>Ontology: the position on the nature of reality</i>	Socially constructed, subjective, may change.
<i>Epistemology: the view on what constitutes acceptable knowledge</i>	Subjective meanings and social phenomena. Focus upon the details of situation, the reality behind these details, subjective meanings and motivating actions
<i>Axiology: the role of values in research and the researcher's stance</i>	Value-bond and emic Research is value bond, the researcher is part of what is being researched, cannot be separated and so will be subjective

In order to understand the relationships between bundles of property rights and benefit sharing, the study adopted an *interpretivism* research paradigm. This approach is hinged on understanding the meanings that motivate actions of individuals. The perception of the world held by the individual is dependent on the subjective meaning that the individual holds (Porta and Keating, 2008). As a result, in the research study, actors will align their behaviors based on their perception of the rules and expected benefits from each action and outcome.

### **4.3. Dimensions of research**

The dimensions of research include three aspects: the purpose of the research, the use of the research, and the temporal dimension of the research. The purpose of the research refers to the nature of the research objectives or what the researcher aims to achieve by conducting the research (Babbie, 2014). The purpose of a research study determines the type of research being undertaken. There are three types of research: exploratory, descriptive, and explanatory. Exploratory research occurs when there is very little previous research that has been undertaken

in a field and the purpose of the research is to collect new data aimed at developing new hypothesis or claim to explain the data (Neuman, 2011b). Descriptive research aims at providing empirical generalization about a phenomenon in order to accurately describe that phenomenon or an event. The majority of qualitative studies aim primarily at description (Babbie, 2014). Explanatory research is concerned with addressing the question of ‘why’. Descriptive studies address questions of what, when, and how; explanatory research on the other hand aims at explaining a phenomenon. In most cases explanatory researches analyze the causality of a phenomenon (Neuman, 2011a). The ensuing research is descriptive and was aimed at better understanding of benefit sharing using the theoretical lens of bundles of property rights.

The time dimension of research refers to the treatment of time in the research. Research can either try to understand a phenomenon from a fixed point in time (cross sectional research) or multiple points in time (longitudinal studies). Cross sectional studies involve observations of a population or phenomenon at one point in time (Babbie, 2014). The inherent problem of cross-sectional studies is that their conclusions are based on circumstances at only one point in time and this may limit observation of causal processes over time. To get round this problem, cross sectional studies incorporate wide spatial dimensions (Neuman, 2011b).

Longitudinal studies, in contrast, permit observation of the phenomena over an extended period of time. Longitudinal studies will vary, depending on whether the sample participating in the research remains constant throughout the period and whether there is a fixed time interval in the period. The ensuing study was a trend longitudinal study aimed at assessing benefit sharing arrangements in the Barotse Floodplain between 1936 and 2012.

#### ***4.4 Methodology***

The term methodology refers to the domain in which a research is conducted, that is, the assumptions and conditions of the particular paradigm being adopted. It generally relates the underlying set of beliefs that guides the researcher in conducting the research (Wahyuni, 2012). The methodology of a research project includes the sampling technique, data collection methods, and data analysis procedures.

#### **4.4.1. Case Selection**

Reference of a study as a case denotes the spatial and/or temporal delimitation of a phenomenon from which an inference can be made to explain that phenomenon (Gerring, 2007). Therefore the purpose of case study research is to intensively study a single case or a small number of cases in order to infer knowledge that applies also to a larger class of cases. Where the research seeks to analyze within-case observations, the study is referred to as a *single case study* while analysis of variation between two or more separate cases is referred to as a *cross case study* (Blanche et al., 2006). However, selection of the cases for observation – or study – is not made on the basis of their representing an entire population (Gerring, 2007). Often the units (observations) in the population are not homogenous: case study research is therefore not sampling research (Tellis, 1997). Instead, selection of the cases is done on the basis of maximizing inference from the cases within the timeframe of the research.

Selection of the Barotse Floodplain as a case study was done for several reasons. First, the wetland floodplain is under a dual administrative system -- traditional and state authority. Historically, utilization of natural resources from the wetland has been under the traditional authority – the *Litunga* (King). Although overall power of the *Litunga* was reduced at the time of independence, natural resources are strongly tied to the customary laws under the Barotse Royal Establishment (Lewanika, 2002). This unique status of the Barotse Floodplain provided a rare opportunity to elucidate institutional dynamics between dual governance systems regarding natural resource management and utilization.

Secondly, the Barotse Floodplain is the second largest wetland in Zambia and although little research has been undertaken on the floodplain, it exhibits an enduring case of traditional management of utilization of a natural resource (Campbell and Shackleton, 2001, Lewanika, 2002). This provided an opportunity to understand the configuration of rules and property rights governing benefit sharing among multiple appropriators.

Thirdly, the selected study area provided an opportunity to analyze the costs of monitoring and rule enforcement among the existing institutions in the area. This is in light of recent reports of

tension between traditional authority and local councils regarding the collection of a levy from fishermen in the area (GRZ, 2011a).

Respondents were selected from among various stakeholders in order to incorporate different aspects that influence benefit sharing (Flint, 2009, Pollard and Cousins, 2008, Leonard, 1995). Hence, respondents for in-depth interviews were drawn from the following groups: (1) cattle keepers in the area; (2) village wetland conservation committees; (3) agriculturalists in the wetland area; and (4) fishery management committees. Six respondents were drawn from each group.

Key informants included: traditional authorities (*Indunas* responsible for allocating and managing the wetland); the Zambia Wildlife Authority (ZAWA); the Department of Fisheries; local Government; the Forestry Department; the World Wide Fund for Nature (WWF); the Lyambai Development Institute; executive leaders from Concern World Wide and community organizations. The total number of respondents for in-depth interviews was therefore 32. The researcher's attachment to the Field Office of WWF Zambia facilitated access to relevant individuals in the key organizations.

#### ***4.4.2 Interview Design***

In-depth interviews provide a means of collecting data in its natural context – this fits well with the interpretive approach to research (Blanche et al., 2006). The study employed open ended questionnaires in order to capture emerging themes not necessarily capture in the questions. The interview design adhered to the flowing process: identification of respondents; initiating contact with identified respondents; and conducting of interviews (Figure 4.1).

Respondents were identified through the field organization – WorldFish Center Zambia, Mongu Office -- to which I was attached during the data collection period. The field organization acted as the sponsor, that is, the individual or organization that helps to gain initial acceptance in the study area (Blanche et al., 2006). Adherence to the selection criteria stated in case selection provided a means of reducing nomination bias on the part of the field organization.

A translator was identified on the basis of knowledge of the areas as well as basic knowledge of conservation and developmental work. This allowed for easier translation of the concepts in the interview check list. In addition, permission from relevant traditional and government authorities was requested before contacting respondents. This was in line with the ethics requirements of the research.

Contact with respondents was made in person and by telephone. These contacts served as an opportunity to brief respondents on the research, obtain their consent, and set a date for the interview. Key informant interviews were conducted before the individual interviews, with community groups. This allowed for better understanding of the context and underlying issues.

The interviews, which lasted between 45 and 90 minutes, covered a wide range of topics including: utilization and monitoring of wetland resources; sanctioning and conflict resolution processes; equity in benefit sharing processes; participation in collective action process; and change in institutional regimes. In accordance with human subjects' procedures, all interview notes were anonymous, with actual contact information held separately. Interviewees were referenced by date, place of residence, and title.

#### ***4.4.3 Documentary Sources***

Documentary analysis refers to the systematic collection, reviewing, and evaluating of documents – in soft and hard copies – in order to elucidate meaning (Bowen, 2009). Documentary sources included minutes of meetings, letters, official documents, and newspaper articles (Blanche et al., 2006). Bowen (2009) suggests three uses of documentary sources: they provide the context in which research participants operate through fostering historical insight; provide a means of refining interview questions based on new insight into the phenomenon; and provides a way of tracking change and development. Collection of document sources was segmented into the following phases: collection, reviewing, and interpreting.

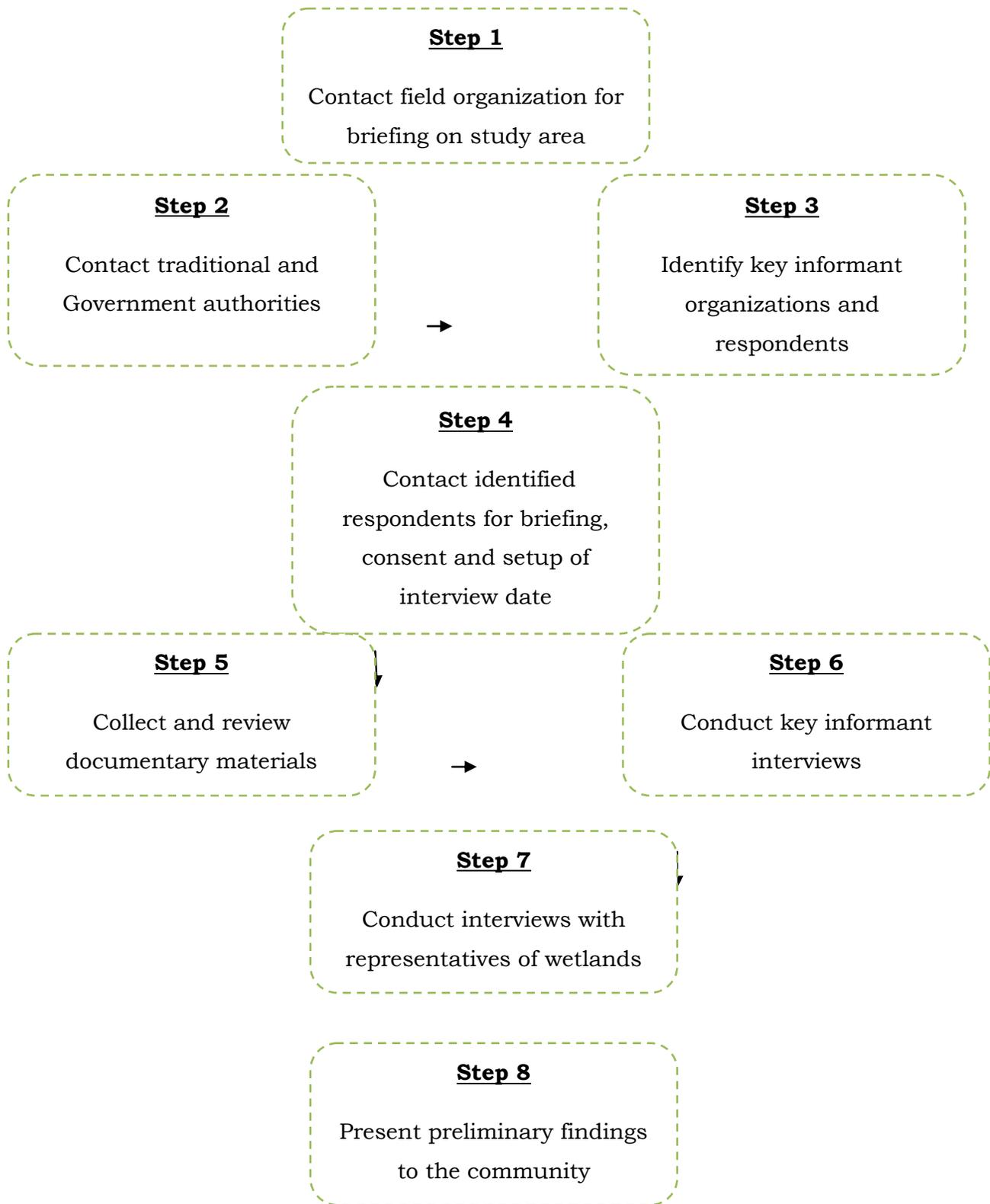
Reviewing of documentary materials involved analyzing the documents in order to enhance the interview questions. This acted as a means of streamlining the interviews in order to elicit relevant data for coding. Topics covered under documentary analysis include: conflict resolution processes, formulation of collective choice rules and implementation of agreed decisions

#### ***4.4.4 Data Analysis***

Data analysis in qualitative research involves a thorough and careful reflection upon and interpretation of the data within the context in which it was collected (Blanche et al., 2006). Four stages of data analysis were used in this research: (1) familiarization; (2) inducing themes; (3) coding; and (4) interpretation.

Data analysis in interpretive research usually begins during collection of the data (Blanche et al., 2006). Therefore, during the familiarization stage, transcribed texts (that is, field notes, interview transcripts) were read in order to understand the context within the conceptual framework (Silverman, 2010). Inducing themes refers to the process of inferring general classes from specific instances (Blanche et al., 2006). Due to the open-ended nature of in-depth interviews, new themes emerged that were not initially in the questionnaire. Inducing themes provided a means to identify and reflect on the meaning of the texts. Barbour (2008) suggests thinking in terms of processes, functions, tensions, and contradictions, with particular attention being paid to the phrasing and non-verbal cues of the sentences.

Interpretation of the documentary material was done as part of the broader process of data analysis of the research. Interpretation involved developing a written account of phenomena using themes as subheadings (Silverman, 2010). This stage provided an opportunity to reflect on the researcher's bias in collecting and interpreting the data. In addition, the conceptual framework was used as a general frame for interpreting the data. However, care was taken to recognize unique concepts and relationships not reflected in the theory (Blanche et al., 2006).



**Figure 4.1: Steps undertaken for data collection procedure**

Coding refers to the marking of different texts of data according to relevant themes and subthemes (Blanche et al., 2006). This entailed breaking the data sets away from the linear order in which they were recorded and placing them in a sequence that highlighted relationships between data sets. The N-Vivo software package (qualitative data analysis software) was used to develop and align themes and subthemes emerging from the transcripts and notes.

#### **4.5. Validity and Reliability of the Data**

Validity and reliability in qualitative research culminate into the matter of the quality of the research (Blanche et al., 2006). Following Creswell and Miller (2010), validity and reliability will be addressed at three levels: (1) from the researcher's perspective; (2) from the participants' perspective; and (3) perspectives of parties external to the study.

In qualitative research, the researcher is the instrument of the research, working back and forth between data collection and analysis (Blanche et al., 2006). Creswell and Miller (2010) suggest that in order to avoid preconceived assumptions in the collection and analysis of data, the researcher should constantly look out for disconfirming evidence from the data set before a relationship is made. Therefore, during interviews and data analysis, efforts were made to constantly reflect on alternative meanings of responses and themes, so as to identify any inconsistencies or disconfirming evidence.

Interpretive research assumes that social phenomena are constructed and perceived by participants (Blanche et al., 2006). The researcher therefore aims at reconstructing participants' reality within the natural settings, in order to understand their subjective meanings attached to their actions. In order to enhance credibility in the interviews, the translator was oriented on the themes and on the intended use of the responses.

Qualitative research is naturalistic. This entails that the phenomenon under research must be closely tied with the setting in which it is found. In order to enhance the credibility of the research, the study should describe the setting, participants, and themes in detail (Creswell and Miller, 2010). I will therefore use process notes to describe the participant interviews (that is, the nonverbal cues), interactions, and actions. In addition, I used video recorder when permitted by the respondents.

## 4.6 Ethics

The Monash University Human Research Ethics Committee approved the research with fisherfolk on the Barotse Floodplain as well as research interviews with Government and NGOs (Approval number CF12/2903 –see Appendix D).

In order to obtain voluntary participation from respondents and ensure that no harm would come to individuals who chose whether or not to participate, a letter of informed consent and explanatory statements were used. The two documents highlighted the following issues: the purpose of the research; description of any reasonable benefits expected from the research; the risks or discomfort associated with the research; potential use and storage of the data collected; modalities for confidentiality and anonymity in the research (See Appendices A and B). In addition, both documents were translated into Lozi, the major vernacular language spoken in the area.

Potential respondents were identified by the facilitating field organization – WorldFish Center -- to which the researcher was attached during the data collection period. Respondents were only approached by the researcher once they had read and agreed to the contents of the letter of consent and the explanatory statement. Respondents were selected based on predetermined selection criteria that included occupation, residence, age, gender, and availability.

The research also took into account gender during in-depth interviews. Two translators were used – one female and one male. This was meant to compensate for cultural differences in how women and men interact with each other. The selected translators were respected members of the community who were recommended by the facilitating field organization.

In order to ensure that the community maximized the outputs from the research and to avoid their feeling that they were being exploited, the following steps were undertaken:

- Ensuring that permission is granted from the local traditional authority before commencing with data collection;
- Being aware of when people are tired or want to stop the interview; Communicating respect and gratitude by reciprocating where necessary;

- Not asking for too much of people's time;
- Being aware of sensitive issues and avoiding questions that are inappropriate or intrusive; and
- Communicating respect and gratitude to respondents.

#### **4.7. Conclusion**

This chapter presented the research design and methodology used in the study. The study was descriptive and used an interpretive research paradigm. The research was also longitudinal in nature, analysing benefit sharing arrangements over a temporal scale. The methodology was qualitative in nature using in-depth interviews and documentary sources for data collection. Thematic analysis was applied to the data, using QSR NVIVO software for analysing and coding texts. The research adhered to all ethical considerations as prescribed by the Monash University Human Research Ethics Committee (MUHREC).

## CHAPTER FIVE

### RESULTS

#### 5.1. Introduction

The chapter aims at assessing the sharing arrangements for natural resources – specifically fish resources -- on the Barotse Floodplain of the Western Province of Zambia, using a property rights perspective and covering the period 1936 to 2012. In this study, the concept of benefit sharing highlighted the inter-linked notions of social and ecological processes in which gains accrue to participants through multi-level governance processes (Nkhata et al., 2012c). Governance is viewed as a social process through which society guides relationships between participants as they advance their interests, mediate their differences, and meet social obligations. The manner in which sharing arrangements are configured results in the advancement or hindrance of particular interests and, subsequently, to the accumulation of gains to participants through societal arrangements (Agrawal and Ostrom, 1999). Benefit sharing is therefore the implementation of governance systems at multiple levels resulting in the actualization of gains by participants through social interactions (Peslett, 2011, Nkhata et al., 2012b).

The issue of who actualizes these gains involves a consideration of property rights as participants' form and exchange social interactions. Property rights refer to the claim to a resource and the capacity of the collective to support that claim (Bromley, 1991). In other words, property rights embody the claims, entitlements, and the corresponding duty of other participants to honor the claim towards the use of the benefit derived from the ecosystem (Nkhata et al., 2012a). Property rights may usefully be referred to in order to describe relationships between participants in relation to a shared ecosystem. Property rights are best thought of as not a single unit but rather as a 'bundle' or discrete grouping of rights that may be shared or divided in various ways. It is argued that the creation and enforcement of bundles of property rights among participants influences the effectiveness of benefit sharing arrangements. Long term secure and well defined bundles of property rights provide an incentive for resource users to manage the resource sustainably (Yandle, 2007). Incompletely defined or incompletely distributed property

rights create ambiguity and conflict in resource use (Schlager and Ostrom, 1992). This case study illustrates the relationship between the establishment and enforcement of bundles of rights and benefit sharing outcomes on the Barotse Floodplain. By examining and categorizing the range of property rights over the years in this floodplain, the study illustrates how the configuration of property of rights has influenced the performance of benefit sharing.

The chapter is structured as follows: the bundles of property rights are presented as an analytic guide to understand benefit sharing arrangements according to the following main eras: traditional authority centered sharing era; state centered sharing era; and collaborative sharing era. Although these are presented individually, an underlying interaction is assumed that subsequently influences benefit sharing on the Barotse Floodplain.

## **5.2. Traditional Authority Centered Sharing Era: 1936 to 1974**

For the purposes of this study, the traditional authority centered sharing era refers to the period from 1936 to 1974, during which the authority for regulation of use and conservation of natural resources in the Barotse Plains was vested in the Barotse Royal Establishment through the Barotse Native Government Orders, Rules and Regulations. The Barotse Orders and Rules were sets of traditional laws that were incorporated in written format and were intended for the conservation of natural resources. They were approved in 1936 during the reign of Litunga Yeta III (Nawa, 1990, Lewanika, 2002). Prior to 1974, a number of legislative reforms (summarized in Table 4.1.) occurred that led to change in the benefit sharing mechanism on the floodplain.

It is argued that this era was strongly associated with traditionally enforced benefit sharing mechanisms and sustainable sharing outcomes that were underpinned by common property rights. Local fisher-folk, through the traditional authority, created and enforced operational and collective choice rights. As has been stated, collective choice rights refer to the authority to modify or improve operational level actions while operational level rights are rights that are exercised in everyday activities (Schlager and Ostrom, 1992). Through rights of access and withdrawal, local users clearly defined the boundaries of the fisheries and the individuals who had rights to utilize fish resources through traditional authorities. Rights to withdrawal were held collectively and amounts of harvest could be adjusted to suit local conditions. Through collective

choice rights decision making rights were established, recognized, and adjusted through social relationships and were consequently enforced by traditional authorities. Local fisher-folk were included in the decision making processes of traditional authorities, thereby creating an incentive to utilize the resource sustainably.

### ***5.2.1. Access rights***

Access rights denote the right of an authorized individual to enter a defined resource (Schlager and Ostrom, 1992), and to use that resource as defined by the extent of its boundaries. Creation and enforcement of access rights in benefit sharing arrangements helps in determining who is allowed to benefit and from what resource system. Without defining the boundaries of the resource and the type of users who can participate, local appropriators risk losing the benefits accruing from a resource to other users and to have their actions degrading the resource (Ostrom, 1990).

The system of access rights on the Barotse during this era followed the assignment of numerous and dispersed fishing sites to title, village and finally to the household or clan. Resource units attaching to titles such as the Litunga (King), *Ngambela* (Prime Minister), *Saa Induna* (Court Induna) and Village Induna were referred to as ‘estates of administration’ (Gluckman, 1960). The Litunga as the traditional authority claimed rights over a variety of resources on the plains that were referred to as the King’s Fields, including fishing sites, reed reserves, forest reserves, and game reserves. These were overseen by his agents and often worked by members of the community (Lewanika, 2002). These sites had names attached to them with well-defined boundaries stipulating their spatial extent (Lewanika, 2002).

**Table 5. 1: A summary description of the legislation marking shifts in benefit sharing arrangements with specific reference to Western Province of Zambia**

Year	Legislation	Comments
1936	Barotse Native Government Orders and Rules	The Barotse native Government Orders and Rules are sets of traditional laws covering a range of social issues including natural resources conservation and regulation of use.
1940	Establishment of the Barotse Forest Fund	The fund was created to manage forest reserves and ensure availability of finances for purposes of managing forests
1964	Signing of the Barotse Agreement of 1964	<p>The agreement incorporated Barotseland into the newly independent Zambia</p> <p>The agreement provided for the autonomy of the Litunga over regulation and management of natural resources in Barotseland.</p> <p>The Litunga maintained authority through the Lozi customary law over all natural resources including land.</p>
1964	Zambia gains independence from colonial rule under United National Independence Party (UNIP).	Zambia gains independence from colonial rule with the incorporation of Northern Rhodesia and Barotseland.
1968	National Parks and Wildlife Services of 1968	All game reserves including Liuwa and Sioma Game Reserves come under the authority of the National Parks and Wildlife Services.

1969	Cancellation of the Barotse Agreement of 1969	<p>Authority over regulation and management of natural resources transferred to state government.</p> <p>The traditional systems for conservation of natural resources become redundant.</p>
1970	Western Province (Land and Miscellaneous Provisions) Act of 1970	<p>The Act vests all land in Western Province in the president of Zambia as a reserve.</p> <p>The Act shifts authority from the Litunga to the President of Zambia</p>
1973	Forest Act of 1973	<p>The Act repeals previous legislation on forests including: Forest Ordinance of 1941 and Barotse Native Government Orders and Rules.</p> <p>The Act removes all provisions that empowered local communities for management of natural resources. Withdrawal of the rights of the Litunga to own land.</p>
1974	Fisheries Act of 1974	<p>Repeals the Fisheries Ordinance and brings management of all fisheries under the authority of government. The Act withdraws all operating traditional systems.</p>
1975	Enactment of the Land (Conversion of Titles) Act of 1975	<p>The Act repeals the Western Province (Land and Miscellaneous Provisions) Act of 1975 and vests all land in Zambia in the President on behalf of the people of Zambia.</p> <p>Introduces leasehold title and prohibits private ownership of land.</p>

1983	Establishment of the Lupande Development Project in South Luangwa National Park	Focuses on managing interactions between elephants and local communities residing around the Lupande Game Management Area.
1986	Enactment of the Statutory Instrument No. 55 of 1986, Fisheries regulations; Statutory No. 198.	The Statutory Instruments (SIs) bring into effect regulations for fishing methods, technologies, licenses, and fish ban. However, the fish ban is implemented only in 1997.
1987	Establishment of the Administrative Management Design Programme for Game Management Areas (ADMAGE)	The origin of governance reforms affecting community and central Government is the ADMAGE program. The main thrust of these reforms is to involve local communities in the protection and management of natural resources. This led to a shift in governance approaches in other sectors such as forests, fisheries and water.
1994	Establishment of the National Environmental Action Plan (NEAP) of 1994	The NEAP was founded on three main principles: 1) the right of citizens to a clean and healthy environment; 2) promoting participation of communities in natural resources management; 3) obligatory environmental impact assessments for developmental projects.
1998	Implementation of the Environmental Support Programme in 1998	Provided the means for the implementation of the NEAP. The EMP had four main components: 1) institutional strengthening and legal framework; 2) environmental education and public awareness; 3) environmental information networking and monitoring systems; 4) A pilot environmental fund.

2000	Launch of the Community Based Natural Resources Management Programme for Western Province in 2000	The programme was launched as a component of the ESP with the main developmental objective to have established effective institutions for the management of natural resources in a sustainable manner for the social and economic benefit of local communities.
2002	End of the Community Based Natural Resources Management Programme for Western Province	
2007	Enactment of the Fisheries Act of 2007	The Fisheries Act makes provisions for the transfer of management rights to local communities through the Fisheries Management Committees in Fisheries Management Areas.
2011	First Successfully Implemented Fish Ban in Western Province	

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Sources: Nawa, 1990; CONASA, 2002; Nyirenda, 2010; Malasha, 2007; Lewanika, 2001; Simwinji and Lewanika, 2002; Gluckman, 1960; Kashimani, 1987; Nkhata et al, 2009.

Access rights to fishing sites attached to titles were enforced through the hierarchical relationship between the Litunga and village headmen. It follows that the allocation of access rights to fishing sites to the Litunga and other positions such as that of the Ngambela and Indunas was based upon the political status of that position (Gluckman, 1960). A distinction was made between access rights to resources attached to the positions and those acquired through family inheritance. The former was acquired through title and enforced so as long the individual held that position. The King's rights to natural resources were traditionally regarded as rights held on behalf of his subjects (Lewanika, 2001). Therefore, even though an individual holding a political title was allocated access and withdrawal rights over a piece of land, fishing site or reed reserve, he/she possessed it based on his political position and not in his personal capacity. In addition, any land

or fishing site that was not allocated was retained by the King -- in this manner, no resource was under open access.

At village level, rights of access were assigned according to membership of a village. Members or residents of villages had a political relationship with the village Induna as head of that village. If an individual left a village, he lost access rights to the resources attached to that village (Nawa, 1990). Therefore, even though an individual was allocated access and withdrawal rights over a fishing site or land, he/she held it on the basis of being a resident of that village.

The type of body of water also influenced access rights between and within villages. Respondents explained that there were four types of water bodies that included *Nuka* (a Zambezi River channel), *Siko* (tributaries of the Zambezi River), *Natikowa* (village lagoon) and *Lisa* (family lagoon). Any individual had the right to access fish from the *Nuka* as it did not fall within any village boundary. However, fishermen often notified the village Induna in the village adjacent to that portion of the Zambezi in which fishing activity was taking place. This was mainly to safeguard fishing gear set in that portion of the water body.

Access rights to fish resources in river tributaries (*Siko*) and lagoons (*Natikowa*), on the other hand, were subject to village boundaries. Members of the village in which the *Siko* occurred had the right to access fisheries in that water body whereas non-members of that village had to seek permission from the Induna of that village. Non village members (or non-residents) could access the *Siko* and *Natikowa* through clan affiliation. Hence an individual would bargain for use rights through common lineage with residents of the village in which the water bodies occurred.

This pattern of enforcement of rights was further manifested at household level. Members of the family or clan had the right to demand individual access and use rights from the head of the household, who in turn had a duty to honor that right (Lewanika, 2002). Every individual could claim the right to be given land, lagoon or reed reserves and work these resources privately (Gluckman, 1960). Once an individual was allocated a fishing site, it was protected by the King against all newcomers including the King himself (Kashimani, 1987). Individuals who were allocated use rights to resource units had privileged rights of access and exclusion (Clarence-Smith, 1979). In some cases, individuals shared a portion of their harvest either with the *Litunga*

or other members of the community as a means of increasing or gaining social status within the community (Gluckman, 1960).

### **5.2.2. *Withdrawal rights***

Withdrawal rights refer to the right to obtain the products or resources accruing from a resource system (Schlager and Ostrom, 1992). In exercising withdrawal rights, right holders observe rules that prescribe actions that are allowed or forbidden. Rules refer to prescriptions that create authorizations (Adger and Luttrell, 2000). Withdrawal rights in benefit sharing arrangements facilitate management of the resource by limiting the extent of appropriation. It is argued that defining the users and boundaries of the resource is not enough, there should be withdrawal rights that limit appropriation by users at operational level for effective benefit sharing arrangements (Ostrom, 1997).

The Barotse Native Government Orders and Rules had a total of twenty-six orders covering a number of matters, of which only four dealt directly with regulation of the utilization of natural resources (Lewanika, 2002). These orders included: (1) wildlife conservation; (2) unlawful methods of hunting; (3) fish conservation; and (4) forest utilization and management (Lewanika, 2001). Rules on fishing were limited and focused mainly on technological and temporal restrictions such as: (a) fishing was to be done after the fish breeding season in March; (b) use of small sized fishing nets and poison were not permitted; (c) overnight fishing in specified lagoons was not permitted (Lewanika, 2001). Although fishing was mostly done after the fish breeding in March, there was no rule that prohibited fishing during the breeding season. Respondents observed that it was common to see very few fishermen fishing during the breeding season.

The tenure or duration of the fish traps, weirs (outlined in table 5.2) required a consideration of who had access rights. Fishing using weirs involved setting a barrier across a stream and placing traps at various openings along the barrier (Kashimani, 1987). The fish was trapped as it tried to pass through the openings. Whereas netting was allowed in water bodies such as tributaries and main river channel, weir fishing was different. An individual who owned the weir – often a descendant of the original builder -- would invite people he/she preferred to come and participate in setting traps along the barrier (Gluckman, 1960). Therefore the access rights to weirs were

private and the owner could exclude others from participating in fishing activity in the section of the stream affected by the weir fish trap (Simwinji and Lewanika, 2002). Interestingly, the level of flooding regime also influenced the type of fishing method practiced in respective water bodies with spatial and temporal restrictions prescribed for each traditional fishing technology (Table 5.2).

**Table 5.2: Traditional methods of withdrawal of fisheries resources on the Barotse floodplain**

Fishing Periods	Months	Methods Used	Local Names
Low Water	June - July	Top set gill nets	<i>Maomba/Matuwa</i>
		Drift nets	<i>Tunyandi</i>
		Trawling	
		Battues	
		Fish drives	<i>Kukonga</i>
		Scoop baskets	<i>Mashing'o</i>
		Barrel-shaped traps	<i>Matumba</i>
		Weirs	<i>Maalelo</i>
Dry season	August	- Top set gill nets	<i>Maomba/Matuwa</i>
	November	Drift nets	<i>Tunyandi</i>
		Trawling	
		Seine nets	<i>Tungoni</i>
		Movable nets	<i>Lwando</i>

Advance of the Flood	December - January	Spearing	<i>Kuwaya</i>
		Hook and line	<i>Kushuta</i>
Maximum flood	February - April	Minimum fishing effort	
Floods	April - May	Weirs	<i>Maalelo</i>
		Cone traps	<i>Makuko/linjamba</i>
		Heart fence traps	<i>Lyandi</i>
		Wedge traps	<i>Mafula</i>
		Battues	
		Spearing	<i>Mabulo</i>

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Some methods of fishing were defined along gender lines. For example, women were encouraged – but not forbidden -- to use fishing baskets for fishing. These types of baskets caught more fish in a shorter period of time compared to gill nets or fish traps (WetlandAction et al., 2007). This method, it was claimed, allowed women to have more time to perform other duties in the household. The traditional fish baskets for women were used in shallow lagoons, often after the floods receded. Fish was often concentrated in these lagoons and hence easier to catch then (ConcernWorldWide, 2008). As the water recedes and a fish resource in the lagoons gradually reduces, fishing activities are eventually restricted to the Zambezi River and its tributaries. Women could not use the fishing baskets in these deeper waters. In addition, fishing in deep water was often done at night and consequently was not considered safe for women. It can be deduced that the role of women in fish activities would gradually reduce as the floods receded.

### ***5.2.3. Management rights***

Management rights refer to the right to regulate use patterns and participate in modifying operational level property rights (access and withdrawal) (Ostrom, 1990, Schlager and Ostrom, 1992). Management rights are collective choice rights allowing individuals who have that right to determine when and how harvesting is undertaken (Schlager, 2004). In order to regulate use patterns, management rights are exercised through collective formulation of rules, monitoring, sanctioning, and arbitration of disputes (Agrawal, 1992). The establishment and enforcement of management rights by local appropriators in benefit sharing arrangements provides for participants affected by operational level rights to participate in the modification and formulation of operational activities (Ostrom, 1990). In this manner, individuals are better able to tailor regulations to suit context settings.

Monitoring of fisheries was implemented according to the Barotse Government structure for natural resources management (Figure 5.3): Sector Indunas were in charge of specific natural resources (i.e. forests, fisheries and canal development, and wildlife) and they formulated rules and orders approved by the Litunga. The main responsibility of Sector Indunas was to provide political and legal representation as well as guidance on natural resource management issues in the Kingdom (Gluckman, 1960). Silalo Indunas on the other hand were in charge of implementing and monitoring the utilization of natural resources at district level, in collaboration with the technical staff from the government departments (Nawa, 1990). The technical staff provided technical advice and represented the interests of the Fisheries Department of the colonial government. However, the traditional authority through the Indunas reserved the right to make the final decision regarding regulation and conservation of natural resources (Personal communication, Induna Ilubonda, 22/03/13). In this manner, the traditional authority maintained some autonomy over decision making regarding natural resources.

At the lowest of organization were Village Indunas. Due to their daily interaction with resources users, these Indunas provided context knowledge and advice as well as promoting interest and awareness among members of the community on conservation matters (Nawa, 1990). Village Indunas provided the entry point for local appropriators in this elaborate institutional structure for management of natural resources.

The traditional sanctioning system for rule breakers was graduated according to the severity of the case. Cases of graduated sanctions were recalled by respondents, as in the following narrative:

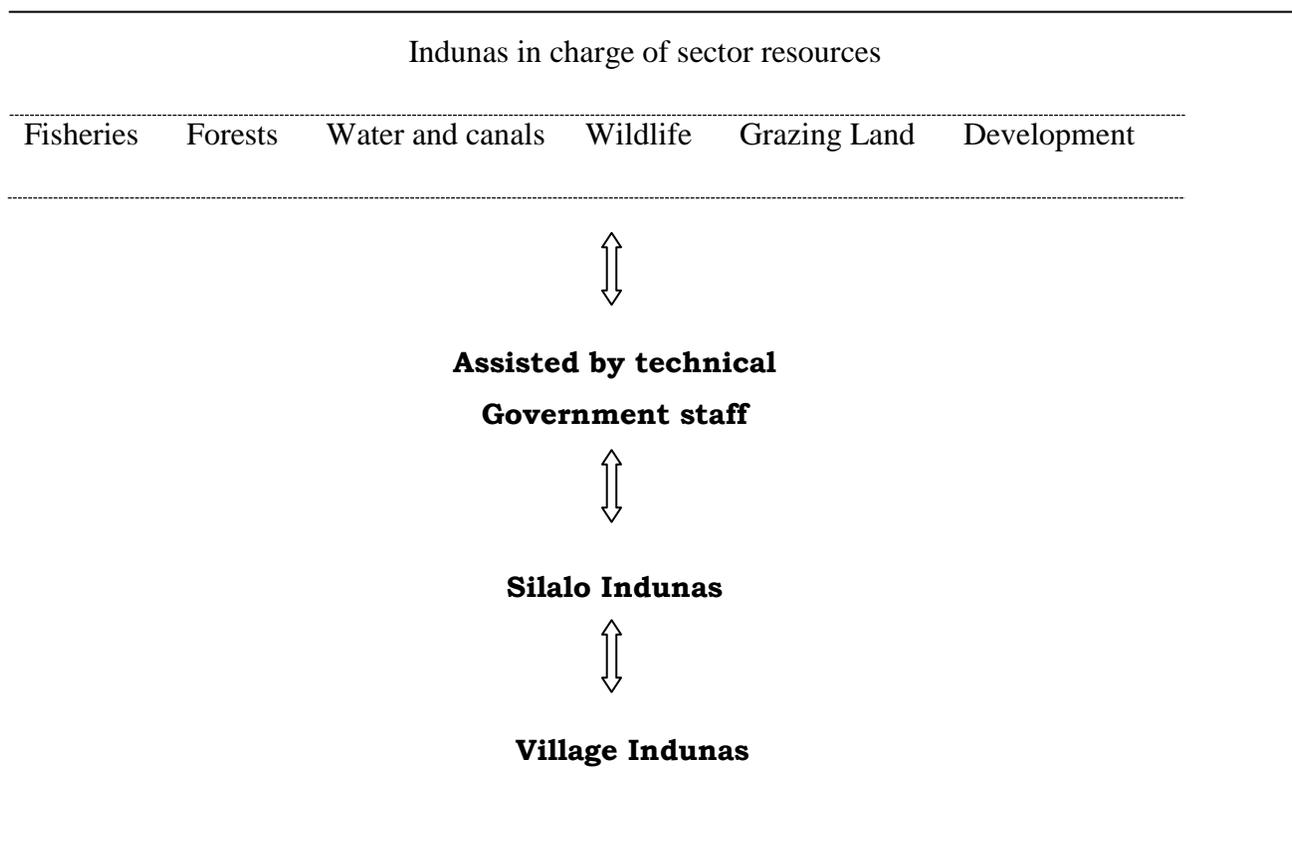
There was a case in which a man was caught for stealing harvest of fish and was taken to the village headmen. The village headman wanted to sanction him through a fine, but the rest of us users asked the village headman to pardon him. He went on to steal on a later occasion, sold the fish to the neighboring village, this happened twice. When the individual was caught again, he was banished from harvesting from the fishery owned by the village as he was ruining the reputation of the village members (PRRU\_Nambwele, 12/03/13).

The above example of traditionally enforced sanctions suggests at least two aspects of sanctioning practices during this era: firstly, the degree of graduation in the sanctions; and secondly, the purpose of which was not to necessarily punish an individual but rather to uphold or maintain respect for both a prescribed way of conducting an action and the enforcing authority. Although not all rules stipulated graduating sanctions, the above example highlights the increasing intensity of sanctions based on the social norms of the community.

Collective decision making was undertaken through traditional courts referred to as *Kutas*. *Kutas* provided a platform for collective formulation of regulations for utilization of natural resources. This is summed up by a statement made by one of the key informants:

When we had problems or wanted to discuss harvesting methods in fisheries, we would gather members of the village and meet at his place (Village Induna) with men with stools and women with mats. Some of the issues would include, helping a member of the village with a grievance or a sick member of the village, with fishing gears and quantities (K.I.4-16/03/13).

**Table 5. 3: Structural organization for management of natural resources. Adapted from Nawa, 1990; Lewanika, 2002).**



The Kuta in this regard offered a means of collectively deciding on a matter and changing operational level rights such as access and withdrawal rights. The existence of the Kuta at every level of Government provided a means through which local communities deliberated and formulated regulations according to the socio-economic context of the village. In addition, disputes among user that could not be settled at the village Kuta were referred to the Silalo Kuta and if need be, the Saa Kuta – the highest court in the Kingdom (Lewanika, 2001).

The system was not free of weaknesses. Its major weakness lay in its implementation: the checks and balances for regulating power between Silalo Indunas and Sector Indunas were often very weak, with a Silalo Induna often operating without supervision, especially in cases where the Silalo Induna had little interest in the work (Nawa, 1990, Nzila, 1987). However, following the enactment of the Orders and Rules 1936, all Indunas were paid, providing an incentive to

participate in the management of natural resources (Nawa, 1990). The use of Indunas further promoted commitment and willingness, among members of the community, to participate in conservation (Lewanika, 2002).

### **5.3. State centered sharing era – 1975 to 1990s**

For purposes of this study, the state centered sharing era refers to the period 1975 to early 1990s in which the authority for regulation of use and conservation of fisheries of the Barotse Plains shifted from traditional authorities to Government departments. After 1974 the guiding legislative framework for regulation and conservation of fisheries in Zambia was the Fisheries Act of 1974. Under the Act of 1974, the Department of Wildlife, Fisheries and National Parks was given the responsibility for management of fisheries in Zambia (The Fisheries regulation, 1986). From the early 1990s, policy reforms in natural resource sector were initiated marking the end of the state centered sharing era. The proceeding section assesses sharing mechanisms for fish resources on the Barotse Floodplain using the bundles of property rights between 1974 and the early 1990s. This era covers the period in which regulation of use and conservation of fisheries was vested in the state through the Fisheries Department.

It is argued that this era was strongly associated with ineffective benefit sharing arrangements. Firstly, weak enforcement of operational and collective level rights due to limited institutional capacity on the part of the Fisheries Department and resentment of local users towards Government officials resulted in a scenario of rights in form and rights in use. Rights in form included the rights that draw their legitimacy from the Fisheries Act of 1974 while rights in use included those which were observed to be actually in operation.

Secondly, according to the Fisheries Act of 1974, resource users were not allowed to participate in decision making processes. Collective level actions were undertaken by the Fisheries Department with little or no involvement of local communities. This resulted in resentment of the local fisher-folk of Government officials and the local users having little interest in coordinating appropriation behavior. The proceeding section examines the configuration of property right bundles and their influence of benefit sharing arrangements between 1975 and early 1990s.

### ***5.3.1. Access rights***

Access rights refer to the authority for an individual enter a defined resource. Access rights identify an authorized user to a specific resource. Enforcement of access rights in benefit sharing arrangements helps in determining who is allowed to benefit from a defined resource. This reduces the risk of local appropriators losing the benefits accruing from resource to other users.

In this era, allocation of access rights was based on the Fisheries Regulations of 1986. According to this Act, any individual wishing to undertake fishing activities on the Barotse Floodplain was required to obtain a fishing license issued by the Fisheries Department. The fishing license is a regulation tool meant to restrict entry of new fishing boats and/or fishers with the objective of controlling harvest of fish resource (Charles, 2002). The tool also ensures that fishermen adhere to fishing restrictions that are spatial, temporal and regarding quantity (GRZ, 2007). A license is obtained for the duration of a year and expires every 31<sup>st</sup> of December upon which it can be renewed subject to paying a fee. The fishing license regulates fishing activity by limiting the number of participants that can undertake fishing activity in a fishery (Malasha, Unpublished ).

Interviews with the District Fisheries Officer for Mongu revealed that fishing licenses for the Barotse Floodplain were not issued in this era and are still not being issued. This is probably due to the limited institutional capacity of the Fisheries Department to enforce fishing licensing among fisher-folks on the Barotse Floodplain as well institutional tension regarding revenue collection from fishing licenses between the Barotse Royal Establishment (BRE) and the Fisheries Department (Malasha, 2007). Therefore the design of access rights to fisheries on the Barotse Floodplain to a large extent was still influenced by traditional rules and norms.

Ideally, fishermen had to obtain a license from the department. This does not happen in Western Province. Unfortunately we as a department have had a problem with the traditional authorities in terms of who collects revenues from the licenses (District Fisheries Officer for Mongu, 18/02/13).

Access rights were traditionally allocated on the basis of village membership and kinship. During the state centered sharing era, the design of access rights was similar to that of the traditional authority centered era except for one notable addition: non-resident fisher-folk had to pay for

access rights to fisheries occurring in water bodies. This was either paid to the Village Induna or the head of the family who had exclusive rights to a lagoon. Interviews with local fishermen revealed that the amount charged for access rights ranged from ZMK 50 (USD\$9.5) to ZMK 200 (USD\$38<sup>1</sup>), depending on the size of the nets: the smaller the net size, the higher the price to be paid. The price range for a flexible net size provided a higher incentive for seasonal fishermen compared to the fixed price of K57 (USD\$10) charged for a fishing license from the Department of Fisheries. To some extent, charging for access rights can be interpreted as a qualification for usufruct right by the Village Induna. Usufruct right refers to the right to earn income from a resource either directly or indirectly (Meinzen-Dick and Nkonya, 2007).

Although respondents stated instances in which the Village Induna consulted with members of the village on the amount that was charged, most Village Indunas determined and used the paid amount without the knowledge or consent of the community. In these cases, there was very little that the local fishermen could do in terms of questioning the amount of harvest that the individual appropriated. Respondents stated instances in which conflicts arose between the fishermen and Village Indunas regarding the price to be paid when the Induna realized that the amount of catch caught was not equivalent to the price paid.

**Table 5. 4: Boundary rules determining access to fisheries**

Water Body	Clanship	Village membership	Paying for access
Nuka	X	X	x
Siko	√	√	√
Natikowa	√	√	√
Lisa	X	X	√

<sup>1</sup> This is based on an exchange rate of 1USD – ZMK 5.224 as at 22<sup>nd</sup> April, 2013.

It is common for Village Indunas to receive money in exchange for access to the lagoons. In most cases, the money is kept by the Village Indunas and utilized without informing the rest of the village. However, some of them discuss with village members who then agree on how it is to be utilized. The revenue collected from immigrant fishers is utilized for community services. The village members get together to decide how the revenue will be utilized. In other cases, the money is collected is kept in the treasury and in times utilized by making a tribute to the BRE (FRU\_Nambwele, 20/03/13).

The revenue obtained from the immigrant fishermen was, in most cases, not utilized for the intended purpose. Whether the money would be shared among village members depended on the village headmen's discretion. It was thus very difficult for village members to question the village headman.

### ***5.3.2. Withdrawal Rights***

Withdrawal rights denote the right to harvest from a resource system. For every right there is a rule that prescribes how the rights is exercised. A rule is a prescription that creates an authorization. The following section assesses withdrawal rights and corresponding rules for the exercise of this right.

Rules for spatial, temporal, and gear restrictions specify how an individual exercises that right (Schlager and Ostrom, 1992). The Fisheries Regulations provided regulations on allowed fishing areas, methods, and periods. Restrictions on fish gear were implemented through restricting the size of the fishing net. The regulation prohibited use of draw nets and gill nets of mesh size less than 76mm throughout the Upper Zambezi Fishing area. The regulation further restricted use of mono-filament of less than 120mm. (The Fisheries regulation, 1986).

Restrictions on the fishing period were implemented through an annual fish ban, according to which fishing was and is still restricted from 1<sup>st</sup> December to 31<sup>st</sup> March annually in order to allow for fish breeding (GRZ, 2007). However, the fish ban was never implemented in Western Province during this era.

The just ended fish ban of 2012 was the first enforced fish ban in the area. It has been successful compared to previous years (District Fisheries Officer, Mongu, 18/02/13).

During the fish ban, trading of fish captured from sources other than fish farms was prohibited. However, it was found that fish trading still occurred during the fish ban with trading taking place in non-sanctioned markets (WetlandAction et al., 2007). It was explained that the local council had erected a local market for fish traders to conduct their business. However, during the fish ban period, fish traders moved to other locations, which they claimed was on communal land. Officials from the Fisheries Department were not allowed to prohibit fish trading in these market locations, with fish traders threatening to approach the Barotse Royal Establishment. During the allowed fish trading period, traders moved to the market constructed by the local council.

The majority of local fisher-folk expressed negative sentiments towards the fish ban stating that the fish ban it was not necessary as most fishermen did not undertake fishing activities in this period:

The ban was not useful because at that time, fish was hard to capture as during this period, the fish was breeding-- the fish hides itself (FRU\_Lealui-02/03/13).

We don't need the fish ban, we have been managing our resources without the fish ban for a long time-besides we don't fish within that period anyway (FRU1\_Lealui-02/03/13).

The negative perception of the fish ban by local users was partly attributed to the manner in which the ban was implemented. Historically, the fish ban was never implemented under the traditional authority; this resulted in the measure being perceived as means of isolating the local user from the resource. The Fisheries Act of 1974 made the traditional system for regulation of use redundant thereby isolating local traditional authority. In most cases the fish ban was not supported by the BRE which in turn made it difficult for the Fisheries Department to implement (Madzudzo et al., 2013).

### **5.3.3. Management Rights**

Management rights are collective level rights that refer to the right to coordinate patterns of appropriation and provision. The design and enforcement of management rights by local appropriators in benefit sharing arrangements allows that participants affected by operational level rights participate in their modification (Ostrom, 1990). In this manner, individuals are better able to tailor regulations to suit case context settings.

The Fisheries Act of 1974 did not provide for the participation of local communities in monitoring, sanctioning, and the formulation of rules (Malasha, 2007). According to the Act, these responsibilities fell under the Fisheries Department through Fisheries Extension Officers. However, there was limited institutional capacity in the Fisheries Department and the influence of traditional authority on utilization of fisheries persisted.

Respondents revealed that traditional courts provided the only means for local users to collectively meet and deliberate over matters affecting them. Through field interviews it was found that events or circumstances often necessitate resource users to meet through village *Kutas*. Some of the examples cited by respondents included: agreement on the use of correct net sizes and agreement on the charges for non-resident fishermen. It appears that such collective meetings are not officially scheduled but rather occur based on a perceived need or crisis.

There are instances in which the power relations within the village Kuta affected collective decision making processes.

In cases where the non-resident fisherman paid for access to the Village Induna, there was very little that other local fishermen could do in terms of questioning the quantity of fish that the individual harvested. Once the individual paid, nothing could be done about it, we just had to accept. Whether or not the money will be shared with other villager members depended on the village headmen's judgment. (FRU\_Lealui, 27/02/13).

In such situations, the Village Induna occupied several positions: the authority with whom non-resident fishermen bargained for access rights; the village authority overseeing conflict resolution processes; and the beneficiary of the revenue paid by the non-resident fisherman. The

beneficiary role of the Village Induna therefore compromised the role of arbitrator in dispute resolution. This often made it difficult for members of the village to question a decision made by the village headman. In addition, the Village Indunas still maintained an influential position even in the Kuta. In this way, collective action processes were greatly undermined.

Other concerns expressed by participants regarding the village Kuta as a platform for decision making and dispute resolution included: (1) deliberations often taking too long; (2) declining power to convene resource users.

Listen, these people were not paid. In some cases, they need to travel in order to assess the nature of the conflict, especially in the case of disputes regarding boundaries. K.I.1-20/02/13)

Some people when they are told to attend the traditional court, they do not attend. Most people prefer going to the local court is because, most people fear the local court compared to the traditional court. (PRU\_Nambwele-11/03/13)

Some of the reasons that led to the delay in resolution of disputes, then, included logistical and financial challenges. Often, Village Indunas acting as arbitrators bore the logistical costs themselves, rather than passing them on to the community. These transactional costs, that is, the costs of organizing and enforcing agreements, resulted in little incentive for the Village Indunas to fulfill their roles. Furthermore, power of village Kutas to convene resource users was in decline. This can be attributed to the lack of legal authority to prosecute offences on cases related to resources other than land. This arose from the fact that, according to customary law, traditional courts could only issue a binding verdict in cases relating to customary land. This consequently limited the influence of village courts to convene meetings designed to resolve conflict among resource users.

The Act also provided for penalties: these were, primarily, a fine, confiscation of a net and/or prosecution by the court of law (The Fisheries regulation, 1986). In reality, sanctioning and dispute resolution followed a different pattern. Interviews with local community members revealed that sanctioning by confiscation of fish nets was noted as one of the penalties enforced by the Fisheries Department during their patrols. Although sanctions through a fine are enforced

by traditional authorities, it seemed that the most effective and often used sanction was forced relocation to another village. It was explained that one of the *Liswanelo* (rights of individuals) is the right to land. Hence an individual cannot be dispossessed of land completely but rather forced to move to another village, with the assumption that he/she will abide by rules in that village.

Sanctioning is only effective to the degree with which it is complied. According to theory, actors appropriating from a shared resource comply as a result of reciprocity by other actors; this is referred to as quasi-compliance and is based on the principle that actors comply with rules because other actors involved in the action situation comply with the rules and hence reciprocate compliance. Field results revealed that compliance with traditionally enforced sanctions and rules was largely a matter of respect for the traditional values and culture of the Lozi people as noted in the statement below.

We often relied on the respect and value that our people had towards our traditional values. They really require some motivation such as “without this, we as people will collapse”, reminding them of their culture, “look we are starving now”, “it is for your sake”. It is mostly the elderly who comply with the request by traditional authorities. The new generation is very difficult to approach (K.I. 3-21/02/13).

The above statement also reflects declining commitment among users towards collective level processes that entail voluntarily coordinated actions, especially among the younger generation. This can be attributed to a gradual reduction in shared understanding or collective identity among resource users. Collective identity is developed through shared understanding and appreciation among institutional actors. The decline in shared understanding through traditional values is attributed to a decline in identification of oneself through the traditional authorities and a turn towards identifying oneself as a citizen of the country among the younger generation.

According to the Fisheries Act of 1974, monitoring of utilization of fisheries was solely undertaken by the Fisheries Department (Malasha, 2007). Interviews with fisher-folk revealed that in fact monitoring was mostly done on the Zambezi River and less on its tributaries. Hence,

in the lagoons and river tributaries in the plains very little monitoring was undertaken by the department.

There were no instances of monitoring of fishing. This depended on the owner of the lagoon where some can determine which fishing nets are used. In some cases where one individual is using a wrong fishing gear, the resource users among themselves may approach the wrongdoer. Certain village headmen help in monitoring of fish utilization. However, this depends on the discretion of the village headman. (FRU\_Lealui-28/02/13)

Due to the persistence of traditional designed rights to fishing grounds (illustrated in section 5.2), Village Induna still played a prominent role in monitoring of fish utilization. The Village Indunas as representatives of traditional leadership and overseer of natural resources places him/her in a strategic position for monitoring of resource<sup>2</sup> (Lewanika, 2002). However, in cases where the village Induna granted permission to a non-resident resource user to access fisheries by receiving monetary payment, the ability to objectively monitor utilization of the resource often compromised the role of the village headman as he/she then becomes the beneficiary of the money. In such instances officials from Fisheries Department would often be requested to intervene - in many cases by the very Induna who had provided access rights.

In summary, it is can argued that during this era benefit sharing arrangements were ineffective. Firstly, access and withdrawal rights were defined by Government with no involvement of local communities in determining sharing mechanism for fisheries. Due to the limited institutional capacity by the Fisheries Department and mismatch of operational level rights to the local context a system of de facto and de jure rights emerged.

Secondly, local users who were affected by operational level actions were no longer included in the decision processes. Local users were never involved in monitoring the biophysical conditions of the floodplain as well as other users' behavior as Government was largely accountable to itself through the prevailing legislation. There was no explicit system for sanctioning law breakers.

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<sup>2</sup> According the Barotse Government structure

The governance system in place did not provide for effective access to local low-cost conflict resolution mechanisms.

#### **5.4. Collaborative Sharing: 2000 to 2012 (Current era)**

For purposes of this study, the collaborative sharing era refers to the period from early 2000 to date. The beginning of this era can be traced to governance reforms through Community Based Natural Resources Management (CBNRM) initiatives that were pioneered in the wildlife sector through the Administrative Management's Design for Game Management Areas in the late 1980s (Table 5.1.) (Nyirenda, 2010).

The programme was premised on transferring management rights and accruing benefits to rural communities. In 1999, the Wildlife Act was amended making local communities have rights of management wildlife. The Act further provided for revenue sharing between communities and the state Government (Nkhata and Breen, 2010c). The popularity of the ADMADE programme especially among Government and donors led to governance reforms in other natural resources such as fisheries and forests (Malasha, 2007). Except for the National Conservation Strategy (NCS), governance reforms in the fisheries sector occurred without an enabling legal and policy framework. Most of the reforms were driven by donor and developmental agencies (Malasha, 2007). This explains why collaborative arrangements in Zambia's fisheries emerged at varying periods and were located in different locations.

For the Western Province, one of the first collaborative governance programs to be initiated was the Community Based Natural Resources Management Programme launched in 2000. The programme was started as part of a component of the National Environmental Action Plan (NEAP) with the objective of strengthening local institutions for the management of natural resources to promote the social and economic benefit of local communities (Simwinji and Lewanika, 2002). This culminated in the formation of Village Natural Resources Management Committees in selected pilot sites. This was to allow for the transfer of management rights to local institutions (Malasha, 2007).

The main objective of the project was to facilitate the creation of effective institutions for sustainable management of natural resources for socio-economic benefits. This was to be

achieved by facilitating the establishment of village natural resources committees as a basis for the monitoring and management of natural resources (Mubita, 2002). In this regard, the project had two key objectives: (1) to develop a customary legal and regulatory framework that supported statutory legal frameworks, and (2) to build the capacity of local institutions for resource management through village natural resources management committees (GRZ, 2002). At a national level, governance reforms in the fisheries finally occurred in 2007 when the Fisheries Act of 2007 was enacted (The Fisheries (Amendment) Act, 2007). The Act provides for transfer of management rights to local communities through Fisheries Management Committees.

It is argued that this era is strongly associated with sustainable sharing outcomes. Benefit sharing arrangements are characterized by collaboration between local communities, traditional authority and Government departments. Local fisher-folk, through the Village Natural Resources Management Committees (VNRMCs), created and enforced operational and collective choice rights. Through rights of access and withdrawal, local users clearly defined boundaries of fisheries and the individuals who had rights to utilize fish resources through the VNRMCs.

Through collective choice rights decision making, rights were established, recognized, and enforced by VNRMCs. Local fisher-folk were included in the decision making processes that include traditional and Government departments. Local users enforced monitoring, sanctioning, and dispute resolution through VNRMCs. This created an incentive to manage the resource sustainably. The proceeding section examines the design and enforcement of property rights under the Community Based Natural Resources Management Programme for Western Province. This is taken as the initial step for the start for collaborative sharing arrangements on the Barotse Floodplain. The analysis provides insights to the challenges and opportunities for co-management under the Fisheries (Amendment) Act of 2007.

#### ***5.4.1. Access rights***

The following section assesses access rights on the Barotse Floodplain during the state centered sharing era.

The design of access rights under the CBNRMP-WP was based on membership of the Village Natural Resources Management Committee (VNRMC). VNRMCs were local institutions established for effective management of natural resources for the benefit of local communities.

Any person wishing to harvest fish for trade should ask for permission from the committee, which then issued an introductory letter addressed to the Fisheries Department requesting issue of a license (By-Laws for Kalenga Community located in Kalabo District).

Access to resources was granted on the basis of being a member of the committee. Once an individual ceased to be a resident of the village (community), the individual ceased to be a member of the VNRMC and hence forfeited access rights to fisheries in the village. The VNRMC gave consent for access to fisheries to individuals not resident in the village.

The VNRMC enforced access rights by involving both traditional leadership and the Government Department. In this manner it incorporated traditional design of access – characteristic of the first era -- with state designed access rights (i.e. licenses). The Fisheries (Amendment) Act of 2007 provides co-management of fisheries with local communities through management plans, and fishing licenses are issued in consultation with Fisheries Management Committees (The Fisheries (Amendment) Act, 2007).

#### ***5.4.2. Withdrawal Rights***

Withdrawal rights denote the right to harvest from a resource system. For every right there is a rule that prescribes how the rights is exercised. A rule is a prescription that creates an authorization.

The CBNRMP-WP provided regulation as individuals exercised the right to withdrawal from the fish resource. These rules pertained to temporal, technological, and spatial restrictions.

No person shall be allowed to use poison to catch fish; no person shall kill fish using meshed nets like sefa-sefa (mosquito nets); no person shall use a net of 1 inch to 2 inch; No person shall fish during the fish ban; No person shall sell or traffic fish in the area during the closed fishing season (By-Laws for Kalenga Community located in Kalabo District). .

One notable element in the rules for withdrawal rights was the distinction between withdrawal of fish resources for domestic use and that for commercial purposes. However, in the by-laws developed through the Community Based Natural Resources Management Program for Western Province, rules were observed that penalized export of the resource.

No person shall export fish resources from the area unless he pays a fee determined by the VNRMC (Senanga District By-law extract).

This is a restriction on quantity based on the purpose of the use. Hence, the by-law encourages harvesting for domestic use rather than commercial. The underlying assumption is that commercial use would require harvesting on a larger scale and thereby deplete the resource.

#### ***5.4.3. Management rights***

Management rights are collective level rights that refer to the right to coordinate patterns of appropriation and provision. The design and enforcement of management rights by local appropriators in benefit sharing arrangements allows for participants affected by operational level rights to participate in their modification (Ostrom, 1990). In this manner, individuals are better able to tailor regulations to suit case context settings. The following section examines the modalities for collective decision making processes, sanctioning, and monitoring as exercises of management rights.

In an effort to transfer management rights to communities, the project established governance structures at district and village level. At district level, the Natural Resources Management Committee was comprised of representatives of the Zambia Wildlife Authority; the Fisheries and Forestry Department; the Department of Water Affairs; traditional leadership; and two representatives of the local government authority. The main functions of the District Natural Resources Management Committee (DNRMC) included providing a platform for consultation with relevant water, forests, fisheries and wildlife and environmental related bodies on conservation and management practices and reinforcing the relevant environment bodies in the enforcement of existing laws and regulations (Mubita, 2002).

At village level, the Natural Resources Management Committee included representatives of traditional leadership, the counselor in the village in which the committee exists; four community members elected by the community. The key responsibilities included: monitoring the utilization of natural resources in the area; stimulating conservation of resources; coordinating development and utilization of resources; and enforcing by-laws for governing natural resources (Mubita, 2002).

While the project affirmed that the District and Village Natural Resources Management Committees were the main vehicles through which integration of local communities in decision making processes was to be achieved, local communities were only integrated at the lower organizational level – VNRMC- of the governance structure. The District Natural Resources Management Committees had no representation of local communities. The DNRMC were responsible for reinforcing and coordinating implementation of existing laws and regulations. The structure was therefore that of a top-down approach from line ministries to the DNRMC and finally the VNRMC.

The other challenge of the governance structure arose due to the competition between of the traditional authority through the BRE and Government department as to who the VNRMC would report to (Malasha, 2007). This was evident even at the start of the project.

It was not easy. We had to negotiate our way through the BRE structures in order to convince them of project (Patrick Mubita, Former CBNRM Project Coordinator, Personal communication).

This was perhaps due to the continuing existence of strong traditional structures so that parallel governance structures were perceived as irrelevant. This is suggested in a statement made by one of the key respondents:

[C]o-management in Western Province does not operate in the conventional sense of forming local natural resources management committees. They are seen as parallel structure where the authority for natural resources management is taken away. (K.I.5-19/03/13).

Nonetheless, the project went on to facilitate the establishment of six VNRCs in the Province and, subsequently, the first ever Community Resources Board in Western Province (GRZ, 2002).

The Fisheries Act of 2007 provides for the following composition of the Fisheries Management Committee: six members from the riparian fishing community elected by the local community; one representative from the local authority; one representative from the traditional authority; and one representative from a non-governmental organization. The Fisheries Management Committee overcomes the challenges of non-representation of communities at the District Natural Resources Management Committee by not having a lower level structure. In this way, communities are incorporated in the decision making process in the Fisheries Management Committee.

The CBNRM-WP created by-laws in order to sanction rule breakers. These by-laws overcame the challenges of sanctioning that were characteristic of the state centered sharing era, since they provided the legal authority to prosecute rule breakers. This process entailed working with experts in traditional rules and officials from Government departments.

Part of the challenge was to update the rules and link them with the relevant natural resource Act. We had to harmonize the two sets of laws (Former CBNRM Project Coordinator).

The by-laws formed a bridge between local institutions and state institutions. The process of developing by-laws entailed transforming institutional statements that were predominantly customs and norms into enforceable prosecutable rules. In this way, the process created legitimacy both for the by-laws and the involvement of Government departments in natural resources management on the plains.

The sanctions were graduated in nature according to the severity of the case. Examples of sanctions in the by-laws include: unlawful fishing - First case K 50, Second case K 100,000 or a cow, or, for unlawful grass cutting – First case K 20, Second case - confiscation of the resource (Mubita, 2002). It was difficult to discern the effectiveness of these sanctions as the project did not reach the stage at which the sanction could be enforced. Sanctions or penalties included in

the Fisheries Act of 2007 were confiscation of fishing nets, a fine or even imprisonment and these sanctions are enforced by the Fisheries Department and the local Government.

In summary it can be argued that during this era there were clearly defined boundaries under Village Natural Resources Management Committees (VNRCs) and that individuals or households who had rights to fisheries were identifiable according to community-developed rules and norms. The rights to access fish resources were held collectively and enforced by the VNRC in collaboration with traditional authority and Government department. Access rights to benefits were shared and hence withdrawal rights could be revised to adjust the amounts of benefits according to experience and knowledge of how the system was structured and functioned. Local users groups who were affected by operational choice rights were included in the decision processes of the traditional authorities through VNRCs. The system recognized the rights of users to devise their own rules and regulations through the formulation of by-laws. Local users were also involved in monitoring the biophysical conditions of the floodplain as well as user behavior and were accountable to themselves through elected officials of the VNRC. Appropriate sanctions were enforced by traditional authorities. The major challenge of benefit sharing arrangements in this era was the tension between The Barotse Royal Establishment and Government in leadership roles.

## **5.5. Conclusion**

This chapter aimed at analyzing sharing arrangements for fisheries on the Barotse Floodplain from 1936 to 2012 using the bundles of property rights. The analysis has illustrated that a consideration of the configuration of bundles of property rights is critical for effective benefit sharing arrangements. The application of theories on property rights and collective action has provided insights into the inherent complexity in sharing of resources among actors, especially in the context of multiple common pool resources such as wetlands. The following chapter attempts to apply the findings within the wider context of benefit sharing literature.

## CHAPTER SIX

### DISCUSSION AND CONCLUSION

#### **6.1. Introduction**

The study aimed at assessing the relationship between establishment and enforcement of property rights and outcomes of benefit sharing arrangements for fisheries on the Barotse Floodplain in Western Province of Zambia. This was undertaken by using the theoretical lens of bundles of property rights in understanding benefit sharing arrangements. To this end, a conceptual framework (presented in Chapter 3) was used to analyze and present results of the study. This chapter aims at discussing the findings and their implications for theory and research. A summary of the findings is presented and their theoretical implications discussed. The chapter concludes by providing recommendations for research and policy.

#### **6.2. Summary of findings and their theoretical implications**

The main objective of the study was to assess the relationship between bundles of property rights and benefit sharing outcomes on the Barotse Floodplain of Zambia. While this relationship is often complex and uncertain, the Barotse Floodplain provides an excellent illustration of the relationship between the establishment and enforcement of bundles of property rights in terms of use and control on benefit sharing outcomes. The major finding of the study is the overwhelming variation of benefit sharing outcomes between eras as a result of varying configuration of bundles of property rights. This section discusses these variations and their implications for benefit sharing literature.

##### ***6.2.1. Traditional authority centered era***

The traditional authority centered era was strongly associated with traditionally enforced use and control of rights and was also characterized by sustainable sharing outcomes. Local fisher-folk, through the traditional authority, strictly established and enforced access and withdrawal rights. Access rights were collectively held and defined on the basis of residence, kinship, and political status thereby determining who was allowed to benefit from fishery resources, which were defined by the boundary of the water body. The pattern of access rights incorporated both

communal and individual systems of rights to fisheries. In this manner, local users carefully matched particular types of access rights - whether communal or individual -- to particular fishing grounds based on the attributes of the water body. For example, during this era, any individual had the right to access fish from the main channel of the Zambezi River (*Nuka*) while access rights to fish resources in river tributaries (*Siko*) and lagoons (*Natikowa*) were subject to village boundaries. Residents of villages in which the *Siko* occurred had the right to access fisheries in that water body whereas non-members of that village had to seek permission. In this way, local fisher folk resident in a particular village reduced the risk of losing the benefit accruing from the resource and the returns from the investment in the resource system. The evidence of open access, communal and private access rights prompts the question of what factors lead to different regimes for different water bodies. One theory used to explain this phenomenon is that of the economic defendability of human territoriality (Thomas, 1996).

According to this theory, territorial behavior among local users is exhibited when the cost of exclusion and defense are outweighed by the prospective gains from the pattern of resource utilization (Dyson-Hudson and Smith, 1978). The costs include: time, effort, and risk of exclusion as well as the potential negative consequences of depending on spatially limited area. The accruing benefits include the exclusive access to a resource (Dyson-Hudson and Smith, 1978). The physical characteristics of a resource system have a large influence on the type of property regime prevailing over a resource system (Thomas, 1996). It is argued that for lagoons and small ponds, which have discrete and definable boundaries, it is probable that local users find it easy to exclude others. For river tributaries and the main channel of the Zambezi River, which are too large to be appropriated or for exclusion to take place under a regime of private property, communal access becomes the most feasible property regime. It is therefore argued that, for certain types of resources, communal property rights promote optimum access and productivity while bestowing on the entire community responsibility for conservation measures that will protect the resource (Ostrom, 1990, Thomas, 1996).

In addition to defining access to fisheries resources, local users in the traditional authority centered era devised rules limiting appropriation levels. They prescribed allowed and forbidden actions in exercising withdrawal rights, based mainly on the following: (a) fishing was done after

the fish breeding season in March; (b) the use of small sized fishing nets and poison was not permitted; (c) overnight fishing in specified lagoons was not permitted; and (d) the duration for which fish traps – weirs – were set up in lagoons was determined by the individual who had exclusive use rights. Although these regulations limited the extent of appropriation by local users, their focus was primarily on technical externalities and allocation problems, while in adequately addressing stock externalities. Technical externalities result from physical interference between the equipment of users during appropriation. Allocation problems involve the assigning of spatial, temporal, and quantity restrictions on the demand from users. Stock externalities refer to the effect of current activities of users on the availability or the ease of obtaining a resource (Blomquist et al., 1991). Problems linked to technical externalities and allocation problems may be overcome by access rights and intra-group operational rules which specify time and place within the group; however, the rules did not address appropriation externalities or extraction rates for fisheries.

In a study of inland fisheries in West Africa and Bangladesh, it was found that traditional managed systems rarely had strict measures for controlling harvesting quantities. In all cases, there was no evidence of traditional regulation of net size, fish size, and/or catch limits (Bene et al., 2003, Deacon, 2012). Unlike contemporary fisheries management, traditional management systems focus more on technical externalities and allocation problems such as assignment and the effect of crowding and less on appropriation externalities that address the subsidiarity of the resource (Bene et al., 2003, Marschke et al., 2012). The underlying rationale for this phenomenon, especially in floodplain ecosystems which are characterized by the non-permanence of water bodies, is that it facilitates fish capture so as not to lose the fish resource before the end of the flooding season.

During the traditional authority centered era, local fisher-folk were included in decision making processes by means of established governance structures. Through collective choice rights, decision making rights were established, recognized, and adjusted according to social relationships; such decisions were consequently enforced by traditional authorities. In this way, local fisher-folk who were affected by operational level rights participated in monitoring,

sanctioning, and formulation of operational level rights. This created an incentive among the populace to coordinate appropriation and provision measures for the resource.

During this era, traditional authority through the Induna system enforced operational and collective level rights with relative autonomy from the state. The traditional system was headed by the Designated Induna, who provided policy and guidance for the utilization and regulation of fish resources; meanwhile, the Village Indunas served as entry points for the participation of local communities. Technical staff from Government departments would merely provide technical advice and guidance to traditional authorities. This arrangement helps to shed light on the role of the state in benefit sharing systems. Agrawal (2001), in his study of forest councils found that in councils composed of local users of forests, traditional leaders were regarded by the Forest Department as subordinate employees with substantial autonomous control over local forests. The role of the Forestry Department was primarily to arbitrate disputes between villages and the forest council office holders. The role of the state was not to control but rather to support effective benefit sharing arrangements (Reed and Bruyneel, 2010).

### ***6.2.3. State centered sharing era***

The state centered sharing era was strongly associated with ineffective benefit sharing outcomes. Benefit sharing arrangements were underpinned by a public property rights regime that saw the breakdown of the traditional common property regime. It is argued that weak enforcement of operational level rights, due to limited institutional capacity by the Fisheries Department and resentment of local users towards Government officials, resulted in parallel systems of *de jure* and *de facto* property rights. *De jure* rights included the rights that draw their legitimacy from the Fisheries Act of 1974 while *de facto* rights included those observed to be in operation.

Responsibility for the enforcement of access and withdrawal rights between Government departments and traditional authorities was unclear. For example, according to the Fisheries Act of 1974, access rights were supposed to be granted on the basis of fishing licenses. However, fishing licenses were never issued on the Barotse Floodplain. This finding has two implications for the understanding of benefit sharing arrangements in the context of wetlands: (1) the applicability of fishing licenses as a means of access restricting in wetland environments; and (2)

usufruct rights in benefit sharing arrangements. In fisheries management, two forms of regulatory instruments are used to grant access rights -- limited entry and territorial use rights (Charles, 2002). Limited entry is a management tool in which the Government issues a limited number of licenses with the aim of controlling fishing effort in a fishery. Territorial use rights are a management tool according to which individuals or groups are assigned rights to fish in certain locations where they have rights of management and exclusion (Charles, 2002, Siar et al., 1992).

In essence, fishing licenses are a regulatory tool that limits entry to fisheries only to those who hold rights granted by the Fisheries Department. In practice, fishing licenses were not issued in the Western Province. Instead, access rights to fisheries were granted on the basis of the boundary of the resource and residence of the fisher-folk. This occurred as a form of Territorial Use Rights for Fisheries (TURF) for local fisher-folk. This finding raises the question of the feasibility of fishing licenses compared to TURFs.

In the case of floodplains, the use of territorial use rights for fisheries can be considered an appropriate right allocation for use rights compared to fishing licenses. In the case of the Barotse Floodplain, resource users followed restrictions for lagoons based on boundaries. It is argued that TURFs are more appropriate where boundaries of fisheries are well defined, as in the case of small lakes, small lagoons and coral reefs (Siar et al., 1992). This provides the following advantages over fishing licenses: (1) the opportunity to self-manage lagoons within the territory of users; (2) a practical approach in overcoming transaction costs for monitoring; and (3) reduction in conflicts among fixed and mobile gear fishing activities (Cauley et al., 1999). In floodplain environments that consist of different types of water bodies and changing water regimes, TURFs may be a better alternative to fishing licenses as a means of restricting access. In addition, TURFs are most effective in conditions where there is predominant use of passive fishing gear such as weirs or traps as well as for fish species that are less mobile (Allison and Ellis, 2001). However, TURFs may not be the solution to the problem of overfishing in an already crowded fishery and hence must be coupled with alternative livelihoods options (Siar et al., 1992).

From the social stand point, TURFs are more effective when implemented within an existing social institution that reinforces positive beliefs, customs, and practices that are aimed at

achieving sustainable goals (Charles, 2002, Siar et al., 1992). Due to the close relationship between fishing practices and the culture of local people, TURFs reflect the context knowledge of the system gained from long generations of continuous use by fisher-folks. Consequently, TURFs also describe systems of sanctioning and penalties among community members (Siar et al., 1992). TURFs therefore provide an opportunity for community based management systems to incorporate local fisher-folk in the negotiation, definition, and implementation of fisheries management plans (Charles, 2002). For non-nomadic communities, the link between local fisher associations and TURFs underlies a critical match between institutional and ecological scales (Allison and Ellis, 2001).

In the state centered sharing era, the Village Induna granted access to non-resident fisher-folk. This merited payment either to the Village Induna or the head of the family who had exclusive rights to a lagoon. The amount charged for access rights depended on the size of the nets -- the smaller the net size, the higher the price to be paid. This finding has an implication for understanding the role of usufruct rights in benefit sharing arrangements. Usufruct right refers to the right to earn income from a resource either directly or indirectly (Meinzen-Dick and Nkonya, 2007). Schlager and Ostrom (1992) class usufruct rights as a use right thereby incorporating rights of access and withdrawal. It can thus be said that collection of revenue by a village head man for access rights to fisheries is an exercise of usufruct rights.

In a study of cases of inland fisheries in Western Africa, it was observed that traditional management of inland fisheries collected fees for access to the resource. In Nigeria, a system of license fees was implemented, the traditional authority collecting revenue for access to fisheries. The system was later revoked by the state and declared illegal. This resulted in resentment on the part of the traditional authority who continued collecting the revenue (Bene et al., 2003). In most cases studies on inland fisheries management, local community groups or traditional authorities do not collect revenues. (Bene et al., 2003). As a way to address this challenge, inclusion of revenue collection systems in by-laws offers an opportunity for reimbursement of the community. In a case that reviewed community fisheries management in Senanzongwe District in Zambia, local communities collected revenue from levies and shared these with the entire

community around the fishing area (Njaya, 2007). This has the effect of re-enforcing the usufruct rights of local communities to benefit from the utilization of fisheries resources (Njaya, 2007).

In the state centered sharing era, the Fisheries Act of 1974 did not make any provisions for the participation of local communities in decision making processes. Collective level actions were undertaken by the Fisheries Department with little or no involvement of local communities. This resulted in lack of interest in local communities in the conservation of fisheries as well as resentment by local fisher-folk of Government officials. In some cases, local community members would deliberately use natural resources unsustainably so as to show their dissatisfaction with the governance regime. These findings provide insight into answering the question: ‘what factors lead to de jure property rights regimes not being de facto property right regimes?’

This question comes in the wake of the realization of the roles that both traditional and state institutions have to play in the sustainable governance of common property resources (CPR) (Helmke and Levitsky, 2004). This realization arises from the coming to light of failures of the past that aimed at solving CPR management challenges by isolating traditional institutions (Yami et al., 2009). As this study has revealed, in many instances traditional property rights are not acknowledged in benefit sharing arrangements, nor are they adequately addressed in the relevant legal frameworks. As a consequence, both the communities as well as Government together with its state agencies have failed to adequately respond to the need to sustain fisheries resources.

In a review of 129 secondary sources, Yami et al. (2009) identify the following conditions, among others, which influence optimum performance of informal and formal institutions for the governance of CPRs: a legislative environment that creates joint decision making; acknowledgement of local knowledge; and locally devised sanctioning and monitoring. It is clear from the results of the study that, during the state centered sharing era, these conditions were not met. For example, the Fisheries Act did not recognize traditional platforms for sanctioning and monitoring. Local communities were not incorporated in the formulation of rules and collective decision making for fisheries resources. In a study of forest councils in Kumaon, India, Chlatre and Agrawal (2008) found a positive relationship between local enforcement and forest

biodiversity. Local residents not only had rights of access but also exercised claimant and proprietor rights.

#### ***6.2.4. Collaborative sharing era***

The collaborative sharing era is strongly associated with positive sharing outcomes. During this era, benefit sharing arrangements are characterized by collaboration between local communities, traditional authority, and Government departments. Local fisher-folk, through the Village Natural Resources Management Committees (VNRMCs), created and enforced operational level rights. Through rights of access and withdrawal, local users clearly defined the boundaries of fisheries and the individuals who had rights to utilize fish resources through VNRMCs.

A critical aspect of collaborative benefit sharing arrangement is the determination of membership of community associations or committees. According to the results of this study, access rights to fish resources during this era were granted on the basis of residence in the area in which the VNRMC occurred. Once an individual ceased to be a resident of the village, the individual ceased to be a member of the VNRMC and hence forfeited access rights to fisheries in the village. An unresolved issue in policy and research is whether or not residence of a geographical or administrative area should guarantee membership in a user association or committee (Campbell and Shackleton, 2001). In the case of a conservancy in Namibia, individuals are required to apply for membership and their membership registered. The registration process makes membership of the conservancy voluntary and optional (Mosimane and Aribeb, 2008). This approach has several shortcomings: limited capacity to register all conservancy members; potential of omission of vulnerable groups due to inadequate information flow; and apathy of some community members towards activities of user associations (Mosimane and Aribeb, 2008). It is therefore argued that the consent of local communities for formation of a conservancy and compliancy with the rules and regulations of the user associations should be enough to guarantee membership (Campbell and Shackleton, 2001).

In another similar study on Lakes Malawi and Malombe it was found that gear type and fishing practices provided the basis for membership to Fisheries Management Committees. This often resulted in conflicts between fisher-folk using different fishing gears, as the fishery consists of

many fish species (Njaya, 2007). In addition, many were excluded from Fisheries Management Committees due to their use of particular fishing gear since many regulations targeted these fishing methods (Mosimane, 2003). The challenge for community structures with regard to membership lies in devising membership criteria that include immigrant fisher-folk without raising tension between local and immigrant fishers.

Membership of user groups should depend on the type of ecosystem, especially in floodplain, which are subject to change in land use practices due to seasonal changes in water regimes (Njaya, 2007). It is therefore recommended that stakeholders such as farmers and livestock keepers should also be included.

Management rights were established, recognized, and enforced by VNRMC. Local fisher-folk were included in the decision making processes, which included traditional and Government departments. Through VNRNCs, local users enforced monitoring, sanctioning, and dispute resolution. This created an incentive for local users to manage the resource sustainably.

The CBNRM provided for the establishment of natural resources management committees at village and district level. Membership of the District Natural Resources Management Committees (DNRMCs) failed to truly represent the interests of the community and only extended the authority of the Fisheries Department and traditional leaders. The local communities were represented only at village level and not district level. The DNRMCs were not downwardly accountable to local communities. This situation hindered the decision making authority of local communities over fish resources in the respective fisheries management areas. These findings are consistent with community structures characteristic of collaborative benefit sharing arrangements (Sen and Nielsen, 1996, Nkhata and Breen, 2010c, Kapungwe, 2000). In an evaluation of decentralized benefit sharing arrangements, Larson and Soto (2008) observed that benefit sharing arrangements have a positive effect if the users are empowered and have downward accountability. Hence decentralization governance approaches result in negative results when the process results in the extension of the control of the state over natural resources (Berkes, 2004, Agrawal and Ostrom, 1999).

The role of traditional leaders in community user groups has often been debated (Murphree, 2004, Shackleton and Campbell, 2000). In the collaborative sharing era outlined in Chapter 5, collective choice actions were established, recognized, and enforced by VNRMCs. The VNRMC was composed of local communities, traditional leaders, and Government officials. Tension arose between traditional leaders and Government departments as to whom the VNRMC would report. It has been argued that while traditional leaders create legitimacy in benefit sharing arrangements, involving them is undesirable as they are not elected members of these institutions (Njaya, 2007). But the establishment of user committees needs to consider the influence of traditional authorities on the behavior of the community (Sen and Nielsen, 1996).

In contrast to earlier forms of benefit sharing arrangements that relied on existing local structures of authority, contemporary sharing arrangements rely on new organizational structures such as fisheries management committees to establish lines of authority (Lemos and Agrawal, 2006). For collaborative benefit sharing arrangements to be effective, it is important that the roles of traditional leaders are clarified so as to establish mechanisms for resolving agreements between user group committees and traditional leaders (Njaya, 2007). Larson and Soto (2008) present a case in Cameroon where user groups that were established without a consideration of the power structure of the community undermined the local Government by seizing functions conducted by the local traditional Government. This resulted in confusion in regard to authority and jurisdiction.

### **6.3. Recommendations of the study**

#### Recommendations for further research

- Analysis of multiple-use common pool resources: the majority of research on common pool resources has focused on single use resources with little attention paid to multiple use common pool resources such as wetlands. It is thus recommended to conduct further research on governance challenges faced by multiple use common pool resources.
- Conduct research on incentive structures facing different ownership positions. This research was limited, to the extent that cross-analysis of different ownership positions such as ‘owner’, ‘proprietor’ and ‘authorized user’ was not undertaken. A cross-analysis

of ownership positions could provide insights into the structure of incentives faced by actors.

- Conduct research on nested governance as an environmental governance approach. It is increasingly being recognized that community conservation is not a panacea to the many challenges in environmental governance. The solution may lie in hybrid approaches that incorporate community conservation and state conservation, so incorporating various levels of governance.
- Market-focused benefit sharing arrangements are increasingly being recognized as feasible alternatives in governance approaches. It is argued that policy has overtaken research in understanding how and where market-focused benefit sharing approaches may work. It is recommended to conduct further research on the underlying processes and complexity of these approaches.

#### Recommendations for policy:

- Community conservation is not a panacea for challenges of environmental governance. Polycentric governance systems provide a means of coping with the tragedy of the commons. Polycentric governance systems provide a means for social actors to organize at multiple governance scales.
- Co-management approaches should be case specific. The conventional approach of co-management in establishing community user groups may not always be the appropriate, especially in cases where a parallel traditional structure exists.
- Enhancement of institutional learning between various Government departments. The majority of benefit sharing approaches in many countries in Sub-Saharan Africa have been implemented in the wildlife sector with little sharing of lessons learnt from departments mandated in other natural resources sectors. With the proliferation of co-management approaches in other sectors, it is important that lessons learned in pioneer sectors be incorporated in other sectors.

## **6.4. Conclusion**

This study sought to understand the underlying complexity of benefit sharing of ecosystem goods and services among multiple actors. It was based on the premise that an appreciation of theories on property rights is necessary for the successful design and implementation of benefit sharing of natural resources, especially in developing countries. The dissertation was driven by the realization that: firstly, despite decades of implementing and prescribing benefit sharing approaches, their performance has not met initial expectations; secondly, little research has incorporated property rights in understanding the dynamic nature of benefit sharing.

According to the conceptual framework, benefit sharing was conceptualized as the creation and regulation of relationships between actors that takes into account accountability, participation and responsibility in decision making, and benefit distribution processes. This model highlighted the role of operational and collective level rights in enforcing the allocation of ecosystem goods and services as well as decision making processes among actors. The analysis shows the variability of benefit sharing outcomes as a function of the configuration of bundles of property rights.

Based on the case of the Barotse Floodplain, the dissertation has provided insights into the consequences of failing to recognize, establish, and enforce bundles of rights in benefit sharing arrangements. The results illustrate that a property rights perspective provides a beneficial way of understanding relations between ecosystem services and human benefits. This is especially the case in contexts in which utilization of shared ecosystem services is susceptible to externalities that make governance difficult and complex.

Property rights are increasingly being viewed as a concept of great importance for dealing with a wide range of problems including climate change, genetic resources, and trans-boundary ecosystems. It is now generally acknowledged that improving the performance of environmental governance approaches requires an emphasis on property rights. Property rights can be conceived as a key governance mechanism for achieving key societal goals such as environmental justice and sustainable development. As a governance tool, they regulate and facilitate access to and use of natural resources. Importantly, they govern who is involved, what

they can do, and when and how ecosystem goods and services are utilized. With increased trends in globalization and the role of markets, property rights go beyond central Governments to include other stakeholders such as the private sector, civil society, and local communities in the governance of natural resources. These changes are an indication that the theme of property rights is replacing the perception that governance of natural resources can be treated as a discrete technical and ecological problem isolated from the contextualizing social system.

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appendix a: consent form

NOTE: This consent form will remain with the Monash University researcher for the university's records.

I understand I have been asked to take part in the Monash University research project specified above. I have had the project explained to me, and I have read the Explanatory Statement, which I keep for my records.

I understand that:	YES	NO
- I will be asked to be interviewed by the researcher	<input type="checkbox"/>	<input type="checkbox"/>
- Unless I otherwise inform the researcher before the interview I agree to allow the interview to be audio-taped	<input type="checkbox"/>	<input type="checkbox"/>

I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalised or disadvantaged in any way.

I understand that any data that the researcher extracts from the interview for use in the report and or published findings will not, under any circumstances, contain names or identifying characteristics without my signed consent below.

I understand that I will be given a transcript of data concerning me for my approval before it is included in the write up of the research.

I understand that I may ask at any time/prior to publication/ prior to my giving final consent for my data to be withdrawn from the project

I understand that no information I have provided that could lead to the identification of any other individual will be disclosed in any reports on the project, or to any other party

I understand that data from the interview audio recording will be kept in secure storage and accessible to the research team. I also understand that the data will be destroyed after a 5 year period unless I consent to it being used in future research.

I do/do not give permission to be identified by name/by a pseudonym/ understand I will remain anonymous at all times in any reports or publications from the project.

Participant's name:

Signature:

Date:

## **APPENDIX B: EXPLANATORY STATEMENT**

### **This information sheet is for you to keep.**

My name is Machaya Chomba and I am conducting a research project with Bimo Nkhata, an Associate Professor in the School of Social Sciences, towards a Master of Philosophy in Integrated Water Management at Monash University, South Africa. This means that I will be writing a thesis equivalent to a 300 page book.

### **Why were you chosen for this research?**

I am seeking the views of stakeholders in the Barotse Floodplain towards the utilization of natural resources accruing from the system. Your contact details were obtained from the community organization group/directory of regulatory organizations.

### **The aim/purpose of the research**

The aim of this study is to analyze local level formal and informal institutions and their influence on distribution of benefits (ecosystem goods and services) accruing from the Barotse Floodplain of Zambia.

### **Possible benefits**

Although there are no direct benefits to you as a respondents, findings from the research will contribute towards understanding institutional dynamics and their influence on the utilization and conservation of natural resources from the floodplain.

### **What does the research involve?**

The study involves you participating in a semi-structured interview that focuses on issues regarding utilization and management of the floodplain. It will last approximately one (1) hour. While the interviews will be audio recorded, your identity will remain anonymous. If you wish,

you may request a copy of the transcribed interview script for confirmation before being included in the research findings. Interviews will be conducted in open space at a specific location convenient to you.

**Can I decline or withdraw from the research?**

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 withdraw will not disadvantage you in any way.

**Confidentiality**

All aspects of the study – including results -- will be completely confidential. All reference to the respondents in the transcribed interview notes will be anonymous. No findings will identify any individual.

**Storage of data**

Data collected will be stored in accordance with Monash University regulations, kept on University premises, in a locked filing cabinet for 5 years. Within this period, you may request a copy of the collected data. A report of the study will submitted for publication, 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 Machaya Chomba on [REDACTED] The findings are accessible for 5 years.

If you would like to contact the researchers about any aspect of this study, please contact the Chief Investigator:	If you have a complaint concerning the manner in which this research is being conducted, please contact:
Bimo Nkhata	Executive Officer

<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	<p>Monash University Human Research Ethics Committee (MUHREC)</p> <p>Building 3e Room 111, Research Office</p> <p>Monash University VIC 3800</p> <p>[REDACTED] [REDACTED]</p> <p>[REDACTED]</p>
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Thank you,

## **APPENDIX C: INTERVIEW SCHEDULE**

### **Section A: Property Rights and Rules**

#### A.1. Access

**How is the right of access to the floodplain determined and enforced? Is this right distributed equally among resource users?**

1. Who has the right to access resource units such as fish, pasture, reeds and agricultural land from the floodplain?
2. What are the rules determining the use of technology when accessing the floodplain?
3. Are there any rules that state the locality or ethnicity of the resources users?
4. Should these requirements be met by everyone or are there exceptions?
5. Who enforces these rights and rules?
6. How do new users obtain access to resources from the floodplain?

#### A.2. Withdrawal

##### **A.2.1. Right of withdrawal**

1. Which groups of people harvest from the floodplain, i.e. fish, pasture, land and reeds?
2. Are there any actions that are only permissible to certain groups of people and why?
3. On what basis are these actions undertaken?

##### **A.2.2. Assignment Rules**

1. How are resource users assigned spatially and temporally (i.e. in space and time)? On what basis are these determined? **Connect to C.2**

2. What are the rules determining the quantity harvested? On what basis are these determined?

3. Who enforces these rules?

### **A.3. Management**

#### *A.3.1. Collective Action Processes*

1. What actions or decisions require group participation?

2. Who is allowed to participate in the formulation of rules regarding management of the resource units (i.e. fish, pasture, land and NWTFPs) from the floodplain?

3. How often do these processes occur?

4. How are arbitration processes (i.e. conflict resolution and interpretation of rules) conducted?

5. How independent are local level management processes from central Government processes?

#### *A.3.2. Monitoring and Enforcement*

1. How is monitoring of utilization of the resource units undertaken? Who bears the costs?

2. What sanctions exist for rule breakers and how are they enforced?

#### *A.3.4. Institutional Scope*

1. What is the scope of jurisdiction of existing institutions (formal and informal) in the floodplain?

## **Section B: Influence on individual and collaborative behavior**

### *B.1. Attributes of Appropriators*

1. Do you trust other resource users to follow the rules in extracting resources from the wetland?
2. How do you perceive the wetland\ and how is it valuable to you and the community?
3. How significant are the resource units obtained from the wetland to your livelihood?

### *B.2. Norms and Culture*

1. How important is the floodplain to the culture of the local population?
2. To what extent are livelihood activities influenced by culture?

### *B.3 Resource User's Perception of Formal and Informal Institutions*

1. How do you perceive Government rules for accessing resource units from the floodplain? i.e. access, management and exclusion
2. What motivates your compliance with the rules and why?
3. How do you perceive the effectiveness of traditional and Government rules for utilizing the wetland resources?

## **Section C: Change in institutions due to flooding regime**

### *C.1 Control and information on the resource system*

1. How do you obtain or determine the condition of the resource system?
2. How predictable is the resource system and flooding pattern?

3. In what way does the predictability or unpredictability of the resource system affect management of the resource system?

4. Do resource users have information about other resource users and about how their actions cumulate into joint outcomes?

### *C. 2 Influence of Flooding Regime on Institutional Arrangement and Practices*

1. How does floodplain productivity and use (i.e. fisheries, cattle herding and agriculture) change (spatial and temporal) with variation in flooding regime?

2. How is the change in use and productivity in response to the flooding pattern enforced?

3. How do property right regimes change with variation in the flooding pattern of the floodplain?

**Refer to A.1 and A.2**

### **Section D: Equity and Institutional Change**

#### *D.1 Distribution of Management Costs*

1. How are costs towards organization, monitoring and formulation of rules distributed among users?

2. D.1.3. How are revenues generated (i.e. licensing) directed towards management of the wetland?

#### *D.2. Equity and Change in Institutions*

D.2.1. How do women acquire access to the benefits accruing from the wetlands? I.e. access to land and grazing rights.

D.2.2. In what instances are concerns for vulnerable groups (widows and disabled) considered in collective action processes?

D.2.3 What circumstances lead to change in rules and rights, and why? Are there specific instances that can be cited?

D.1.4. How are concerns regarding property rights and rules presented in collective action processes?