CONSERVING LAND FOR PEOPLE: TRANSFORMATIVE ADAPTIVE CO-MANAGEMENT OF SUSTAINABLE PROTECTED AREAS IN THE EASTERN DEMOCRATIC REPUBLIC OF CONGO

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Abstract

Conservation practices and approaches in the Democratic Republic of Congo (DRC), as in other parts of the world, have evolved from traditional to fortress and collaborative contemporary approaches such as adaptive co-management. These approaches aim to include multiple decision-makers using diversified resources and, existing formal and informal governance structures. Collaborative approaches also consider conflict resolution and external factors that can influence conservation outputs and outcomes.

In the DRC context, conflicts over resources are related not only to resource access and power but also to the ineffectiveness of collaborative approaches that exclude stakeholders such as local communities. These conflicts have negatively affected protected areas and weakened the management and governance of protected areas. Therefore, evolving approaches such as adaptive co-management that consider power relations, the multi-scaled involvement of actors and learning loops to adjust strategies are seen as better options to improve the governance of protected areas and minimise the degradation of key ecosystems.

My research explored the gazettement processes of three protected areas in the eastern DRC (Itombwe, Kabobo and Okapi Reserves). I focused on the influence of social-political, historical and psychological factors on the management and governance of protected areas in the DRC. In addition, the research reveals the inclusive gazettement processes of protected areas is the foundation of successful co-management approaches. I found that values and good governance practices play a key role in influencing local perceptions and support to conservation interventions. Whilst some conservation practitioners believe that economic benefits to communities are the most predominant motivating factor, I found that good conservation management practices can motivate communities to support protected area management. Bad management practices were related not only to inadequate conservation approaches and practices but also to factors such as corruption, inadequate law enforcement and the inappropriate equipment of rangers.

Therefore, I suggest that long term protected area management in DRC should consider how the value of resources for communities and protected areas have been changing throughout the history of conservation, and how to best share power and responsibilities with local resource users and stakeholders. This is only possible if conservation practices and approaches, governance process and institutions are transformed at multiple levels.

Declaration

I, Deo Kujirakwinja hereby declare that this thesis is my own original work, has not been submitted for any degree or examination at any other university, and that the sources I have used have been fully acknowledged by complete references. This thesis is submitted in fulfilment of a PhD in Environmental Science in the Faculty of Science at Rhodes University, South Africa.

Signature:  Date: 28/02/2020

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Acronyms and Abbreviations

3T	: Tin, Tungsten, Talentum
ACM	: Adaptive co-management
CBNRM	: Community-based natural resource management
CCPF	: Conseil consultatif provincial des forêts
CFCL	: Concession forestières des communautés locales
CoCoCongo	: Coalition de la conservation au Congo
CoCoSi	: Comité de coordination de site
COMIFAC	: Commission des forêts d'Afrique centrale
CSC	: Conflict sensitive conservation
DRC	: Democratic Republic of Congo
E	: East
ES	: Ecosystem services
ESF	: Ecosystem service framework
FSC	: Free State of Congo
FZS	: Frankfurt Zoological Society
GIS	: Geographic Information System
GPS	: Geographic Positioning System
Ha	: hectare
IAA	: International African Association
ICCN	: Institut Congolais pour la conservation de la nature
IDP	: Internally displaced people
INGO	: International non-governmental organization
ITG	: Itombwe Technical Group
IUCN	: International Union for the Conservation of Nature
LGC	: Local Governance Committee
MEA	: Millennium Ecosystem Assessment
N	: North
NP	: National Park
NR	: National road
NTFP	: Non-timber forest products
PPP	: Public-Private Partnership
SDT	: Self-determination theory

SES	: Social-ecological system
SLF	: Sustainable livelihood framework
T-ACM	: Transformative adaptive co-management
TEEB	: The Economics of Ecosystems and Biodiversity
UNESCO	: United Nations Educational, Scientific and Cultural Organization
US $	: United States dollar
USAID	: United States Agency for International Development
WCG	: Wildlife Conservation Global
WCS	: Wildlife Conservation Society
WHS	: World Heritage Site
WWF	: Worldwide Funds for Nature

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[1] Subsistence uses included consumption of products at household level, as well as their uses for cultural purposes. Local trade covers quantities of products sold or exchanged with neighboring villages and towns.

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Glossary

This section includes terms and their meaning in this thesis. Although the glossary includes general definitions, some of the terms are defined in the context of my research. Also, the definitions are not detailed for some terms and readers may have to refer to literature cited in the glossary.

Terms	Definitions and sources
Adaptive co-management	is defined as a flexible system of resource management tailored to specific places and situations supported by and working in conjunction with various organizations at different scales (Armitage et al. 2009). It is characterized by the dynamic process to respond to the changing ecological and socio-economic systems
Actors	include relevant right-holders and stakeholders, including indigenous peoples, local communities with respect to gender and social equity in decision-making (Borrini-feyerabend et al. 2013)
Co-management	refers to a partnership by which various stakeholders agree on sharing among themselves the management functions, rights and responsibilities for a territory or set of resources under protected status (Borrini-Feyerabend et al. 2004). It is 'an approach to solving complex problems in which a diverse group of autonomous stakeholders deliberates to build consensus and develop networks for translating consensus to results'(Emerson & Nabatchi 2015, *p.14*).
Conservation	The management of human use of the biosphere so that it may yield the greatest sustainable benefit to the present generation while maintaining its potential to meet the needs and aspirations of the future generation (Hambler & Canney 2013)
Ecosystem services	Is the capacity of natural processes and components to provide goods and services that satisfy human needs, directly or indirectly. (De Groot et al. 2002). Thus it includes '*benefits that people obtain from ecosystems'* (Millenium Ecosystem Assessment 2005a)
Governance	refers to the act of governing, or how actors use processes and make decisions to exercise authority and control, grant power, take

	action, and ensure performance; all of which are guided by sets of principles, norms, roles, and procedures around which actors converge (Emerson & Nabatchi 2015). For this research, governance includes, but not limited to the agreements, procedures, conventions or policies that define who gets power, how decisions are taken and how accountability is rendered to create conditions for ordered collective action (Graham, John & Plumptre, Tim, Amos 2003).
Intrinsic values	refers to the natural object or system itself, irrespective of whether it has any use. Intrinsic values are those inherent to nature, independent of human judgement, such as non- human species' inherent rights to exist (Díaz et al. 2015; Chan et al. 2016).
Instrumental values	refers to the product that nature can provide to human wellbeing. associated with the notion of nature's benefits as far as they allow people to achieve a good quality of life, be it through spiritual enlightenment, aesthetic pleasure or the production or consumption of a commodity (Díaz et al. 2015).
Local knowledge	refers to the understandings, skills and philosophies developed by societies with long histories of interaction with their natural surroundings (Curci 2010). This includes the way people observe and measure their surroundings, how they solve problems and validate new information. It includes the processes whereby knowledge is generated, stored, applied and transmitted to others (FAO 2004). Local knowledge is the knowledge that people in a given community have developed over time, and continue to develop. It is: Based on experience. Often tested over centuries of use.
Management	'right to regulate internal use patterns and transform the resource by making improvement' by diverse actors (including governments, farmers, business, communities, and NGOs) (Carlsson & Berkes 2005; Lockwood 2010).
Natural resources	are useful raw materials that we get from the Earth that we use and modify in ways that are beneficial to us.

Participation	is understood as the involvement of non-state actors in environmental governance processes, whether state-led or community-based (Coolsaet 2015).
Participatory mapping	is a map-making process that attemps to make visible the association between land and local communities by using commonly understood and recognized language of cartography (IFAD 2009).
Policy	a deliberate and (usually) careful decision that provides guidance for addressing selected public concerns (Torjman 2005). Policy derives from management goals and define the desired behavior of distributed heterogeneous systems, applications, and networks (Wies 1994).
Protected area	a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values' (IUCN 1994).
Relational values	preferences, principles and virtues about human-nature relationships (Chan et al. 2016). Relational values are determined by relationships with nature and the responsibility towards people and nature that derive from these relationships (De Vos et al. 2018)
Right-holders	actors socially endowed with legal or customary rights with respect to land, water and natural resources (Borrini-Feyerabend & Rosemary 2015).
Selective conservation management	is a contextualized situation of protected area management in the DRC where financial and technical supports are not shared or allocated to the all protected areas based on a set of criteria but based on the availability of funding and donors.
Stakeholders	'stakeholder' is generally used to define a person, group or organisation who has an interest in an issue, service or resource, or who is, or would be, affected by it. The current definition used in conservation circles is 'those likely to be affected by a decision or likely to affect the implementation of a particular decision' (Mike

	2008).
Social category	is a collection of individuals who share at least one attribute in common (Rabbie & Horwitz 1988). Categories are associated with gender, age or based on the traditional ranking associated with ethnic groups and the history of each landscape (Barkan 2016).
Social groups	consists of two or more people who regularly interact on the basis of mutual expectations and who share a common identity (Barkan 2016).
Tradition	refers to beliefs and practices that have been transmitted from generation to generation (Lewis & Hammer 2007)
Traditional system	refers to a governing system based on local beliefs and practices. It is based on the precolonial political system.
Transformation	can be defined as physical and/or qualitative changes in form, structure, or meaning-making. It can also be understood as a psycho-social process involving the unleashing of human potential to commit, care and effect change for a better life (University of Oslow 2013).

Dedication

To conservation actors and stakeholders who have dedicated and continue to dedicate their lives, time and effort to save biodiversity in the DRC on a daily basis,

To my sons (Nick Azaria, Josias Aurelien, Tony Asser and Lionel Al-Heri) and my daughter (Christina Annah Amina K.) who have been acting as motivators for my PhD research so that they know that “you know when you start your journey but you may not know when and how you will reach your destination”, but you have to make your dream a reality,

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PART 1. BACKGROUND, CONTEXT OF THE STUDY AND HISTORICAL SETTINGS OF THE RESEARCH

Chapter 1. Introduction

1.1 Protected areas as social-ecological systems

Establishing protected areas[1] is recognised as one of the most effective measures to respond to the ongoing environmental crisis that has impacted on key biodiversity and species worldwide (Stolton & Dudley 2010; Geldmann et al. 2013; Palomo et al. 2013). Despite the positive contribution of protected areas to human wellbeing (Brockington & Wilkie 2015), protected areas have been threatened by anthropogenic activities, inadequate governance[2], inappropriate management and policies as well as bad political governance[3] (Butchart et al. 2012; Gray et al. 2016; Geldmann et al. 2018). Jones et al. (2018) found that more than half of the established terrestrial protected areas are facing high human pressures that prevent them from responding adequately to social and ecological needs.

The outcomes of protected areas for biodiversity, ecosystem services and human well-being are intricately linked to how they are managed. Like other SESs, protected areas are influenced by rules and institutions (Mcginnis & Ostrom 2014; Cumming et al. 2015) as well as interactions between functions and services. In addition, protected areas are influenced by beneficial relationships between social and ecological elements (Congleton 2007; Palomo et al. 2014; Cumming & Allen 2017). However, the interactions between human and ecological elements can result in far-reaching positive and negative feedbacks that need to be considered in existing governance systems and management approaches (Geldmann et al. 2013; Tranquilli et al. 2014; Borrini-Feyerabend & Rosemary 2015).

The process of achieving the good governance of protected areas must include multiple stakeholders at different levels and scales (Palomo et al. 2014; Cumming et al. 2015); functional local institutions; and an enabling political context (Palomo et al. 2014; Cumming et al. 2015; Mathevet et al. 2016; Cumming & Allen 2017). For social-ecological protected

[1] This research considers protected areas as legally gazetted spaces. Gazetted lands can be referred to as landscapes if they include multiple land uses. In this study, the term protected area will be used interchangeably with the term protected landscapes.
A protected area is defined by the IUCN as 'a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values' (Dudley 2008).

[2] Governance of protected areas follows broad "good governance" principles in all decision-making regarding protected areas, including: respect for rights and the rule of law; promotion of constructive dialogue and fair access to information; accountability in decision-making; and existence of institutions and procedures for fair dispute resolution (Borrini-Feyerabend & Rosemary 2015).

[3] Political governance is related to the political system ruling the country or structures whereas protected area governance regimes refer to type of protected area governance

area systems to achieve their goals they need to balance interactions between ecosystems, institutions and governance systems, and power imbalances between resource users and decision-makers (Palomo et al. 2014; Cumming & Allen 2017). The context described above is entirely illustrated by the conservation situation in the Democratic Republic of Congo (DRC) and the conditions as detailed in Chapter 3.

1.2 Adaptive co-management and protected area management

In recent decades, adaptive co-management (ACM) has emerged as a promising framework for sustainable protected area management (Armitage et al. 2007; Plummer et al. 2012). Management approaches and governance practices of protected areas as complex SESs require flexible and adjustable approaches to respond to changing situations (Palomo et al. 2014; Cumming et al. 2015; Cumming & Allen 2017). Moreover, they require decentralised management approaches and governance systems (Plummer & Armitage 2007; Plummer et al. 2012, 2017b). ACM is one of the most widely acclaimed governance approaches that has been applied in various contexts and ecosystems (Armitage et al. 2009; Plummer et al. 2017b). The ACM approach embraces a flexible process that involves various stakeholders at multiple levels. In addition, ACM includes learning spaces that allow participants to respond to, and shape emerging changes (Armitage et al. 2009; Plummer et al. 2012, 2017b; Fabricius & Currie 2015).

Although ACM is not a panacea (see Plummer 2009), it has provided a diversified option to respond to major conservation challenges (internal and external) and unplanned events (crises) through its key attributes and principles (Armitage et al. 2009).

The ACM approach fosters the decentralisation of resource management, the legitimisation of decision-making, conflict resolution mechanisms and problem solving processes as well as a learning opportunity (Armitage et al. 2007; Trimble et al. 2015a). To operate, the ACM approach considers the involvement of multiple actors' interests, shared power and responsibilities (see Box 1.1, also Olsson et al. 2004; Carlsson & Berkes 2005; Fabricius & Currie 2015). Box 1.1 presents the four key components of ACM as described below.

a. Enabling environment
    - Institutional arrangements
    - Leadership
    - Policy
    - legislation
b. Learning
    - Experimentation on the ground
    - Monitoring and evaluation
c. Collaboration
    - Multiple stakeholders
    - Mutual rights and responsibilities
    - Multiple levels and scales
d. Iterative process

Box 1. 1. The four key components of ACM process (see Fabricius & Currie 2015)

The ACM approach emphasises the devolution of power from the state agencies to include non-state stakeholders, the legitimisation of informal governance networks and transparent decision-making processes (Folke et al. 2005; Armitage et al. 2007; Plummer et al. 2012).

Moreover, ACM has been used as an approach that can assist in the response to recurrent conflicts over natural resources, power as well as the degradation of protected areas and social systems (Plummer et al. 2012, 2017b). Actually, many practitioners associate the conflicts in protected areas with user and access rights to resources for communities without including other factors related to lifestyle and modern society (Kujirakwinja et al. 2010b; Verweijen & Marijnen 2016). Other causes of conflicts are the low level of involvement of resource users in decision-making (Hanson et al. 2009; Kujirakwinja et al. 2010b), the unequitable management of protected areas and inappropriate governance practices (Hatchwell 2014; Verweijen & Marijnen 2016; Rosaleen et al. 2019). Another cause of conflict is the failure to adequately integrate local socioeconomic and cultural systems into the management practices and policies of protected areas (Adams & Hutton 2007; Long 2011).

Some changes in conservation approaches (from fortress to collaborative) have been implemented since the late 1980s worldwide (Wilson et al. 1996) and in the DRC in

particular (see Section 4.4). Whilst these changes have led to noticeable improvements in protected area management in the DRC throughout history (see Section 4.2), I argue that ACM principles and practices have not been adequately implemented in the DRC's protected area management (see Chapter 4 and 7). Thus, my research involved an investigation of factors and limitations that have prevented the effective implementation of ACM in the DRC.

In the DRC context specifically, the ACM approach is critically needed to respond to the plurality of power over protected areas' boundaries and related conflicts, access to resources, and degradation of biodiversity (Ostrom 1990; Mcginnis & Ostrom 2014). The aim of applying ACM is to foster an equitable and effective co-management through participatory governance. Although some forms of co-management have been implemented in the DRC (see Section 4.3.3), there are still significant gaps to fill as experimental models did not consider social changes, learning processes and feedbacks (Inogwabini 2014; Pieraccini 2015; Verweijen & Marijnen 2016). Therefore, there is a need for research to assess how protected areas have been managed and how the ACM approach and its principles could transform current conservation interventions to maximise multi-level partnerships and power sharing with local stakeholders. These principles include institutional design, partnerships and power sharing, social capital and policy implementation (Armitage et al. 2007; Plummer et al. 2014). I argue that locally tailored co-management approaches that could draw from global best practices can be beneficial for the management and governance of protected areas in the DRC.

1.3 Aims, Objectives and research questions

Given the need to reassess and redesign protected area management and governance in the DRC, my research investigated how co-management approaches have been implemented in protected areas in the DRC and how conservation interventions could be aligned with ACM principles (Berkes 2009; Bown et al. 2013b; Palomo et al. 2014; Trimble et al. 2015a).

The aim of my research was to evaluate how historical changes have shaped current management practices and local perceptions of protected areas, and to identify how ACM can transform current co-management and governance processes for the sustainability of protected areas in the DRC.

To address this, I evaluated the impacts of past and current conservation governance processes and management practices on the sustainability of three biodiversity-rich and conflict-affected protected areas in the eastern DRC (Itombwe Nature Reserve, Kabobo

Wildlife Reserve and Okapi Wildlife Reserve [1]). In addition, I explored options for transformative adaptive co-management (T-ACM) that would include cognitive and behavioral patterns. To achieve the above aim, I considered four key objectives (each one is linked to specific chapters of my thesis):

Objective 1 was to assess and analyse current conservation management and governance processes, practices and challenges as influenced by historical processes and contexts (Chapter 3, 4, 6). To achieve this objective, three research questions were defined as follows: (1) How has conservation approaches evolved in the DRC throughout history? (2) What are the enabling factors that can transform future management practices? (3) What are local actors' perspectives on the historical management of resources and their influences on current management processes? For this objective, I considered historical ecology, political ecology and ACM principles, especially by considering power relations and dynamics among the involved parties, changes happening in conservation practices and the factors that influenced success or failure.

Objective 2 was to examine the perceptions of actors regarding the use of, and benefits, from protected areas and potential conflicts of interest (Chapter 5, 6). Key questions were as follows: (1) How have local communities been valuing protected areas throughout history? (2) What are the perceptions of local actors towards conservation management practices and governance processes? (3) How do local actors relate to each other at different levels regarding decision-making processes? (4) What are the existing and potential conflicts of interests and whose interest counts? For thisobjective, I drew on key ACM principles (collaboration, institutions and included some learning as far as conservation practices and management are concerned, see Box 1.1), and the ecosystem service framework to guide assessment of what resources are important and used by communities for their livelihoods (in terms of livelihoods I drewon the sustainable livelihood approach).

Objective 3 was to explore what emerging factors identified in the previous objectives might block (barriers) or facilitate (enablers) a transition to ACM (Chapter 7, 8). To address this objective, the following questions were as follows (1) What are the enabling factors for and barriers to effective ACM of protected areas in the DRC? (2) What motivational factors could influence the positive support of communities towards protected area management? My

[1] In my research, Itombwe, Kabobo and Okapi will be used to represent respectively Itombwe Nature Reserve, Kabobo Wildlife Reserve and Okapi Faunal Reserve throughout.

theoretical framing for this objective included the ACM framework, political ecology and the ecosystem service framework where learning from various institutions, governance and stakeholders were the key ingredients. I used 'Self Determination Theory' to identify what factors might be considered to improve governance and encourage communities to adhere to conservation goals within the three landscapes.

The last objective (Objective 4) was to evaluate my results against the ACM principles and develop pathways from my findings towards transformative ACM (Chapter 8). The key question was what are the major factors and elements emerging from previous chapters (4, 5, 6 and 7) to consider for the T-ACM of sustainable protected areas in the DRC? The last chapter considered the array of frameworks based on the key components I used in the whole thesis (see Chapter 8).

1.4 Structure of the thesis

The thesis is divided into three main parts. Each of these parts includes one or more chapters. Part 1 comprises three chapters. Chapter 1 (current) exposes the context and sets the background and motivation for the study. Chapter 2 presents the theoretical concepts and frameworks that framed and bound this study. It also includes the research approaches and methods used in my study. Chapter 3 covers among other topics, the context of conservation in DRC, and the decision-making processes for natural resource management. Chapter 4 sets the scene for the conservation trajectory in the DRC from the prehistorical period to the current time. I discuss how the management of protected areas has discriminated against local stakeholders in favor of financial stakeholders in DRC, which it still does.

Part 2 of the thesis provides the empirical results and includes three chapters. Chapter 5 outlines the gazettement processes of the three protected areas with a major emphasis on stakeholders' involvement, power sharing and community rights. Chapter 6 discusses the values and benefits of protected areas for local stakeholders. Chapter 7 presents the results related to the perceptions of local stakeholders of protected areas. In addition, I also discuss factors (motivators and de-motivators) that influence communities' support for, or opposition to, the establishment and existence of local protected areas. I also discuss the existing governance styles of the respective protected areas and multiple decision-making levels.

Part 3 of the thesis is composed of one chapter (Chapter 8) which summarises the key findings and makes key recommendations.

Chapter 2. Research area and context of protected area management in DRC

2.1 Introduction: from protected areas to paper parks

The DRC is one of the most important countries for biodiversity conservation and forest protection (Debroux et al. 2007; de Wasseige et al. 2015). The DRC holds about sixty percent of the Congo Basin's forests and is inhabited by exceptional biodiversity and a variety of ecosystems (Debroux et al. 2007; de Wasseige et al. 2015). To conserve its biodiversity and key ecosystems, the DRC has established a large network of protected areas; some dating back to colonial times (see Section 4.2). Currently the protected area network in the DRC comprises eight national parks and more than fifty wildlife/hunting reserves (Counsell 2006; Debroux et al. 2007; UICN/PAPACO 2010; Inogwabini 2014). More recently (2016), the DRC has passed the law on 'local forest concessions for communities'[1] (CFCL) to secure forest spaces for communities. The current number of CFCLs is not known, although their numbers have been increasing across the DRC (Buttoud & Nguinguiri 2016; Vermeulen & Karsenty 2017; Lescuyer et al. 2019). As part of the DRC's forest area network, CFCLs are established either for local livelihoods or biodiversity conservation (Vundu & Kalambay 2013; Vermeulen & Karsenty 2017).

As part of the forest network, protected areas and CFCLs have been threatened by anthropogenic activities and phenomenon (unplanned urbanisation) (Beyers et al. 2011; Inogwabini 2014; Tranquilli et al. 2014). As such, traditional and armed poaching, artisanal and industrial mining, timber harvesting, and farming are regularly reported by conservation actors as negatively impacting on ecosystems and biodiversity (Plumptre et al. 2014b; Tranquilli et al. 2014; Spira et al. 2017). For example, Spira et al. (2017) recognise the negative impact of artisanal small mining on the biodiversity and ecosystems of Itombwe and Kahuzi-Biega National Park. Moreover, inadequate governance regimes and processes, as well as the unstable political environment have contributed to the ineffectiveness of the protected areas in the DRC (Hirschnitz-Garbers & Stoll-Kleemann 2011; Trefon 2011; Cuvelier et al. 2013). These pressures have persisted over long periods with severe consequences on protected areas, wildlife and livelihoods (see Chapter 4, also Van

[1] Local community forest concessions (*Concession des forêts des communautés locales – (CFCL))* are not part of my research though some of the concessions will be established for biodiversity. CFCLs are defined bylaw as a portion of forest legally allocated to communities to respond to their needs with limited size of 50,000ha.

Schuylenbergh 2009; Pouillard 2016). However, most protected areas have been referred to as 'paper parks' as they have lost most of their biodiversity and their boundaries have been invaded (Stolton & Dudley 2010; Geldmann et al. 2013; Reading et al. 2016; Watson et al. 2016). Moreover, organisational, financial and operational constraints have hindered expected conservation outcomes (Carey et al. 2000). The pervasiveness of 'paper parks' is concerning because most protected areas in the DRC have lost much of their conservation value (e.g., Maisels et al. 2013; Plumptre et al. 2016) as well as suitable habitats and key ecosystems (Geldmann et al. 2013; Megevand et al. 2013; Borrini-Feyerabend & Rosemary 2015).

Indeed, the wildlife populations of many species have declined and their habitats degraded and/or fragmented (Kujirakwinja 2010; Maisels et al. 2013; Plumptre et al. 2016b). For example, other than the mountain gorilla (*Gorilla beringei beringei*) that has doubled in numbers in about three decades (Robbins 2018), all other great apes species have declined. Plumptre et al. (2016) reported the decline of the eastern lowland gorilla (*Gorilla beringei graueri*) by eighty percent and of the eastern chimpanzee (*Pan t. scweinfurthii*) by twenty percent.

2.2 Context and selection of the research study

2.2.1 Context of protected area management in the eastern DRC

As described in Section 4.2, most protected areas were created during the colonial period and expanded later after independence in 1960 (D'Huart & Verschuren 2014; Inogwabini 2014; Pouillard 2016). However, the management and governance of the established protected areas did not consider surrounding communities needs and their rights (Inogwabini et al. 2005). The establishment of protected areas in the DRC is explored in more detail in Chapter 4.

I selected three protected areas for my research (Itombwe, Kabobo, and Okapi) where co-management approaches are claimed to have been implemented (Brown 2010; Kujirakwinja et al. 2010b, 2018). All three protected areas are threatened by the extraction of resources by both local communities and industries, a high rate of unemployment, and the persistence of insecurity fueled by mineral extraction and ethnic violent conflicts (Bisidi et al. 2008; Plumptre et al. 2009; Brown 2010; Crawford & Kujirakwinja 2016). Local communities in and around these protected areas have had limited access to adequate social services such as schools, health centres, and markets (Plumptre et al. 2004, 2009; Bisidi et al. 2008). For

example, results from socioeconomic surveys in Itombwe (Bisidi et al. 2008) and Kabobo (Plumptre et al. 2009) reported that more than 80% of local communities did not have primary school education in these areas. These social challenges have been worsened by armed conflicts targeting minerals and wildlife trophies (Luca et al. 2012).

As for other protected areas in Africa, protected areas in the DRC represent complex SESs where internal and external factors, unbalanced power and policy mismatches have influenced their functioning (Kujirakwinja et al. 2010b; Beyers et al. 2011; Inogwabini 2014; Tranquilli et al. 2014; Verweijen & Marijnen 2016). As in other countries, the persistence and sustainability of protected areas as SESs are dependent on how interactions between internal and external factors (see Figure 2.1) are understood and their feedbacks and governance systems are approached (Holling 2001; Ladyman et al. 2013). Internal factors that have influenced conservation management in my three research sites (Itombwe, Kabobo, Okapi) included governance systems (A); multi-leveled political structures and power (political and customary) as well as local livelihood activities (B); and conservation interventions (C). External factors (D) included driving forces for migration and external resource users. Local communities living in and around protected areas in the DRC have interacted and are still interacting with protected areas by extracting resources to sustain their livelihoods. My research sites share some common characteristics related to biodiversity threats; power; conservation interventions and involved stakeholders (Figure 2.1).

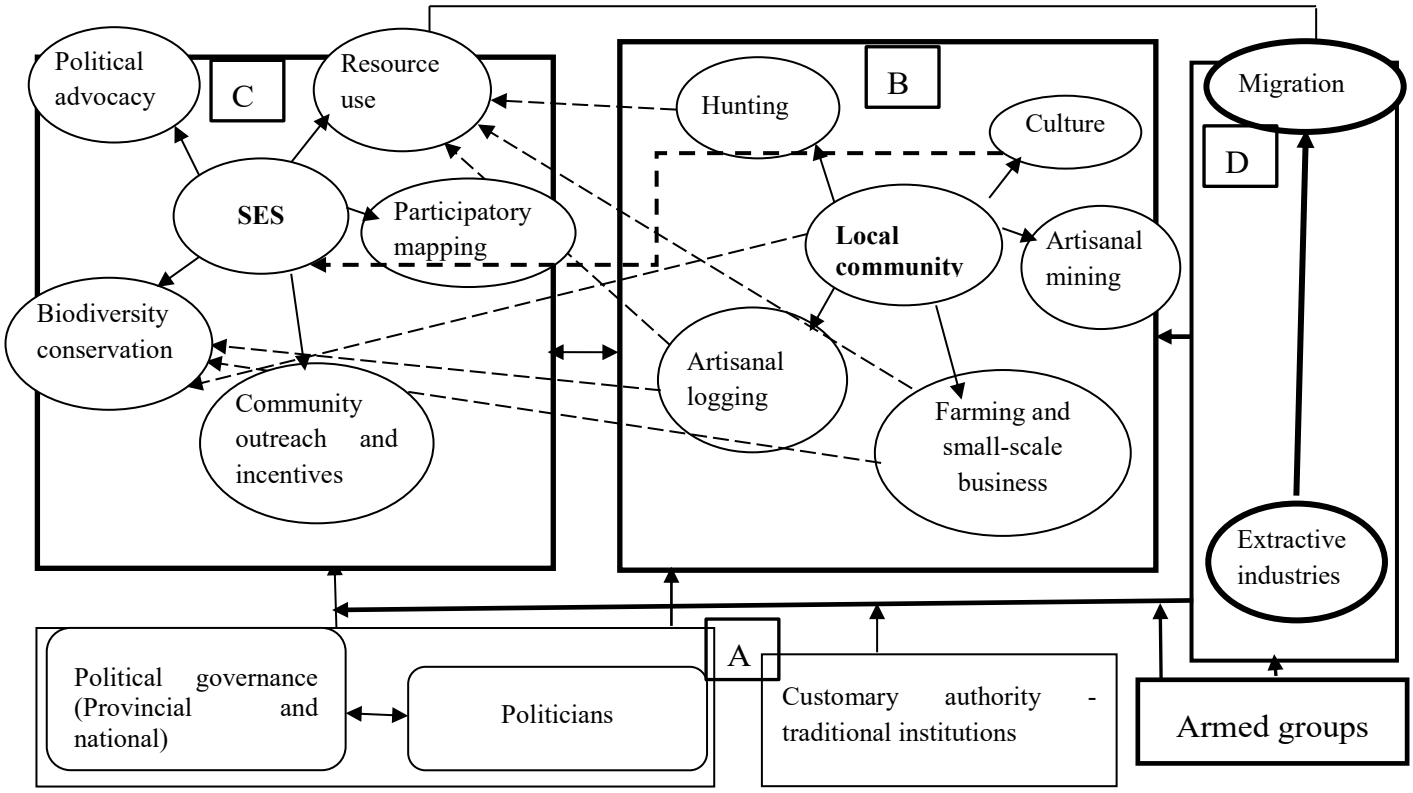

Figure 2.1. The complex SESs for the three research sites in the DRC showing interactions between resource extraction (B), conservation interventions (C) and the impact of multiple power-holders (politicians and traditional authorities) and institutions (political governance) as well as armed groups on each resource uses/users and resource managers. External pulling factors are incoming migrants and resource extractive bodies. The dotted arrows show the interaction between human activities and five main conservation interventions implemented by conservation actors. The arrows show strong ifluence and interactions among actors as well as how they negatively and positively impact on both local communities and protected areas.

Since the legal proclamation of the three protected area (see Chapter 5), five types of conservation interventions (see Figure 2.1, C) have been implemented to minimise the impact of anthropogenic threats (see Figure 2.1, B) on biodiversity and ecosystems (Lescuyer & Nasi 2016; Spira et al. 2017). Conservation interventions have sought to affect people's behavior (i.e. through education outreach and community projects), to deter practices that threaten biodiversity (e.g. law enforcement operations), establish new institutions and structures to enhance cooperation with other stakeholders (e.g., advocacy and legal cases), and set achievable conservation targets through research (Inogwabini 2014; Pelissier et al. 2015; Kasereka et al. 2016; Pouillard 2016).

Many of these conservation approaches, however, have not considered the basic principles of the co-management of natural resources such as power sharing (Kasereka et al. 2016), community needs and existing informal institutions (Kujirakwinja et al. 2010b, 2013). In

addition, despite the existence of the ICCN[1] (Institut Congolais pour la Conservation de la Nature) staff and international non-governmental organisations (INGOs), the three protected area are facing plurality of power from various governance bodies based on their individual interests and benefits (Kujirakwinja et al. 2010b; Vlassenroot 2013; Crawford & Kujirakwinja 2016). Traditional chiefs and political authorities at different levels (local, provincial and national), government structures and other public services (see Figure 2.1, A) have been deciding on resource management in the protected area regardless of the boundaries of their mandates clearly defined bylaw (Trefon 2004; Huggins et al. 2005; Vlassenroot 2013).

Land tenure and natural resource access rights in and around the three protected areas have been influenced by traditional systems (see Figure 2.1, A) or regulated by controversial policies overlapping with various laws (Long 2011; Hochleithner 2017). Although the support from the above power-holders is important for the effective management of the three protected areas, uncontrolled decision-making for these power-holders has had major impacts on these protected areas (Trefon 2004, 2008). For example, local traditional governance systems in Okapi have been accused by conservation actors for encouraging communities to mine illegally in the reserve as traditional chiefs have been collecting tributes from illegal miners (see Section 2.3.3, also Hochleithner 2017). Yet, conservation actors rely on local chiefs and provincial authorities to motivate and educate local communities to support protected areas and enforce local arrangements (Morris 2016).

Furthermore, the local social-ecological settings have been influenced by external drivers through regular and purposive migration, and extractive companies, especially for minerals and timber (see Figure 2.1, also Crawford & Kujirakwinja 2016). Migration in the three protected areas was driven mainly by the availability of natural resources, security for displaced people, unregulated movement of people and the existence of roads (Crawford & Kujirakwinja 2016).

Another external factor influencing these SESs was the arrival of industrial and semi-industrial extractive companies for wildlife products, minerals (gold and 3T (Tin, Tungsten, Talentum)), and timber (Phillips 2001; Beyers et al. 2011; Spira et al. 2017).

[1] The ICCN is the protected area authority in DRC.

Finally, armed groups associated with some political and traditional authorities have maintained resource extractive businesses in some regions of protected areas under their control (see Figure 2.1., also Cuvelier & Cuvelier 2010; Luca et al. 2012; Cuvelier et al. 2013; Spira et al. 2017). The impact of armed groups within these protected areas has been largely discussed in the DRC. Armed groups have been involved in mining and the bushmeat trade to support their activities (Weinberg et al. 2011; Spira et al. 2017). The situation described above has been worsened by inadequate national environmental politics characterised by corruption and poor conservation planning (Kodi 2008; Trefon 2011; Edwards et al. 2014).

2.2.2 Selection of research sites

I selected my three research sites (see Figure 2.2) because they were established through participatory processes or included some participatory activities. Specifically, the gazettement and zoning of the three protected areas included community consultations, conflict resolution, collaborative boundary identification and zoning as well as the establishment of community governance structures (see Chapter 5). In addition, participatory processes and co-management practices were implemented at different steps of their management processes (Figure 5.2). These steps included gazettement (creation), boundary identification, zoning and management as described in Chapter 5 (Brown 2010; Crawford & Kujirakwinja 2016; Kujirakwinja et al. 2018). All three protected areas are inhabited by emblematic and endemic species (see Section 2.3, also Grossmann et al. 2006; Plumptre et al. 2007a). Moreover, the three protected areas have important value for local livelihoods and culture (see Section 2.2) as well as international resource demand. However, as for other protected areas in the DRC, the three sites are threatened by illegal resource extraction and limited management capacity (Tranquilli et al. 2014; Kujirakwinja et al. 2018).

2.3 Study area description

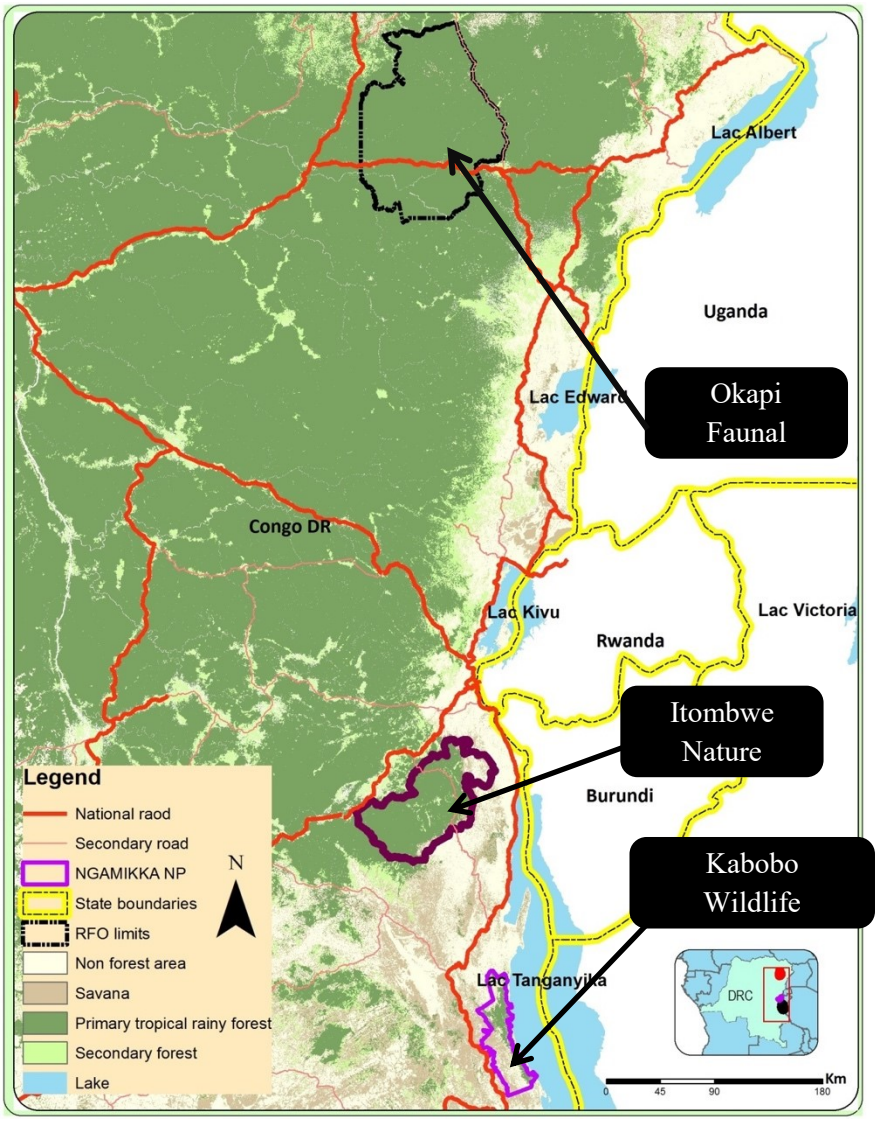

Figure 2. 2. Map of the study area showing the three research sites in the eastern DRC and vegetation types: Okapi (in black), Itombwe (brown) and the proposed Kabobo and the southern part of NGAMIKKA (purple)

2.3.1 Itombwe Nature Reserve

The Itombwe nature reserve is part of the Itombwe massif which is larger than the reserve (Doumenge & Schilter 1997; de Failly & Bandu 2010). The area is known for its biodiversity richness and habitat diversity, especially for high altitude species (Doumenge & Schilter 1997; Plumptre et al. 2007a; Greenbaum & Chifundera 2012). Its international recognition is mainly associated with the discovery of the Grauer's gorilla (*Gorilla beringei graueri*) in the early 1900s and the existence of a number of other endemic species (birds, amphibians, reptiles and plants (Prigogine 1977; Doumenge 1990; Doumenge & Schilter 1997; Omari et al. 1999; Greenbaum & Chifundera 2012; Plumptre et al. 2015b). Together with Kabobo and

Virunga National Park, they host more species and endemic species than other protected areas in the Albertine Rift Region (Plumptre et al. 2007a).

Located in the tropical montane massif, Itombwe has a variety of ecosystems that provide ecological services and benefits to local communities (Doumenge & Schilter 1997; de Wasseige et al. 2015). Local communities have sustained their livelihood through access to ecological benefits and products such as firewood, bushmeat, and minerals (Bisidi et al. 2008; de Failly & Bandu 2010). Competition for control over land, mining resources and social identity have fueled localised violent conflicts between natives, non-natives and migrants[1] for a long time (Vlassenroot 2013). For example, a recent conflict between natives (Fuliro, Bembe, Bavira) and non-natives (especially the Banyamulenge[2]) was related to land ownership and social identity (Vlassenroot 2012, 2013; Muchukiwa 2016).

The Itombwe region is among the poorest areas in the Albertine Rift region with inadequate social services and infrastructure as well as limited development support to local livelihoods (Plumptre et al. 2004, 2013; de Failly & Bandu 2010).

2.3.2 Kabobo Wildlife Reserve

The Kabobo Wildlife Reserve (here referred to as Kabobo) is part of the Kabobo Massif located in the eastern DRC, along the western shores of Lake Tanganyika. Kabobo consists of about 1,000 km² of medium altitude and montane rainforest as well as savanna ranging from 770 to 2,725 metres (Plumptre et al. 2007b, 2008). The region is known for its biodiversity with a high number of species and endemics (Plumptre et al. 2007b; Fischer et al. 2017), and has the potential for discoveries of new species and rediscoveries of species that were observed several years ago or where only one specimen existed (Greenbaum & Chifundera 2012).

More than sustaining biodiversity, it provides a number of ecosystem services (regulatory and functioning) that benefit local and regional communities to sustain their livelihoods (e.g., food, rivers, timber) and maintain local cultural systems (e.g., rituals and beliefs) (Weeks & Mehta 2004; Fisher et al. 2012; Crawford & Kujirakwinja 2016). Local livelihoods are sustained by fishing, small-scale subsistence farming, artisanal mining and timber

[1] Four main social categories were reported to coexist in these protected areas. Natives are the first people who originated from the area. Non-natives are people who have been living in the area for long time but originated from other regions. Migrants are people who have immigrated to the region recently (more than 10 years).
[2] Nilotic ethnic group that migrated from Rwanda to the DRC in the early 1900s either as workers or pastoralists (Rukundwa 2004; Jackson 2007).

exploitation (Plumptre et al. 2009; Crawford & Kujirakwinja 2016). Despite its importance for biodiversity and provision of services, the area is threatened by anthropogenic activities meant to support livelihoods and respond to the demand for food and raw construction materials for neighboring cities (Kalemie) and towns (Crawford & Kujirakwinja 2016).

The social system around the Kabobo landscape is maintained through traditional governing systems whereby local established chiefs are recognised as power-holders for natural resources (Omasombo 2014; Crawford & Kujirakwinja 2016). The arrival of migrants has affected local traditional regulations and rules with a clear impact on SESs (Crawford & Kujirakwinja 2016). For example, livestock and intensive logging were introduced in the area by migrants from other regions. Therefore, large areas of the region have been deforested for farming and livestock.

One can argue that the Kabobo SES is vulnerable to social and political crises (i.e. internal historical conflicts, migration). Additionally, the Kabobo SES is fragile to uncertain events (industrial mining, intensive agriculture and cultural values) that negatively impact on local communities and biodiversity conservation (Greenbaum & Chifundera 2012; Crawford & Kujirakwinja 2016). The region has been regularly reshaped by incoming people and conflicts, disrupting social structures and systems as well as contributing to the degradation of ecosystems (Weyn 2010; Crawford & Kujirakwinja 2016). For example, the outbreak of violent conflicts over control of land recently (2016) around Kabobo led to changes in the occupation of the surroundings, as some villages were abandoned and people settled in neighboring towns and cities. The gazettement processes and the management practices of these protected areas are detailed in Chapter 5 of this thesis.

2.3.3 Okapi Faunal Reserve

Okapi Faunal Reserve (referred to as Okapi) is located in the north eastern DRC (1° N-2° 29'N and 280 E-290 4'E) within the Ituri forest where it represents about one fifth of the Ituri forest (Peterson 1990; Stephenson & Newby 1997; Wilkie et al. 1998; Yanggen et al. 2010; de Wasseige et al. 2015). The Ituri forest is recognised as being one of the largest lowland forests in the Congo Basin (Peterson 1990; Wilkie et al. 1998).

The Okapi is of great social-ecological and cultural importance for local communities and for neighboring countries. It provides significant ecological services and benefits as well as fulfilling various ecological functions like climate change regulations and ecosystem

functions (Debroux et al. 2007; de Wasseige et al. 2015). Okapi harbors large populations of emblematic and threatened mammals, such as the okapi (*Okapia johnstoni*), the elephant (*Loxodonta c. africana*) and the chimpanzee (*Pan t. schweinfurtii*). It provides a habitat for important endemic bird species (Plumptre 1997), as well as threatened amphibians and small mammal species (Hart & Hall 1996; Wilkie et al. 1998; Gubista 1999; Katuala et al. 2005; Plumptre et al. 2010a).

However, most the numbers of large animals, such as the elephant, the chimpanzee and the okapi, have declined as a consequence of increasing anthropogenic activities, which includes hunting and artisanal mining, ineffective law enforcement and the consistent presence of armed groups (International Crisis Group 2003; Vlassenroot & Raeymaekers 2004; Beyers et al. 2011; Tranquilli et al. 2014).

The area is known to have been inhabited by humans for a long time and experienced migration throughout its history (Stephenson & Newby 1997; Mercader & Brooks 2001; Mercader 2002). Different tribes and ethnic groups with diverse cultural values inhabit the Ituri region (Stephenson & Newby 1997; Wilkie et al. 1998), and it is recognised as a significant home for Pygmies (30 to 40,000 individuals) in Central Africa (Bahuchet 2000; Hewlett 2014). The area has supported local livelihoods for ages as local communities are dependent on forest resources (Peterson 1990; Mercader & Brooks 2001). Regional trade has long been reported in the region, which was essentially based on resource extraction for timber, minerals and non-timber forest products (NTFPs), especially honey and bushmeat (Peterson 1990; Wilkie & Finn 1990).

The surroundings of Okapi and its delineated conservation management zones (conservation, hunting, agriculture) have been shaped (informally) by both armed conflicts and local claims over access rights to resources including mining. Indeed, conservation management zones were defined mostly based on human settlements, and changes are expected as communities are claiming rights over land and the use of resources (Wilkie et al. 1998; Brown 2010).

Migration is one of the most important shaping factors for the Okapi SES (Peterson 1990; Wilkie et al. 1998, 2000; Tshombe 2007). Migration in the area has been driven by mining opportunities, fertile agricultural soil, abundant fauna (compared to other protected areas), access to forest products and low human density in the Ituri region (Peterson 1990; Wilkie et al. 2000; Tshombe 2007; Brown 2010; Abernethy et al. 2016). Therefore, human settlement and agricultural farming are expanding both within and around the Okapi.

Chapter 3. Theoretical, conceptual framing and research methods

3.1 Theoretical and conceptual framework

To understand the important social and ecological issues related to protected areas in the DRC, I used elements of the social-ecological system (SES) framework see Figure 3.1). As introduced in Chapter 1, my research focused specifically on governance systems, actors and the interactions between these two elements (governance systems and actors) and protected areas, which are considered as resource systems (Mcginnis & Ostrom 2014). To understand how the three elements (governance, actors and local contextual settings of protected areas) may have interacted to influence effective co-management of protected areas in the DRC (see Figure 2.1), I borrowed some elements from other theoretical approaches and frameworks. These included the historical ecology approach (Crumley 2017; Szabó 2017), political ecology (Adams & Hutton 2007; Robbins 2012) and the sustainable livelihood approach (Scoones 2000) and adaptive co-management (Plummer et al. 2012; Trimble et al. 2015b).

The framework and related theories described below contextualise the DRC conservation situation (see Section 2.2). I applied these frameworks in my research because they highlight aspects of power dynamics and relationships as well as the rights and responsibilities among stakeholders. Additionally, these frameworks and approaches included temporal dimensions to allow me to capture patterns that reflect historical changes of resource use and management in my analyses (see Chapter 4, also Plummer et al. 2014; Trimble et al. 2015b; Colvin et al. 2016; Larsen & Brockington 2018a). Given the existing linkages among these frameworks, I opted for a holistic approach to understand policy, governance, resource use, conflicts and temporal changes regarding the value of natural resources to local communities (Palomo et al. 2014; Plummer et al. 2014). In Chapter 1, I indicate how each of these frameworks and approaches link to my research objectives.

3.1.1 The Social-Ecological Systems (SES) framework

3.1.1.1 Defining SESs

In Chapter 1, I introduced the idea of protected areas as complex SESs. Here I elaborate on the SES and provide more background on SES thinking. SESs are understood as complex adaptive systems where humans and non-human elements interact in uncertain conditions (Preiser et al. 2018). Cumming et al. (2015) define SESs as systems that include social, economic, and ecological elements as well as the interactions between them. This implies that

SESs include humans and their activities, knowledge and institutions, as well as ecological processes and functions (Halliday & Glaser 2011; Berdej et al. 2015). SESs can change, adapt or disrupt as a response to feedbacks and interactions between subunits (Cumming 2011; Halliday & Glaser 2011; Mcginnis & Ostrom 2014). Therefore, responses to feedbacks should consider and manage interactions between humans and nature, their impacts as well as the political and institutional changes (Halliday & Glaser 2011; Cumming et al. 2015).

To untangle the complexity of the governance of protected areas as SESs, I refer to the governance-focused analytical framework (Figure 3.1) that has been applied to different systems including protected areas (Ostrom 2009; Mcginnis & Ostrom 2014; Palomo et al. 2014). The SES framework was developed to provide an analytical tool that considers SES and their subunits as well as interactions between key elements (Mcginnis & Ostrom 2014).

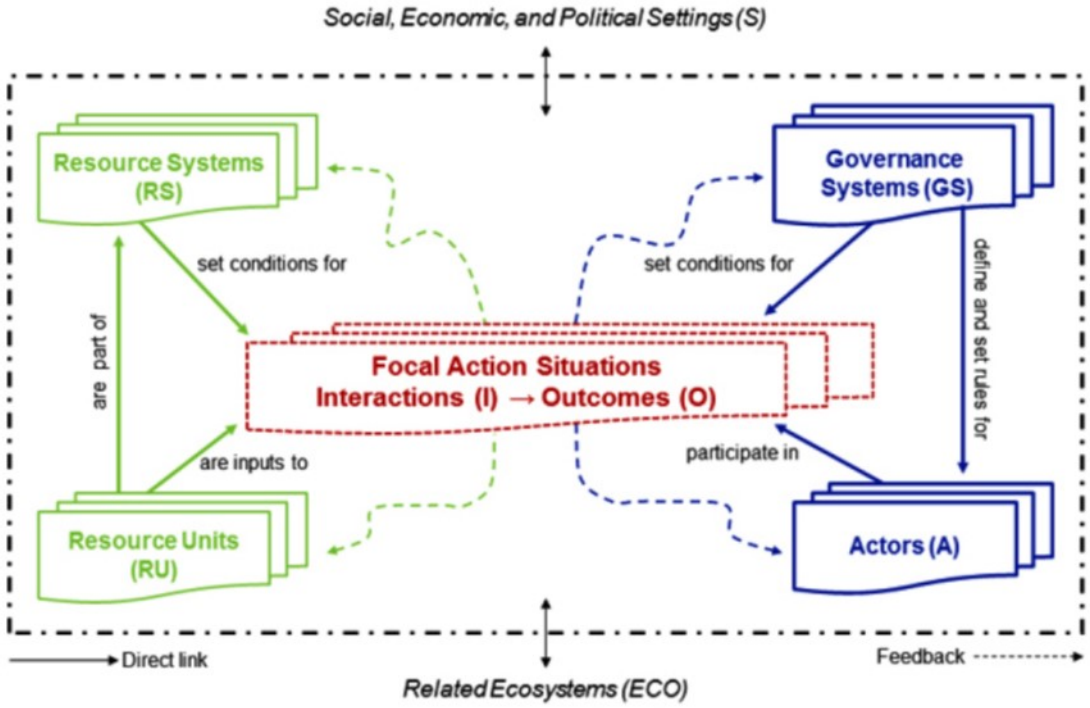

Figure 3.1. The SES framework as developed by Mcginnis & Ostrom (2014) with key elements that considers the interaction between resources systems/resource units/governance systems/actors that are thus influential factors.

For my research, I only considered governance systems and key factors that affected Protected area and how various actors participated, influenced and were involved in protected area management and decision making (see Chapter 7).

3.1.1.2 Protected areas as SESs

Protected areas operate in contextual social, ecological and political settings that include interactions between humans and nature (Palomo et al. 2014; Cumming et al. 2015; Trimble et al. 2015a; Preiser et al. 2018). Thus, protected areas are affected and influenced not only by internal factors but also by exogenous factors such as institutions and actors (see Figure 2.1, also Palomo et al. 2014; Cumming et al. 2015). Indeed, protected areas as institutional and social constructs involve various stakeholders and processes as well as interests across scales (Palomo et al. 2014; Brockington & Wilkie 2015; Cumming et al. 2015). For example, whilst a protected area can be gazetted at local level, its importance may be recognised as important internationally due its biodiversity and ecosystem services (Palomo et al. 2014). Moreover, the management of protected areas supposes the integration of multiple institutions in delivering expected outcomes (social, ecological and institutional) and in maintaining its initial social-ecological values (Palomo et al. 2014; Cumming et al. 2015). Thus, the understanding of the social and ecological factors that influence protected areas requires dynamic approaches that enable stakeholders to respond to interactions and feedbacks (Palomo et al. 2014; Cumming & Allen 2017; Preiser et al. 2018) to ensure resilient SES (Cumming & Allen 2017).

3.1.2 The sustainable livelihood framework (SLF) and ecosystem services

Protected areas are recognised as providing various benefits and services that can positively influence local livelihoods. Thus, understanding the contribution of protected areas to local livelihoods is important. One of the frameworks used by researchers to understand linkages between various elements of livelihood is the sustainable livelihood framework (SLF).

The SLF was developed to assist in the understanding of the capabilities and vulnerabilities of rural households at different scales (Chambers & Conway 1991; Ellis 1998; Scoones 2000; Ellis & Allison 2004). The SLF is a people-centered approach concerned with poverty alleviation. The livelihood has been considered as the analytical unit of the framework (Scoones 2009). Livelihoods comprise assets (natural, physical, human, financial and social capital), activities, rights and access assets that together determine the living assets gained by individual household (Scoones 2000). Livelihoods operate within an institutional frame that governs the access and use of resources for the wellbeing of users. The SLF considers the sustainability of contributing assets (capitals) to maintain resilient livelihoods (Allison & Horemans 2006). The SLF has been applied at different levels (micro, meso and macro)

(Brocklesby & Fisher 2003; Morse et al. 2009), in different contexts (protected areas, natural resources, health) and in various ways (in full or partially) (Ellis & Allison 2004; Allison & Horemans 2006).

I specifically focused on natural and social capital to identify what products and resources extracted from protected areas by communities helped to sustain their livelihood. Along the same thinking, I wanted to understand the role of existing institutions (formal and informal) and access rights to various assets. In addition, I assessed processes and regulations for accessing key resources within protected areas. Therefore, this study did not aim for the monetary evaluation of resources or evaluate the impact of protected areas on poverty. Rather, my research focused more on inequalities between social categories (natives, non-natives, migrants and internally displaced people) in accessing resources such as land and forest products.

Chapters 6 and 7, which are associated with livelihoods, were developed based on the assumption that protected areas provide valuable ecosystem services, benefits and resources that support local livelihoods (Fisher et al. 2012; Chao et al. 2018; Velho et al. 2018). Studies from across the world (e.g., Costa Rica, Ghana, Rwanda) have demonstrated that protected areas can have positive and/or negative impacts on local livelihoods (see Andam et al. 2010; Maekawa et al. 2013; Bennett & Dearden 2014; Brockington & Wilkie 2015). In cases where protected areas negatively affect livelihood alternatives (Karki 2013; Brockington & Wilkie 2015), biodiversity and ecosystems may be more at risk (Joppa et al. 2009; Kujirakwinja et al. 2010b), which in turn can destabilise local livelihood assets (Gardner et al. 2013; Franklin & Pindyck 2018) and hinder the effectiveness of biodiversity conservation (Naughton-Treves et al. 2005; Brockington & Wilkie 2015). Conversely, however, many studies have shown that effective management approaches can enable balanced outcomes: conservation and improved livelihoods (Adams et al. 2010; Brockington & Wilkie 2015). Therefore, the way protected areas are governed and managed plays a key role in shaping both local livelihood outcomes and the resilience of protected areas (Adams et al. 2004, 2010; Palomo et al. 2014; Brockington & Wilkie 2015).

I used elements of the SLF (natural capital, social capital, the role of institutions and outcomes of protected area management strategies) and the ecosystem service framework (see Section 6.3) to understand what benefit and services communities from my research sites are getting from the three landscapes. Additionally, I assessed the status of key products and

resources and identified key resources that might affect communities' wellbeing if the access is not granted in future.

3.1.3 Historical ecology

Historical ecology has been widely used in landscape management to document and understand historical factors that might have influenced ecological changes in a given region (Stein et al. 2007; Crumley 2017). Historical ecology addresses environmental questions through spatial or institutional lenses (Balée 2006; Robin & Carruthers 2011). On the one hand, historical ecology applied to landscape ecology deals with spatial changes and assesses how landscapes have changed overtime (Stein et al. 2010). On the other hand, historical ecology applied to governance and management, assesses changes happening in processes, policies and power relations (Swetnam et al. 1999; Balée & Erickson 2006; Crumley 2017). Both approaches consider variability and temporal dimensions of environmental issues.

Although the term 'historical ecology' arose in the 18th century (Balée 1998; Carruthers 2013), there is no unanimous definition of it nor specific methodological approaches associated with it (Crumley 2017; Szabó 2017). Most definitions include an emphasis on historical interactions between humans and nature, and the investigating of political and cultural factors (Balée & Erickson 2006; Szabó 2017). For my research, I use Balée's (1998) definition of historical ecology as 'a research program concerned with the interactions through time between societies and environments and the consequences of these interactions for understanding the formation of contemporary and protected areas' cultures and landscapes'.

I focused on historical ecology as applied to governance and management (the 'second' approach), and considered historical social-cultural dynamics and political influences as well as their effects on protected areas. This approach helped me to analyse past and current information on protected area management in the DRC to derive key enabling factors for sustainable future trajectories. This approach fits within the ideas of Crumley (2017) who argues that historical ecology can assist in constructing a narrative of landscape evolution as well as transformation in the management of landscapes.

Using a historical ecology lens, I analysed the trajectory of protected area management and governance from past to present. I was particularly concerned with power dynamics; policies;

access rights and attitudes of local communities; and management practices related to ecosystem service use.

3.1.4 Political ecology framing

Political ecology is one of the framings that addresses environmental questions through the understanding of historical, political and social-economic factors that affect people and their landscapes (Walker 1998; Forsyth 2003; Robbins 2003). Most political ecologists are unanimous (Bryant & Biley 1997; Carruthers 2013; Mauch & Robin 2014) about the characteristics of political ecology research. Political ecology focuses on power dynamics and political relationships (Robbins 2012). Political ecology analysis should be historically situated, place-based and include multiple scales (Robbins 2012).

The application of political ecology and historical ecology in my research responded to the need to contextualise protected area management in the DRC and power dynamics from the past to the present in an attempt to identify opportunity windows for better practices. Moreover, I intended to discover possible power struggles and discriminatory access rights to resources among diverse social categories (see Section 3.2.1.1) at my research sites. A political ecology lens enabled me to consider interactions between various spatial and institutional levels as well as their impacts on SESs (Robbins 2003; Petty et al. 2015).

I referred to the political lens to analyse power and the involvement of various stakeholders in protected area management. One of the main questions that political ecology addresses in protected areas is about asymmetric power amongst multilevel power-holders and rights to resources (see Vaccaro et al. 2013). Political ecologists who have researched conservation revealed the unequal power relations between state agents and non-state actors regarding decision-making and access rights (Bryant 1997; Vaccaro et al. 2013; Newman et al. 2017).

The exercising of power and relationships have been identified as one of enablers or barriers for effective protected area governance and management (Tanner 2003; Borrini-Feyerabend & Rosemary 2015). The way the power is exercised by *power-holders and right-holders* can impact positively (solving and preventing) or negatively (exacerbating) on conflicts over natural resources (Borrini-Feyerabend et al. 2004; Nuijten 2005). Both power and conflicts are considered by political ecologists (Bryant & Biley 1997; Andrade & Rhodes 2012) as social constructs that can influence changes, transform approaches and drive adaptation towards a desired situation (Schröter et al. 2014). Redpath et al. (2017) and Baynham-Herd et

al. (2018) have reported that conservation conflicts are sometimes related to identity, recognition and individual status with a major influence on the behavior of local communities. For example, Vaccaro and others (2013) demonstrated that protected areas have multiple interested parties with different visions and interests with regard to protected areas as SES. Their research argued that mandated agencies are legally concerned about regulations and defined missions for protected areas, and tourist and conservation NGOs are concerned about the preservation of biodiversity and the beauty of the area. However, communities who are considered as the 'owners' of the space are concerned about provisioning services and benefits, although they have limited or elusive power to influence protected areas.

In the DRC context, most protected areas are state-managed, although there have been some adaptations of different approaches (see Chapter 4). The latter have been characterised by the limited inclusion of local communities and non-conservation stakeholders (Kujirakwinja et al. 2010b; Verweijen & Marijnen 2016). Interactions among power-holders themselves, on the one hand, and power-holders and right-holders, on the other hand, have had positive and negative feedbacks such as cooperation and conflicts (see Table 8.1, also Kujirakwinja et al. 2010; Verweijen & Marijnen 2016; Marijnen 2017). Thus, reconstructing social-political conditions, where power is redistributed among actors in protected areas in the DRC and where historically denied access rights are restored to conserve critical protected areas, will be part of the outcomes of my research.

3.1.5 Adaptive Co-management (ACM)

The failure of traditional conservation and natural resource management approaches (fines and fences, top down) combined with the emergence of national and international issues (human rights, decentralisation) have demanded the need for alternative resource management approaches and governance regimes (Armitage et al. 2009; Trimble et al. 2015b). These alternative approaches consider power sharing; the legitimacy of actors and structures, and the representation of non-state partners and actors in decision-making and the implementation of activities (Armitage et al. 2009; Palomo et al. 2014; Cumming & Allen 2017; Ward et al. 2018). Most of these alternative approaches proposed by scholars and practitioners are based on collaboration, responsibility, power sharing, and empowerment (Berkes 2007; Kothari 2008).

ACM is one of the predominant approaches that have attracted researchers and practitioners worldwide (Plummer et al. 2012, 2017b; Trimble et al. 2015b). ACM combines principles

emanating from adaptive management (participatory planning, performance, uncertainties) and co-management (legitimacy, representation, power sharing) (Bown et al. 2013b). ACM includes learning processes and multileveled partnerships (Armitage et al. 2007; Bown et al. 2013b; Plummer et al. 2013; Hasselman 2017). Furthermore, ACM emphasises problem solving, devolution of power and empowerment of local stakeholders (Folke et al. 2005; Berkes 2007; Trimble & Berkes 2015). Therefore, ACM promotes cooperation among stakeholders and includes multi-scalar structures to maintain SESs (Armitage et al. 2009; Plummer et al. 2013).

To be operationalised, ACM implies institutional arrangements that consider diverse interests (Plummer et al. 2014). Therefore, local arrangements and structures together with legal provisions are needed for managing resources (Armitage & Armitage 2008; Khan 2013; Thondhlana et al. 2015). Key elements for a successful ACM include management that is flexible and responsive to changes, a holistic focus on social-ecological interactions, diversity of perspectives, reflection in decision making and innovation in problem solving (Armitage et al. 2007, 2009; Chapin et al. 2010).

In this study, I used the ACM evaluation framework (see Plummer & Armitage 2007; Plummer et al. 2014; Trimble et al. 2015a) to assess conservation management processes and governance regimes in the DRC and to identify key factors to be considered for future practices. I included the following elements, as defined by the literature (Armitage et al. 2009; Bown et al. 2013b; Trimble et al. 2015a): mechanisms and processes of decision making; collaboration between protected area managers and other stakeholders; resources from protected areas that sustain livelihood; and community perceptions towards protected area management (Plummer et al. 2013). Therefore, I applied the ACM framing to evaluate the roles and responsibilities of stakeholders and assess the rights and policies that could hinder or promote effective co-management practices in a changing context like that of the DRC.

Cultural institutions and context can block or enable ACM processes (Sacco et al. 2009; Hoogstra-Klein et al. 2012) because they are associated with spiritual values, identity and sense of place for communities surrounding protected areas (Infield & Namara 2001). Conservation conflicts between communities and conservation actors are often associated with local culture (Peterson et al. 2010), and the inclusion or exclusion of traditional and spiritual beliefs in protected areas management influences community support and promotes

adaptive co-management practices (Byers et al. 2001; Thondhlana et al. 2015). Thus, I included cultural values and attributes in my analysis.

ACM as an approach includes both cultural values and access rights to be integrated in the decision-making processes (Bown et al. 2013b). Infield (2001) argues that successful ACM in protected areas should consider how access to resources relates to local culture and how laws and regulations are encoded in the local culture. Furthermore, culture is one of the livelihood assets to be privileged in ACM practices as a source of learning from traditional knowledge (Plummer & Armitage 2007; Dudley et al. 2009). To ensure that community needs were included in the research, I used the self-determination theory (SDT) to understand key motivational factors that might or might not favour local support of ACM arrangements (see Section 7.1.2).

3.2 Methodology and methods

3.2.1 Mixed method approach: the overview

Research in conservation science and SESs revokes rigid methodological approaches because rigid approaches cannot capture the complexities of linked human and environmental systems (Creswell 2003; Newing et al. 2011; Landström 2017). Mixed methods provide a flexible approach to overcome disciplinary shortfalls and maximise contributions from various methods (quantitative and qualitative) to unfold complex issues related to research fields, such as power relations, livelihoods and biodiversity management (Cumming et al. 2006; Mcginnis & Ostrom 2014; Palomo et al. 2014). For example, some scholars (e.g., Cavendish & Campbell 2005; Angelsen et al. 2014; Dokken & Angelsen 2015) argue that, although quantitative approaches have been widely used to assess livelihoods, the quantitative approach can miss out contextual variables (e.g., governance) which can be captured by qualitative approaches (Angelsen et al. 2011; Sahu 2013; Neuman 2014).

Therefore, by using a mixed method approach I benefited from the strength of both approaches. A mixed method approach includes objectivity (impartial analysis) and the translation of qualitative information into quantitative data (Campbell & Luckert 2002; Creswell 2003; Newing et al. 2011). The integration of quantitative and qualitative data is critical as qualitative results can contradict or complement quantitative results and vice-versa (Meissner et al. 2010). Indeed, the combination of quantitative and qualitative results increases the validity of findings (Meissner et al. 2010; Newing et al. 2011). One of the final

products from mixed-method is triangulation in the interpretation and discussion steps of the research (Creswell 2003; Newing et al. 2011). Furthermore, mixed methods have been recommended to ensure a better understanding of the underlying parameters and causal relationships of socially related issues (Neuman 2014).

My choice for the mixed method approach was motivated by the a need for flexibility in accommodating more than one theoretical framework and approach (see Section 3.1) but also given that I considered using different disciplines (Hadorn et al. 2008; Meissner et al. 2010). Given the complexity of my topic, I initially thought to consider the ACM evaluation framework as my primary analytical framework. However, based on the contextual situation in my research sites, I realized that I needed more than one framework. Therefore, I used specific analytical features (components) from other theoretical frameworks and approaches to interpret my findings.

The qualitative approach for this research included focus groups, key informant interviews and an analysis of archived documents such as law, management plans, previous research on the use of resources and people's attitudes. The quantitative approach included numeric information collected through household surveys (Campbell & Luckert 2002; Newing et al. 2011).

3.2.1.1 Household surveys

Quantitative data were derived from household surveys conducted in all three of my three study sites. In total, 615 households were interviewed in villages around and/or within the boundaries of each protected area.

a. Sample selection

Using the ArcGIS 10.3.1 software, I considered villages located within each protected area boundaries. Using shapefiles for each protected area, I also considered villages located within five kilometers outside of the boundaries of each protected area. The existing final maps of each protected areas were obtained from the Wildlife Conservation Society (WCS) and used as base maps for the selection of villages.

In total, 617 respondents were consulted. With regard to Itombwe and Okapi, about 200 households were selected for each site. The sample was stratified by chieftaincies[1] since both

[1] The kingship is the middle administrative strata in DRC whereby power is inherited based on traditional rules and practices. They are called *chefferie* (inheritance) or *secteur* (the chief is nominated by the government)

reserves overlap more than one chieftaincy. The number of interviewees was based on the proportion (percentage) of the area included in each protected areas as well as the demographic information. For example, one of the five chieftaincies of Okapi had about 30% of 200 households because 30% of its land was included in the boundaries of Okapi. Given that each chieftaincy had several villages, I divided the number of households by villages based on their demographic weight (Appendix 1).

However, in the case of Kabobo, which has only one kingship/chieftaincy, I considered the eastern and western boundaries of the reserve where human settlements are established (see Figure 2.2). The western boundary of the reserve is the national road 5 (NR5) and the eastern boundaries are the shores of Lake Tanganyika (Figure 2.2). The proposed sample size (200 households) was divided by the number of villages within the Kabobo boundaries based on demographic information from the Tumbwe Chieftaincy and access to villages (road and lake). Using this demographic information, I randomly selected 150 households along the road and 50 households along the Lake Tanganyika.

b. Survey design

The questionnaire was designed in English and translated to French and Swahili to simplify data collection on the ground and avoid any misinterpretation on the part of field assistants (Douglas & Craig 2006). I personally did the translations given that French is my first language and Swahili, which is my 'native' language, is one of the four national languages. In addition, before deploying field assistants on the ground, they assisted me to make any changes in language and meanings required to make the questionnaire more appropriate to the different regions. This process was done to address the context specific language interpretation (Douglas & Craig 2006).

The questionnaire (Appendix 1) had six sections based on my research aim and questions. The sections of the questionnaire included (1) general information related socio-demographic data; (2) livelihood and household assets; (3) forest revenue and land tenure; (4) the governance of natural resources; (5) the gazettement process and management practices of protected areas; and finally (6) the factors driving changes in the landscapes which included migration, mining and conflicts.

The design of the questionnaire included Likert-scaled questions (agree, disagree, not sure), close-ended questions, and open-ended questions. I decided to use a three point scale, rather than the typical five point scale, to increase reliability and accuracy of responses. It is argued

that the three point scale reduces confusion amongst respondents without affecting the results of the research (see Cummins et al. 2000, Croasmun & Ostrom 2011).To enable a quantitative analysis of open-ended questions, the responses collected from the open-ended questions were coded according to key emerging themes. The details from the open-ended questions were used to explain the results in terms of social categories (see section below).

(i) Social categories in the three protected areas

Rabbie & Horwitz (1988) define social categories as a collection of individuals who share at least one attribute in common. Categories can therefore be associated with gender, age or based on the traditional ranking associated with ethnic groups and the history of each landscape (Barkan 2016). I wanted to understand if the social settings in these areas influenced conservation practices and resource access rights. Therefore, some analyses are based on social categories whilst others are analysed according to protected areas or stakeholders. The communities in my research sites were divided into four social categories that included natives, non-natives, migrants and internally displaced people (IDP) with different rights and traditions.

Natives were identified as community members whose ancestors had been in the areas for a long time and were recognised as being indigenous to the region. They were usually related to the governing family either as members of the extended family or the related clan. Pygmies were recognised as native communities, although they have their particular living style and social-economic settings (Bahuchet 1991).

Non-natives included people whose ancestors settled in the area a long time ago but were identified as people who came into the area from neighboring regions and were recognised by the traditional chiefs belonging to the communities. Historically, they may have arrived during the colonial era.

Migrants were identified as people who came in “recently” (mostly after the gazettement of the area) from other regions and whose ancestral roots cannot be traced in the area. They were part of the social setting as they had acquired some assets (e.g., land) in the respective landscapes.

Displaced peoples were households that had settled in the area temporarily for security reasons. They might have settled in the area in recent months or years.

(ii) Access to resources

Access to natural resources is defined as the recognised rights to use natural resources through local (traditional) agreements or legally recognised regulations enforced by recognised duty bearers/power-holders (Campese et al. 2009; Desmet 2016). Based on local traditional systems, indigenous people[1] (natives) were recognised as right-holders and their leaders as power-holders. The transfer of rights may or may not be exercised by power-holders. However, they might be informed or involved in transactions (see Chapter 6). I assessed access modes to ecosystem benefits (places and resources), especially those concerning land, forest, forest products, hunting and settlement. Choices of these resources were guided by local uses and related governance practices that are critical for protected area management and governance.

There were four different access modes, which are still implemented in the three protected areas (see Section 6.5.3). The first mode is the tribute (royalty) which is defined as a symbolic gift/payment made to the chief or the right-holder of a given resource that granted the user rights (Hackenberg 2009). The tribute to be paid depends on the size of the resource (land) to access or quantity of resources harvested from the forest. According to local culture, the tribute was paid in kind (cow, goat, chicken or equivalent in money) but the system had changed from the past. For example, mining, farming and timber entitlements were paid in kind based on agreed quotas. Access to land was one off, although the acquirer should pay regular tributes after harvesting.

The second mode of accessing resources was free although users had to bring the chief part of the yield, as a sort of tribute. The latter is referred to in different local languages such as *tozo* (Kabobo). Users accessed resources without any payment, though they had to give something to either the chief or the right-holder. This payment was meant to support the governing system with part of their yields on an opportunistic basis.

The third access mode was though yield/harvest sharing. Sharing yield is one of the conditions for accessing resources for the incoming people (see Chapter 6). Beneficiaries have to share whatever harvest they make from the accessed resource. This is similar to a token, but is considered as payment for renting the land.

[1] The use of indigenous people (IP) in this thesis is different from the current understanding of IP as a marginalised group defined as first occupants of a region. For example, for the central African region, the IP group or native is not associated with pygmies.

The last access mode was the purchase of the resource or access either financially or in kind. This mode is one of the current practices whereby land and parts of forests are sold to locals or incoming people by both right-holders and power-holders.

c. Data collection

Data collection was conducted by six field assistants who were trained and were involved in previous surveys in my research sites (Plumptre et al. 2009; Spira et al. 2017). Their training included methodological approaches and the understanding of the questionnaire. The field assistants had good knowledge of the region and could also speak other local languages in the respective regions.

I had to hire field assistants due to security constraints because in some of the areas of the three protected areas, non-local researchers might be targeted by bandits which is not the case for local people. The other reason was to avoid the conflict of interest that could bias the results of my research, given that I have been involved in conservation interventions in the DRC for the last fifteen years, especially in Itombwe and Kabobo.

To ensure that the information collected did reflect the local realities of households, only heads of households (husband or spouse) were interviewed. I selected heads of households to interview because they decide on the allocation of resources in their families (Posel 2001). In addition, heads of households might sit in meetings as representatives of households based on local culture. Although, some researchers associate decision-making to be associated with high income and more wealthy households, this was not the case in my study areas (Hoddinott & Haddad 1995; Posel 2001).

d. Data analysis

The responses were tallied and converted to proportions (percentages) for different variables. For key variables, comparisons were made between protected areas and/or based on the four social categories: natives, migrants, non-natives and IDPs (see above). I did not use statistical tests given the orientation of my study which aimed at identifying better ways of governing protected areas basis on current practices. I agree with some researchers who suggest that statistical tests do not inform on causal effects of a research and tests are not considered as a scientific validation of results (Ho et al. 2019; Parsons et al. 2019). For livelihoods activities and income, annual revenues were summed up based on the estimated quantity harvested by

household, local price indicated by the interviewee and earnings from labour or other jobs where applicable.

3.2.1.2 Focus group discussions

The focus group technique is a way of collecting qualitative data. The technique involves a small number of people in an informal group discussion (or discussions) 'focused' on a particular topic or set of issues (Kreuger et al. 2002; Newing et al. 2011). Focus group techniques have been used in diverse disciplines dealing with qualitative data, especially in the social sciences (Creswell 2003). It is recommended specifically for studies dealing with rights, attitudes and perceptions because it gives the researcher an opportunity to collect information from multiple individuals at once (Newing et al. 2011; Masadeh 2012). It has been widely used as a participatory technique for issues related to natural resource use and stakeholder analysis (Onwuegbuzie et al. 2009; Newing et al. 2011; Masadeh 2012).

I conducted 12 focus groups in the three research sites to inform my understanding of the perception of local communities and other actors about protected area management and resource governance. Four focus group discussions were held in each protected area with communities to expand on the key themes (see Appendix 2) related to the history of the protected area, governance and resource access rights as well as local perceptions of protected area management.

For each focus group, preparatory meetings were organised with traditional chiefs a day before focus group discussions. All social categories were represented in the focus groups in the Okapi and Kabobo with no distinction on gender or social categories. However, for Okapi I held meetings with pygmies men and women separately. The aim of these meetings was to select participants and to agree on the time to hold meetings. The participants represented existing social categories (see Section 3.2.1.1) and professional groups in the area. Focus group discussions were attended by 12 to 20 people per session. Ideally, I aimed for 12 participants but the communities in some villages were eager to be involved in the discussions.

Focus group discussions were held either in the mornings or afternoons depending on the availability of the participants but also depending on people' social behavior. For example,

meetings with Pygmies[1] in Okapi were held in the mornings. The main reason was that most of the Pygmies were available in the mornings before they went off for other business (e.g., socialization, hunting and prospecting sites where they could collect honey) in the afternoons. In Itombwe, meetings were held in mornings because security was volatile in the area. Most people did not spend the nights in their homes and might have started moving out of their villages in the afternoons.

The facilitation team was comprised of two field assistants in Itombwe. For Kabobo and Okapi, there were four people facilitating meetings. I was personally involved in focus groups in Kabobo and Okapi. I did not attend the focus group discussions in Itombwe for security reasons. Discussions were led by field assistants while, I as the main researcher, took notes and supported the facilitation teams if needed. Apart from the facilitation teams, conservation staff working with the communities attended the discussions in Kabobo and Okapi.

The information collected from the focus groups was included in the results as narratives supporting the quantitative information. More details were collected from the focus groups (Kabobo and Itombwe) where I was involved, compared to Itombwe where I did not participate.

3.2.1.3 Approach to the document review

One of the weaknesses of conservation practices and research, especially in the DRC, is that most conservation studies and interventions fail to consider historical elements to spot temporal changes happening in local SESs. For my research, historical information related to each protected area was collated to produce a comprehensive timeline and understanding of historical management practices (see Chapter 4). The review aligned with the theoretical frameworks (see Section 3.1) and helped me to derive key factors to be considered for future management practices and governance processes in the DRC (see Table 8.1).

The historical information was collected from past and current literature on political history, conservation and the political ecology of protected areas in the DRC (Davis 2009; Mathevet et al. 2015). The review focused on temporal changes related to power relations, policies, access rights, the attitudes of local communities and management practices with regard to natural resources. Moreover, my research assessed concisely how natural resources were used

[1] The use of the term 'pygmies' is not related to the discriminatory considerations in the Central African context (Lewis 2002). Pygmies in this thesis are one of the social groups/people of DRC

and managed, and who were involved in decision-making for their use and access (see Chapter 7).

The review approach included five steps as defined by de Vos et al. (2005, p.126) for literature review studies. These include: (1) defining the limits of the research; (2) selecting primary sources of information (books); (3) searching for appropriate journal articles; (4) locating professional reports and monographs; and finally, (5) mapping the collected information to write up the review. Accessed documents covered the period from the late 1880s (e.g., Stanley 1886; Calmeyn 1912) to recent documents (e.g., Nzongola 2002; Van Schuylenbergh 2009; Pouillard 2016; Scholte et al. 2018).

Historical information was gathered from books, articles and field reports related to conservation and the politics of the DRC (Balée 2006; Kwashirai 2013). Non-digital materials were accessed from the Rhodes University library or acquired from bookshops.

The selection of books, articles and reports were based on their contents after reading through their abstracts and tables of contents. Chapters related to historical resource use, governance and protected area management were read, and important information was summarised. The same process was applied to reports and working papers. For field reports and books that were not available on line, electronic copies were requested from their authors or institutions. Literature accessed included writings in both English and French languages.

Using Google Scholar as a search engine and Web of Science websites, I combined different keywords and topics to find relevant documents. Key words included ‘historical conservation management and governance practices in DRC’, ‘precolonial conservation’, ‘Belgian Congo conservation’, ‘traditional management of natural resources’, ‘pre-historical conservation in DRC’, ‘governance of protected areas in DRC’. Digital documents were accessed from the internet (e.g., www.gallica.bnf.fr which has most of the historical published materials on the DRC) and others documents were collected from authors if they were not accessible from the Internet.

3.2.1.4 Personal observations and key informants

Participant/personal observation is an ethnographic and psychological method that can give a contextual picture of the situation (Kothari 2004; Kawulich 2005). Being a conservationist in the DRC for the last fifteen years, I was involved in or leading and implementing some of the field activities related to the gazettement of Itombwe and Kabobo (Kujirakwinja et al. 2010b,

2018; Crawford & Kujirakwinja 2016). This helped me to get a clear picture of the process and understand most the responses to my questionnaire. Additionally, I have been attending or facilitating other meetings (management or political) related to protected area management in the DRC[1]. In the course of my research, I attended three workshops during the time of my research (2015-2018). The first meeting was the annual wardens' meeting in DRC where 13 wardens attended. Another meeting was on the integrated management of Okapi and peace building around Okapi. The meeting was attended by conservation and humanitarian NGOs, civil society groups and public services in line with UNESCO's support for peace building and WHSs. For the latter, natural resource conflict resolution and management were the central themes. Therefore, critical information in this thesis reflects these on-the ground observations.

I interacted with twelve key informants who included protected area managers and representatives from conservation NGOs. Individual discussions were conducted for each landscape focusing on collaboration between protected area managers and communities. Key informants included conservation actors and elders (Itombwe and Okapi), whilst in Kabobo, interviews were conducted with traditional chiefs, as the wildlife agency was not yet in place. As for the focus groups, the results from these interviews will be reported to support the quantitative results and recommendations.

3.3 Limitations of methods

Despite various advantages of mixed research approaches in the study of complex situations, some challenges/limitations related to my research can be highlighted.

3.3.1 Household surveys

Not only are interviews using questionnaires limited in their ability to reach all the interviewees but it is also possible that interviewees do not answer all the questions (Cox 2015). For my research, some questionnaires were half filled in because of people dropping out of the interview session. One of the reasons for this was that respondents had a low level of education and could not respond to all questions. For some questionnaires, respondents might have been giving responses as per the current situation rather than broader or historical information. In addition, the insecurity in the area prevented field assistants from having

[1] The DRC protected area authority organizes twice a year technical meeting attended by most of the wardens across the country as well as representatives from International NGOs and donors supporting ptotected areas

enough information. For example, during the fieldwork in Itombwe, the presence of individuals belonging to specific armed groups interrupted the session, as they did not want individuals reporting on issues in the area. This affected the numbers of respondents in Itombwe. Finally, interpretive issues may arise during data analysis as the landscapes may have specific contexts.

3.3.1.1 Security constraints

The DRC has experienced a long and devastating armed conflict that has affected the free movement of people. The eastern DRC is the most affected area where more than 100 armed groups were identified in 2017 (Spira et al. 2017). Thus, the situation in Itombwe and Okapi affected my research, as I could not access some areas myself and the data had to be collected by my field researchers.

3.3.1.2 Law enforcement operations

Okapi was the only one amongst my research sites where regular and targeted law enforcement was conducted, which might have affected people' answers. I conducted my research after an intensive law enforcement operation targeting mining. Therefore, some of the responses from communities may have been influenced by positive and negative outcomes from these operations.

3.3.1.3 Focus group discussions

Most of focus groups conducted were attended by members of communities from different tribes and with different level of education. Therefore, for some meetings, there were some powerful people who did not allow all participants to express their views (Bloor et al. 2001). For example, in one of the villages in Kabobo (Kisondja), while there were about 12 women, only six were publicly involve in discussions, whereas others could agree with what has been said (either vocally or by shaking their heads).

Chapter 4. The Evolution of conservation in the Democratic Republic of Congo: from the precolonial era to the present

4.1 Introduction

Historical overviews are of prime importance for conservation and environmental researchers in understanding contemporary temporal environmental and institutional changes as well as the driving factors of changes (Duncan et al. 2010; Mathevet et al. 2015). Additionally, an understanding of the history of conservation in any region can help to contextualise conservation interventions, drive adaptations to current actions and transform governance and management strategies (Beinart 2000; Myllyntaus & Saikku 2001; Balée & Erickson 2006). Moreover, a historical view can help to explain how conservation practices have emerged over time from one society to another, and how ecosystems have changed (see Section 2.3, also Carruthers 2004; Duncan et al. 2010; Mathevet et al. 2015).

Political changes and recurrent financial crises in the DRC have had positive and negative impacts on protected areas as local social-ecological systems (see Section 3.1.1, also Myllyntaus & Saikku 2001; Davis 2009). Positive impacts were characterised by adequate financial and political inputs, the improvement of conservation practices and governance regimes (d'Huart 2001; Cuvelier et al. 2013; D'Huart & Verschuren 2014). On the other hand, negative impacts included the depletion of species and the degradation of local ecosystems and social structures. In addition, these changes resulted in power struggles between the protected areas' key players (users and managers), discriminatory rights and changes on how local stakeholders value resources (Cioc 2009; Pelissier et al. 2015; Wigley 2015).

As in many countries, especially in the global south (Beinart 2000; Murombedzi 2003; Robin & Carruthers 2011), the history of conservation in the DRC[1] can be divided into three periods: precolonial, colonial and postcolonial (Cioc 2009; Inogwabini 2014; Pouillard 2016). These historical periods were characterised by different natural resource management approaches and governance regimes (Inogwabini 2014). In this chapter, I describe the history of protected area management in the DRC from the pre-colonial to the contemporary period.

The purpose of this chapter is to describe and discuss how conservation approaches and practices have evolved throughout history. Moreover, it identifies key historical factors that

[1] In this research study, I will use the term 'DRC' throughout when reflecting on the country, regardless of the period. The name kept on changing throughout the history.

have influenced conservation practices and approaches and that could enable adaptive co-management (ACM) practices in the DRC.

4.2 The conservation history of the DRC: from traditional to contemporary protected area management

4.2.1 Pre-colonial conservation (before the 1880s)

4.2.1.1 Traditional systems and natural resources

Writings on the DRC's history report the presence of hominids in most forests during the Pleistocene period (Peterson 1990; Mercader & Brooks 2001; Nzongola 2002). However, limited information exists about who were the first occupants of the DRC's forested areas (Bahuchet 1993; Bellier 2012). While some scholars and practitioners claim that the Pygmies[1] were the first occupants (Turnbull & Chapman 1948; Lewis 2000), others contest and think that most regions had heterogeneous populations made up by the Bantu and Batwa[2] (Malengreau 1947; Hart & Hart 1986; Bahuchet 1993; Lewis 2002).

As for other African societies, this period included heterogeneous populations who lived in harmony with nature and valued biodiversity and ecosystems as a representation of their social-cultural values and beliefs (Cioc 2009; Hambler & Canney 2013; Chan et al. 2016). During this time, these authors claim that natural resources were governed by locally established structures (for example, kingdoms and clans), laws, and regulations based on traditional rules, norms and values (Sohier 1940; Verschuren 1956; Cornevin 1966; Hart 1978; Mercader 1995; Rodary et al. 2003).

During the pre-colonial period, decision-making processes were encoded in the local culture and regulations/laws were enforced by a designated local group from the communities (Ballard 2006). Indeed, society was organised in a way that different social groups played different roles to maintain traditional systems. For example, Pygmies in the eastern DRC played a major role in the traditional system in protecting the king's chieftaincy and enforce local regulations (Lewis 2000; Ballard 2006).

[1] This study does not cover the controversial population history in DRC as far as Pygmies, Bantu, and Banyamulenge are concerned. Pygmies are referred to as Batwa or Mbuti depending on regions (Bahuchet 1991; Lewis 2000).

[2] Batwa are referred to as indigenous people by various researchers and human rights practitioners. Batwa are referred to in my thesis as Pygmies recognised as a specific ethnic group

Indeed, the persistence and functioning of traditional systems were maintained by local communities through a collection of tributes from resources users at different levels (Lewis 2001; Rodary et al. 2003; Malhi et al. 2013; Fa et al. 2016). Power levels included family, clans, villages, and chieftaincies (Nzongola 2002). Local rights to natural resources were recognised across these social levels and based on available resources and resource users (Vlassenroot & Huggins 2005). Although no systematic resource assessment research was carried out, communities and their leaders established extraction limits for key resources and ecosystems (Sohier 1940; Vlassenroot 2013). Local resources were used for subsistence (e.g., food, construction materials, and medicinal plants), and some were used for barter and trading purposes (see Section 6.4.1.4, and also Dorsinfang-Smets 1970; Wilkie et al. 2000; Malhi et al. 2013).

During this period, it is thought that few negative pressures were exerted on natural resources (Rodary et al. 2003). Some scholars have reported low human density and better resource management practices encoded in traditional institutions (Verschuren 1956). Furthermore, limited access to technology and isolation from commodity markets also played a key role in natural resource availability (Verschuren 1956; Prévot 1961; Rodary et al. 2003; Cioc 2009). However, not all authors agree with the view that traditional societies in the DRC exerted no negative impacts on natural resources given that their lives were associated with hunting and gathering (Adams & Mulligan 2003; Renton et al. 2007). Borgerhoff & Coppolillo (2005), and Kwashirai (2003) for example, acknowledges that wildlife and their products were often used for ritual ceremonies (see Section 6.5.2), and that immigrants moving into the area (Peterson 1990; Kwashirai 2013) also increased pressure on biodiversity (Nzongola 2002; Cioc 2009). I argue that no matter the level of impact, through some studies in other areas and modelling, there have been negative impacts on biodiversity throughout human existence. Indeed, recent research has shown that current wildlife decline and deforestation might be due to the continuous unsustainable use of resources from the precolonial times (Kwashirai 2013).

Migration pull factors included fertile forests and the presence of large populations of wildlife for meat in new areas (Peterson 1990). Push factors were essentially environmental changes, conflicts, climate, and catastrophes from the regions of origin of the migrants (Vanthemsche 2012; Hewlett 2014). Human migration has been a shaping factor for different regions in the DRC for a long time, including my research area (Kidd 2009; Hewlett 2014;

McLeman et al. 2016). For example, archeological research conducted in the Ituri forest reported the migration of Bantu and Pygmies from neighboring forests and villages searching for a better life (Peterson 1990; Mercader 1995; Mercader & Brooks 2001). Similarly, Weyn (2010) reports on how the Kabobo region was populated by people coming from the southern regions of the reserve (Baluba) and the northern contiguous territories (Babembe).

4.2.1.2 The commercial value of natural resources during the precolonial period

The exchange of resources (bartering) within and around villages was reported not to have had much of an impact on resources until the arrival of external actors , essentially Arabs and Portuguese (Nzongola 2002; Heywood 2009; Vanthemsche 2012). The European contact was through the exploration of the Kongo kingdom[1] by Diego Cao (1483) with the expansion of Christianity (Thornton 1981). Moreover, this initiated cooperation between the Portuguese king and the Kongo king which facilitated the incursion of Portuguese in the western side of the DRC and trade, including slavery (Thornton 1981; Heywood 2009). The Portuguese were also motivated by political aspects[2] as they sent soldiers to support the Kongo king when his kingdom had to deal with internal war, which was a violent war within the Kongo kingdoms (Thornton 1981).

In the eastern regions of DRC, intensification of trade was operated by Arabs from east Africa, especially from Ujiji in Tanzania (Thornton 1981). Brown (1971) reports how the incoming of foreigner traders (Muslims) changed the economic life of people around Tanganyika by abandoning barter and adopted a monetary system. The 'commercial' transactions during this period targeted ivory, palm oil, wax in exchange for manufactured products, firearms, and slave trade (de Saeger 1959; Prévot 1961; Cornevin 1966; Brown 1971; Nzongola 2002). The commercial transactions included also some local products based on locations and tribes (Brown 1971, p. 620). The arrival of Arabs also led to the expansion of Muslim practices as well as the commercial transactions in the region (Brown 1971; Croucher & Wynne-jones 2006).

The advent of Arabs and European traders (i.e. Portuguese and Dutch) affected how resources were valued by users and managed at local level (Cornevin 1966; Nzongola 2002;

[1] The boundaries of the Kongo kingdom are different from current boundaries of the DRC. It was located in the western DRC and included part of Angola. Meanwhile, the Kongo kingdom was the largest kingdom established on the current DRC territory (Thornton 1981; Heywood 2009; Omasombo 2014).
[2] The political conflicts are not covered or detailed in this research nor the slavery issue

Adams & Mulligan 2003; Jones 2006; Cioc 2009) as well as leading to their degradation (Dorsinfang-Smets 1970; Beinart 2000; Vanthemsche 2012).

In addition to ecological impacts, the arrival of traders increased local conflicts within and between kingdoms over the control of resources and power (Brown 1971; Thornton 1981; Nzongola 2002). The arrival of traders, especially the slavery trade, affected local culture and traditions because the practices of traders did not comply with local culture and traditional beliefs (Cornevin 1966; Heywood 2009).

4.2.2 Colonial conservation (1880-1960)

The colonial history of the DRC is divided into two periods. The first period was the Leopoldian Kingdom referred to as the Congo Free State (CFS). The era of King Leopold II is a key reference point not only in the history and the development of the DRC, but also in its resource degradation (Stanley 1886; Cornevin 1966; Nzongola 2002; Cioc 2009; Murray 2016). The second period is the Belgian Congo (BC) when the country was a colony governed by the Belgian government (Nzongola 2002; Van Schuylenbergh 2009; Vanthemsche 2012).

4.2.2.1 Conservation under King Leopold II: Congo Free State (1880 – 1908)

The colonial period of the DRC is related to the occupation of the 'country' by King Leopold II. The King influenced the future of the DRC not only through acts of terror, savagery and social injustices (Nzongola 2002; Weisbord 2003; Hochschild 2006; Roes 2010) but also through his capitalistic approach. Some scholars recognise that his approach contributed to the development of infrastructure and social services that were associated with resource extraction (Nzongola 2002; Weisbord 2003).

Through his smart 'humanitarian and scientific motivations' of developing the DRC, Leopold targeted natural resource extraction (Nzongola 2002; Weisbord 2003; Cioc 2009; Vanthemsche 2012). Leopold's unrevealed goals were to explore opportunities for the exploitation of highly-priced natural resources and the establishment of his private business empire (de Saeger 1959; Cioc 2009; Vanthemsche 2012). For example, scientific explorations were used to identify key areas with resource extraction potential rather than collecting scientific information (Young 1994; Nzongola 2002; Cioc 2009). These explorations were largely conducted under the leadership of, and funding from, the international Africa association (IAA). Although these explorations were in fact for economic

purposes, they did contribute to scientific knowledge about the DRC's biodiversity through the establishment of numerous research stations (Stanley 1886; de Saeger 1959).

To ensure the direct management of his 'property', Leopold established his administration of the Free State of Congo (FSC) in 1885. The established administration became the foundation for setting up the colonial administration (Prévot 1961; Nzongola 2002; De Clerck 2006; Leduc-Grimaldi 2016; Murray 2016). The main resources that were exploited included red rubber, minerals, forests, wildlife, and agricultural land (Nzongola 2002; Kabemba 2011).

Conservation management interventions during this era included restrictions of access rights for natives while rights and privileges were granted to western citizens. These privileges included hunting for ivory, tourism, large mining and forest concessions (Stanley 1886; de Saeger 1959; Harroy 1993; Beinart 2000; Van Schuylenbergh 2009). In the meantime, local traditional rules related to resource use and access were banned (Vanthemsche 2012).

During this first period of colonisation, precious and highly-valued wildlife species (e.g., gorilla, okapi) and their products (e.g., ivory), as well as forests were regarded as goods to be commoditised (see Section 3.1.1.2, also de Saeger 1959; Harroy 1993; Nzongola 2002; Cioc 2009; Van Schuylenbergh 2009). The commoditisation of resources resulted in the degradation of biodiversity and ecosystems in DRC (Cioc 2009). For example, discriminatory rights for hunting were established through hunting licenses. Only citizens from European descent could afford to acquire hunting licenses and were allowed to use firearms (de Saeger 1959; Harroy 1993; Van Schuylenbergh 2009). Most of the hunters often exceeded the quotas stated on their licenses (de Saeger 1959) as there were almost no enforcement measures in place (Van Schuylenbergh 2009). Thus, elephant herds were extensively killed for ivory while okapis and gorillas were captured and transferred to western Zoos (Akeley 1931; de Saeger 1959; Cioc 2009[1]). In contrast, subsistence hunting for natives was only allowed for specific animal species in selected areas. Additionally, local communities were urged to report their harvested animals (Harroy 1993; Van Schuylenbergh 2009; Pouillard 2016). Discriminatory rights to natural resources led to recurrent violent conflicts between natives and colonials in many areas. However, in some areas, negotiated solutions were adopted that granted some rights and access to selected natural resources for natives (Van Schuylenbergh 2009).

[1] Cioc (2009) gives details about tons of ivories sold by Leopold II before and after the London convention signed in 1900

During this period, international treaties (e.g., the London convention in 1900) were ratified and national policies were designed to protect species that were threatened by sport-hunting, such as the elephant (*Loxodonta a. ciclotis)*, and exportation, for example the okapi (*Okapia johnstoni*) and the gorilla (*Gorilla b. spp*) (de Saeger 1959; Harroy 1993; Cioc 2009). In response to internal pressure and international appeal, protection measures were taken to protect the remaining elephant populations (e.g., Kasaï) (de Saeger 1959). However, elephant hunting was not banned under the CFS period. Whilst most policies designed during the CFS period aimed to comply with international treaties on paper, the opposite was happening on the ground. For example, Cioc (2009) notes that Leopold ratified most environmental conventions to improve his political reputation at global level though little was implemented at local level to minimise or stop wildlife trade.

Rampant financial exploitation and poor management of resources had major consequences for ecosystems and the social-ecological systems they supported. Most natural resources were degraded during this time, many species populations plummeted, and local traditional regulations were ignored (de Saeger 1959; Pouillard 2016).

4.2.2.2 Conservation during colonisation – Belgian Congo (1908-1960)

Given the terror and atrocity of Leopold II's regime (see Weisbord 2003), and the criticism from the international community, Leopold II was forced to give up his DRC venture and transfer his 'property' to Belgium in 1908, although he was still the King (Hochschild 2006; Cioc 2009; Vanthemsche 2012).

The colonial government was established in 1909. Since then, Belgium became responsible for administering the country based on Belgian laws and regulations (Nzongola 2002; Cioc 2009). Natural resource governance systems and related laws established during the CFS period were still in place and were reinforced by the colonial government (Nzongola 2002; Cioc 2009). The new colonial government had inherited both the political and financial crises that resulted from the extractive contracts signed by Leopold with different companies (Vanthemsche 2012). Four main social-political factors affected the SES (resources, users and policies) during this period.

Firstly, discriminatory regulations and rights to resources favoured colonials and the dismantlement of local systems and regulations (Nzongola 2002). Belgian laws were applied to the colony that was now called the "Belgian Congo" (BC). These laws made a clear

distinction between resource access rights for natives and those for Europeans. Environmental and conservation laws during this period were designated to serve economic purposes, political systems and the objectives of the colonial project (Jewsiewicki 1977; Ewans 2003). However, many of the colonial policies and laws were often not enforced on the ground, especially for Europeans (Weisbord 2003; Hochschild 2006).

Secondly, the colonial government started valuing natural resources for their instrumental and financial values (Curry-Lindahl 1974; Vanthemsche 2012). The colonial government strengthened control over resources and established a monopoly for western companies (Cioc 2009; Vanthemsche 2012). Additionally, highly-valued resources were traded based on the established colonial rules and agreements with other European countries (Nzongola 2002; Cioc 2009; Kabemba 2011).

Thirdly, the government used discriminatory and wedged politics (divide and rule) to maximise resource extraction (Nzongola 2002; Van Schuylenbergh 2009; Vanthemsche 2012). For example, social-political classes were created within the same community and opposed to each other (Nzongola 2002; Karsenty 2010a) regardless of local cultural settings. Some tribes or ethnic groups were given more advantages than others as a reward for supporting the colonial government (Roes 2010; Vanthemsche 2012). The 'divide and rule' was one of the political strategies applied by the Belgian government to maximise resource extraction by citizens of European decent (Morrock 1973)[1]. For example, the colonial government granted special rights and benefits to traditional chiefs to gain their cooperation and support (De Clerck 2006; Mambi 2010). Moreover, local taxes on indigenous land and resources were reattributed to local chiefs (Trefon 2004; Vlassenroot 2013).

Regarding wildlife, traditional chiefs were granted the right to hunt 'precious' animals (e.g. elephants and gorillas) although the harvested trophies were shared with the government (de Saeger 1959; Van Schuylenbergh 2009). The political profile of traditional chiefs was dependent on their loyalty to the colonial administration and their leadership in containing their communities from opposing colonial leadership (Vanthemsche 2012; Vlassenroot 2012). This strategy was used to weaken local structures that depended on solidarity and unity within social structures (Malengreau 1947; Bianga 1978). The divide and rule strategy is still affecting conservation interventions in the DRC and identified as the major source of

[1] The two other strategies included the settlement of a large number of Europeans and the second was to co-opt native elites through 'briberies.

conflicts related to land and resources, as well as recurrent conflicts over protected areas (Long 2011; Beck 2012; Peemans 2014). Some conservation actors have been identified as catalysers of conflicts amongst and between local communities to their leaders. These practices have been applied to influence local opinions or demands (Kujirakwinja et al. 2010b; Kasereka et al. 2016).

Finally, the creation of protected areas (national parks and reserves) was a tool for conservation and political leverage to hide discriminatory rights to key resources (Cioc 2009). Indeed, the Belgian government pioneered the legal declaration of National Parks (NPs) in Africa. The Albert[1] NP was the first legally gazetted NP in Africa in 1924 (Akeley 1931; de Saeger 1959; Languy & de Merode 2006). During this period, three more NPs (Garamba, Upemba, and Kundelungu) were established. In addition, a number of hunting reserves were established to respond to the western citizens' appetite for sport-hunting (Verschuren 1956; de Saeger 1959; Harroy 1993; UICN/PAPACO 2010; D'Huart & Verschuren 2014).

Various scholars have argued that recurrent conflicts over access rights to natural resources (as described above), together with international pressure for biodiversity conservation motivated the establishment of protected areas (Harroy 1993; Van Schuylenbergh 2009; Pouillard 2016). However, whilst the establishment of protected areas was applauded by ecologists, there were hidden political motivations that have been discussed by social and political scholars (Ballard 2006; Cioc 2009).

The first 'hidden motivation' was to secure land and natural resources for citizens of European decent (Nzongola 2002; Trefon 2004; Karsenty 2010b; Pouillard 2016). European citizens in the DRC acquired land for hunting and leisure, whilst overseas zoos and museums required live specimens (Adams & Mulligan 2003; Cioc 2009; Van Schuylenbergh 2009; Wigley 2015; Pouillard 2016).

The second hidden motivation was for the Belgian government to improve the bad image of Leopold with regards to human right abuses and discriminations (Weisbord 2003; Hochschild 2006; Roes 2010). The country had to comply with international treaties and conventions related to biodiversity and the environment to maintain international support (Adams & Mulligan 2003; Cioc 2009). Similar to the Leopoldian period, the signed biodiversity conventions or treaties were not implemented on the ground. Wildlife trade and hunting, as

[1] Albert National Park included the current Virunga NP in DRC and Volcanoes NP in Rwanda

well as the exportation of live specimens to populate european zoos, were happening regardless of the laws designed to curtail these activities (Nzongola 2002; Cioc 2009; Van Schuylenbergh 2009; Kwashirai 2013; Johnson 2014). Finally, the creation of protected areas along international boundaries was designed to secure international political boundaries from the invasion of neighboring countries and foreign resource users (e.g., Garamba NP) (D'Huart & Verschuren 2014; Pouillard 2016).

Despite the creation of protected areas during the colonial period, forest degradation and defaunation that commenced during the CFS period continued (Cioc 2009; Van Schuylenbergh 2009). Moreover, local social systems and structures were not considered in the gazettement processes. Therefore, local communities were losers as their rights and rules were denied, social systems disrupted and power dismantled (Malengreau 1947; Amisi & Ballard 2005; Vlassenroot 2013).

4.2.3 Post-colonial and Contemporary conservation (1960-2015)

The DRC was proclaimed as a sovereign state in 1960. The period between 1960 and 1965 was characterised by political violence, an unstable political environment, and leadership conflicts (Nzongola 2002; Turner 2007; Vanthemsche 2012; Mahaniah 2013). Although the political crises between 1960 to 1965 have been widely discussed by researchers (Bota 2001; Nzongola 2002; Ikambana 2007; Mahaniah 2013), little is known about conservation management during that period (Verschuren 1975; Harroy 1993). Therefore, I consider the Mobutu regime as a landmark for 'post-colonial conservation' in the DRC. The post-colonial time for conservation in DRC can be seen as a continuation of the colonial conservation period (Harroy 1993; D'Huart & Verschuren 2014) although there were some policy adjustments and new paradigms.

For the sake of clarity, the post-colonial period is divided into two sub-periods, detailed below.

4.2.3.1 Conservation as a political tool and pride (1965-1985): Early Mobutu regime

Despite general criticisms of the Mobutu regime for being a dictatorship regime and an example of political corruption (Nzongola 2002; Ikambana 2007), this period has been considered as one of the best periods for conservation in the DRC (Verschuren 1975; Harroy 1993; UICN/PAPACO 2010). Together with Verschuren (1975), a number of conservation actors considered Mobutu as a '*pro-conservation'* president because of his support for

protected areas (Verschuren 1975; Harroy 1993; Russell & Harshbarger 2003; Cioc 2009). Verschuren (1973) recognised that 'the highest authorities (presidency) in the country are conscious of the value of their heritage (national parks)'. The merits of enhancing biodiversity conservation during this regime are detailed below as well as some negative features that are still affecting conservation approaches today.

a. Expansion of protected areas

During the Mobutu regime, protected areas were expanded and their sizes increased tenfold (UICN/PAPACO 2010; Inogwabini 2014). Like the establishment of protected areas during the colonial period, the expansion of protected areas was a top-down process. There were no legal provisions that defined processes and procedures to follow (Inogwabini et al. 2005). Local stakeholders and resource users were not involved or consulted (Verschuren 1975; Inogwabini et al. 2005; UICN/PAPACO 2010; D'Huart & Verschuren 2014). This resulted in further loss of land and user rights for communities and a loss of power over territories for traditional chiefs (Mutimanwa 2003; Vikanza 2011; Peemans 2014).

The expansion of protected areas in the DRC has been considered by some scholars as 'land grabbing' for conservation and a continuation of the colonial practices of gazetting protected areas (Mugangu 2009; Long 2011; Vikanza 2011; Fairhead et al. 2012; Peemans 2014). In most cases, the expansion of protected areas included villages and farming lands with no resettlement or compensation mechanisms for the impact on communities' livelihoods (Mutimanwa 2003; Vikanza 2011). The presence of villages within protected areas has been being identified partially as the historical sources of the current conflicts between protected area managers and communities (Mugangu 2009; Kujirakwinja et al. 2010b). Moreover, the presence of villages was also considered as one of the major contributing factors for forest degradation and the defaunation of protected areas during the post-colonial period (Mutimanwa 2003; Mugangu 2009).

Similar to the colonial period, the expansion of protected areas was politically motivated and aimed to fulfil international requirements or to put the DRC and the president (Mobutu) on the map as a champion of conservation (Verschuren 1975; Harroy 1993; Van Schuylenbergh 2009; UICN/PAPACO 2010). Therefore, the gazettement (expansion) of protected areas during Mobutu's regime was not solely for protecting critical biodiversity and ecosystems, but also for political pride.

b. Upgrading protected areas at national and international level

During the early years of the Mobutu regime, many of the DRC reserves were upgraded to national parks status (UICN/PAPACO 2010; D'Huart & Verschuren 2014). Other national parks were recognised as World Heritage Sites (WHSs) (Inogwabini 2014). In total, four protected areas were recognised as WHS during this period. The fifth WHS (Okapi) was recognised after its creation in 1992 (see Section 5.4.3). Fundamental studies were funded by the United Nations for education, science and culture organisation (UNESCO) for most of the DRC's WHSs (Maldague 1980). Studies were tailored to collect information related to the WHSs' requirements. In my opinion, the recognition of the DRC protected areas as WHSs can be considered as the origin of the internationalisation of conservation in the DRC. The international support encompassed providing funding and technical support to WHSs (see below section on internationalisation).

c. Improving policy frameworks and community access rights to resources

During the Mobutu regime, colonial policies and laws were updated or adjusted to fit political and ideological agendas. One important policy was the conservation law promulgated in 1969, which is considered as the foundation of protected area management in the DRC. This Conservation Law (1969) was intended to regulate the management of gazetted protected areas (national parks and reserves) and was applied in conjunction with the hunting law promulgated in 1982. The 1969 conservation law recognised the roles of the ICCN as the mandated agency for protected area management. The ICCN was empowered to secure protected areas and regulate human activities in protected areas (Harroy 1993). Only scientific research, recreational and educational activities were and still are allowed within protected areas with the special approval of the ICCN (Harroy 1993; Pelissier et al. 2015).

Despite changes in names for the mandated agency (ICCN) throughout the history of the DRC, there were few changes to its mandates, governance regimes and management approaches (Verschuren 1975; Harroy 1993; UICN/PAPACO 2010).

Similar to the colonial periods, access rights to resources were denied or restricted to local communities in protected areas (Kujirakwinja et al. 2010b; Verweijen & Marijnen 2016). For example, although communities were allowed to hunt, a specific law to regulate hunting (1982) was promulgated and provided distinct rights for locals and foreigners. Local communities could hunt in game reserves, but they were required to hold a permit obtained from either the warden for individuals or from the local administration for community hunting. Additionally, hunters are required to report on their harvest (Van Schuylenbergh

2009; Pouillard 2016). As for the colonial periods, these measures have never been implemented on the ground, which resulted in wildlife depletion in hunting reserves (Nzongola 2002; Cioc 2009).

d. Effective conservation management

The ICCN saw its financial and technical capacities increased during the Mobutu regime because it was one of the departments of the presidency (Verschuren 1975; Harroy 1993; Adams & Mulligan 2003; D'Huart & Verschuren 2014; Inogwabini 2014).

During the postcolonial period, the integrity of the protected area boundaries was maintained through militarised law enforcement by rangers supported by Presidential special troops (Maldague 1980; Inogwabini et al. 2005). As a result, the number of wildlife populations increased in most protected areas (Verschuren 1975; Inogwabini 2014).

Although these actions were supported by conservation actors such as international non-governmental organisations (INGOs) and donors (see Maldague 1980 and Verschuren 1975), militarised law enforcement increased animosity with neighboring communities. The latter endured negative punishment as a result of retaliation from both soldiers and armed poachers (Verschuren 1975; Mugangu 2009). However, Mobutu failed to maintain established protected area management structures and policies during the political crisis. The main challenges included limited funding and the loss of political support to his regime (Verschuren 1975; Inogwabini 2014; Pouillard 2016). Actually, no master plan or vision had been developed for protected areas.

4.2.3.2 The contemporary conservation period (1985-2015): transitional conservation

a. The fall of the Mobutu regime and a paradigm shift

The last moments of the Mobutu regime were characterised by political struggles, armed conflicts and financial crises (Nzongola 2002; Ikambana 2007). The above factors had a negative impact at local, national and regional levels. At local level, violent conflicts were reported in the eastern DRC between different tribes over the control of land and social identity (Vlassenroot 2013). At regional level, the DRC was involved in the armed conflict in Rwanda that resulted in the displacement of millions of Rwandan citizens in various parts of the DRC (Reyntjens 2009).

The fall of the Mobutu regime and the arrival of Rwandan refugees that included the army have been considered as one of the drivers of the current armed conflictual context in the DRC (Reyntjens 2009). In addition, the arrival of Rwandan refugees negatively affected local biodiversity in the DRC through hunting, deforestation and insecurity (Vlassenroot 2008).

Since the fall of Mobutu regime in the mid-1990s, the political situation in DRC has remained unstable as remnants of different rebel groups have settled in different forested regions, which has a negative impact on protected areas (Nzongola 2002; Vlassenroot 2008; Beyers et al. 2011; Spira et al. 2017). Protected areas in the eastern DRC have been used, and are still used, as a shelter for armed groups (Cuvelier et al. 2013). Moreover, resources from protected areas (e.g., minerals, bushmeat, ivory) have been used by armed groups to acquire military equipment, money and food (Vlassenroot 2008; Spittaels 2010b; Verweijen 2013; Spira et al. 2017).

The impact of armed groups on local SESs has increased steadily over the years. This has prevented conservation bodies from delivering effective conservation outcomes. Armed groups have weakened the operational capacity of conservation bodies (Beyers et al. 2011; Kujirakwinja et al. 2011; Cuvelier et al. 2013). Therefore, wildlife populations have declined (Beyers et al. 2011; Plumptre et al. 2016b), suitable wildlife habitats have been either degraded or fragmented (Megevand et al. 2013), and the boundaries of protected areas have been encroached upon (Kujirakwinja et al. 2010b; Inogwabini 2014). In addition, the ICCN lost control over most of the DRC's protected areas, and hundreds of rangers were murdered between the 1990s and today (Inogwabini 2014; Tranquilli et al. 2014; Pelissier et al. 2015; Plumptre et al. 2016b).

As a response to financial constraints and poor conservation management, the ICCN opened up protected area management for partnerships with international bodies (Inogwabini et al. 2005; Pelissier et al. 2015). These partnerships pushed for shifts towards collaborative approaches (Hart & Hart 2003; Inogwabini et al. 2005; Pelissier et al. 2015) and induced changes in policies, practices, and approaches (Peluso 1993; Inogwabini et al. 2005; Van Schuylenbergh 2009; Pelissier et al. 2015; Pouillard 2016). However, conservation interventions by international bodies have had both a positive and negative impact (see section below on internationalisation) (Inogwabini et al. 2005; Pelissier et al. 2015).

b. Gazettement of new protected areas and conflicts

One new protected area, Okapi, (see Section 4.3.3) was created during the late period of the Mobutu regime (1992). As reported above (see Section 4.2.3.1), the creation and expansion of protected areas in the DRC were done through top-down approaches and managed through fines and fences (Van Schuylenbergh 2009; Pouillard 2016).

In response to arising conflicts from the fines and fences approach and the increasing encroachment upon the boundaries of the protected areas, the gazettement processes of protected areas has become participatory, although the level of involvement of non-conservation stakeholders is varied (see Chapter 5). The advent of the participatory boundary gazettement of protected areas was thought to minimise conflicts. However, some of the participatory-gazetted protected areas are still facing challenges regarding access rights and community engagement, as observed in my research sites (see Chapter 6).

c. International stakeholders and paradigm shift

The increase in the involvement of international organisations and donors in conservation worldwide has been documented by various researchers (see Curry-Lindahl 1978; Larsen & Brockington 2018). In addition, the positive (financial and technical support) and negative (e.g., weaken governmental agents) impacts of international conservation management has been reported in different countries (Rodriguez et al. 2007; Clark et al. 2008; Larsen & Brockington 2018).

Environmental INGOs are often referred to as bridging agents for conservation and a vehicle for the internationalisation of conservation (Rodriguez et al. 2007; Berkes 2009; Trimble 2013). As in other countries (Rodriguez et al. 2007; Larsen & Brockington 2018), environmental INGOs have been vehicles for a shift in environmental approaches and practices in the DRC (Counsell 2006; Clark et al. 2008; Hatchwell 2014; Marijnen 2018). Their support is diverse and encompasses financial, political and technical aspects (Pelissier et al. 2015).

International support to conservation is recognised as the major determining factor for the persistence of wildlife and protected areas in the DRC (Hart & Hart 2003; Inogwabini et al. 2005; UICN/PAPACO 2010; Hatchwell 2014; Kasereka et al. 2016). Moreover, international bodies are seen as a guarantee for transparent finance management and compliance as well as a vehicle for global environmental guidelines and requirements (Mitchell 2007; Rodriguez et al. 2007; Lunt et al. 2013).

Over the last three decades, international support of protected areas in the DRC has increased greatly (Inogwabini et al. 2005; Pelissier et al. 2015). Pelissier et al. (2015) reported that about 85% of the funding of protected areas in the DRC in 2014 came from NGOs, although about 80% was directed to WHSs and selective key threatened species – *sensu IUCN*[1] – such as the great apes and endemic species (Kasereka et al. 2016). This international support is part of the global environmental agenda to respond to the high degradation and defaunation of protected areas as well as the lack of funding from the DRC government (Rodriguez et al. 2007; Clark et al. 2008; Larsen & Brockington 2018).

Beside financial support, international actors encouraged 'postmodern' integrated approaches that improve traditional governance regimes (Inogwabini 2014; Marijnen 2017). Collaborative approaches implemented by NGOs included the participatory gazettement of protected areas (see Chapter 5), law enforcement operations, conservation, human well-being interventions (see Chapter 6), and the promotion of local leadership (see Chapter 7). Integrated approaches enhanced local relationships and maintained the persistence of key protected areas (Inogwabini et al. 2005). Moreover, these approaches enhanced institutional arrangements and policies as part of a postmodern approach (Pelissier et al. 2015).

However, negative aspects related to international interventions have been identified by different scholars and practitioners (Inogwabini 2014; Baruka 2015; Pelissier et al. 2015). Firstly, most support and planning of conservation interventions have been and are still donor driven, as they have to be aligned with priorities set by donors and INGOs (Yanggen et al. 2010; Pelissier et al. 2015). Secondly, the ICCN as a public mandated agency has lost its leadership and management capabilities to the benefit of international conservation bodies. This is similar to the findings in Colombia where Rodriguez et al. (2007) reported that 'foreign NGOs are regarded as a threat to the sovereignty of host nations'. Thirdly, the implementation of a 'discriminatory conservation approach'[2] that targets charismatic species and high profile protected areas (e.g., World Heritage Sites, Man and Biosphere reserves) is problematic. This approach has had a negative impact on biodiversity in the DRC and on ecosystems there and elsewhere. For example, while the support to World Heritage Sites has 'maintained' their biodiversity (at a certain level) and raised their profiles (AGRECO 2013;

[1] IUCN is the World Conservation Union that categorises species based on various criteria that include numbers, distribution, threats and conservation measures (see www.uicnredlist.org)
[2] The term 'discriminatory conservation approach' in my research refers to the conservation support to some protected areas with no consideration of the biodiversity richness

D'Huart & Verschuren 2014), other protected areas, if not most of them without support, have degraded and their biodiversity has declined greatly (Inogwabini et al. 2005; Pelissier et al. 2015; Plumptre et al. 2016b). A recent study on the financing of protected areas in the DRC (Kahuzi-Biega, Maiko National Parks including Itombwe, one of my case study) demonstrated that World Heritage Sites (i.e. Kahuzi-Biega) are able to cover about ninety percent of their costs, while others (non-World Heritage Sites) could not cover fifty percent of their operational costs (Baruka 2015). Finally, although NGOs are supporting collaborative arrangements, it is suspected that decisions over processes and approaches did not involve other decision makers and community leaders (see Section 6.4.1). Most decisions were made at a high level as opposed to ground level (see Section 4.3.1, Figure 4.1).

4.3 Implementing 'postmodern' conservation approaches

Postmodernism is one of the philosophical thinking about the transformation, a critique of the modernism, the deconstruction of social and political theories that fits the postmodern society (Attwell & Cotterill 1998; Wolfe 1998; Heywood 2017). Applied to conservation, some researchers (Attwell & Cotterill 1998) consider approaches and theories that include any shift from traditional conservation approaches towards novel practices and production of knowledge. These approaches include moving from fortress approaches to participatory approaches that operate under uncertain and complex context as well as plurality of the reality such as ACM (Buck et al. 2001; Armitage et al. 2007). Postmodern approaches and theories are thought to convey both positive changes (e.g., new modes of experience, culture and theories) and negative changes (e.g., cultural fragmentation) (Kane 2011).

4.3.1 Arrangements for co-management practices

Environmental scholars have raised concerns about the negative impact of the fortress approach in conservation management in DRC (Vikanza 2011; Pyhälä et al. 2014; Marijnen & Verweijen 2016; Verweijen & Marijnen 2016). In addition, some of them have reported the failure of conservation management to deliver appropriate environmental outcomes (Pyhälä et al. 2014; Kasereka et al. 2016) and identified as one of the major causes of conflict (Kujirakwinja et al. 2010b; Verweijen & Marijnen 2016; Rosaleen et al. 2019). Therefore, scholars and INGOs' actors have advocated and tested new approaches that included multiple stakeholders at different levels and scales. Many of the interventions implemented included

joint planning of activities, a coordination mechanism amongst partners, and institutional arrangements that included community structures (Hart & Hart 2003; Inogwabini 2014).

4.3.1.1 Multi-stakeholder strategic partnerships

A multileveled coordinated approach[1] was designed by conservation actors (ICCN, INGOs, UNESCO) in 1999 to enable coordinated conservation interventions and joint decision making (d'Huart 2001). The approach was based on a three-level arrangement: local (CoCoSi[2], Figure 4.1), national (CoCoCongo[3], Figure 4.1) and international (Figure 4.1). The co-management mechanisms were encoded in the strategic documents of the ICCN as well as in an agreement document with INGOs at protected area and national levels (d'Huart 2001; Hart & Hart 2003). The aim was to maximise funding and expertise from various INGOs, to compensate the institutional weaknesses of the ICCN, and to ensure better coordination of financial support (d'Huart 2001; Pelissier et al. 2015). The co-management mechanism included financial, technical and political partners across various levels (Figure 4.1).

[1] Although some authors (d'Huart 2001; Hart & Hart 2003; Pelissier et al. 2015) have referred to this coordinated mechanism as co-management, I have condidered the mechanism as a forum to coordinate conservation interventions among partners with no or limited input from local stakeholders.
[2] CoCoSi is the *comité de coordination de site* (protected area coordination committee). It is a forum that includes ICCN senior staff at protected area level and INGOs as implementing partners.
[3] CoCoCongo is the *Coallition pour la conservation au Congo* (Coalition for conservation in DRC) that includes ICCN senior staff at national level, protected area wardens and INGO representatives at national and protected area level, government officials at national level as well as donors and international agencies.

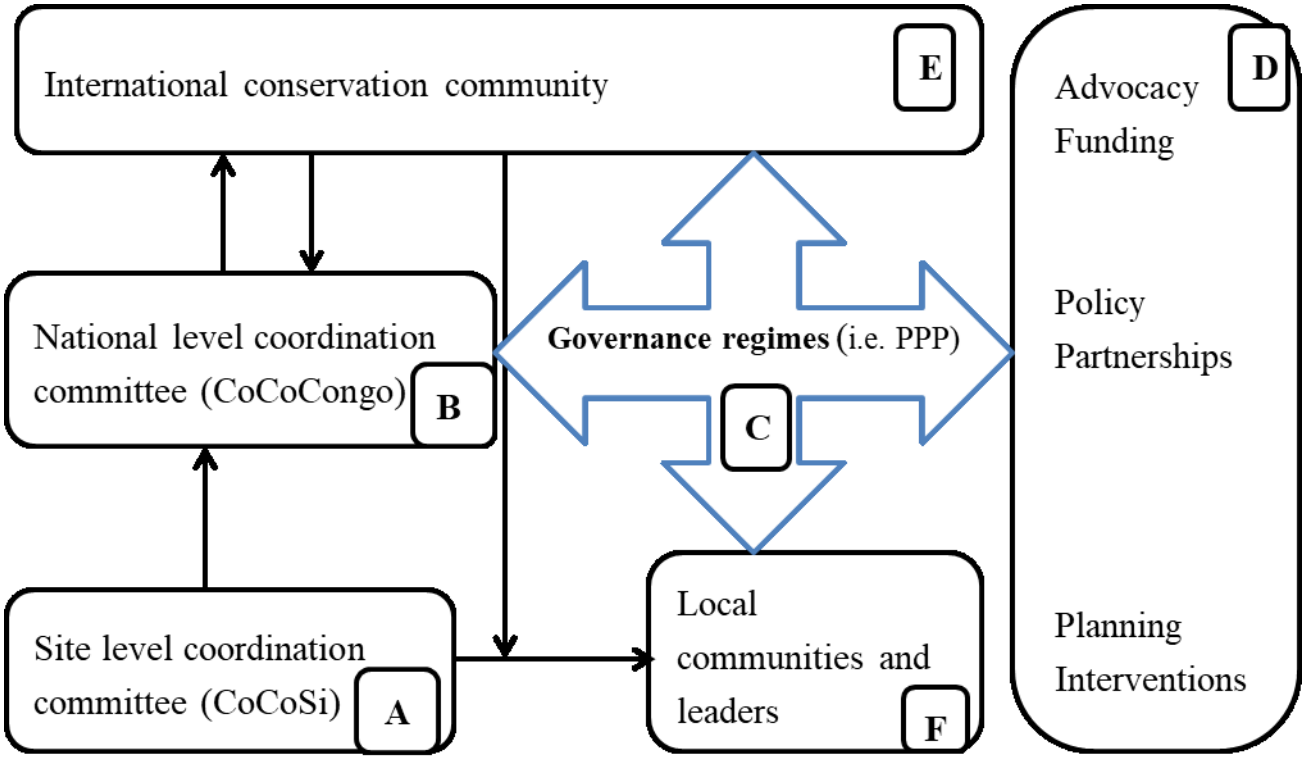

Figure 4.1. Mapping of the co-management structures established at different levels for protected areas in the DRC from local to international levels with feedbacks from the international conservation community. A is the planning structure at protected area level which interacts with local communities (F), B is the national political forum involved in strategic management supported by the international community (E), C represents different protected area governance systems (regimes) that influence the three levels of protected area governance (D).

The co-management mechanisms pursued three main targets (Figure 4.1, D) including, (a) advocacy for protected areas, (b) improving legislation, policies and partnerships, and (c) ensuring joint planning and complementarity on the ground (Figure 4.1). The co-management mechanism enhanced collaboration among conservation INGOs (implementing partners) with the ICCN. Additionally, the duplication of activities and conflicts among partners were minimised or avoided (d'Huart 2001; Hart & Hart 2003; Inogwabini et al. 2005). Furthermore, the more communities were involved in conservation interventions, the better relationships between protected area managers and communities improved (Kujirakwinja et al. 2010b, 2013). Though governance regimes (C) varied from state managed protected areas, collaborative management and public-private partnerships (PPP).

The CoCoSi (Figure 4.1) included the ICCN and recognised INGOs (with MoU[1]) operating at protected area level. As a forum at protected area level, the CoCosi is chaired by the ICCN. Normally, the forum is held twice a year, or more if needed. The main task is joint planning and evaluation of implemented activities (Figure 4.1) as well as responding to critical matters affecting the protected areas. Although communities (Figure 4.1) are not full members of the CoCoSi, their representatives – mainly traditional chiefs – are invited for some sessions. Most often, their attendance is considered as being for advocacy purposes.

At national level (Figure 4.1), the CoCoCongo meets once a year and involves multiple stakeholders including representatives from Provincial and National Governments, ICCN senior staff (headquarters and protected areas), INGOs and donors. One traditional chief from each chieftaincy is invited, although the choice may be associated with the social profiles and positive relationships between traditional chiefs and the protected area management (d'Huart 2001; Hart & Hart 2003).

The CoCoCongo deals with policies, strategies, and political arrangements (Figure 4.1). Protected area governance regimes (Figure 4.1) are defined and approved by the CoCoCongo based on local, national and global environmental challenges. Decisions made at national level guide the implementation of activities at local level and affect both protected area and community interventions (Figure 4.1). For example, the recent move from 'classic co-management' to public-private partnerships (PPP) – see section 4.3.2 – was evaluated and approved by the CoCoCongo (see AGRECO 2013; Hatchwell 2014; Marijnen 2017). However, some of the recommendations from the national forum are not fully implemented (Hart & Hart 2003).

4.3.1.2 Community-based partnership mechanisms

Conservation interventions targeting communities in the DRC can be traced back to the late 1980s (Kasereka 2003). The approach is associated with the arrival of INGOs as well as global paradigm shifts (Mercader 1995; Berkes 2007). However, the ICCN's 'official' community conservation strategy at national level was developed in 2006 and updated in 2015 (ICCN 2015). Despite the emphasis on the strategy of the involvement of local constituencies in conservation interventions, the level of inclusion of external stakeholders in conservation is still inadequate in many of the protected areas in the DRC.

[1] MoU (Memorandums of understanding) were signed between ICCN and INGOs working in protected areas. MoUs described key interventions to be implemented by the INGOs and expected support from the ICCN.

Collaborative interventions with communities aimed to 'respond' to emerging local conflicts (often around issues of boundaries of protected areas and access to resources (Kujirakwinja et al. 2010b)), resulting from the lack of community engagement in conservation interventions and anthropogenic factors associated with local livelihoods and power. For example, the zoning process of some protected areas was implemented to respond to land claims and access rights complaints by local communities (Brown 2010). The zoning process was one of the ICCN's main strategies to stimulate community involvement in the management of the targeted protected area (Tshombe 2007; Brown 2010).

Community interventions included participatory boundary demarcation and zoning (see Chapter 4), joint patrolling and community wildlife monitoring (e.g., Itombwe and Kabobo), facilitating self-organising structures (e.g., local natural resource governance committees), community projects and conflict resolution activities (Kasereka 2003; Tshombe 2007; Kujirakwinja et al. 2010b; Inogwabini 2014).

a. Community governance structures as local interface

Community structures were and are still established at different administrative levels (*groupement* and *chefferies*[1]) as part of the community conservation strategy (ICCN 2015). The establishment of these structures was facilitated and supported by INGOs based on management plans, threats to key species and operational strategies (Mudinga et al. 2013). Members of these structures are elected among representatives of community groups (churches, local organisations and schools). Community structures form the interface for environmental education, monitoring of community incentives and conflict resolution between protected area managers and communities (Figure 4.1). However, in most cases, they have been ineffective in delivering planned outcomes. Furthermore, community members and leaders of conservation structures have been suspected of being spies by other community members and chiefs, while conservation bodies considered those leaders as accomplices to poachers (Kujirakwinja et al. 2010b; Mudinga et al. 2013).

Overall, the effectiveness of these arrangements is dependent on the leadership of facilitators (the ICCN, community leaders and INGOs); the level of transparency and complementarity; the understanding of local power dynamics; and the availability of financial support from partners.

[1] Groupement is an administrative entity that manages villages. A chefferie (chieftaincy) manages a number of groupements.

4.3.2 Shift from coordinated management to PPP as an example of co-management in the DRC

The debate related to public-private partnerships (PPPs) in natural resource governance is growing worldwide (Sikor 2013; Baghai et al. 2018). While the management of protected areas was solely devoted to national agencies (public), to date the protected area agencies have been partnering with private agents, essentially conservation INGOs and foundations that run protected areas on behalf of the state mandated agency (Sikor 2013; Baghai et al. 2018). This governance type has been considered as one of the forms of PPP, although the application has been confusing (Sikor et al. 2008; Sikor 2013). However, the question is whether INGOs can be classified as private entities with social goals (Sikor et al. 2008; Sikor 2013). To accommodate PPP in resource management, Sikor (2013) considers the soft distinction between the public and the private entity based on the origins of partnering. INGOs are considered as private agents compared to public-mandated agencies (public) PPP initiatives for protected areas that have been implemented in various countries, including Africa (e.g., Zambia and South Africa) for long time (Pope 2006; Toemin 2010; Scholte et al. 2018). In many cases, PPP is considered as an environmental approach to compensate for the weak governance of protected areas by state-mandated agencies who failed to mobilise sufficient funding and implement best practices as required by the international agenda (Pope 2006; Ring 2008; Nshimbi & Vinya 2014). However, various scholars have linked the failure of many PPPs in natural resource management with the confusing missions of social entities as private agents (Sikor 2013; Nshimbi & Vinya 2014; Scholte et al. 2018).

In the DRC, the PPP approach was adopted as an alternative governance style to respond to the regional shift in conservation governance types (the Central Africa Forest commission – COMIFAC) in 2004 (Baghai et al. 2018; Scholte et al. 2018). In the case of central Africa, the embracing of the PPP approach was mainly to respond to ineffective conservation, as the ICCN and the DRC government have failed to maintain key protected areas (AGRECO 2013; Hatchwell 2014; Scholte et al. 2018). The shift from coordinated management to PPP was driven by donors to maximise their influence in conservation and test a ‘new approach’ that could lower corruption and inefficiency of ICCN (AGRECO 2013; Verweijen & Marijnen 2016; Scholte et al. 2018). For example, the PPP for Virunga and Garamba were the result of pressure from the European Union (Marijnen 2017, 2018). Without enough resources and capacity to run its protected areas, and facing great challenges (heavy armed poaching,

inadequate salaries for rangers), the ICCN approved the transfer of management to third parties (INGOs) with hopes for improvement in both conservation outcomes and the management of protected areas (Pope 2006; AGRECO 2013; Hatchwell 2014).

Between 2005 and 2018, four PPPs (Garamba, Virunga, Salonga and Okapi) were established in the DRC between the ICCN and individual NGOs in the protected areas listed above. Garamba was the PPP for African Parks Networks; Virunga represented the African Conservation Funds that changed to the Virunga Foundation; Salonga was run by the Worldwide Fund for Nature (WWF) and Okapi by the Wildlife Conservation Society (WCS). Although the processes and types of PPP governance were different, the four protected areas were directly managed by INGOs.

Initially, the PPP was tested and established in Garamba (2005) and Virunga (2010) (AGRECO 2013; Hatchwell 2014). The agreements almost transferred the management role and power to the private entities (INGOs), leaving the ICCN with an evaluation role. These pilot agreements have been criticised because conservation outcomes were marginalised and not considered as key indicators in the evaluation of the performance of PPPs (AGRECO 2013; Hatchwell 2014; Verweijen & Marijnen 2016; Scholte et al. 2018). In addition, some of the PPP initiatives have been criticised for limited involvement of local communities and leaders and for a lack of transparency in management (Marijnen 2017; Scholte et al. 2018). In many cases, PPPs have had a negative impact on established co-management mechanisms (see Figure 4.1). Co-management mechanisms have been diluted and ignored by the duty bearer, the INGOs, (AGRECO 2013; Hatchwell 2014; Marijnen 2017) which has increased conflicts and decreased communities' support of protected areas. Indeed, the PPP approach has been criticised for reintroducing top-down management practices and favoring external decision making space (AGRECO 2013; Marijnen 2017; Baghai et al. 2018; Scholte et al. 2018).

However, the PPP approach has helped to raise the profiles of targeted protected areas as well as the profile of the implementing INGOs (AGRECO 2013; Scholte et al. 2018). INGOs managing privatised protected areas have also managed to mobilise more funding compared to the past with the co-management approaches (Scholte et al. 2018). However, evidence of positive conservation outcomes related to this approach remains scant (AGRECO 2013; Hatchwell 2014; Scholte et al. 2018). Wildlife populations have not yet recovered and the integrity of the DRC's protected areas are still in danger (AGRECO 2013).

Learning from the weaknesses from the first two PPPs (see AGRECO 2013; Scholte et al. 2018), the ICCN has since adjusted the PPP approach for Salonga in 2015 and Okapi in 2018, and moved to what ICCN calls *'co-management*[1]*'* (Scholte et al. 2018). The 'co-managed PPP' is a combination of principles of the delegated and shared management of protected areas (Borrini-Feyerabend & Rosemary 2015) with unbalanced power and the limited involvement of resource users.

The main differences between the previous PPP approach in Garamba and Virunga are that the power of the PPP grantee is reduced to direct management of the protected areas. Planning of activities is done with the ICCN and INGOs operating on the site (Scholte et al. 2018). The private agent remains accountable for managing the park and covering management costs. While for the previous PPPs, the grantee had the power to decide on other partners operating in the same site, the proposed model does not allow for that. Thus, planning and budgeting are done through an established 'co-management' forum.

As for other partnerships (co-management), the ICCN has failed to enforce some of the provisions of the PPP agreements. This was not only due to the limited governance capacity of the ICCN but also because private agents have been using their financial power and influence to oppose ICCN decisions (AGRECO 2013; Inogwabini 2014). For example, the CoCoSi meetings are compulsory for each protected area and embodied into PPP agreements; however, for some of the PPPs, this has become optional.

4.4 Conclusion: linking the past to the future

Conservation management and governance in DRC has moved through four historical periods with different conservation approaches and practices. Changes in governance and management partnerships, as well as conservation, approaches varied over time, influenced by social-political drivers. Figure 4.2 summarises the key factors (positive and negative) that have influenced conservation management from the pre-colonial period to the present.

[1] Co-management for this section refers to the ICCN PPP type that is different from theoretical definition of co-management.

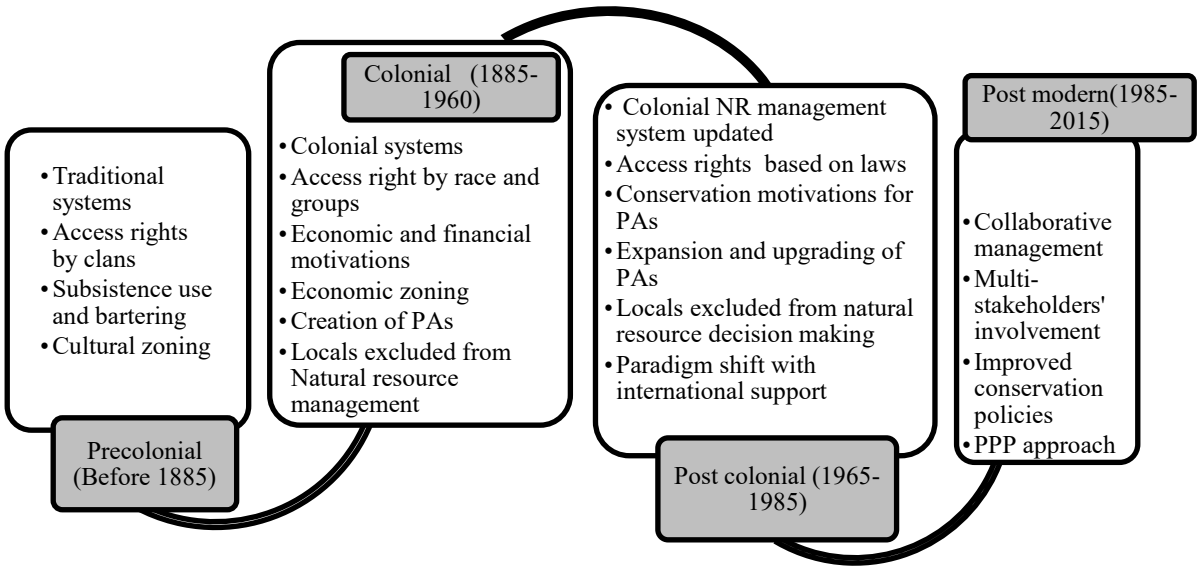

Figure 4.2. Historical natural resource management and governance of natural resources in DRC –

Before colonial times, the governance of resources was embodied in the local administration portfolio. During colonial times, natives were excluded from resource management. The colonial period saw the creation of protected areas and large concessions. The postcolonial era was characterised by changes in the governance and management approaches of protected areas and the adoption of new approaches to respond to institutional, financial and technical challenges.

Protected areas in the DRC are vulnerable to political and financial crises. Although these crises have been reported as an opportunity for a paradigm shift and financial support from INGOs, their impact has affected both protected areas and the ICCN (see Section 4.2).

Throughout the DRC periods, the persistence of protected areas in the DRC was dependent on political leadership and international support at various scales (see Figure 4.1, also Section 4.2.3.2). The support from external stakeholders covered a large array of the expenses of protected area management and induced changes in conservation approaches and governance regimes (Pelissier et al. 2015; Scholte et al. 2018). However, changes in conservation approaches and policies were reactions to what was happening on the ground (conflicts and local needs) and globally (environmental agenda and theories) (see Section 4.3).

Throughout its history, protected areas have been managed by a mandated agency, which has been a dominant actor regardless of approaches and governance regime. However, protected area management in the DRC has been discriminatory for local resource users despite the

shift observed and claimed by conservation practitioners (Beinart 2000; Duncan et al. 2010; Kwashirai 2013). The governance of protected areas was characterised by a lack of transparent mechanisms and inadequate institutionalisation of local cooperation (see Section 6.5.3). For example, local agreements over resource access and use were developed by conservation bodies with limited implementation where they existed. Moreover, the ICCN was reported to have limited capacity (financial, technical) to operationalise new approaches and governance regimes (AGRECO 2013).

PART II. HISTORICAL CONSERVATION PRACTICES AND GAZETTEMENT PROCESSES

Chapter 5. Gazetting land for conservation in the eastern DRC: social-ecological processes and impact

5.1 Introduction

Protected areas[1] have evolved as one of the most effective measures to prevent the ongoing mass extinction of biodiversity (Stolton & Dudley 1999, 2010; Hockings et al. 2006; Oldekop et al. 2016), the degradation of key ecosystems and deforestation (Welch 2005; Mackey et al. 2008; Bowker et al. 2017). Moreover, they provide irreplaceable ecosystem services and benefits to communities (see Chapter 5, also Coad et al. 2008; Brockington & Wilkie 2015; Castro et al. 2015). All over the world, including in the DRC, the creation (herein gazettement) of protected areas is recognised as a way to protect critical landscapes and biodiversity (Woodley et al. 2012; Geldmann et al. 2013). The establishment of protected areas around the world, especially terrestrial ones, were historically designated exclusively by central governments (see Chapter 4), with limited or no involvement of local stakeholders and resource users (Phillips 2003; Plummer & Fitzgibbon 2004; Palomo et al. 2014; Borrini-Feyerabend & Rosemary 2015) and with various hidden motives (see Section 4.2). This has resulted in conflicts between communities and conservation stakeholders accompanied by the degradation of protected areas (Megevand et al. 2013; Inogwabini 2014). Therefore, in many areas in the developing world, many protected areas have become *paper-parks* (Hockings et al. 2006; Reading et al. 2016).

In the DRC, the creation and management of protected areas has historically been influenced by the global environment agenda (see Chapter 4, also Cioc (2009)). For example, in response to the Aïchi convention, the DRC decided to expand its protected area network from 10.5% to 17% (Inogwabini 2014).

Despite the evolvement of conservation practices in DRC (see Section 4.3), protected area boundaries were and are still either contested or ignored by local communities and their political leaders (Kasereka 2003; Brockington & Wilkie 2015). Consequently, most protected areas have been invaded by local communities as well as incoming people for farming, grazing, mining, and human settlement (Kujirakwinja et al. 2010b, 2018; Crawford & Kujirakwinja 2016). As described in Section 2.2.1, this has had an acute impact on the ecological features of protected areas (Kujirakwinja et al. 2010b, 2016; Jones et al. 2016).

[1] In this research protected area is understood as defined by the IUCN (see Dudley 2008)

To align with the shift in conservation paradigms, gazettement processes have adopted participatory approaches and conflict resolution practices which involve various stakeholders at different levels (Margules & Pressey 2000; Chan et al. 2006; Armitage et al. 2009; Palomo et al. 2014; Oldekop et al. 2016). These approaches have been operating within formal and informal institutional settings to address protected area social injustices (Armitage & Armitage 2008; Chapin et al. 2010).

5.1.1 Overview of gazettement processes in DRC

Gazettement processes and practices in DRC have changed since the late 1980s (see Chapter 4). Prior to that, most protected areas were proclaimed according to the traditional conservation approaches that included the 'fortress conservation' models (Harroy 1993; UICN/PAPACO 2010; Inogwabini 2014). Current practices have adopted approaches that include the participation of communities and power-holders at different scales (Kasereka 2003; Brown 2010; Plumptre et al. 2013). Unfortunately, despite the improvement of processes and policies related to gazettement processes, the level of involvement of communities and their rights are still questionable (see Figure 5.2, also Inogwabini 2014; Marijnen & Verweijen 2016).

For the most part, the gazettement of protected areas in the DRC has been influenced by biodiversity targets alone, mostly ignoring external push factors (see Figure 2.1) such as migration, political dynamics, changes in resource valuation by communities and effects of social-economic changes (see Section 6.4.1) linked to the commoditisation of resources (Wilkie et al. 1998; Crawford & Kujirakwinja 2016). I argue that the establishment of protected area boundaries and related zones (based on the biosphere paradigm see Bridgewater 2002; Cumming et al. 2015) has been directed by existing law although community user rights, and regulations have not been updated to reflect social and political changes.

Gazettement processes are part of the participatory and collaborative processes implemented in the three protected areas (see Figure 5.2). In this part of my study, I assessed the alignment of gazettement processes of three protected areas with legal requirements (involvement of resource users in the gazettement processes and the learning process for future gazettement processes). I also evaluate local perceptions of participatory gazettement processes (see Section 5.4.5). The three main objectives of the study described in this chapter are as follows:

(1) To investigate the gazettement processes of three protected areas in the eastern DRC (Itombwe, Okapi and Kabobo Reserves) in terms of ACM principles or guidelines;

(2) To assess how gazettement processes were perceived by local communities from the three landscapes; and

(3) To identify the pitfalls of the gazettement processes from the three landscapes to inform future ACM processes.

5.2 Methodological approach

I used mixed methods, including qualitative and quantitative data collection and analysis (detailed in Chapter 3) (Dominguez & Hollstein 2014; Bennett et al. 2017). In this study, I highlight information relevant to the gazettement of protected areas with specific methods. Qualitative information was collected through a review of the literature related to conservation history (see Chapter 4) and gazettement in DRC, focus group discussions with communities, participant observations and key informants' interviews. Quantitative data was generated from household surveys in the three reserves (Kreuger et al. 2002; Mcculloch 2004; de Vos et al. 2005; Newing et al. 2011).

5.2.1 Household surveys

As detailed in Section 3.2, household surveys were randomly stratified by chieftainship (chefferie) in Itombwe and Okapi and by access modes (road and lake) for Kabobo. In total, 618 respondents were interviewed in the three protected areas. Questions were related to (a) the gazettement process of each reserve; (b) the involvement of local stakeholders in the gazettement processes; and (c) the perceptions of communities regarding the involvement of specific social groups. Questions were closed and based on Likert item scales (agree, disagree and somewhat).

5.2.2 Focus group discussions

Focus groups (see Chapter 3 for details) were used to gather information from community leaders and members to supplement the literature information with regard to the key issues related to gazettement processes in respective reserves. Moreover, discussions targeted historical events that elders could remember (see Section 5.4).

5.2.3 Key informant interviews

I also consulted individuals who have been working in conservation or involved in the gazettement processes in the three protected areas (Itombwe, Kabobo and Okapi), including wardens, NGOs and traditional chiefs. Their information was used to clarify and supplement the information collected from focus group discussions and household surveys. While there were more than one INGO working in Itombwe and Okapi, the WCS was the only conservation INGO active in the region and the main facilitator of the process. Meetings were set based on the time that suited the interviewees and conversations with individuals lasted for one hour or more. With key informants, topics related to gazettement processes were discussed and the involvement of other actors in the processes featured among other questions. These discussions were not recorded.

5.2.4 Literature review on protected area gazettement

The process of reviewing the literature was the same as detailed in Section 3.2.1. However, themes for the study explained in this chapter were related to historical facts and practices related to each of the three protected areas (e.g. Plumptre et al. 2007b, 2009b; Brown 2010; Crawford & Kujirakwinja 2016). Selected words and keywords such as the name of each reserve, gazettement, participatory mapping and management, zoning in the DRC were used.

5.2.5 Participant observation

Information was generated from my personal observations and experience in the region where I have been working for the last 15 years (see Section 3.2.1.4). I was involved in the gazettement of Itombwe from 2008 to 2016 (Kujirakwinja et al. 2018) and was one of the main facilitators in gazetting Kabobo. As detailed in Section 3.2.1.4, I attended three workshops during the time of my research (2015-2018) where some of the topics and issues related to the governance of protected areas in DRC were discussed.

5.3 Data Analysis

5.3.1 Timeline tools for key events

Timeline tools are qualitative methods that are used to report events (social, political, cultural) in different ways: chronological or sequential (Adriansen 2012).

To produce timelines for my research sites, historical information was collected from the literature (see Section 3.2.1.3) and from individuals - either during focus group discussions or

during discussions with key informants. Most information collected from diverse sources converged although communities could not remember precise dates of key events. I had to refer to the existing literature and key informants to link information. For example, while the Pygmies had a clear history of Okapi, they could not remember the dates of respective events.

Timelines were designed for each reserve and presented in tables (Table 5.1, 5.2, 5.3) to present the key events that might have facilitated the gazettement of the area. To ensure accuracy, draft timelines were shared with experts who have worked in the landscape for long period.

5.3.2 Descriptive statistics

Descriptive statistics were performed on the quantitative data focusing on proportions (percentages) of responses to questions for each reserve and a comparison was made between reserves or social categories (as detailed in Section 3.2.1.1). The comparison was made to understand what might have been the most effective process based on respondents' views (see Section 5.5.1, Figure 5.6). Percentages were generated by the total respondents for each protected area. Results were presented either using graphs or tables. For some variables (e.g., the involvement of stakeholders), data were presented by social categories (described in Chapter 3) including natives, non-natives, migrants and displaced people. For other data, results were presented by protected area.

5.4 Results and discussion on gazettement processes and shortfalls

5.4.1 Itombwe Nature Reserve[1]

5.4.1.1 Historical background

The history of Itombwe includes a combination of biological expeditions and conflict resolution activities related to its gazettement (Table 5.1, also Kujirakwinja et al. 2018). Itombwe is one of the protected areas in the DRC that has been extensively surveyed for biodiversity (Omari et al. 1999; Plumptre et al. 2007a; Greenbaum & Chifundera 2012). It is thought to have discovery opportunities for amphibians and small mammals, despite the ongoing degradation (Greenbaum & Chifundera 2012; Plumptre et al. 2015b).

The Itombwe is located in the eastern DRC that have been one of colonial mining hotspot and a theater of armed conflicts throughout the DRC history. This situation has never changed as

[1] The details related to the gazettement of Itombwe have been published in Oryx (see Appendix 4 Kujirakwinja et al. 2018)

the area is till home of ethnical armed groups and both legal and illegal mining (artisanal and industrial). This has had negative impact on both the biodiversity and local livelihood.

The Itombwe gazettement process was disrupted by conflicts of power and opinion among stakeholders and a lack of transparent engagement by facilitation parties (NGOs). Although most biological surveys involved the ICCN personnel before its gazettement, the ICCN established its operational base later after the legal gazettement of the reserve in 2007. The process was championed by the ICCN with the WCS and the WWF as main facilitators (*for detailed process see* Kujirakwinja et al. 2018).

Table 5. 1. Historical events describing key events that led to the gazettement of Itombwe

Dates	**Description of the event**
1900s	Discovery and description of the Grauer's gorilla (*Gorilla beringei graueri)* (Doumenge & Schilter 1997; Omari et al. 1999)
1950-1980s	Ornithological collection of birds by Prigogine (Prigogine 1977)
1959	Rapid biological surveys and identification of 17 key sites (maternity) of gorillas in Itombwe (Doumenge & Schilter 1997)
1990	Rapid expedition for biological surveys (Hart & Hall 1996)
1990s	Socioeconomic study in Itombwe by IUCN (Doumenge 1990) Provincial decision to protect the biodiversity of Itombwe Massif (Mubalama et al. 2013)
2002	Informal agreements between conservation actors and traditional chiefs to protect gorilla key sites (Yuma 2002, *pers. comm*.)
2000s	Biological surveys to assess the status of gorilla maternities and collect comprehensive data on large mammals (Mubalama et al. 2008)
2003	Meeting of stakeholders and the legal establishment of the Itombwe Technical Group (ITG) by the National Ministry in charge of environment (de Failly & Bandu 2010; Mubalama et al. 2013)
2006	Legal gazettement of the reserve without clear boundaries (de Failly & Bandu 2010; Kujirakwinja et al. 2010b)
2009	Stakeholders meeting to resume participatory boundary delineation and community involvement (Kujirakwinja et al. 2010b)
2010	Established presence of ICCN staff for Itombwe
2010-2016	Participatory process for gazetting Itombwe including boundary identification: data collection, community consultation and political process at the provincial level (Plumptre et al. 2009, 2013; Kujirakwinja et al. 2015)
2013	Establishment of the provincial consultative committee for forest for the South Kivu Province (Mubalama et al. 2013; Kujirakwinja et al. 2015)
2016	Legal recognition of agreed boundaries by the provincial governor (Kujirakwinja et al. 2018)

5.4.1.2 Key gazettement steps

Itombwe was legally gazetted in 2006 after a process that involved many disruptions by community leaders, human rights INGOs or traditional chiefs (Table 5.1). Consultations were launched by conservation INGOs before concluding the process at field level. The WWF negotiated the legal gazettement of the reserve with the minister in charge of environment (de Failly & Bandu 2010). This non transparent process generated a conflictual situation whereby local stakeholders supported by human rights NGOs withdrew themselves from the process and activities related to conservation, especially activities led by the WWF (de Failly & Bandu 2010; Kujirakwinja et al. 2010b). Communities were unhappy with the gazettement of Itombwe, which occurred before the completion of consultations, field visits and the validation of boundaries. Therefore, to solve the issue, the use of a conflict sensitive conservation (CSC) approach (see Hammill et al. 2009) that included participatory conflict analysis and management was helpful in revitalising the process (Kujirakwinja et al. 2010b, 2018). This influenced the participatory process later on to develop joint interventions overseen by a coordinated committee (see Section 5.4.5, also Mubalama et al. (2013)). The gazettement process of Itombwe included the steps described below.

a. Field research and biological surveys

Historically, research in Itombwe was focused on large mammals and birds, with some opportunistic collections of amphibians and reptiles, and some social studies. However, these studies did not cover all the villages (Prigogine 1977; Doumenge & Schilter 1997; Hall et al. 1998; Omari et al. 1999; Greenbaum & Chifundera 2012). Biological information for Itombwe was progressively collected by researchers (from different INGOs led by the WCS) and was used to inform the gazettement process (Plumptre et al. 2013). These surveys and socio-economic studies did not cover the entire landscape or reserve as data collection was localised and guided by key biodiverse areas (Hart & Hall 1996; Omari et al. 1999; Mubalama et al. 2008; Plumptre et al. 2010b). Biological and socio-economic information was used to inform the areas to consider for different zones to be included in the participatory mapping (Bisidi et al. 2008; Plumptre et al. 2013, 2015b). Local communities were involved in surveys and studies as guides, trackers and camp assistants (Hart & Hall 1996; Bisidi et al. 2008; Mubalama et al. 2008). Biological expeditions were used as opportunities to meet with community leaders and other stakeholders regarding the gazettement of the reserve (Mubalama et al. 2008, 2013; Plumptre et al. 2009).

b. Local stakeholders' consultations

The gazettement process of Itombwe included informal (during surveys) and formal (planned with locals) consultation meetings and workshops (Plumptre et al. 2010b). These workshops were attended by communities and leaders at local and provincial levels in different phases: consultations with local leaders, with the youth and the wider community consultations in different groupements (Kujirakwinja et al. 2018). The most important was the provincial stakeholder meeting that established the Itombwe Technical Group (ITG). The ITG adopted the participatory process and all participants signed the commitment act (Mubalama et al. 2013; Kujirakwinja et al. 2015). The process was disrupted in 2006, when the central government formally declared the reserve with support from the WWF (de Failly & Bandu 2010; Kujirakwinja et al. 2018) without involving local communities and civil society, and other conservation stakeholders. The unilateral legal gazettement of the reserve by the central government in 2006 suspended the process, as communities and their leaders did not approve any of the proposed boundaries (de Failly & Bandu 2010; Kujirakwinja et al. 2010b, 2018b). Moreover, the proposed boundaries were larger than the Itombwe Massif was and included towns and cities around the Massif (see Section 3.3.1). To resume the process, a conflict resolution process was initiated and included non-conservation stakeholders to ensure a transparent gazettement process (Kujirakwinja et al. 2010b, 2018).

Meanwhile, after more than two years of conflict resolution, involved parties agreed to work together through a joint committee for both planning and leading the process (for details see Mubalama et al. 2013; Kujirakwinja et al. 2018). As a result, the process resumed and community meetings and workshops aimed at ensuring that community rights and culture were considered to minimise conflicts between natural resource managers and communities (Bisidi et al. 2008; Inogwabini 2014; Kujirakwinja et al. 2018). Preliminary consultations with traditional chiefs and leaders were conducted during the early 2000s, while intensive consultations were held between 2008 and 2016 (Mubalama et al. 2013; Kujirakwinja et al. 2015, 2018). These consultations covered the identification of boundaries and conservation zones with expected support from protected area management.

c. Planning meetings as a response to the disruption of the process

As described above, conflict arose as a result of a lack of transparency, a lack of respect for established law and land grabbing from local communities (de Failly & Bandu 2010; Kujirakwinja et al. 2010b). Using the CSC approach, one to one mediation meetings, and a

large workshop, local stakeholders (communities, traditional chiefs and provincial government) and bridging organisations (NGOs and Civil Society) agreed to establish a joint coordination board (see Mubalama et al. 2013) to streamline the process and to ensure transparency and collaborative decision making (Kujirakwinja et al. 2010b; Mubalama et al. 2013). The committee was composed of conservation organisations, government representatives and civil society, as well as representatives from indigenous rights organisations. The committee piloted the process to ensure that both human and indigenous rights were included in the gazettement process with regular feedback to respective stakeholders (Mubalama et al. 2013; Kujirakwinja et al. 2018). Thereafter, planning meetings and field workshops were conducted by delegates from involved parties including representatives of traditional chiefs in respective zones.

d. Participatory mapping and zoning

The 2006 ministerial decree that created Itombwe had incorrectly identified the boundaries of the designated reserve (de Failly & Bandu 2010; Mubalama et al. 2013; Kujirakwinja et al. 2017). Therefore, it was critical that the boundaries were adjusted based on local settings and land uses (Kujirakwinja et al. 2010b; Mubalama et al. 2013). Activities implemented included: GIS (geographic information system) mapping based on biological data (Plumptre et al. 2013), the validation of maps at field level, the documentation of boundaries and the political validation of boundaries.

Designed maps were presented to local communities for discussions so that proposed boundaries could be adjusted and approved by local communities (Kujirakwinja et al. 2010b; Mubalama et al. 2013; Kujirakwinja et al. 2018). Results from the field were presented to provincial stakeholders (including local chiefs) for comments. After the approval of the maps, field teams together with communities collected geographic coordinates on the ground. Three zones were identified: the conservation zone, the development zone and the buffer zone (Plumptre et al. 2013; Kujirakwinja et al. 2018). At the time of writing this thesis, only the outer boundaries of the reserve were documented on the ground whilst less than 10% of the conservation zone has been physically marked.

e. Political meetings

To fulfil the forestry legislation related to the gazettement of protected areas (i.e. the forestry code of 2002, the ministerial decision of 2008 and the conservation law of 2014) provincial meetings were held to report back to provincial leaders on progress made. Initially,

conservation bridging organisations[1] (WCS and WWF) facilitated the establishment of the provincial body[2] to approve the gazettement of Itombwe. Political meetings were coordinated between the Itombwe joint committee and the provincial council. Political meetings included formal and informal consultations and workshops. Formal meetings and workshops aimed at building a constituency for the process, which targeted provincial authorities and others, which included provincial forestry services, government and civil society, were held to ensure that these actors were updated on the process. Meetings were also used as a political constituency to manage arising political conflicts and streamline the adoption of identified boundaries (Mubalama et al. 2013; Kujirakwinja et al. 2015).

f. The designation of the Itombwe zoning plan

Throughout the process, conservationists (especially the WCS) involved in the process noticed that the zoning did not consider key biological and physical elements; i.e. some taxa (i.e. amphibians), ecological processes and climate change, which were left out during the initial GIS mapping (Plumptre et al. 2009, 2013, 2014a, 2015b). Therefore, a desk-based modelling exercise was undertaken by the WCS (Plumptre et al. 2013) to propose a zoning plan that included key ecological features. The plan was shared with the joint committee, and subsequently discussed with communities for their inputs and approval (Plumptre et al. 2013). The plan proposed more than three zones given the level of fragmentation of some regions and the isolation of wildlife (Plumptre et al. 2013; Kujirakwinja et al. 2018). The plan was tested on a small scale in Mwana valley that was known to be important for Grauer's gorillas (*Gorilla beringei graueri*), chimpanzee (*Pan troglodytes schweinfurthii*) and elephant (Mubalama et al. 2008; Kujirakwinja et al. 2017) as well as being occupied by local communities. Throughout a two-years process, communities agreed to allocate part of their forests for conservation and defined three more zones: hunting, agriculture and multiple use zones (for non-timber forest products) and identified cultural sites regardless of zones (Kujirakwinja et al. 2015, 2018).

g. Key notes on gazettement process in Itombwe

[1] WCS and WWF were the two INGOs operating in Itombwe and interested in the gazettement of the Itombwe for its biodiversity as one of the biodiversity hotspots in Africa. Hence, they played the *de facto* role of facilitators. The human right organisations were amainly as third parties to ensure quality and transparent gazettement approaches are implemented.

[2] The provincial body is called provincial forestry consultative council (conseil consultative provincial des forêts – CCPF)

Itombwe was designated through a winding and conflictual process that included different stakeholders at various levels (Kujirakwinja et al. 2010b, 2018). The process included various tools such as GIS mapping, participatory mapping, and a conflict resolution process (see Section 5.4.1.2, also Kujirakwinja et al. 2018). The process was fueled by learning from mistakes and resistance from communities and politicians (Kujirakwinja et al. 2010b, 2018). As for most ACM processes (see Armitage et al. 2008; Trimble et al. 2015a), the Itombwe learning loops included single loops where actors learn from consequences to change techniques and enhance their capacity (see Reed et al. 2010) when dealing with political issues that impended the process. Therefore, the facilitating team developed a proactive monitoring system to overcome political interferences and influences regularly. For Itombwe, the learning side of the process included four key elements of protected area gazettement in the DRC.

Firstly, the gazettement processes of protected areas in the DRC are not linear despite descriptions and prescriptions either by law (forestry code and conservation law) or by specific technical organisations (e.g., Dudley 2008 for zoning). Secondly, the gazettement processes should include discussions related to social and economic spaces with local social groups who interact with local ecosystems to benefit from their support and ownership of future interventions. Such an approach will avoid conflicts over identity (see below) and values. Thirdly, a good understanding of traditional systems and land tenure (right-holders and power-holders) is important. In the Itombwe case, such an inclusion of local context and values would have helped to avoid conflicts and delays in legal gazettement. As explained in Section 5.4.1, the limited understanding of local traditional systems in Itombwe led to the delay of the process. Instead of involving clans and local leaders, facilitators included traditional chiefs who did not have decisional power with regard to land. Fourthly, it was recognized that stakeholders involved in the gazettement processes have different interests (i.e. conservation of the landscape; protection of indigenous and human rights; and political agenda) that should be taken in account. However, the way these interests might change in future has been ignored by conservation stakeholders. Fifthly, conflict resolution should be considered as part of the gazettement process. Such an integrative process could generate spaces for learning and enhance collaboration. Finally, political factors should be included from the inception of the process to ensure successful gazettement and conflict management. The inclusion of community rights and access to natural resources were among the

motivators for community support of the gazettement of Itombwe (Kujirakwinja et al. 2015, 2018).

5.4.2 Kabobo Wildlife Reserve

5.4.2.1 Historical conservation information

Kabobo is a protected area that was created through a participatory process (see Section 4.3) involving stakeholders from local to national levels. Key conservation events related to the gazettement process are summarised in Table 5.2.

As for most protected areas in the DRC (see Chapter 4), the conservation of Kabobo has been associated with political/armed/tribal conflicts, resource extraction and cultural alienation (Koning 2010; Spittaels 2010b; Weyn 2010). Plumptre et al. (2007) report how the area was destabilised by recurrent wars and prone to immigration after independence. The same situation was observed later (2012) when pastoralists and farmers from other regions occupied part of the massif and changed existing land patterns (Crawford & Kujirakwinja 2016).

Table 5. 2. Historical events in the Kabobo gazettement process

Dates	Events
1950s	Birds and amphibians explorations – not linked to the gazettement process (Plumptre et al. 2007b)
1975	Kidnapping of American researchers in the Kabobo Massif by Laurent-Desiré Kabila (Plumptre et al. 2007b)
2003	Biodiversity information assessment: Identification of Kabobo-Luama as important sites for biological prospections to feed the Albertine Rift database (Plumptre et al. 2007a)
2006-2007	Biological surveys of Kabobo highlands (Plumptre et al. 2007b) with the discovery of six new species and hundreds of unidentified plant species (Fischer et al. 2017)
2008	Socio-economic surveys (Plumptre et al. 2009)
2009	Community consultations and stakeholders' workshops (Kujirakwinja et al. 2010b)
2010	Participatory mapping for boundary identification and marking
2012	Stakeholders' workshops Biological surveys with the discovery of one new plant species (Leal 2014)
2012	Political meetings at provincial levels
2013	Stakeholders' workshops
2014	Participatory mapping to adjust boundaries and Ngandja Nature Reserve separated
2015	Regional political meeting (South Kivu and Katanga
2016	Stakeholders' workshop and establishment of the local governance committee
2016	Provincial legal gazettement of the reserve

The Kabobo gazettement process was motivated by results from the desk review on the biodiversity of the Albertine rift (Plumptre et al. 2003, 2007a). The research demonstrated the high endemism and diversity of species in Kabobo Massif and the limited availability of biological information (Plumptre et al. 2003, 2007a). The gazettement process was enlightened by the aerial vegetation surveys that showed a continuous forest interrupted by highland savanna grasslands with low to no human occupation. The gazettement process started in 2007 with the biological surveys (see Section 5.4.2.2) and informal consultations (Plumptre et al. 2007b).

The targeted area was initially intended to be a regional national park (NGAMIKKA named after four hills - Ngandja, Misotshi, Kabili, Kabobo) covering two provinces (South-Kivu and Katanga, now Tanganyika) (Kujirakwinja et al. 2010b). However, the regional process was captured by the local political elite and leaders (including those from the ICCN and

provincial ministries) for unrevealed goals. For example, the area was gazetted regardless of insufficient consultations and participatory mapping both inside and outside of the reserve (WCS, unpublished report). Consequently, Kabobo was designated for Tanganyika and Ngandja Nature Reserve (herein Ngandja) for South Kivu province. Ngandja covered the northern portion of the former NGAMIKKA. It was legally declared in July 2016 (at provincial level) with limited community involvement. However, as my research focused on Kabobo located inTanganyika, this report does not include information about Ngandja.

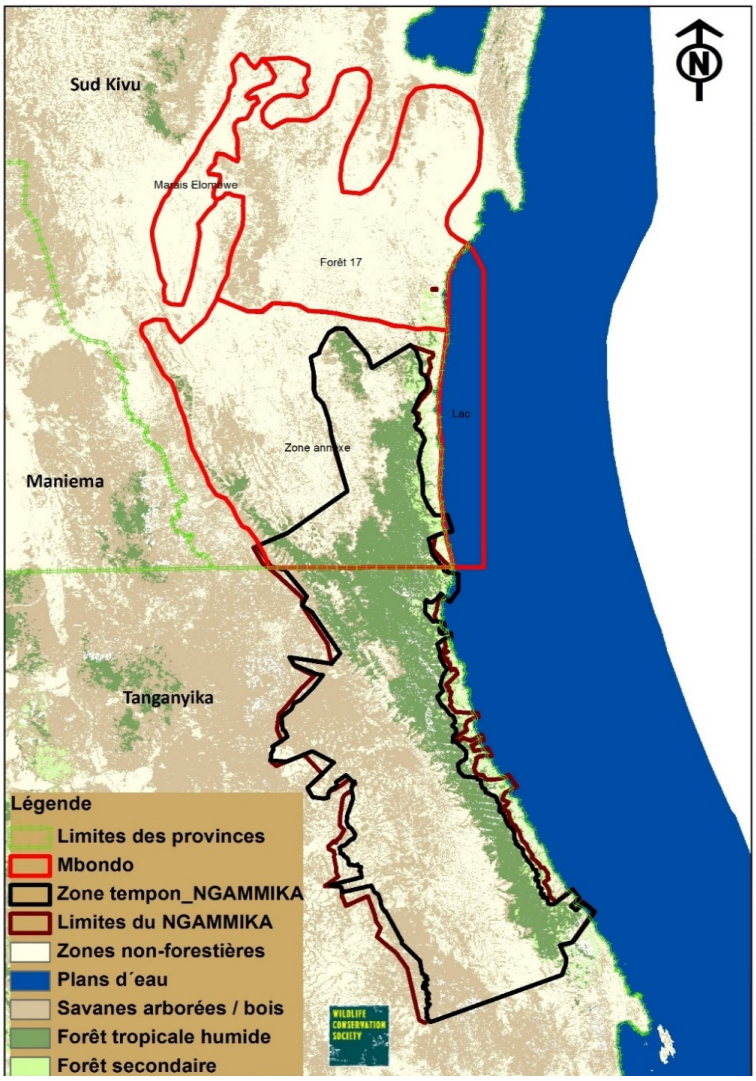

Figure 5. 1. Map showing Ngandja Reserve (red lines) and Kabobo (black)

5.4.2.2 Gazettement process of Kabobo

The gazettement process in Kabobo was driven by external stakeholders (the WCS) with the active involvement of governmental structures including the ICCN headquarters, the provincial government, the provincial forestry department and traditional local chiefs

(Plumptre et al. 2008; Kujirakwinja et al. 2010b). The main goal was to protect biodiversity and ensure the long-term functioning of the Kabobo ecosystems. The key components of the gazettement process are outlined below.

a. Biodiversity and socioeconomic surveys

Initial biodiversity surveys were conducted between the 1950s and 1970s on birds and amphibians with no protection interventions in the area (Mayr 1957; Plumptre et al. 2007a; Greenbaum & Chifundera 2012). A comprehensive biodiversity survey was conducted in 2007 (updated in 2012) (Plumptre et al. 2007b; Leal 2014). Biological surveys conducted in 2007 and 2012 did not cover the whole region due to security reasons and because of funding constraints (Plumptre et al. 2007b). Among other results from the survey, six new species were discovered and included four small mammals and two amphibians (Peterhans et al. 2013a, 2013b), more than a hundred unidentified plant species (Plumptre et al. 2007b) and one new plant species (Fischer et al. 2017). The 2007 surveys were broader than just classical biological surveys and included informal interviews with community leaders and elders to reconstruct the history of Kabobo and collect feelings about the long term protection of the area (Plumptre et al. 2007b). During these surveys, communities requested support from the WCS for the protection of their cultural heritage that was threatened by immigrants (Plumptre et al. 2007b). In 2008, socioeconomic studies were conducted to assess local livelihoods and attitudes towards the gazettement process (Plumptre et al. 2009). Key results from these informal interviews included the need to conserve the area and to ensure that the conservation interventions include livelihood strategies to overcome local poverty and the isolation of the region.

Results from these studies (biological and social-economic) guided the participatory zoning process of the reserve and identified key access rights indications, key resources to be accessed and the preferred governance mode.

b. Local consultations

As described above, informal consultations started during biodiversity surveys to initiate dialogue regarding the protection of the massif (Plumptre et al. 2007b; Crawford & Kujirakwinja 2016). Consultations with communities and leaders were done at four administrative[1] levels: village, groupement, chefferie and provincial levels. Meetings held at

[1] The administrative subdivision in DRC includes villages at local level. The *groupement* is an administrative entity that includes a number of villages. The *chefferie* (chieftaincy) is a decentralised unit that includes a

local level were set to avoid that the gazettement and related issues were based on leaders/elite views as representatives of communities, but rather on those directly coming from the villagers (Kujirakwinja et al. 2010b). More than 9,000 people were engaged in discussions around the landscape, including pygmies and women. Meetings were held to gather the communities' opinions about the creation of a protected area and identify possible boundaries and their rights over resources within the proposed boundaries. Local consultation meetings were continuous as the participatory process was based on the conflict sensitive conservation approach (Hammill et al. 2009; Kujirakwinja et al. 2010b).

Stakeholders meetings involved natural resource (land and forest) right-holders[1] and power-holders at middle level (groupement and chefferie). Supporting groups such as civil society and local organisations were considered as stakeholders. Thereafter, further stakeholders meetings were held regularly at least once to thrice a year based on challenges and activities that had been implemented (Kujirakwinja et al. 2010b, 2013). They were held to share the development of the process and to clear existing blockages towards the gazettement of the area.

c. Participatory mapping

Local communities and stakeholders approved the gazetting of the area but requested that zoning be conducted to ensure access to natural resources and cultural sites (Kujirakwinja et al. 2010a). The mapping process followed the proposed legal documentation supplemented by the conflict sensitive conservation approach. The process included three steps, although it was not a linear process (Kujirakwinja et al. 2010a).

The first step was the identification of zones based on key IUCN guidelines (Dudley 2008), local resource use and human settlements. Three main zones (the conservation zone, the buffer zone and the development zone) were identified and marked. Despite the ongoing discussions among conservationists in the DRC about mining in Kabobo, three artisanal mining sites were requested as a separate extractive zone to be considered.

The second step was the boundary marking using GPS (Global Positioning System) units for landmarks and the future physical marking of boundaries. Data collection was conducted by WCS staff and community representatives. This step was followed by the validation of

number of groupements. Kabobo is covered by one chefferie. The chefferie is the traditional entity run by a chief supported by 'small traditional chiefs' at local level.

[1] Communities and chiefs of villages are recognised as right-holders by traditional culture while traditional chiefs as decision makers are power-holders together with governmental agencies.

boundaries (maps) at local level after fieldwork and at provincial level after entering GPS coordinates on the computer for mapping (Kujirakwinja et al. 2013).

The last step was the physical boundary marking with local community representatives, selected by villagers based on recommendations from local meetings with chiefs, as a measure to stop the invasion of the conservation zone. All this was done before the legal gazettement of the area. This process was repeated thrice (2009, 2010, 2014) to adjust boundaries to changes happening on the ground, as human settlement and land uses were changing due to immigration.

d. Political meetings and legal gazettement of Kabobo

The gazettement process of Kabobo lasted for more than 10 years due to the unstable political environment and political conflict of interests between conservation and mining (Crawford & Kujirakwinja 2016). Whilst required processes and steps were completed on the ground and approved locally by traditional chiefs, the provincial government did not establish the CCPF[1] that was supposed to approve the gazettement for legal designation. Therefore, the area remained unprotected with a negative impact on its resources and ecosystems.

Regular meetings (quarterly) were held with traditional chiefs around Kabobo to discuss key threats to local ecosystems and possible interventions at local level. Meetings were attended by traditional chiefs (intermediate level), provincial forestry department[2], civil society and local universities. The aim was to encourage traditional chiefs to enforce traditional regulations and motivate the forestry department to enforce forestry law within convened zones.

Engaging communities and traditional chiefs was not enough for the legal gazettement of Kabobo, as the official gazettement needs political buy in and approval. Therefore, to meet legal requirement the political process was launched by establishing the approval body (CCPF). The CCPF chaired further meetings at different stages of the process to assess progress, evaluate political implications and complications. Meetings were held at provincial level and involved provincial authorities including the governor's cabinet, the provincial ministry in charge of environment, provincial members of parliament, the forestry and mining services and civil society and traditional chiefs.

[1] CCPF – *Conseil consultative provincial des forêts (Provincial forestry consultative council* in charge of technical evaluation of gazettement processes – They are established in each province.
[2] The Forestry Department is in charge of unprotected forest and a key player in the current gazettement process in the DRC. It is empowered to pilot the process as directed by existing laws

The legal gazettement of Kabobo was finalised in December 2016 by the provincial governor of Tanganyika. It was finalised after a supplementary two months of community consultations by provincial authorities, the forestry department and civil society to ensure that the reported information was still valid and approved by local communities.

e. Local governance structures

One of the key recommendations from local stakeholders was to ensure that the political delay of the gazettement of the reserve did not result in the high degradation of the reserve. In 2012, traditional chiefs decided to have regular meetings to ensure that the decisions made were implemented to protect the reserve. In the meantime, based on the DRC community conservation strategy (see Section 4.3.3), the WCS facilitated the establishment of community governance structures at village and groupement levels. To ensure that these structures were supported by established administrative structures, traditional chiefs were members of these structures. To support local governance structures, traditional chiefs (groupements) decided to establish a local governance committee (LGC)[1] to oversee the governance of the reserve and respond to the increasing deforestation and degradation of key ecosystems. The structure was legally created by the territorial administrator and recognised in the gazettement act of the established Kabobo. The LGC was supposed to act as the counterpart of the ICCN for the management of the reserve. I have been facilitating the development of the agreement to be signed and also the guiding documents for the co-management of the reserve.

5.4.2.3 Key notes on Kabobo gazettement

The gazettement of Kabobo was conducted based on CSC (Hammill et al. 2009; Kujirakwinja et al. 2010b) as well as the current conservation laws and policies. The gazettement of Kabobo was motivated by the richness of its biodiversity, the local community's willingness to preserve their heritage, and the commitment of conservation NGOs, essentially the WCS. One of the reasons for the communities supporting the gazettement of the reserve was to stop incoming migrants destroying their heritage for financial returns (Crawford & Kujirakwinja 2016).

The approach for gazetting Kabobo was based on ACM principles that included CSC (Crawford & Kujirakwinja 2016). The process was inspired by previous gazettement and

[1] Factsheet in Appendix 3

zoning processes (Kujirakwinja et al. 2010b) and especially included learning from the mistakes and successes of gazetting protected areas (Itombwe, see Section 5.4.1) and designing zones (Okapi, see Section 5.4.3) (Kujirakwinja et al. 2010b).

The process was inclusive and multi-scale to minimise contestations and conflicts. Consultations were made from lower levels (villages) to gather resource users' opinions and requirements, to national levels. For example, boundaries were defined by local communities at village levels while validation and its gazettement involved traditional chiefs and political leaders. Moreover, the boundary designation was adjusted regularly based on the local requirements and changes happening due to incoming migrants. The process included informal local governance mechanisms to protect the reserve as a response to the ambiguous political support (Ostrom 1999; Sabatier & Weible 2007).

The gazettement of Kabobo can be seen as the most participatory process compared to Itombwe and Okapi that reflected inclusion and process was well grounded in local SESs.

5.4.3 Okapi Faunal Reserve

5.4.3.1 Historical information

Before the arrival of the colonials, natural resources were governed by traditional rules and customary regulations within specific traditional boundaries (see Chapter 4) (Rösler 1997; Mercader & Brooks 2001; Rodary et al. 2003; Tshombe 2007; Cioc 2009; Brown 2010). As shown in Table 5.3 below, the history of the conservation of Okapi was dominated by the extraction of natural resources, migration, the degradation of its biodiversity by armed conflicts and the permanent presence of armed groups within the reserve (Vlassenroot 2008; Beyers et al. 2011; Nangini et al. 2014). This has been happening since the 1960s (Mulele rebellion) until now (Turnbull & Chapman 1948; Peterson 1990; Nzongola 2002; Bouwer 2010).

Table 5. 3. Historical events of the Okapi faunal reserve including the gazettement

Date	Key events
1901	The taxonomic description of okapi by Karl Erickson from two skulls collected in Virunga National Park and received from Harry Johnston (for whom the okapi is named – *Okapia johnstoni*) (Kümpel et al. 2015)
1927	P. Putnam establishes his base in Epulu (a camp that people refer to as "hotel") and the Okapi Capture and Breeding Station (Hart 1978; Brown 2010). He conducted research on pygmies. His work was published in 1948 (Turnbull & Chapman 1948; Turnbull 1965)

Date	Key events
1950	Jean de Medina established the Okapi Capture Station and was hired by the colony to run the elephant training station in Epulu (Stiles 2010; Pouillard 2016). As a hunter, he trained elephant while providing wildlife specimens to European zoos Establishment of the capture and breeding station for different species including okapi, elephant, antelopes. Establishment of wildlife capture zones and the prohibition of hunting in those areas
1950s	C. Turnbull conducted studies on pygmies and published his book "The Forest People" (1961) which has been criticised for incoherencies as far as the description of the social life of forest people is concerned (Turnbull 1961)
1964	Mulele rebellion and the slaughtering of okapi and other wildlife in the Okapi Capture Station with severe impact on the infrastructure (Nzongola 2002)
1970s to 1990s	Various research projects in Ituri forest based at the Okapi Capture Station. Main research targeted okapi ecology, archeology and anthropology – focusing on pygmies and their social relations with other groups. Among them Terese and John Hart who spent more than 30 years in the Okapi Faunal Reserve (Hart 1978; Hart & Hart 1986; Mercader 1995; Mercader & Brooks 2001)
1980s	Rehabilitation of the Okapi Capture Station
1982 to 1988	Conservation NGOs interventions supporting the Okapi Station that was managed by the ICCN[1]: the WCS (Wildlife Conservation Society), the WWF (World Wide Fund), the GIC (currently WCG (Wildlife Conservation Global) and FZS[2]
1989 to 1992	Consultation meetings with traditional chiefs and local leaders regarding the gazettement of the forest by the International NGOs and representatives from the ministry (Brown 2010) Legal gazettement of Okapi by the ministry in charge of environment (Tshombe 2007; Brown 2010)
1994	Biological surveys in the central zone of Okapi (Hart & Hall 1996)
1996	Okapi declared by UNESCO as a World Heritage Site (WHS)
1996 - 2002	Armed conflict and occupation of the area by the Ugandan army backed rebellion – intensive natural resource exploitation and regional trade (ivory, minerals and timber) within the reserve (Hart & Hart 2003; Beyers et al. 2011; Maisels et al. 2013)
1997	Okapi declared a WHS in danger by UNESCO based on the impact of the armed strife after the fall of the Mobutu regime (Hart & Hart 2003; Inogwabini et al. 2005)
2000s	Integration of the landscape approach in Okapi to minimise the degradation of the forest and enhance community involvement (Yanggen et al. 2010) Zoning process approach developed and tested for agriculture zones (Brown 2010)
2006-2007	Evacuation of the illegal miners from the reserve under the instigation of Provincial Government Authority (Beyers et al. 2011)
2012	Murder of 15 okapi individuals (sort of sabotage) in the rehabilitated zoo by Morgan[3]'s armed group. This was another bad situation where ICCN lost control

[1] ICCN stands for Institut Congolais pour la Conservation de la Nature (DRC protected area Authority)
[2] FZS stands for Frankfurt Zoological Society
[3] Morgan was the head of a branch of the Simba armed groups that was operating in the Okapi FR, mainly involved with the ivory trade and illegal gold mining

Date	Key events
	over the forest and illegal mining and ivory trade resumed in the area (United Nations Group of Experts 2014). Invasion of illegal miners in the reserve and general insecurity due to the presence of armed militias around the Epulu station
2015	A provincial order was given to the ICCN with the support of the army to force miners to move out of the reserve. About 10,000 people evacuated the area
2016	Agreement act signed with community regarding the boundaries of the core conservation zone in the middle of the reserve.

5.4.3.2 Key gazettement steps

The establishment of part of the Ituri forests as a reserve (Okapi) in 1992 was motivated by its social-ecological importance (see section 2.3.3) at local, national and international levels (Turnbull & Chapman 1948; Wilkie et al. 1998; Tshombe 2007; Brown 2010). Moreover, its designation (presidential decree) was motivated by the presence of okapi (*Okapia johnstoni*), large elephant (*Loxodonta n. africana*) population, and its continuous monodominant forest, all of which need to be protected (Mercader 1995; Makana et al. 2011). Furthermore, the World Heritage Committee (twentieth session – 1996) recommended its recognition as a WHS in 1996 for its biodiversity values (okapi), floral diversity, and cultural diversity. The process of its gazettement was top-down and based on previous research studies and driven by individual researchers and INGOs.

Its gazettement was championed by the ICCN and supported by INGOs, especially the WWF, the WCS and the FZS. Its management was under the ICCN, even before its declaration. The gazettement process of Okapi is detailed below.

a. Field research studies

Okapi is one of the protected areas where archeological and anthropological, archeological and a few ecological studies conducted revealed the cultural and ecological importance of the area, and recommended its protection (Wilkie & Curran 1991; Mercader 1995; Rösler 1997; Stephenson & Newby 1997). Most initial research focused on pygmies and their interactions with other community groups (Turnbull & Chapman 1948; Turnbull 1961, 1965; Hart 1978; Hart & Hart 1986). Anthropological research and archeological studies (i.e. Mercader et al. 2000) confirmed the long term presence of hominids in the forest and the use of different tools (Mercader 1995; Rösler 1997; Mercader & Brooks 2001). Ecological research followed later as part of conservation interventions (Hart & Hall 1996; Dino et al. 2008). For example,

biological surveys were conducted in 1994 for some regions of the reserve and further surveys were conducted later (Hart & Hall 1996; Dino et al. 2008).

b. Okapi capture station

As described in Chapter 3, different kinds of protected areas were established in the DRC not only to protect degraded landscapes and depleted species but also to respond to the passion of colonial leisure activities (i.e. hunting and tourism) and research (de Saeger 1959; Verschuren 1975; Van Schuylenbergh 2009; Pouillard 2016). Okapi was one amongst several areas that were designed for leisure through the establishment of a capture station and elephant training (Turnbull & Chapman 1948; de Saeger 1959). It was established during colonial times (1950s) for sports hunting, tourism and live specimens of okapis for European Zoos. To avoid the impact of local hunting, two major zones were established by the okapi capture station manager (Brown et al. 2008; Brown 2010).

Therefore, the okapi capture station represented the first move towards the establishment of the Okapi and zoning (see Section 5.3). It was maintained as capture zone until its gazettement as Okapi in 1992.

c. Local consultations and meetings

During focus group meetings, communities reported that there were initial discussions with selected local chiefs regarding the formal gazettement of the Okapi (Tshombe 2007; Brown 2010). Although conservation informants have confirmed the transparency of the meetings, communities considered these meetings as informative and further discussions were to follow. Thus, meetings with communities held before the creation of the reserve were mainly focused on environmental education to protect key species and forest around the zoo (capture station). Following consultations with selected chiefs, a wider workshop was held and attended by community representatives (especially all the traditional chiefs), conservation INGOs and a representative from the central government (Ferraro et al. 1997; Tshombe 2007; Brown 2010). For the conservation actors, 'results from these meetings were considered as final approval from the communities' reported most of the informants. But, 'communities considered these meetings as the initial steps before any decision could be taken', said a villager.

d. Legal gazettement of the reserve

The legal act gazetting the area specified the outer boundaries of the reserve, but did not indicate other zones to be considered (Tshombe 2007; Brown 2010). Zoning and related

management options were left to the ICCN to decide on community rights, access and resource use (Mercader 1995; Stephenson & Newby 1997). Although villages were included in the official boundaries of the reserve, no displacement of people occurred. Instead, zoning of the reserve was used as an option to allocate land to local communities (*see below*).

e. Participatory zoning

Although the Okapi was proclaimed in 1992, there was some informal zoning, especially related to hunting and fishing (Turnbull & Chapman 1948; Turnbull 1961). During focus group discussions, Pygmies reported that, during the 1940s, informal conservation zones were established by the station manager with the agreement of the communities. It separated capture zones from areas to be accessed for resource extraction, including hunting. That was done in accordance with the local culture (Stephenson & Newby 1997; Brown 2010). However, the proposed zones were neither marked nor systematically designed.

After the legal gazettement of the reserve, three zones were suggested to reconcile ecological needs, social-cultural needs and economic needs (agriculture zone) (Stephenson & Newby 1997; Tshombe 2007; Brown 2010)

The participatory zoning started in the early 2000s with one agriculture zone as a test, which was refined later to be applied to the entire protected area (Tshombe 2007; Brown 2010). The process was expanded later to cover conservation and hunting zones. The process was based on the landscape approach (Sanderson et al. 2002) implemented by NGOs and funded by the United States Agency for International Development (USAID) in the Congo Basin (Yanggen et al. 2010). The approach aimed to respond to the degradation of forest and biodiversity loss in larger areas beyond the protected areas and to establish community-based natural resource management (CBNRM) (Sanderson et al. 2002; Yanggen et al. 2010; Brown & Makana 2014) (CBNRM processes are not part of this research).

The methodological approach for zoning comprises 15 steps (see Brown 2010, p.16 - 17) including initial contacts for awareness and socio-economic surveys to effective participatory mapping and marking. Zones were established based on demographic variables (household size), fallow period and the average size of farms per household per year for agriculture zones (Brown 2010). Regarding hunting and the conservation zones, limited biological information was considered (Wilkie et al. 1998; Dino et al. 2008; Brown 2010). Although zones were established with communities, some conflicts were reported by local communities during my focus group discussions about resource user rights, the size of agricultural zones and the

ineffective enforcement of local agreements. These conflicts have continued despite the establishment of dialogue committees in each village to deal with any issue related to resource uses (Tshombe 2007). Okapi is one of the pilot sites for community involvement and the establishment of community governance committee. However, to date, relationships between communities and conservation organizations are still conflictual with limited support of community to conservation (*pers. observation*).

5.4.3.3 Key notes on the process

Okapi suffered from the effects of colonisation through the exportation of live wildlife specimens (Mercader 1995) and later on the area suffered, and is still suffering, from armed conflicts and the illegal extraction of resources (Beyers et al. 2011; Gaynor et al. 2016). The establishment of Okapi happened during the early times of the conservation paradigm shift in the DRC, (see Section 4.3.2) although the gazettement process did not fully involve communities and local stakeholders.

Although communities were consulted later and they consented to maintain the reserve, conflicts over natural resources have been reported for the last three decades (Beyers et al. 2011). The main drivers of conflict were the changes in the local valuation of natural resources by communities and access to the market for key resources including minerals and wildlife products. Moreover, access rights for local communities to natural resources were not defined neither by law nor during the initial zoning steps (Redford & Fearn 2007; Tshombe 2007; Brown 2010). The guidelines defining access rights were developed by conservation actors with little involvement of communities.

The establishment of multiple use zones (hunting, agriculture) was expert-driven and focused on biodiversity with limited ecological information. Moreover, it did not consider immigration as an influencing factor of resource extraction.

The zoning process was one of the measures used to respond to the issue related to access rights for communities. It was not part of the gazettement process. The zoning process implemented for agricultural zones in Okapi has been used and improved for the gazetting of other protected areas, including Itombwe and Kabobo (see Section 5.4.4, also Kujirakwinja et al. 2010b).

The zoning of Okapi should be updated to consider social-ecological changes happening within the region. As for most ACM processes, zoning in Okapi should consider social

factors (e.g., migration) and access rights based on existing social dynamics. In addition, conservation and hunting zones should consider ecological factors such as wildlife populations and the need for proteins and carrying capacity for hunting zones. Moreover, the zoning of Okapi should consider social (governance structures, capacity building) and financial costs for the management of respective zones (Albers et al. 2017).

5.4.4 Gazettement process in DRC

As described in Chapter 4, the gazettement of protected areas was conducted before the 'post-modern period' without legal provisions guiding the processes. At the creation of Okapi for example, consultations with communities was not part of the process although prospecting for land tenure and rights was required by the land act (see Figure 5.2, also Harroy 1993; Pouillard 2016).

With the evolvement of conservation practices, (see Section 4.4) some forms of involvement of communities were taking place. For example, while conservation practitioners reported 'full consultations' before the gazettement of Okapi, community members denied this. One of the participants reported during group discussions that 'only some traditional chiefs were consulted before the legal gazettement of the reserve'. The same can be highlighted for Itombwe where a lack of transparency and cooperation between local stakeholders and the WWF delayed the gazettement process (Kujirakwinja et al. 2010b, 2018).

Indeed, environmentally related policies and laws did not propose any step-wise process. The laws and policies emphasise the key information required to gazette protected areas legally (Box 5.1).

Required information before gazetting protected areas

1. Ecological information
2. Socioeconomic studies
3. Consultations with communities
4. A comprehensive map of the area
5. The approval from the CCPF

Box 5.1. Legal required information to gazette protected ares in DRC. These elements are drawn from the ministerial decree and conservation law

Figure 5.2 includes different steps that were implemented to gazette the respective protected areas. As reported in section above, the three protected areas did not follow same steps and bridging organizations did not use the same approach or put same efforts for data collection. Gazettement steps include biological information, socioeconomic parameters, consultations with local residents and approval by right-holders.

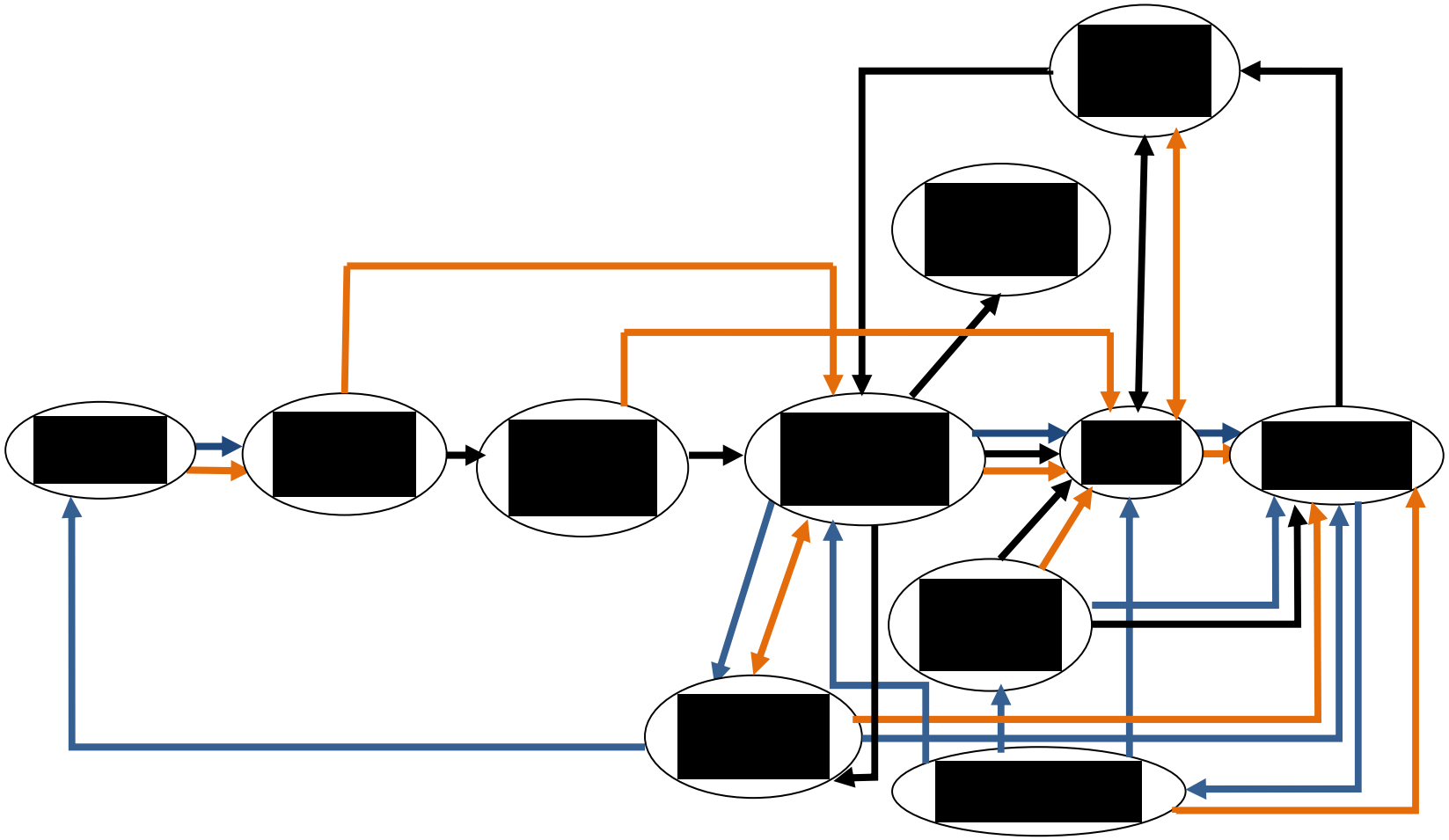

Figure 5. 2. Gazettement processes of Okapi (Blue), Itombwe (orange) and Kabobo (Black). Steps include biodiversity surveys, selective studies, socioeconomic information, community consultations and workshops. The gazettement process includes ecological and socio-economic surveys to inform on biodiversity and social, economic and cultural features. Results from surveys have to be shared with communities (consultations) either through direct consultations (villages) or representation (leaders). Consultation meetings are held at different levels (local, regional and national) either for zoning, mapping or to fulfill legal requirements.

As for other countries and based on existing ACM evaluation frameworks (see Trimble et al. 2015a; Plummer et al. 2017), the gazettement and zoning processes of protected areas in the DRC are essentially based on social-ecological settings (see Figure 5.2). However, for most of the gazettement processes, only biodiversity information was considered whereas ecological processes were not included. To ensure that the process complied with existing laws, socioeconomic information was collected but the extent of these studies varied from one area to another (e.g., Bisidi et al. 2008; Plumptre et al. 2009b). Consultations with local right-holders and resource users are required by law to prevent future conflicts between protected area managers and communities as well as local power-holders. Especially, to ensuring that access rights of local communities are considered throughout and specific agreements designated collaboratively.

One of the weaknesses of the gazettement processes of the three protected areas is that they relied on existing (but incomplete) social and ecological information: inadequate biological information and inaccurate knowledge of local institutions and systems (see Section 5.4). Indeed, despite the existence of legal requirements, the involvement of communities and their leaders in the three protected areas were not similar (see Figure 5.2). Hence, processes and approaches differed, which had an impact on the level of participation and support of locals with regard to conservation interventions (see Chapter 7). The perceptions of local communities towards these gazettement processes are provided in the next section.

5.4.5 Local perceptions of communities towards gazettement processes

The gazettement processes of the three protected areas were reported by respondents to have involved local communities and local chiefs (Figure 5.3), although with different levels of engagement.

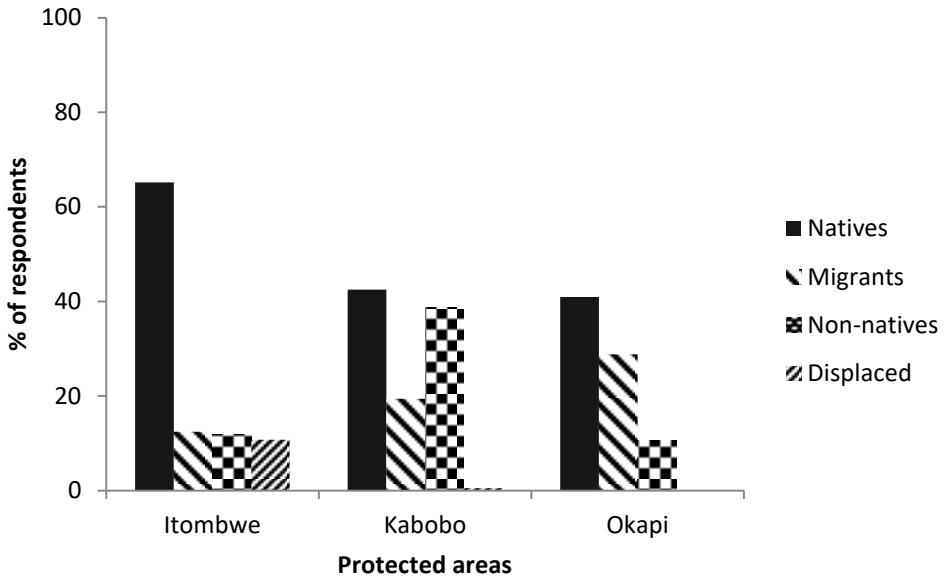

Figure 5. 3. Percentages of local residents by social categories (see section 2.3.2.1) agreeing to be involved in the gazettement of Itombwe (n= 178), Kabobo (n= 217) and Okapi (n=132)

More native dwellers (65%, n=116) reported being involved in the gazettement process of Itombwe. Other social categories, that is non-natives (n=21), migrants (n=22) and IDPs (n=19), were equally involved (12% each). Itombwe was the only reserve that involved IDPs in the gazettement process. One of the reasons could be that IDPs in Itombwe mixed with non-natives during consultations as they belong to the same tribe (see Section 5.4.3.2).

Natives (43%, n=90) and non-natives (39%, n=84) reported being the most involved in the gazettement process of Kabobo compared with migrants (19%, n=42). Although the gazettement of Kabobo took long (more than 10 years), most of the steps were finalised before the arrival of migrants in the area (Kujirakwinja, pers. com). This was confirmed by results from focus group discussions where a participant said, "that he does not know where the boundaries of respective zones are located and he was not part of the validation process of boundaries because he arrived in the area recently".

The majority of the respondents (81%, n=106) in Okapi reported being involved in the zoning process of Okapi. However, natives (41%, n=72) and migrants (29%, n=44) respondents were more involved than non-natives were (11%, n=16).

Despite the perceived inclusiveness of the processes, some members of local communities were not aware of the management zones established in these protected areas (Figure 5.4).

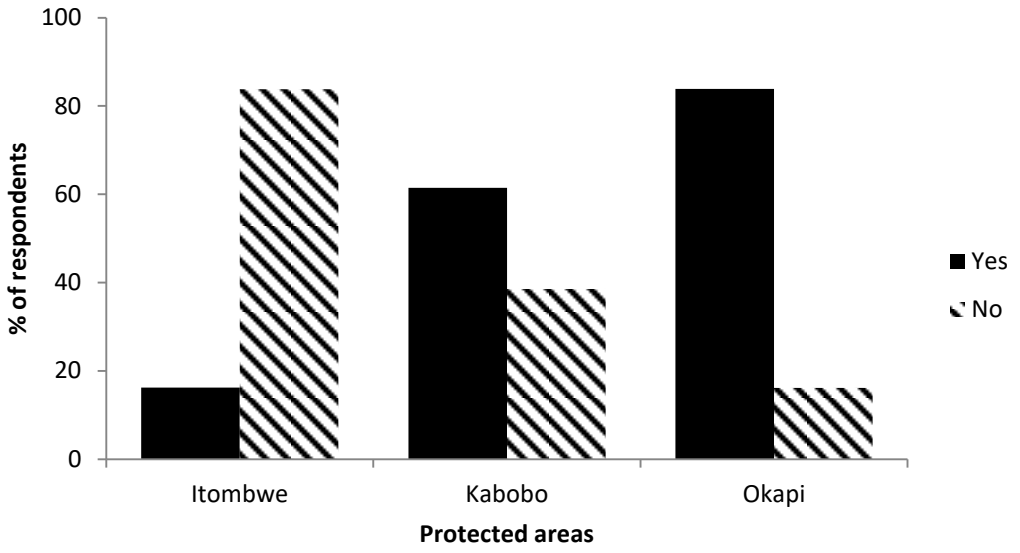

Figure 5. 4 Percentages by protected area of respondents who were aware of the existence of conservation zones in their respective protected areas (Itombwe, n=197, Kabobo, n=218, Okapi, n=149).

Communities were more aware of management zones in Kabobo (61%, n=134) and Okapi (84%, n=125) than Itombwe (16%, n=32). This might be related not only to the participatory approach but also essentially to the physical marking of specific zones. In Itombwe, the zones were documented but not marked. However, although in Kabobo, residents were aware of respective zones they reported, "the need of changing boundaries given the thickness of the buffer zone and development zones as the population is increasing". In Okapi, one of the participants in discussions reported, "Although we were not involved in the initial gazettement of the reserve, we were involved in the establishment of different zones".

Figure 5.5 reports on the level of involvement of communities in the process of establishing boundaries.

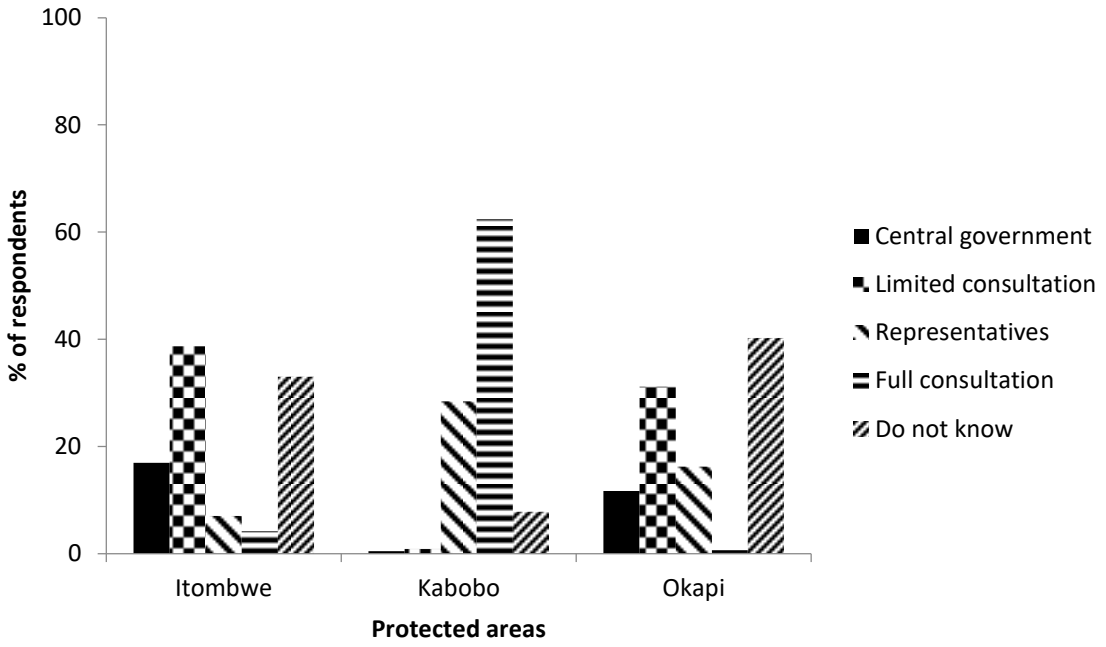

Figure 5. 5. Percentages of local residents reporting on how the gazettement processes of respective protected areas were driven: the central government decision or through participation (full, limited or through representatives) (Itombwe (n=212), Kabobo (n=218) and Okapi (n=154)).

Itombwe respondents reported a low level of consultation (39%, n=82) and the influence of the central government (17%, n=36) while 33% (n=70) of the communities did not know how the process was conducted. However, more than half of the respondents (62%, n=136) in Kabobo reported that the process was conducted through full consultations and with representatives (28%, n=62) (see Section 5.2.3.3). The role of the central government was low. In Okapi, 40% of the respondents (n=62) did not know about the gazettement process although some members (31%, n=48) of local communities recognised consultations, the involvement of community representatives (16%, n=25) and the role of the central government (12%, n=18).

The gazettement processes in the three reserves involved various stakeholders (Table 5.4) including local chiefs (villages), representatives of right-holders (family/representatives of clans), villagers, community representatives (i.e. social groups and civil society organisations) and educated people (elite). Although the level of involvement of stakeholders varied among protected areas, it is clear that traditional chiefs were the most involved in gazettement processes (Table 5.4.).

Table 5. 4. Percentages (by stakeholder) of respondents reporting their feeling – agree, disagree and neutral – about the level of inclusion based on social groups involved in gazettement processes in the three protected areas.

	Itombwe (n=207)			Kabobo (n=208)			Okapi (n=180)		
	Agree	Somewhat	Disagree	Agree	Somewhat	Disagree	Agree	Somewhat	Disagree
Local chiefs	61	6	33	98	1	1	51	22	27
Villagers	36	11	53	88	12	0	44	22	34
Representatives	51	6	43	95	5	0	61	18	22
Elite	64	4	32	71	24	1	29	26	45

As reported earlier (see Figure 5.4), the majority of respondents confirmed the inclusion of diversified stakeholders. The table above shows that respondents from Itombwe reported that communities (villagers) were not fully involved whilst the process involved mostly traditional chiefs (including their relatives - clans) as well as representatives and educated people.

The Kabobo process included all stakeholders, although traditional chiefs were the most involved (40%) alongside social representatives. In Okapi, respondents felt that they were not involved in the process as much as the educated people (see Section 7.3.3). The involvement of communities was lower for Okapi compared to other two protected areas. Traditional chiefs and representatives were the most involved in the zoning processes. In addition, respondents reported on how the process was conducted and who might have been the main facilitating agents (Figure 5.6). For some respondents, the process was conjointly led by either ICCN and NGOs or by ICCN, NGOs and traditional chiefs.

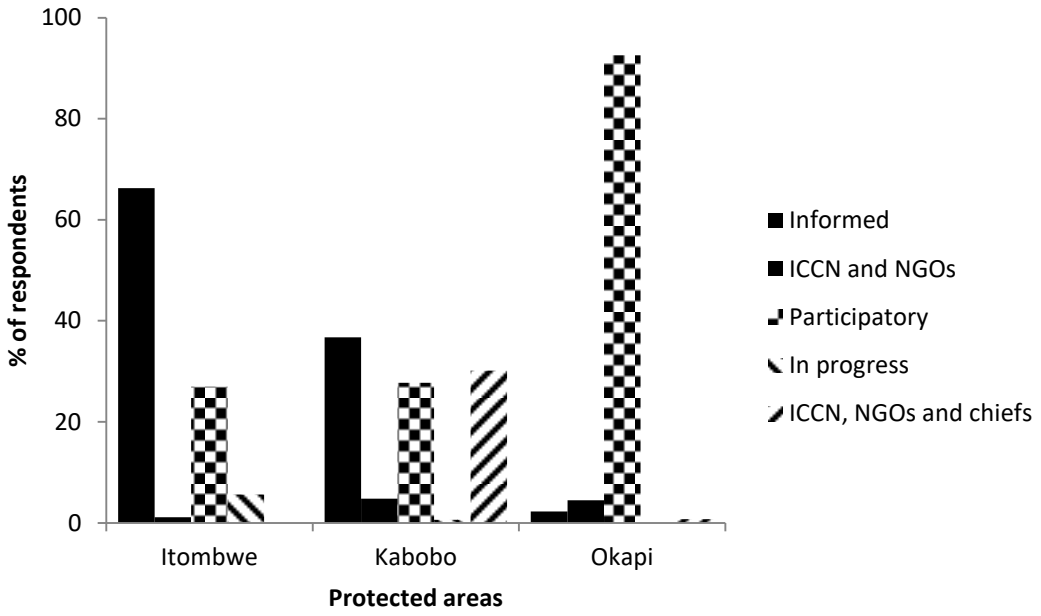

Figure 5. 6. Percentages of respondents (by protected area) reporting how the management zones were designated or who were the main involved parties in respective protected areas.

The majority of respondents from Itombwe (66%, n=59) regardless of their social category (see Section 3.3.2.1) reported that they were informed about the gazettement/zoning process. Fewer respondents (27%, n=24) recognised that the process was participatory.

For Kabobo, the process was multifaceted as some respondents were informed (37%, n=61) while others recognised that the process was inclusive. The process was essentially led by the ICCN, conservation NGOs and traditional chiefs (30%, n=50).

Although the gazettement of Okapi was reported to be a top-down-led process (Figure 5.4) zoning processes were participatory (93%, n=124), even though the gazettement process was facilitated by the ICCN and conservation NGOs. During our focus group discussion in Okapi, most participants (including Pygmies) reported that zones were defined by ICCN and NGOs and they were involved in marking the boundaries. Moreover, boundaries were approved by authorities who were far away from their landscapes.

5.5 Discussion

As in most ACM processes, the gazettement processes in the three protected areas had different forms of participation with iterations for some steps (see Figure 5.2, also Armitage et al. 2007, p.5). Information gathering and consultations were continuous throughout the

gazettement processes in all three protected areas to respond to emerging issues (e.g., representativeness of communities, internal power dynamics in communities) and blockages (e.g., political context and security). The gazettement process in Kabobo was built on learning from Itombwe (Kujirakwinja et al. 2010b), Okapi (Brown 2010) and the CSC approach (Kujirakwinja et al. 2010b, 2013, 2018). Indeed, continuous information gathering is one of the ingredients of the ACM approach as far as learning and conflict resolution are concerned (Armitage et al. 2007; Reed et al. 2010; Plummer et al. 2013). For example, gazettement processes involved various social groups (see Table 5.4) although the level of involvement varied from one protected area to another. One of the reasons might be that the gazettement of Itombwe and Kabobo was learned from the Okapi zoning process (Kujirakwinja et al. 2010, 2013, and Figure 5.4, 5.5).

This is one of the limitations raised by various scholars (Arnstein 1969; Plummer & Armitage 2007; Butler et al. 2015; Larsen & Brockington 2018) regarding ACM interventions whereby bridging actors (mainly NGOs or elites) may overprotected areas local communities (Figure 4.5), implement interventions based on their objectives and hijack collaborative process. This is referred to in participation literature as 'the dilemma of participation' as described by Callahan (2007a, p.166). Indeed, she associates the dilemma of participation with satisfaction and information within social groups (see Section 7.2 on the importance of personal satisfaction in the self-determination theory). These dilemmas are associated with the size of the group, exclusiveness or opposition, risk, time and technology/expertise (Callahan 2006).

As for most ACM approaches where expert facilitators are needed (Plummer et al. 2017b), the gazettement processes of protected areas in the eastern DRC were facilitated by INGOs, although the role of the central government varied from one protected area to another. My results (see Figure 5.5) show that the more the central government is involved the fewer there are other stakeholders (see Figure 5.5). In my opinion, Kabobo seems to be the best gazettement model because its process aligned with the DRC required outputs (Figure 5.1) and aligned well with ACM principles (Box 3.1). Moreover, the gazettement of Kabobo benefited from field experiences related to the conflict management approaches implemented by the WCS in various protected areas (Kujirakwinja et al. 2010b, 2013, 2018).

The gazettement processes of the three protected areas were implemented through 'participatory' processes using either the collaboration strategy with a variety of existing social-political stakeholders and/or opposing decision-makers (selecting powerful

stakeholders to decide on protected areas) (Nelson 2006; Larsen & Brockington 2018). Whilst collaborative processes required more time because it was based on trust and relation building, and resources (e.g., Kabobo), the latter strategy that may have seemed quicker generated conflicts and mistrust (e.g., Itombwe). I argue that protected areas established through powerful stakeholders are prone to conflicts and the degradation of protected areas (Kujirakwinja et al. 2010b; Tranquilli et al. 2014). However, protected areas established through full collaboration are demanding in terms of finances, time and technical resources.

As for most ACM processes that involve multiple stakeholders and their diversified interests, gazettement processes and conservation zones were perceived differently by respondents (Figure 5.5). The local perception about zoning was influenced by the level of involvement, the types of stakeholders involved and the physical delineation of management zones (Figure 5.3). The zoning process in Okapi ranked higher because of the participatory approach implemented after its creation and the physical marking of agricultural zones (Brown 2010). In contrast, the zoning process in Itombwe was expert-driven and essentially included traditional chiefs and the elite (Kujirakwinja et al. 2018). In Kabobo, the zoning process seemed to be a combination of stakeholders and the marking of zones.

5.6 Conclusion

ACM processes imply learning and the adjusting of interventions (Reed et al. 2010; Fabricius & Currie 2015). From my research, I argue that the gazettement of protected areas in conflict or post-conflict regions should consider conflict resolution and political ecology frameworks that should reconcile conflicting interests and balance power between stakeholders (Armitage et al. 2007; Fabricius & Cundill 2015; Plummer et al. 2017b). Conservation practitioners reported the Itombwe and Okapi gazettement processes as being participatory (Bisidi et al. 2008; Yanggen et al. 2010).

With regard to the three protected areas, my research revealed that participation, types of stakeholders involved in gazettement and zoning processes and the recognition of specific user and access rights are the major determinants of positive or negative perceptions of local communities towards gazettement processes (see also Oldekop et al. 2016). Moreover, the gazettement process is not a linear exercise and should consider changing factors (Trimble et al. 2015a) as well as incoming actors.

I argue that Kabobo is considered as the best model for ACM application in DRC. The gazettement process of Kabobo was flexible, sensitive to conflicts and regularly adjusted to changes and claims from resource users and leaders. The success of these processes relied on the continuous commitment of bridging organisations for financial and technical support, as well as the commitment and engagement of local traditional chiefs (Berkes & Davidson-Hunt 2006; Trimble et al. 2015a; Plummer et al. 2017b). As for most collaborative processes, the participatory gazettement processes of these protected areas took a long time (about 10 years) and resources to partially achieve their goals (Callahan 2006, 2007; Armitage et al. 2009). None of the three protected areas has fully completed the gazettement nor the zoning (that includes physical marking) despite the long time this has been spent.

Chapter 6. Ecosystem services and local livelihoods in the eastern DRC's protected areas

6.1 Introduction

Since the emergence of the notion of ecosystem services (ES) with the Millennium Ecosystem Assessment (MEA) (Millenium Ecosystem Assessment 2005b), a lot of studies have drawn attention to the role of ES in improving livelihoods (Millenium Ecosystem Assessment 2005a; Mertz et al. 2007). These studies assert that ES have sustained and continue to support social and cultural systems worldwide (Turner & Daily 2008; Haines-Young, Roy; Potschin 2013; Potschin & Haines-Young 2013). Hence, ES contribute to the well-being of people if kept in healthy conditions (Millenium Ecosystem Assessment 2005a; Chan et al. 2006). Current developments of the ES paradigm have included not only instrumental and intrinsic values but also the intangible values of ecosystems that consider relational and place values (Potschin & Haines-Young 2016; Cundill et al. 2017). The evolvement of the ES approaches is associated with the emerging ACM processes that include interactions between humans and nature, access rights to resources, regulatory systems and learning processes (Reed et al. 2013).

Current directions have included the ecosystem services cascade approach (Potschin & Haines-Young 2016; Dick et al. 2017) as an analytical tool based on 'the production lines' (Saarikoski et al. 2015; Potschin & Haines-Young 2016). The ES cascade considers that for ecosystems to continuously deliver services and, goods and benefits, there is a need to minimise identified pressures, maintain ecosystem processes, and establish effective governance regimes (Primmer et al. 2015; Potschin & Haines-Young 2016). This is especially important because ES are shaped by anthropogenic and political factors all over the world with negative or positive tradeoffs (Potschin & Haines-Young 2016; Dick et al. 2017). My research on the DRC's protected areas is one of the cases where ES have been affected by anthropogenic activities (see Chapter 2, Figure 2.1) and governance systems (see Chapter 4) that included a range of social-political pressures (see Chapter 2, Figure 2.1). Hence, my thesis refers to the cascade framework to understand how the valuation and use of resources from protected areas may affect SES. Many changes happening in the DRC's SESs were not only linked to internal pressures (resource exploitation for livelihoods and local trade), and external pressures (immigration, armed conflicts, extractive industries), but also to

the ineffective governance of protected areas and the influence of international stakeholders (see Trefon 2004, 2009).

As described in Section 3.1, the DRC holds about 60% of the Congo Basin tropical rainforest which is recognised to be important for ES at local and global scales (Nlom 2011; Ernst et al. 2012; de Wasseige et al. 2015). The DRC's forests provide numerous services and benefits to local, national and international communities (de Wasseige et al. 2015). At the local level, ecosystems maintain livelihoods (e.g., land, forest, income), providing several benefits and products to local communities for their everyday uses (de Merode et al. 2004; Nlom 2011; de Wasseige et al. 2015). At regional and international levels, the DRC's ecosystems have been threatened by the ongoing growing demand for raw materials (minerals, timber and non-timber forest products) regardless of their conservation status (e.g., protected areas or World Heritage Site) and values (Batware 2011; Katunga 2011; Ernst et al. 2012; Luca et al. 2012; Malhi et al. 2013; also Section 2.3). In addition, the governance and management of key ecosystems in the DRC have been reported to be ineffective (Trefon 2008). Despite the existence of conservation and environmental laws and policies, their implementation has been weak and inexistent for some regions. Predominant corruption and inappropriate political governance have also been identified as key drivers for the degradation of key ecosystems regardless of their contribution to local livelihood (Trefon 2004, 2011, 2013). For example, despite legal restrictions regarding mining activities, rivers have been polluted by mining companies within and outside protected area without any compensation and restoration plans (Potapov et al. 2012).

Moreover, whilst the DRC's forests harbours more species than other countries in the Congo Basin (Bele et al. 2015; de Wasseige et al. 2015), the trade of high priced wildlife species and products (e.g., elephant) have been documented in the three protected areas for a long time (Peterson 1990; Nzongola 2002; Cioc 2009; Beyers et al. 2011; Maisels et al. 2013).

Protected areas in the DRC have been affected by resource users and the increasing demand for natural resources. These uses have had a negative impact on human well-being and biodiversity (Ernst et al. 2012; Malhi et al. 2013; Willemen et al. 2013; de Wasseige et al. 2015). Some protected areas have been degraded and some are failing to deliver adequate and appropriate ecosystem benefits and services (Counsell 2006; Trefon 2008; Burnley 2011; Long 2011). For example, most aquatic and terrestrial ecosystems have been depleted of their species (e.g., hippopotamus, elephant, chimpanzee) and their functioning capabilities have

been affected (Maisels et al. 2013; Kujirakwinja et al. 2016; Plumptre et al. 2016b). For example, the decline of the hippopotamus population has been suspected of having had a negative impact on fisheries (Mosepele et al. 2009; Kujirakwinja 2010). Therefore, understanding how resources are valued and used and how the governance of resources has evolved throughout time might guide future management regimes and governance processes.

6.2 Aims of the chapter

This chapter describes the ES framework, the traditional and current use of key products and the importance of key ecosystem services and benefits for local communities. My aim is to understand how ecosystem services and benefits are valued and managed through history by communities in the eastern DRC's protected areas. I also aim to address issues related to the rules and regulations for access to specific goods and benefits. Finally, I aim to show what resources and products are important to local livelihoods in their respective landscapes.

To achieve these objectives, this chapter is organised to answer the following questions:

- How do communities value the benefits and goods from ES associated with protected areas?
- How are rights and access to ES determined, and how have these changed in the three protected areas?
- How have the access rights/governance of ES affected the benefits gained by communities from ES throughout history?

This chapter targets the understanding of the flows and the governance of ES in the eastern DRC. Moreover, I want to understand what services and benefits are important for communities involved in the three protected areas, who the key decision-makers are, and how they access goods and products.

6.3 Conceptual framework: ES and the cascade framework

The ESF (see Section 3.2) has become the *de facto* tool to understand the linkages between ecosystems and human well-being (Potschin & Haines-Young 2013). But also to evaluate ecosystem outputs for the sustainability of both ecosystem services and livelihoods (Haines-Young, Roy; Potschin 2013). The MEA (2005), which popularised the concept, defines ES as '*benefits that people obtain from ecosystems'*. ES include provisioning, regulating, cultural

and supporting services (Millenium Ecosystem Assessment 2005a; Potschin & Haines-Young 2013).

Since the MEA, various scholars and researchers have amended the original ES classification in response to specific needs and criticisms (e.g., Haines-Young & Potschin 2009; Yang et al. 2016). For example, the Economics of Ecosystems and Biodiversity (TEEB) initiative categorised ecosystem services into more categories (provisioning, regulating, habitat and cultural) than the MEA framework (TEEB 2010). The goal was to facilitate the economic valuation of ecosystems and biodiversity (TEEB 2010; Potschin & Haines-Young 2013; Saarikoski et al. 2015). Other studies have adapted and improved the framework by applying it to different systems and topics such as protected areas, agroecosystems and biodiversity, mapping and participatory processes for valuation (Chan et al. 2006; Zhang et al. 2007; de Groot et al. 2010; Palomo et al. 2013).

One of the frameworks that has been widely applied on the ground is the cascade framework (Haines-Young, Roy; Potschin 2013; Haines-young & Potschin 2018). The cascade framework categorises ecosystem services based on production chains. It includes ecosystem structures, processes, functions and services (Saarikoski et al. 2015; Haines-young & Potschin 2018). It emphasises the role of policies and governance structures to minimise pressures on ecosystem structures and processes that provide products and resources. This framework was used by scholars (e.g., Saarikoski et al. 2015; Dick et al. 2017) to assess different ecosystem services and their valuation by communities for their livelihoods. As such, it is crucial to acknowledge the impact (positive and negative) of access rights, governance mechanisms and policies on the state of ecosystems and their contribution to the local human well-being (Grunewald & Bastian 2015). However, the failure of governance and management mechanisms to regulate exploitation and establish exploitation thresholds negatively affects ecosystems, expected services and benefits to communities (Bennett et al. 2015; Chan et al. 2016).

More than the MEA framework, the ES cascade framework (Figure 6.1) considers provisioning, regulating and cultural services, and benefits (Haines-Young & Potschin 2009b).

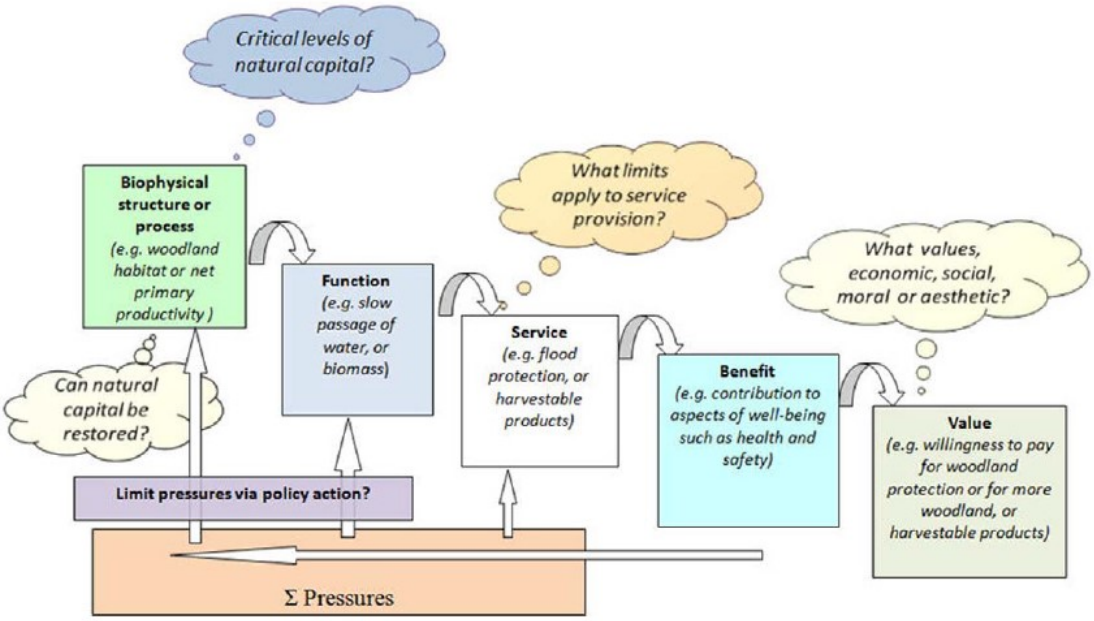

Figure 6.1. The cascade framework as adapted by Potschin-young & Haines-young (2011) that includes functions, services and pressures

It also includes the interconnection of services (functions, structures and processes) that are characterised as supporting services with reference to nature (Haines-Young, Roy; Potschin 2013; Potschin & Haines-Young 2013). Indeed, the understanding of properties and characteristics of ES and how the latter contribute to the human wellbeing are key leading primes (de Groot et al. 2010; Dick et al. 2017). Dick et al. (2017). As a response to pressures on ES, adequate decisions and policies, as well as appropriate structures have are important to ensuring the sustainability of ecosystems and human well-being (Chan et al. 2006; Haines-Young & Potschin 2010; CGIAR 2014; Grunewald & Bastian 2015). To contextualise the framework, Potschin and Haines-Young (2013) suggest three different approaches (habitats, systems and places) linked to functions, structures and processes (see Potschin & Haines-Young 2013).

Potschin et al. (2003) recommend a place-based approach for local scale studies to ensure that key contextual factors affecting ecosystems are better understood (Hein et al. 2006; Grunewald & Bastian 2015; Primmer et al. 2015). The place-based approach includes the values of ES as well as the way users assign importance to services and benefits. Moreover, the place-based approach considers past changes and future visions, as well as policy and alternative management (Hobbs et al. 2009; Potschin & Haines-Young 2013).

This approach is supported by current discourse on the relational value of ecosystems (Chan et al. 2016; Cundill et al. 2017) that considers identity, policy and social norms in the ES analysis. Thus, the analysis of ecosystem services and benefits should include issues related to access rights, governance and policies. As such, results from this approach may assist design management systems and governance regimes that respond to the access rights, policies, sustainability and the health of ecosystems (Potschin & Haines-Young 2013).

I opted for the place-based approach for my research to unpack the services, benefits and management of these ecosystems and future directions. Therefore, I distinguish ecosystem services from goods and benefits based on places and resources (Haines-Young & Potschin 2010; Haines-Young, Roy; Potschin 2013). I assessed how resource users valued and still value ecosystems, related services based on their cultures (autochthonous[1] and immigrant) and benefits (Primmer et al. 2015; Cundill et al. 2017).

Key elements explored include choices of local patterns and uses of ecosystem services, changes that have happened throughout historical times, the involvement of communities in conservation processes and local regulations to access and use resources (Salles 2011; Potschin & Haines-Young 2013; Primmer et al. 2015; Chan et al. 2016).

6.4 Methodology

As detailed in Section 3.3, Chapter 3, I used household questionnaires, focus group discussions, key informants and personal observations. For this chapter, data were collected through closed-ended Likert-item questions and open-ended questions. The Likert-item questions had three levels including good or agree, fair or neutral and bad or disagree. The results are presented using social categories[2] for some services and benefits that may influence, and be influenced by, different users based on their categories. For example, income generated by communities is presented according to ES categories and according to protected areas (see Table 6.2).

For the open-ended questions, responses were coded based on themes to enable quantitative analysis and comparison between protected areas. As for other chapters (5, 7), where

[1] Autochthonous is considered in its original sense of people who originate from a place. It does not refer to the current global political meaning (Bellier & González-González 2015)

[2] Social categories for this research included natives who belong to families that identify themselves as originated from the area, non-natives whom ancestors migrated in the region before and during the colonial times, migrants as recent (after the independence) incoming people from different regions and settled in the area and, internally displaced peoples (IDPs) who have temporarily settled in the area as a response to the insecurity in their regions or villages

appropriate, results are supported by key informants' opinions and focus group discussions. Focus group discussions were grouped according to protected area-based on key themes (see Appendix 3). Quotations were extracted from audiotapes based on rights, access and the historical uses of products and resources. Finally, household incomes were calculated to understand what ES were important for specific products and resources for each protected area and to identify key entry points.

6.4.1 Traditional access rights and governance of ES

I was interested in the traditional management and governance of specific products and benefits used by communities in the protected area over time: the recent period (0-10 years), intermediate (11 - 20 years), past (21-30 years) and older periods (more than 30 years). I considered three main products (honey, timber and wildlife) that were identified as the main products for local livelihood (see Section 6.5.2) by communities and key informants in the three protected areas during the testing of the questionnaire.

Data were collected on access to key services and benefits (land, forest, forest products, bushmeat and settlement) that were based on social categories (see Section 3.3.2.1) and local access modes (see Section 6.5.3) in the three protected areas. Respondents were asked to explain the local rules to access each product and resource, including traditional system conditions, such as the payment of a tribute and the purchase of products.

6.4.2 Valuing ecosystem services

Based on the geographical approach to analyse the ES (Potschin & Haines-Young 2013), they were categorised as places, resources and goods. These categories have been associated with the Common International Classification of ES Goods and Services that considers provisioning, regulatory and cultural services (see Table 6.1). I focused on eleven places and resources because they were identified by communities as being the most important for the area (see Table 6.1). Although Table 6.2 presents all the 11 ecosystems for each protected area, I report on the four most important places and resources based on respondents' choices.

Key ecosystems, ecosystem services and benefits included land for farming and livestock; timber for firewood and construction; and non-timber forest products, especially honey, bushmeat and medicinal plants. I selected the types of services, benefits and resources based on information on local needs and uses as well as studies and reports from each area (Bisidi et al. 2008; Plumptre et al. 2009). Rivers, mountains and caves were identified as sources of

cultural services, whereas other services and benefits were related to livelihood income and subsistence. Table 6.1 shows the 11 goods and benefits in their respective ES categories.

Table 6. 1. Selected ecosystem products, benefits and services categorised according to geographical categories (places, resources and goods) (Potschin & Haines-Young 2013) and the Common International Classification of Ecosystem Goods and Services (provisioning, cultural)(Haines-young & Potschin 2018)

Items	Geographic categories	ES categories
Rivers[1]	Place	Provisioning and cultural
Caves	Place	Cultural
Firewood	Resource	Provisioning
Timber	Resource	Provisioning
Honey	Resource	Provisioning
Bushmeat	Resource	Provisioning
Medicinal plants	Resource	Provisioning
NTFPs	Resource	Provisioning
Minerals	Goods	
Land (agriculture)	Place	Provisioning
Land (pasture)	Place	Provisioning

These ES were ranked by respondents from 1 to 11 by importance (1 being the most important and 11 the least important) (see Section 6.5.1, Table 2). To easy comparison amongst protected areas, I decided to consider four highly ranked services and/or benefits by respondents (see Table 2).

6.4.3 Livelihoods assets

For livelihoods, I assessed the total mean income for livestock and agricultural activities by protected area and by social categories where applicable. In addition, I assessed the domestic use of key resources such as bushmeat, agricultural products, timber products and non-timber forest products. For the bushmeat for example, I targeted key animal species found in these protected areas and hunted for meat. The study excluded small animals (amphibians, birds, etc.), insects and reptiles. Respondents were asked to list species hunted in their areas, the frequency of hunting, the distance from the village to the hunting location (forest or around villages). Uses included subsistence, cash, and reinvestment (see questionnaire, Appendix 1). For data analysis, I used T-test to compare livelihood incomes among social categories and

[1] I refer to rivers as a set of ES associated with multiple uses of rivers

between protected areas. For the same data, I also calculated standard errors for the mean income by social category.

6.5 Results

6.5.1 Ecosystem services and their importance to the eastern DRC communities

The results for this section report on the 11 important services and benefits selected by respondents (Table 6.1). Table 6.2 presents the ranking of ecosystems, ES and benefits based on their importance to respondents with the four most important highlighted.

Land, rivers, minerals and bushmeat ranked higher compared to others based on the total proportion of respondents by importance (1-4). Despite existing literature on NTFPs and controversies about resources to be included in this category, for the purpose of my research I focused on protected areas, I decided to exclude bushmeat, honey, medicinal plants and firewood in the NTFP group. Key resources included in NTFPs included liana, mushrooms, grass, wild fruits.

Table 6.2. Ranking of ES (total percentage by choice) by geographical categories (places, resources, goods) based on the choice of respondents (percentages) for the importance of ecosystems for their livelihoods (including relational values) by protected area.

Categories		**Itombwe**				
		1	**2**	**3**	**4**	**Rank**
	Items	**(n=174)**	**(n=162)**	**(n=107)**	**(n=86)**	
Places	Land (agriculture)	**58**	24	8	9	**1**
	Land (pasture)	13	**35**	7	5	**2**
	Rivers	9	4	**26**	17	**3**
Resources	Firewood	1	9	25	**30**	**4**
	Bushmeat	10	13	12	15	**5**
	Medicinal plants	1	6	8	13	**6**
	Timber	1	2	5	6	**7**
Goods	Minerals	6	5	7	2	**8**
Places	Caves	1	0	0	0	**9**
Resources	NTFPs	0	1	2	1	**10**
	Honey	0	1	0	1	**11**
		Kabobo				
		1	**2**	**3**	**4**	
		n=222	**n=223**	**n=216**	**n=222**	
Places	Land (agriculture)	**74**	20	1	1	**1**
	Land (pasture)	2	**30**	33	10	**2**
Resource	Firewood	0	3	**25**	34	**3**
Place	Rivers	15	30	15	**22**	**4**
Resources	Timber	3	9	10	12	**5**
	NTFPs	0	0	12	9	**6**
	Bushmeat	0	2	1	5	**7**
	Medicinal plants	0	1	0	4	**8**
Goods	Minerals	6	4	1	1	**9**
Place	Caves	0	0	0	0	**10**
Resource	Honey	0	0	1	0	**11**
		Okapi				
		1	**2**	**3**	**4**	
		(n=159)	**(n=155)**	**(n=150)**	**(n=77)**	
Places	Land (agriculture)	**75**	10	4	3	**1**
	Rivers	13	**42**	26	12	**2**
Resources	Firewood	4	17	**29**	28	**3**
	Bushmeat	2	11	11	**24**	**4**
Place	Land (pasture)	5	10	6	11	**5**
Resources	Timber	0	7	16	10	**6**
	Medicinal plants	2	1	4	6	**7**
	Honey	0	2	1	0	**8**
Goods	Minerals	0	0	2	5	**9**
Place	Caves	0	0	0	0	**10**
Resource	NTFPs	0	0	0	0	**11**

Overall, although respondents from the three protected areas valued places, resources and goods differently (see Table 6.2), land for farming and rivers were the most important for the three protected areas. Firewood was the common important resource for the three protected areas (see Table 6.2). Land for livestock was the important place for both Itombwe and Kabobo respondents while bushmeat was one of the two important resources (see Table 6.2). For example, NTFPs were highly valued in Kabobo compared to Itombwe and Okapi, while honey was highly valued in Okapi compared to the other two (see Table 6.3).

Results from open-ended questions revealed that for the three protected areas, land and rivers were valued for both their cultural values and extractive values. For example, the extractive value of rivers was associated with fishing and gold mining. The cultural value was associated with myths. Land was also valued for its extractive value (farming and livestock) although it was also important for the cultural identity of respondents.

6.5.2 Use and access to ES

6.5.2.1 Historical use of ES

Respondents were asked to report on how key resources (timber, honey and bushmeat) were used throughout historical times (see Section 6.4.1) for the three protected areas (Table 6.3).

Table 6.3. Percentage (%) of respondents reporting historical uses[1] of three forest main forest products (timber, bushmeat and honey) in the three protected areas from the past to the present (see Section 6.4.1)

		Itombwe (n=132)			Kabobo (n=222)			Okapi (n=137)		
Period		Honey	Bushmeat	Timber	Honey	Bushmeat	Timber	Honey	Bushmeat	Timber
Current	Subsistence	63	51	69	17	35	13	46	16	10
	Local trade	12	23	5	1	2	1	0	2	2
	Both	25	26	26	82	64	86	54	82	89
Recent	Subsistence	90	71	85	21	42	15	43	12	5
	Local trade	8	27	12	1	1	0	0	2	3
	Both	2	2	3	78	58	85	57	87	92
Inter-mediate	Subsistence	94	82	92	43	61	13	33	8	5
	Local trade	2	14	2	1	1	0	2	2	0
	Both	4	4	6	56	38	87	65	90	95
Past	Subsistence	93	86	93	56	71	19	17	7	7
	Local trade	2	9	0	1	0	0	2	2	0
	Both	5	5	7	44	29	81	82	92	93
Historical	Subsistence	93	86	93	58	73	21	18	16	16
	Local trade	2	9	0	1	0	0	2	2	0
	Both	5	5	7	41	27	79	80	82	84

[1] Subsistence uses included consumption of products at household level, as well as their uses for cultural purposes. Local trade covers quantities of products sold or exchanged with neighboring villages and towns.

About half of respondents of Itombwe reported that the three ES products were used for local subsistence throughout history (Table 6.3). However, a few changes were noted from the past (93% of respondents) to current times (63% of respondents) where local trade in the three resources has increased (See Table 6.3). In addition, results show that subsistence uses of these resources have declined from the past to the present. Finally, local trade in honey and bushmeat has increased more than trade in timber (see Table 6.3). For example

In Kabobo, more than half of respondents reported that most resources were used for subsistence and local trade over the times. The use of honey and bushmeat has changed from subsistence (58% to 17% of respondents) to both subsistence and local trade of the forest ES. The multiple usages of the resources might have been encouraged by the improvement of the road and the arrival of migrants along the boundaries of Kabobo.

A participant in the focus group discussions in Kabobo reported, “changes were related to unregulated immigration, poor governance and management of resources” (see Section 7.4). These changes were related to extractive practices and uses of natural resources (e.g., vegetable farming, hunting with dogs, timber exploitation using chain saws), as well as the trade of ES with neighboring cities and towns. Another participant added, “Changes happening in Kabobo were related to corruption of public agents and the need of money by traditional chiefs”. For example, one participant reported, “Traditional chiefs are interested in what immigrants pay them to access resources (tributes) than the impacts of ongoing uses of natural resources”.

Finally, respondents from Okapi reported multiple uses of all the ES products throughout the period. However, the subsistence use of honey increased from the past to the present, whereas subsistence uses of other resources declined (see Table 6.3). Furthermore, information from the focus group discussions in Okapi indicated that Pygmies provide bushmeat and honey to other communities. Most of the key informants in Okapi mentioned the existence of a large regional bushmeat trade network involving a wide range of actors. Among other factors, favouring bushmeat trade in Okapi, rapid urbanisation of surrounding human settlements, the continuous presence of armed groups (including the DRC army forces) and illegal artisanal mining across the region were the most cited.

The combined use of resources had been increasing in the three protected areas for the three resources although there are specific variations for each of the protected areas. Respondents

in Itombwe mentioned that they were still using resources for subsistence, but that trade and the combined use of honey and bushmeat had increased throughout the time. In Kabobo, however, bushmeat trade had steadily increased (see Table 6.3). Resources had been used for both local consumption and trade throughout for a long time in Okapi

Nevertheless, the continuous exploitation of resources had conveyed changes that had affected the quantity and quality of resources in the three protected areas. During focus group discussions, participants from the three landscapes reported negative changes (decline) in their harvests for bushmeat and honey (Table 6.3). Participants maintained that the changes were related to immigration, the presence of armed groups within the forest, and the interference of other public services unrelated to conservation management.

6.5.2.2 Use of forest product from protected areas

Livelihood incomes are generated from small-scale farming, fishing, hunting, mining and forest exploitation. Most of the livelihood activities contributed to the subsistence of households (Figure 6.2).

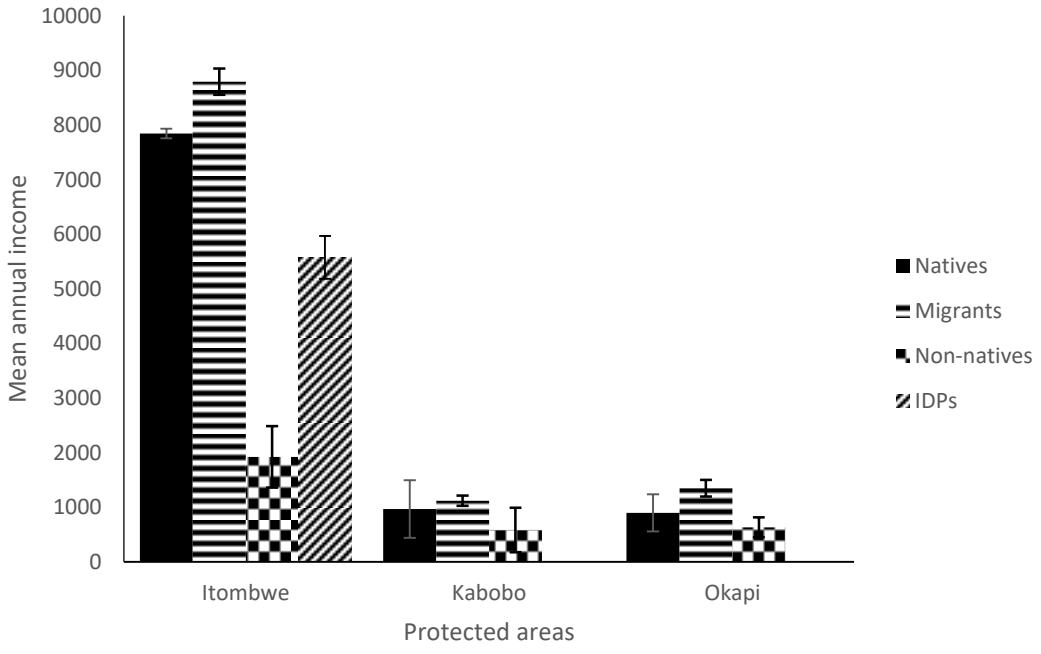

Figure 6. 2. Total mean livelihood incomes by social categories for respective protected areas

In Itombwe, migrants had a higher total mean income (US$ 8,790, n=29, SE=241) compared to natives (US$ 7,841, n=146, SE=86), IDPs (US$ 5,571, n=26, SE=393) and non-natives

US$ 1,990, n=36, SE=562). The source of income varied amongst social categories. The source of income for migrants included mining (36% of the total income), small business (30%), wages from labour (27%) and farming (7%). However, income for natives came from wages (33%), forest products (26%), l husbandry (26%) and farming (15%). The source of income for non-natives was generated from labour (96%), essentially farming or employment and farming (4%) whereas income for IDPs included wages from labour (66%) and farming (34%). Using the statistical analysis (T-test), there was no significant difference (*p=0.75*) amongst social categories.

For Kabobo, migrants had a high mean income per annum (US$ 1,119, n=46, SE=93) compared to natives (US$ 967, n=94, SE=525) and non-natives (US$ 584, n=86, SE=406). The source of income for migrants included small business as the main source of income (75%). For natives, the main source of income included farming (56%) and mining (31%). Income (13%) from fishing was important for respondents from the villages along Lake Tanganyika. Non-natives generated their incomes mainly from farming (52%) and wages from labour (43%). There was no significant difference (*p=0.109*) among social categories.

Finally, for Okapi, migrants had a high cash income (US$ 1,347, n=60, SE=152) compared to natives (US$ 897, n=83, SE=338) and non-natives (US$ 634, n=26, SE=181). The main source of income for non-natives included animal husbandry (61%) and farming (30%). For natives, farming (77%) and wages (23%) were their main sources of income. Farming was the sole source of income for migrants. The statistical test revealed no significant difference (*p=0.994*)

The monetary contribution of ecosystem goods and benefits to local livelihood in the three protected areas was reported as low by respondents (Figure 6.3). Respondents reported only the quantity sold and did not include the products used by respondents for consumption.

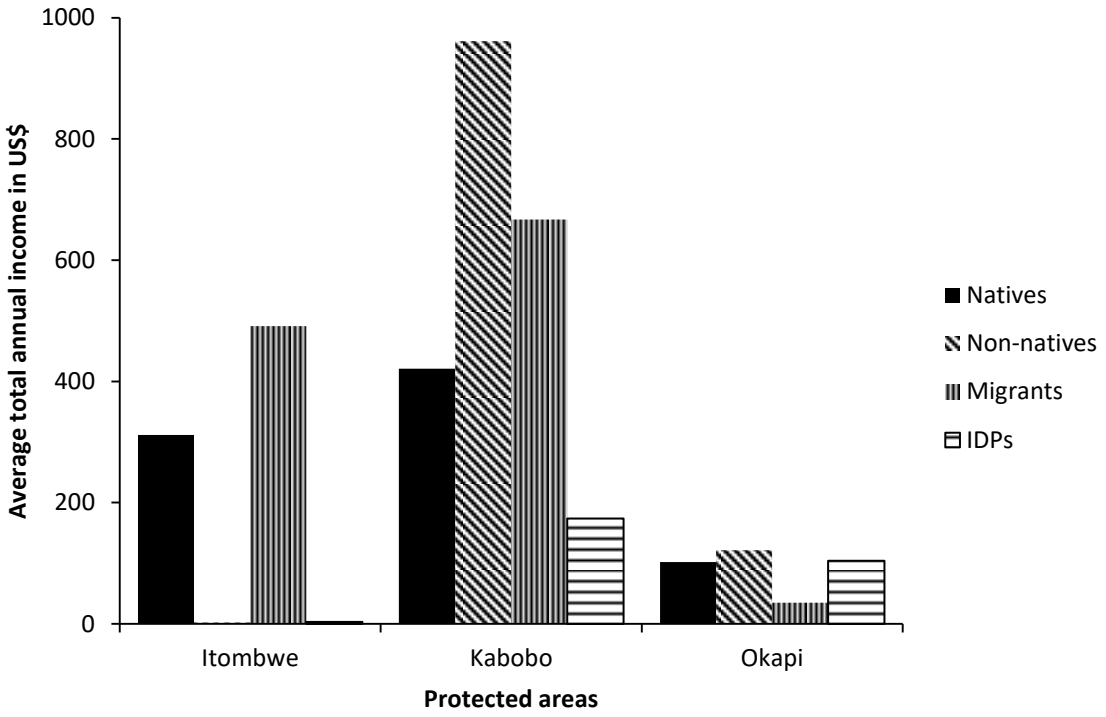

Figure 6.3. Annual average cash income in American dollars (US$) generated from forest products per household in the three protected areas by social categories (in 2015)

Respondents from Itombwe reported that migrants (US$ 58, n=4) and natives (US$ 36, n=65) had a high mean income generated from forest products compared to non-natives (US$ 2, n=21) and IDPs (US$ 3, n=2). Products exploited and processed included firewood (38%), charcoal (24%) and liana (18%). Liana products are used to make traditional chairs and baskets. People collecting resources travelled an average of 4 km from their villages.

For Kabobo, non-natives (US$ 309, n=7) and migrants (US$ 203, n=9) reported earning a higher income from forest products compared to natives (US$ 91, n=17). Key forest products included timber (31%), charcoal (25%) and poles for construction (32%). The distance travelled to collect resources was about 3 km. Most of these products were traded in neighboring towns and cities. Kabobo respondents had a high income generated from forest products.

For Okapi, respondents generated a low income from forest products although IDPs had a high average income (US$ 104, n=1) compared to other social categories – non-natives (US$ 31, 2), natives (US$ 17, 17) and migrants (US$ 17, n=4). Charcoal (51%) was the most

contributing product and honey (22%). Communities travelled for about 2 km to collect resources.

Bushmeat

Bushmeat was an important source of revenue and protein for the three protected areas (Table 6.3). I was interested to know which species were hunted in each protected area (Table 6.4, Figure 6.4).

Table 6. 4. Proportions (%) of respondents reporting species[1] hunted in each protected area

Species	Scientific name	Itombwe (n=16)	Kabobo (n= 9)	Okapi (n=5)
Monkeys	e.g., *Colobus spp., Cercopithecus spp., Piliocolobus foai*	27	24	22
Warthog or Forest hog	*Phacochoerus africanus or Hylochoerus meinertzhageni*	3	21	14
Porcupine	*Hystrix sp.*	25	0.0	22
Hamster rat	*Cricetomys gambianus*	29	1	18
Antelope	*Cephalophus spp.*	4	29	19
Other species[2]		12	25	5

Hunting occurred within the forest (59%) and its surroundings (31%) for most of the species. Hunters walked different distances for specific species although long distances were recorded in Kabobo (mean distance: 6 km). The average distance was 3 km in both Itombwe and Okapi. The purposes for hunting varied among protected areas (Figure 6.4).

[1] Antelope and monkey species were considered as groups because respondents could not distinguish subspecies that they hunt

[2] Other species included low proportions of various species that included elephant, chimpanzee, okapi and small rodent species

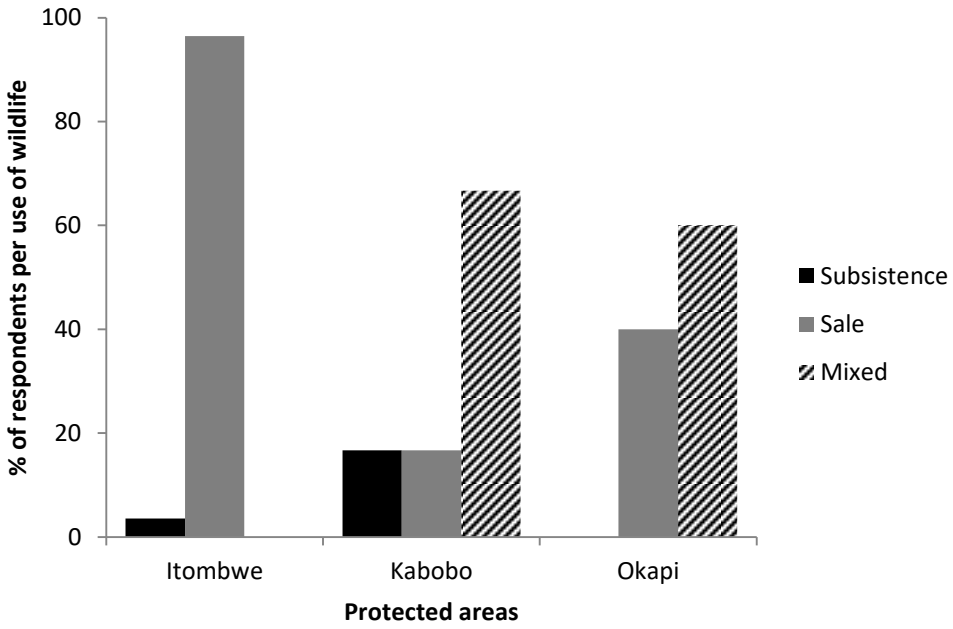

Figure 6. 4. Percentage (%) of respondents by protected area reporting the use of bushmeat. Bushmeat was used either for consumption, sale or both consumption and sale

Bushmeat was equally used by respondents in Itombwe (n=44) for both trade (52%) and consumption (48%). Species traded included duikers (*Cephalophus spp.*) and monkeys (*Colobus spp., Cercopithecus spp., Piliocolobus foai*) [1] (see Table 6.4). For bushmeat consumption, respondents targeted porcupine and hamster rat. The average annual income generated from bushmeat varied by social category: natives (US$ 91) and US$ 67 for migrants. Non-natives and IDPs did not generate an income from bushmeat.

Half of the respondents (52%) in Kabobo (n= 25) reported that bushmeat was for both trade and consumption in their households. Targeted species included monkeys (*Colobus spp., Cercopithecus spp., Piliocolobus foai*), warthogs (*Phacochoerus africanus*) and antelopes (see Table 6.4). For subsistence, hamster rats (*Cricetomys gambianus*) and monkeys were the most hunted species for meat consumption. Migrants (US$ 39) and natives (US$ 26) generated a high income from bushmeat compared to non-natives (US$ 6). Finally, less than half of the respondents (45%) in Okapi (n=123) reported that bushmeat was for both trade and subsistence and a third of respondents (32%) reported that bushmeat was for trade. Species targeted were antelopes, hamster rats, porcupines and monkeys (see Table 6.4). Forty

[1] All different species of antelopes and monkeys in the area are hunted. Therefore, scientific names are not provided for these animals.

percent of the respondents confirmed that trade was the purpose for hunting monkeys and antelopes. Migrants (US$ 17) reported generating a high income compared to non-natives (US$ 8) and natives (US$ 5).

Overall, local communities regardless of social categories, animal species, and existing regulations (e.g., zoning, access rights) were involved in hunting. In the three protected areas, hunting targeted small sized animals (small monkeys, antelope and hamster rats). Results from this research show that all social categories in the three landscapes eat bushmeat (98%) frequently regardless of species. In addition, the bushmeat trade was the predominant purpose. Half of the respondents ate bushmeat at least twice a month on average. Small monkeys and hamster rats were the most targeted species across the three protected areas. Respondents reported that large-sized animals had become rare and where they were seen they were in low numbers.

6.5.3 Access rights and regulations

6.5.3.1 Access rights to ES in the traditional system

Respondents were asked to select the mode of access to resources by local communities' ES. As reported earlier (see Chapter 4, Section 4.2.1.1), traditional access to ES was the common mode in the past, although four access modes were reported (see Chapter 3, Section 3.2.1.1). Despite expected changes with the establishment of protected areas, (see Section 4.2.3) similar features (exploitation of resources) of some of the traditional systems were still in place. However, there were differences among social categories and among protected areas (Table 6.5).

Table 6. 5. Proportions (%) of respondents by social category reporting on mode of access to key resources in the three protected areas

Protected areas		Itombwe				Kabobo				Okapi			
		Tribute	Buy	Free	Share	Tribute	Buy	Free	Share	Tribute	Buy	Free	Share
Natives	Settlement	2	0	96	1	52	0	48	0	18	0	82	0
	Forest	3	0	97	0	17	0	83	0	17	0	83	0
	Hunting	5	0	94	1	26	1	73	1	17	0	83	0
	Land	2	0	98	0	17	1	83	0	18	0	82	0
Average per total respondents, per protected area		3	0	97	0	26	0	74	0	17	0	83	0
Non-natives	Settlement[1]	47	0	42	11	75	1	24	1	29	6	65	0
	Forest	45	2	48	6	32	0	68	0	28	4	68	0
	Hunting	43	1	47	10	46	1	52	2	24	3	74	0
	Land	44	1	52	2	21	1	78	0	27	9	64	0
Average per total respondents, per protected area		45	1	47	7	41	1	58	1	27	5	67	0
Migrants	Settlement	37	3	52	8	75	2	22	1	29	23	45	3
	Forest	40	2	54	5	32	1	67	0	27	19	48	6
	Hunting	38	1	56	5	47	1	50	2	27	13	53	7
	Land	36	1	59	3	21	1	78	0	27	20	50	3
Average per total respondents, per protected area		38	2	55	5	41	2	57	1	27	19	49	5

The majority of the natives in Itombwe accessed resources and products for free (97% of n=138 respondents), while a small propotion reported paying tribute to local chiefs (3 % of respondents) and sharing crop/resource yields with right-holders (1%). Similar patterns were reported for migrants who accessed resources for free, while a few accessed resources through paying tribute to power-holders and right-holders. Finally, non-natives accessed resources for free (47%) and by paying tributes to power-holders (45%). Few respondents (7%) mentioned accessing resources by sharing crop yields. It appeared that tribute was an important mode of access for non-natives and migrants compared to natives.

In Kabobo, free access to natural resources and tributes were two dominant modes of access regardless of social category. Although all social categories paid tribute (royalties), tributes were mainly paid by non-natives (41%, n=192) and migrants (42%) as opposed to natives (26%). The tribute was mainly paid to access land for settlement regardless of social category.

[1] Settlement refers to residential land while land refers to farming or pasture land

Similar results were reported for Okapi where the predominant access mode was free access. In addition, a few respondents (16% of n=23) reported that they accessed resources by paying tributes, regardless of social category and resource. However, financial transactions for resouces were higher in Okapi compared to other protected areas for migrants (19%) and non-natives (5%). Indeed, key informants and participants in focus group discussions supported the findings that during the traditional era, access to land was either for free and people had to pay tribute to sustain the traditional system (see Section 4.2).

There was little variation between the protected areas' natives who had easy access to resources compared to other social categories (non-natives and migrants) regardless of the type of the resource (see Table 6.5). Non-natives and migrants accessed some resources for free and others accessed them by paying tributes to right-holders or buying products, especially in Okapi, whereas in Itombwe free access was much more for the natives compared to other social categories.

Natives and non-natives in Kabobo and Okapi reported paying royalties/tributes to power-holders or right-holders as part of their culture to sustain the traditional system. Migrants did not have a choice because paying tribute was the easiest way to access ES in these areas. Free access to land by migrants in Okapi was associated with the established resource access system, as reported by participants in the four focus groups. The 'unregulated' access to resources affected ecosystems, their services and benefits. During the focus groups discussions in Kabobo and Okapi, participants reported that negative changes had happened and were still happening in most of the ecosystems as well as key ecological services and benefits. Among other reasons, participants in the focus group discussions identified the increase of the human population due to immigration, ineffective law enforcement by traditional chiefs and institutional conflicts between public services (see Section 7.3.1). An example from both communities was related to wildlife populations; participants reported that some species were becoming rare and hunters had to cover long distances in the protected area to find them. Moreover, they reported that agriculture had expanded compared to previous times. In Kisondja (Kabobo), a participant said, "We have moved far inside the forest and crops are replacing trees".

Other claims from communities generated from open-ended questions revealed that several social factors induced these changes. Firstly, political and social changes including democracy, human rights and multiple power nodes had occurred. A participant in Itombwe

reported, “In the past, natural resources were managed by traditional chiefs and local people complied with existing regulations. Today, we have the mandated agency, which is weak, multiple public services operating in the same space with conflictual mandates and interests. They are collecting money from resources with little care for the future of communities. Traditional chiefs are now powerless and have lost control over our heritage”. The same idea was reported in Kabobo where a participant (migrant) said, “As Congolese citizens we can settle anywhere and access resources. Traditional chiefs cannot stop migrants to access resources as long as migrants respect them”. In Okapi, participants reported the negative impact of migrants and conservation workers on land use in agricultural zones. Both groups accessed land with limited respect of established rules that govern agricultural zones. For example, employees of conservation organisations were reported to be powerful land users as they had power that was more influential (gazettement) and more financial capabilities to pay for local labor than local community members had. In addition, traditional regulations were no longer compulsory or enforced as they were regarded as conflicting with existing laws and regulations.

Secondly, the establishment of protected areas on traditional space limited access right to ES and infringed on the roles of local systems in the management of protected areas. A participant during focus group discussions in Okapi reported, “Traditional power has been diluted by established managers as well as interfering authorities (e.g., mining and forestry officers)”. Moreover, the access and uses of ES were defined by conservation bodies based on their defined strategies and goals in Okapi. For example, as one participant said, “Agreed agricultural zones have been invaded by the ICCN which has established the airstrip and primate corridor within the agricultural zone without community consent and extension of the agricultural zone”.

Thirdly, the change of lifestyle (from traditional to modern) was reported as a factor that had influenced the shift from an intrinsic value of resources towards a utilitarian value for almost all resources and products. A participant in the discussions in Itombwe reported, “The way people are using resources now has diverted from past times where everyone cared about the future. Now everyone is busy looking for money from any resource with no respect to the culture”. “We want to benefit from our resources as for other areas”, added another participant. Participants in discussions reported that their livelihoods had been threatened by

restricted access to minerals and timber even in agricultural zones, while others living outside (e.g., Mambasa) could extract resources and products to improve their livelihoods.

6.5.3.2 Traditional resource governance and management

a. Regulations and enforcers

Respondents were asked to select who were the enforcers of traditional rules and regulations for natural resources. Results revealed that traditional rules were enforced through local established systems that included traditional chiefs, clans/families, committees and other stakeholders (Table 6.6).

Table 6. 6. Percentage (%) of respondents reporting on their perceptions of enforcers of traditional resource management in the three protected areas

	Itombwe (n=84)				Kabobo (n=115)				Okapi (n=31)			
Enforcers	Agree	Some what	Dis agree	Do not know	Agree	Some what	Dis agree	Do not know	Agree	Some what	Dis agree	Do not know
Chiefs	68	0	0	32	99	1	0	0	79	15	3	3
Committees	38	6	0	56	77	20	3	0	88	3	9	0
Families	49	6	1	43	63	34	3	0	79	9	9	3
Others	100	0	0	0	34	11	45	11	67	0	0	33
Average	**57**	**3**	**1**	**39**	**74**	**17**	**7**	**1**	**81**	**8**	**7**	**4**

Half of respondents (57%) in Itombwe reported that decisions about natural resources were made by a combination of stakeholders (Table 6.6), although traditional chiefs were involved in regulations on hunting and the respect of taboos. On average 39% of respondents were not aware of the decision-making system. During focus group discussions in Itombwe, participants reported power conflicts amongst families/clans and traditional chiefs. Conflicts were essentially related to land and forest management. Participants reported that traditional chiefs were the legitimate custodians of tradition and not decision makers with regard to ES, especially forest and land. However, families had executive power and were the repository of local memories. This was one of the factors that was ignored by conservation organisations during the gazettement process of Itombwe (see Section 5.4.1, also Kujirakwinja et al. 2018).

In Kabobo, on average almost ¾ of respondents (74%) agreed that decisions were made by the local established hierarchy system. Decision-making included the traditional system at different levels: traditional chiefs, local committees and clans (see Figure 6.4). Zoning and taboos were essentially managed by traditional chiefs and their respective committees (see

Figure 6.4). Similar results were reported by the majority of the respondents in Okapi (81%). However, local committees were mentioned more by respondents compared to families and clans. Respondents reported that taboos were enforced by families. For Kabobo and Okapi, most regulations were enforced by the chief and his committee (see Figure 6.4). The chief was empowered to decide without consulting the families/clans.

b. Types of traditional management regulations

Regulations varied from one landscape to another and were related to taboos, zoning and regulatory practices (Figure 6.5).

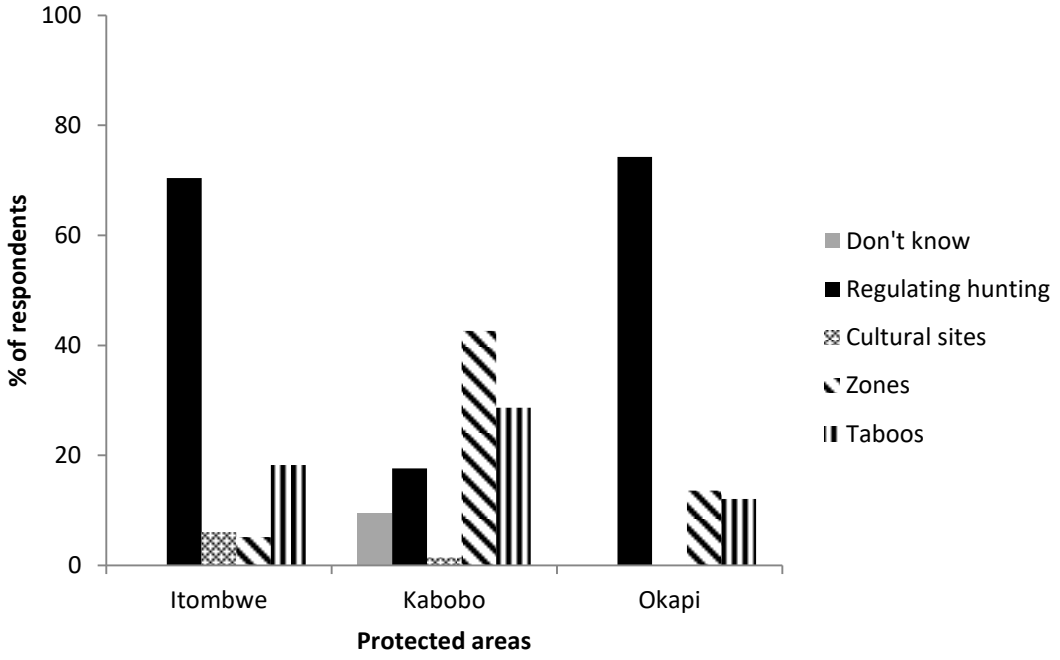

Figure 6. 5. Proportions (%) of respondents reporting on traditional resource regulations practices implemented in the three protected areas. These practices included seasonal and spatial hunting and fishing regulations, respect for cultural zones but also, in general the zoning for resource use, and taboos.

Traditional regulations in Itombwe were essentially for regulating hunting (70% of 56 respondents) and through taboos (18% of 56 respondents). Zoning and cultural sites were not fully implemented. However, 43% of 114 respondents in Kabobo reported zoning of their areas and the use of taboos (29% of 114 respondents) as main practices for regulating access to resources. Finally, about ¾ (74%, n= 29) of respondents in Okapi reported that most regulatory practices were related to hunting. Few respondents reported zoning (14%) and taboos (12%).

These results were different to information collected from focus group discussions for Okapi. A participant in the focus group discussions reported, “Cultural sites were one of the management measures to preserve places for rituals and cultural ceremonies”. Details related to the practices of these regulations are summarised below as reported by communities in open-ended questions.

Traditional beliefs and taboos were linked to specific species that symbolised each clan or were used for specific reasons (see Section 6.5.1). For example, communities from Okapi and Itombwe reported that as part of the exercise of their power, traditional chiefs had a better knowledge of their people, therefore they could control access to resources based on the number of people and their needs as well the culture.

c. Regulation of provisioning services: hunting, fishing and farming

Communities in the three sites reported that regulations for hunting included seasonal hunting, prohibited practices as well as the species and category of animals to hunt (see Section 3.2.1.1). The timing for seasonal access was decided by the chiefs and respective social groups (e.g., hunters, fishermen, etc.) and clans (i.e. small chiefs at village level). Therefore, no hunter was supposed to go into the forest for hunting during the closed seasons or use prohibited techniques and equipment. Prohibited practices included using poisonous plants for fishing, hunting culturally valued species and specific categories (e.g., pregnant animals), and burning the sacred forest other than agricultural land.

In Itombwe for example, respondents reported that gorillas (*Gorilla beringei graueri*) and pangolins (*Smutsia spp.*) were not hunted by ordinary hunters unless authorised by the chief or for ritual reasons. In Kabobo, hunting for chimpanzees was prohibited. Fishing was regulated by season and by location as well as the number of individuals fishing. In Okapi, hunting for elephants and okapi was prohibited unless authorised for cultural or medicinal reasons.

d. Zoning ES for forest products and land uses

Respondents reported that forests were divided based on their importance (cultural sites, key species), their uses by local communities and cultural values. Hence, villages and their surroundings were zoned based on specific activities (human settlement, farming, cultural sites and forest), although it was not as systematic as it is today with systematic zoning and regulations. For example, no extractive activities were allowed in cultural zones apart from

cultural ceremonies that happened regularly (annually) or rarely (death or enthronement of the chief) (see Figure 6.4).

6.5.3.3 Land rights and use of forest products

In the three protected areas, land is still collectively owned and traditional chiefs at different levels (clans or villages) are custodians for managing land and forests on behalf of communities (see Section 6.5.3.1, Table 6.5). Most respondents in the three protected areas recognised that they owned the land they were using (89% of 491) through customary rights. Only 11% were leasing in return for harvest sharing (Table 6.7**Error! Reference source not found.**).

Table 6.7. Proportions (%) of respondents reporting on land tenure and uses in the three protected areas

Protected areas	Land use			Surface		Tenure		Location		
	Farming	Livestock	Tree plantation	1-2 ha	+3 ha	Owner	Leasing	Forest	0-5 km	+5 km
Itombwe (n=141)	95	1	4	71	29	83	16	34	31	35
Kabobo (n=206)	81	15	4	86	13	67	29	13	84	3
Okapi (n=144)	62	36.6	1	93	4	99	1	40	47	13

For Itombwe, about one third of respondents had their land either within the boundaries (34%), around the reserve (31%) or far from the boundaries (35%) of the reserve. Non-natives had more land (3 ha) compared to other social categories who had about one hectare (See Table 6.7). This might be related to the need for pasture for cattle grazing.

For Kabobo, the majority of respondents (84%) had land around their villages (less than 5 km). Few respondents had land either inside Kabobo (13% of respondents) or far from the boundaries (3% of respondents). Large areas of land were owned by migrants (2 ha) compared to other social categories who had about one hectare. Finally, in Okapi less than half of respondents (47%) had land around the reserve (less than 5 km) and inside the reserve (40% of respondents). A few respondents had land far from the boundaries (13%). Each household reported owning at least one piece of land averaging 2 hectares, with natives having more land (3ha).

Overall, access to land was regulated by traditional chiefs and their committees (Table 6.7) based on local traditions. Land exploited for resource collection, farming and pasture by the respondents were located mainly around the protected areas. Few respondents reported having land within the boundaries. The latter is related to the categories of the three protected areas (category VI; see Dudley 2008). Nevertheless, I argue that conflict over land between protected area managers and communities might arise in the future (see Section 7.3.1). With the establishment of protected areas, communities have lost ownership of their traditional land which they still claim ownership whilst they only have user rights. Despite the established traditional rules and established boundaries for conservation zones, illegal access to land for migrants was reported by key informants. In the three protected areas, migrants were using larger areas of land compared to other social categories. Key informants acknowledged that the failure of managing extractive zones (i.e. agricultural and hunting zones) was related to the weak enforcement of agreed regulations by traditional chiefs and established committees (see Section 7.3.1). However, during focus group discussions, communities reported that the conservation bodies had failed to support the enforcement of existing access right agreements.

6.6 Discussion

6.6.1 Local valuation of ES and their importance to local communities

Protected areas in the DRC, especially for my research sites (Itombwe, Kabobo and Okapi), are still delivering ecological services and benefits to local communities despite changes happening in the valuation (from relational to utilitarian) and governance of ES (see Section 6.5.1). Indeed, various research found that protected areas are one of the effective tools and approached to preserve forests and biodiversity from anthropogenic activities such as deforestation (Woodley et al. 2012; Geldmann et al. 2013; Megevand et al. 2013; Bowker et al. 2017) and fight climate change (Pettorelli et al. 2012; de Wasseige et al. 2015). I found that ES and benefits were valued and used differently (see Section 6.5.2) by respondents from the three protected areas. Interestingly, the value, access rights and importance of ES and benefits varied among social categories associated with the uses by respondents (see Table 6.2). My results align with Mayaux et al. (2013) who found that access to resources shapes ES and benefits in African reainforests. The value of ES was also related to the contribution of resources to local livelihoods (see Section 6.5.2.2).

My research (see Table 6.1) revealed that places (land and rivers) and resources (firewood and bushmeat) were more important than products for respondents from the three protected areas. This was the case especially for services and benefits that contributed directly to their daily life and regular usage (see Section 6.5.2). For example, firewood was reported among the four important products/resources for the three protected areas because it was the predominant source of energy for regions within and around the three protected areas (see Section 6.5.1). Various research (Schure & Levang 2014; de Wasseige et al. 2015) report that the DRC is an energy deficient country where about 90% of households use firewood and charcoal. Indeed, similar to other studies in the Kabobo and Itombwe (Bisidi et al. 2008; Plumptre et al. 2009), my findings show that communities in this area use firewood to respond to their energy needs.

In addition, land for both farming and pasture was important for respondents because of its social and financial contribution to local livelihoods as found also by Huggins (2010) and Peemans (2014.) In my study areas, I found that natives were more protective of resources for social identity (see Section 6.5.2) whereas migrants were more interested in the financial return of SES.

Other resources and products were valued for their quick financial return especially mining, fishing and charcoal production (see Section 6.5.2). Although mining was identified as one of the major threats to the three protected areas (Plumptre et al. 2016b; Spira et al. 2017), my research revealed that mining is not oane of the main livelihoods for respondents in my research area. Indeed, mining activities were conducted by recent immigrants searching for financial opportunities and quick revenue activities (Kraemer 2012). Therefore, a better understanding of the migration routes and mining value chain might be important to identify the involved actors and financial impacts for the three protected areas (Spira et al. 2017).

6.6.2 Drivers and consequences of changes to ES and their value

Current exploitations of resources in these protected areas had to respond to the 'latent' demand for resources and products at local, regional and international levels. In addition, SES changes were driven by both internal factors (e.g., population growth) and external factors (e.g., migration, mining (Crawford & Kujirakwinja 2016; Plumptre et al. 2016b), regional trade and the increased urbanisation of neighboring towns (Trzyna 2007; Crawford & Kujirakwinja 2016). Ecological changes were associated with social factors that encompassed global social-political changes (e.g., demand for raw materials) as well as the local

governance practices of ES (e.g., the establishment of protected areas, the monetarisation of ES). These changes had negatively affected the protected area systems, the governance of resources and access rights. For example, the arrival of immigrants had affected local traditional systems, especially with regard to access to ES and their status (Lee 1966; Crawford & Kujirakwinja 2016).

Another factor that affected the valuation of ES and access rights was the continuous dependence of traditional chiefs on remittances and tributes from migrants (see Table 6.5). This behavior favoured unregulated immigration that led to the degradation of ecosystems (Crawford & Kujirakwinja 2016). Most ES and benefits that had cultural values in the past had lost their spiritual features. Currently, only ecosystems and ecological services with low commercial capabilities and financial outputs still have cultural value for some respondents in the three protected areas. Agatha (2016) reported that contemporary economic practices have transformed customary practices in Uganda. In addition, Potschin & Haines-Young (2013) identified the demand and supply for ecosystem services as factors that can affect the sustainability of ES. This was evident in my research sites where most forest products were responding to the demand from the rapid urbanisation of neighboring cities and towns. Although that might have positively affected local incomes for some areas within and around the three protected areas, the sustainability and long-term supply of resources were threatened.

I found that financial transactions (sales) of resources were highly recognised in Okapi compared to Itombwe and Kabobo, especially for land.

6.6.3 Livelihood activities and use of ES

Income diversification was influenced by incoming people (migrants and non-natives) motivated by financial and economic opportunities. Based on push and pulling factors' migration theory (Lee 1966), I found that the influence of incoming migrants can be explained by their experiences from their areas of origin where some of economic activities were already developed and opportunities in the area of destination. Surprisingly, natives were more active in low income generating activities that included forest products and bushmeat. However, I found that the contribution of forest products to local livelihoods was lower for Itombwe and Okapi than Kabobo. The comparative results between Itombwe and Kabobo are similar with previous studies conducted in both areas the late 2000s (Bisidi et al. 2008; Plumptre et al. 2009), though the contribution of forest products to local livelihoods has been low. For example, the contribution of a forest income for communities to total mean

income in Kabobo had increased from 4% (Plumptre et al. 2009) to 10%[1] from 2008 to 2015. The increase in forest resource exploitation can be confirmed by the current deforestation rate that has been witnessed since 2010 (see Section 4.3.2 also *pers.observation*; also Plumptre et al. (2016a)).

Alike other studies in Central Africa (Fa et al. 2003; Lindsey et al. 2013; Ziegler et al. 2016), regardless of social categories, I found that bushmeat was substantially for trade, although a few respondents reported that bushmeat was for consumption or both trade and consumption. However, forest income was the lowest for the three protected areas. Bushmeat contributed for about 1% of revenue for each protected area. Similar to other studies (Plumptre et al. 2009; Spira et al. 2017), I found that hunting in the three protected areas targeted different species regardless of their sizes and locations as well as their conservation status.

6.6.4 Governance and use of ES

Access to resources was regulated by traditional governance systems based on customary law and traditions. For example, access to land was free for different social categories, although, some categories had to comply with local rules (i.e. tributes or sharing yields) (see Table 6.5). The average size of land (essentially for farming and pasture) per household varied slightly between protected areas (1.3 ha to 1.9 ha) and among social categories (see Table 6.7). However, I found that the average size of land per household had decreased in Kabobo (from 1.5 ha in 2008 (Plumptre et al. 2009) to 1.3 ha in 2016 while the average size of land had increased in Okapi (from 0.5 ha in 2010 (Brown 2010) to 1.9 ha in 2016). The decrease of farming land in Kabobo was related to the livelihood diversification strategies of migrants who depended more on small business than on agriculture (see Section 6.5.3). For Okapi, the increase of farming land in these areas is explained by the arrival of immigrants from neighboring provinces and the increased demand for food in the neighboring cities and mining sites. No comparative information exists for Itombwe regarding the land surface exploited by communities.

The size of the land was defined by livelihood activities and social identity. Non-natives and IDPs who had high livestock assets in Itombwe owned also large areas of land (2.8 ha for non-natives and 2.4 ha for IDPs). In Kabobo, land per household differed between immigrants who owned large areas of land (1.6 ha) compared to natives and non-natives (1.1

[1] The number of provinces of DRC was increased from 11 to 25 making Kalemie the capitol of the Tanganyika Province. That might have increased the demand on forest products.

ha) for financial purposes. Property rights were the determining factor for Okapi. Natives in Okapi were reported as owning large areas of farming land (2.8 ha) compared to others social categories who had one hectare. The informal ownership of large areas of land by natives in Okapi might be one of the results of the participatory zoning (see Section 4.3.2) that gives power to local communities to control land (Brown 2010).

However, the *de facto* transfer of informal ownership of land has led to violent conflicts over land in Itombwe and Kabobo. In Kabobo illustrates the violent response against immigrants over land. Immigrants were 'violently' chased from the Kabobo region by Pygmies (supported by other ethnic groups) in 2016 whilst immigrants had customary rights of using the land. This reflects the poor governance of land as stated by Erero et al. (2013) which may hinder conservation interventions. This aligns with studies on land tenure that recognised that customary land governance does not secure property rights (Vlassenroot 2012, 2013; Erero et al. 2013). I agree with Vlassenroot (2013) that conflicts over land are recurrent in places where different social categories own land through a customary system regardless of their origins (e.g., Itombwe, Kabobo). Other researchers (Mugangu 2009; Long 2011; Vikanza 2011) have reported conflicts over land within and around protected areas between communities and protected area managers. These researchers relate these conflicts to the confusion and transfer from property rights to user rights. This is the same as the findings in my research sites where agricultural zones are found within protected areas where communities have rights to use but cannot own the land any longer.

Despite the failure of the traditional governance system to sustain resources, current governance approaches and practices have used some of the traditional systems and governing regimes with regard to resources (e.g., zoning, seasonal access to resources) (see Figure 6.4). However, some of the traditional power over resources has been diluted by protected area regulations. This has resulted in a duplication of power that has generated conflicts between protected area managers and communities over access rights and benefits.

A free access mode to resources was the predominant regime in the three protected areas supported by tributes paid by resource users to power-holders or right-holders (Table 6.5). However, I found that, natives and non-natives paid tributes as part of their cultural obligations whereas migrants were paying tributes as a way to accessing resources without any social-cultural link to the places. Access rights were different among social categories in

different protected areas (see Table 6.6). My results are similar to those of Berkes et al. (2000) who identified specific access rights and management regimes for native groups.

I found that the decision-making mechanisms related to ES involved an array of actors related to the traditional chief. Decisions were implemented through established social structures supported by established committees. I argue that the governance of ES was localised (territory) and centralised by governing families at different levels (villages, kingship). Meanwhile, the traditional system involved a few people from communities (local committee). Major differences between the traditional governance regimes of resources in the three protected areas were observed and associated with local traditions (Figure 6.5). In Itombwe, the traditional chiefs had limited power over land and forest compared to clans. This plurality of power over resources resulted in conflicts between traditional chiefs and their extended families (clans). In Kabobo, the traditional chief was empowered to decide on resources and in Okapi, the local established committee had a big influence on decision-making. The traditional governance of resources was somewhat participatory in Okapi compared to the other two protected areas. With contemporary institutional changes, the traditional systems had lost their structure and power as modern institutions had been established.

However, traditional chiefs were the important key players in the governance and management of ES. Therefore, traditional systems (Tengö et al. 2017) should be considered for effective conservation as one of the pillars to motivate neighboring communities to support conservation interventions. Including traditional systems and structures in the management and government regimes of protected areas may mean that they benefit from local social identity and cohesion (Vaccaro et al. 2013; Zafra-Calvo et al. 2017).

6.7 Conclusion

Protected areas and their contiguous ecosystems in the eastern DRC are still important for communities to sustain a local livelihood (Naughton-Treves et al. 2005; Kasereka et al. 2016). Despite social-ecological changes reported by respondents in Itombwe, Kabobo and Okapi, local ecosystems are still providing key services and benefits (Plumptre et al. 2015a).

However, I found that access to resources was encoded in local traditions. Although decision-making involved some forms of consultations, the latter were selective as mainly the reigning family was consulted. In addition, I found that migration, as an external factor, has shaped the

way resources were managed (Kallio 2016). Therefore, the sustainability of the three protected areas in the DRC will depend on how better arrangements related to rights and structures are established to control migration and access to key resources. To ensure the effectiveness of these arrangements and structures, the roles and responsibilities of local traditional systems and stakeholders should be clearly defined (Plummer et al. 2017b). For key resources such as land, bridging organisations should consider property rights in designated conservation zones.

My study revealed three important implications for improving the existing ACM processes in these protected areas (see Chapter 5). Firstly, protected area managers should consider the temporal changes of how local communities value (social and financial) and use resources so that managers can adjust their strategies and approaches accordingly. Rita et al. (2017) whilst communities value and use differently resources, protected area managers do not make that difference as they focus on the protection of these SES. For example, despite the negative impact of mining to protected areas in the eastern DRC (e.g., Plumptre et al. 2016b; Spira et al. 2017), its contribution to local livelihood and employment, conservation stakeholders should reconsider the conservation nexus mining activities in the DRC's protected areas. As for other resource access right conflicts, collaborative mining zoning should be considered in biosphere reserves to minimise conflicts and avoid wasting financial and technical resources.

Secondly, conservation actors should develop context-based strategies and interventions by social categories based on key resources that support their livelihoods (Cumming & Allen 2017). For example, supporting small businesses will increase the economic power of migrants and affect local traditional systems. Such situations may negatively affect the local governance of protected areas. This implies that conservation plans and strategies should consider changes affecting resource extraction such as immigration, use of land and livelihood activities. Thirdly, the development of clear and specific guidelines on access, rights and joint enforcement roles between community decision-making bodies and protected area managers are important for the sustainability of protected areas. Therefore, conservation strategies should include local traditional knowledge and practices related to conservation management in the guidelines and plans of protected areas. Finally, to respond to the weakness of traditional systems in enforcing traditional regulations, local committees should be strengthened by conservation actors.

Chapter 7. Governance of protected areas and community perceptions and motivations

7.1 Introduction

7.1.1 Local attitudes and governance of protected areas

Interactions between humans and nature, especially within protected areas, are characterised by complex relationships and uncertainties (Palomo et al. 2014; Bowker et al. 2017). The quality of interactions can influence the type and success of management practices and governance regimes and affect social-ecological system sustainability (Cumming et al. 2015; Bowker et al. 2017). Moreover social and psychological factors (i.e. relations, attitudes, decision making processes) influence communities' motivations and behavior towards conservation (Challender & MacMillan 2014; Cetas & Yasué 2017). Various scholars (Xu et al. 2006; Bennett & Dearden 2014; Dewu & Røskaft 2017) in conservation governance have called for more studies to understand the attitudes of local communities towards protected areas (Maldonado et al. 2012; Kasereka et al. 2016). Understanding local attitudes would assist in developing appropriate and successful conservation approaches as well as interventions based on social-economic costs; people' feelings and desires; culture; and management goals (Kideghesho 2008; Adams et al. 2010; Moreto et al. 2017). Similar to other countries (see Peluso 1993; Hutton & Adams 2005; Moreto 2015), the negative impacts of exclusive, top-down management approaches on the perceptions of communities towards protected areas have been also reported in the DRC (Kujirakwinja et al. 2010b; Inogwabini 2014; Plumptre et al. 2014b; Verweijen & Marijnen 2016).

Despite the shift towards co-management of protected areas in the DRC (see Section 4.4), current management practices still include restrictive regulations (Pelissier et al. 2015; Kasereka et al. 2016; Verweijen & Marijnen 2016), the exclusion of local resource users (Plumptre et al. 2014b; Marijnen 2018) and local power-holders as well as coercive law enforcement (Inogwabini 2014; Plumptre et al. 2014b; Marijnen 2017). Such practices have created tensions between managers and communities (Kujirakwinja et al. 2010b; Verweijen & Marijnen 2016) and often resulted in negative relationships and mistrust between parties as well as a lack of compliance to established regulations (Verweijen & Marijnen 2016; Mutanga et al. 2017).

The involvement of resource users and local leadership in decision-making related to protected area management and the design of clear collaborative agreements between protected area managers and local stakeholders have been identified among the enabling factors for the long term persistence of protected areas (Andrade & Rhodes 2012; Cetas & Yasué 2017; Plummer et al. 2017b). Studies have shown that the involvement of communities, local knowledge and traditions can improve local relationships between communities and protected areas as well as the perceptions of local communities on protected areas. Moreover, it may minimise tensions between stakeholders (Dickman 2010; Plummer et al. 2014; Mascia et al. 2017; Moreto et al. 2017).

Although there have been studies conducted on the impact of fortress conservation approaches on protected areas in the DRC (Kujirakwinja et al. 2010b; Verweijen & Marijnen 2016; Scholte et al. 2018), limited information has been collected on the factors that might hinder or enable collaboration between protected area managers and communities (Kasereka et al. 2016). In addition, results from the field where some co-management practices were tested (see Section 4.3) varied from one protected area to another. Enabling factors were essentially dependent on the facilitating agencies (especially INGOs), the leadership of protected area managers, and relationships between INGOs and protected area managers (Mutimanwa 2003; Kujirakwinja et al. 2010b; Larsen & Brockington 2018).

However, despite the importance of the factors listed above (leadership, bridging agencies and relationships), few studies on the perceptions of local communities of protected areas have been undertaken. Information that is available about attitudes and perceptions have been reported by socioeconomic studies commissioned by donors that cover specific project zones (see Kasereka et al. 2016) or conducted to fulfill legal requirements to comply with conservation laws (e.g., Bisidi et al. 2008; Plumptre et al. 2009). Consequently, most of these studies delivered partial information related to the perception of communities of protected areas.

For collaborative management approaches to be effective, cognitive factors such as perception and cultural values can affect stakeholders' relational behavior and impact on the support towards protected areas (Darner 2009; Cetas & Yasué 2017). This applies also to ACM approaches that rely on bridging actors to invest in social relationships (Schultz et al. 2011), multidimensional collaboration (Scheffer et al. 2003) and tangible and intangible results (Plummer et al. 2017a). However, although the current governance practices of

Protected areas have included community support and the governance principles of accountability, transparency, and trust (Armitage & Armitage 2008; Armitage et al. 2009), little has been done to include changes of the attitudes of communities, social-cultural values and their motives for or not supporting conservation (Hockings et al. 2006).

The DRC offers a particularly good opportunity to understand the negative impact of exclusionary approaches and the positive influence of ACM approaches (Kujirakwinja et al. 2010b, 2018). Using self-determination theory (SDT) (see Section 7.1.2) for this chapter, I assessed the following:

(1) The perceptions of communities about protected area management practices in and around Itombwe, Kabobo and Okapi;

(2) The involvement of communities in management decisions;

(3) The relationships between protected area and communities;

(4) The inclusion of cultural values in conservation approaches and practices;

(5) The identification from previous chapters of key factors that could lead to good management and governance of three protected areas.

7.1.2 Self-determination theory (SDT) as an analytical framework

Self-determination theory (SDT) is one of the motivational theories that consider autonomous (intrinsic) and heteronomous (external) factors that influence individual behaviors (Deci & Ryan 2000; Moller et al. 2006). Motivation and attitudes are key psychological factors that determine the level of participation of individuals in specific activities (Osbaldiston & Sheldon 2003). SDT emphasises the effects of autonomy and control on people's behaviors and actions (Pelletier et al. 1998; Deci & Vansteenkiste 2004; Trimble et al. 2015a; Cetas & Yasué 2017). Therefore, the theory is useful in understanding factors affecting local attitudes. Indeed, the theory has been applied to various fields, including the environmental context (e.g., Cetas & Yasué 2017).

SDT explicitly evokes three main ingredients that include autonomy (choices), competence (wellness) and relatedness (connectedness, sense of belonging) as determinants of motivations for actions (see Figure 7.1, Deci & Vansteenkiste 2004; Deci & Ryan 2014; Cetas & Yasué 2017). The theory responds to issues related to the capacity of individuals to

deal with the external environment, interactions with other stakeholders as well as issues related to personal interests, values and responsibility (Deci & Ryan 2000).

Moreover, the theory highlights the importance of personal choice and satisfaction. Ryan and Deci (2017) argue that the people's motivation is dependent on how individuals value an activity (internal) or place and the strong influence of external coercion (Hirschnitz-Garbers & Stoll-Kleemann 2011). Both intrinsic and extrinsic motivations emphasise the importance of the skills, the wellbeing and the responsibility of individuals (Cetas & Yasué 2017) to transform people' behavior and practices. The theory recognises the importance of rewards and control to stimulate motivation, demotivation and amotivation[1] (DeCaro & Stokes 2008; Deci & Ryan 2015).

My study used a motivational analytical framework based on SDT (Figure 7.1) linking the governance of protected areas and personal needs in delivering positive or negative conservation outcomes. Thus, to achieve positive outcomes and minimise negative influences, governing bodies should consider local motivational factors and include key indicators of behavioral change in their practices and policies.

[1] Amotivation refers to the relative absence of motivation that is not caused by a lack of initial interest but rather by the individuals feelings of incompetence and helplessness when faced with the activity (Deci & Ryan 2000, 2015)(Deci & Ryan 2000).

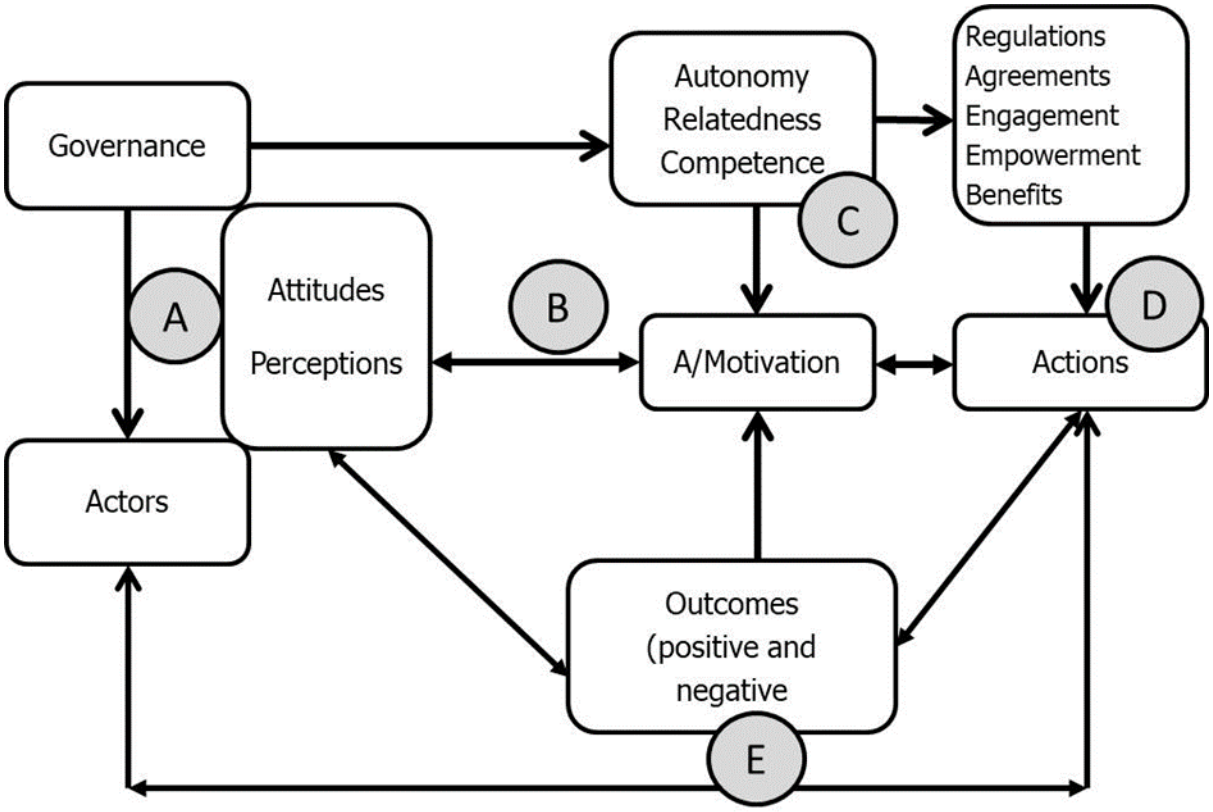

Figure 7. 1. Analytical framework for local attitudes and perceptions in the eastern DRC, adapted from SES and SDT frameworks (adapted from Deci & Ryan (2000). The framework shows how governance approaches and practices influence attitudes and perceptions of various actors based through key behavioral principles (autonomy, relatedeness and competence) that influences regulations and agreements regarding people's actions. Communities' perceptions influence both outcomes and actions.

Governance of protected areas (A) and rights to natural resources by communities influence the behavior of local stakeholders through rules and regulations (see Section 6.3.3) related to access rights and use of resources (Fabricius & Currie 2015; Trimble et al. 2015a). Deci and Vansteenkiste (2004) emphasise the role of basic needs satisfaction based on personal goals and the influence of external factors (regulations and interactions) on motivation. Therefore, the way stakeholders respond (positive or negative) to governance and management practices might be related to how much they gain or lose (cognitive and material) at different levels (Naidoo et al. 2006; Adams et al. 2010; Stolton et al. 2015).

Therefore, conservation actors adopting ACM processes should aim to understand attitudes and perceptions of local communities (A). In this way they can be motivated to support conservation (B) and to take actions that support sustainable social-ecological systems (D) based on the three ingredients of self-determination (C), which include the degree of

autonomy of people (choices and control), relatedness (social networks and space, engagement) and competence (wellness, capabilities) (Deci & Vansteenkiste 2004; Cetas & Yasué 2017). Therefore, the way these elements are considered in management practices may influence communities' attitudes and perceptions to support or hinder conservation outcomes. Thus, interventions (actions) should be implemented (D) to stimulate positive or negative feedbacks to local attitudes and motivation to change (E). The failure of governing bodies to positively motivate communities may hinder the outcomes of interventions and threaten local social-ecological systems (Deci & Vansteenkiste 2004; Cetas & Yasué 2017).

Using the SDT lens (see Figure 7.1), I expect that presently in DRC community attitudes and perceptions are generally more negative towards the management of protected areas due to social costs and injustice (i.e. discrimination, restrictions) that were endured by communities (see Chapter 4) and limited interventions towards human well-being. I also expect that the involvement of communities in conservation interventions can positively influence local perceptions if processes are transparent and equitable. Moreover, conflicts over resources and local perceptions are influenced by bad governance and management practices.

Attitude is what one feels about a phenomenon. Attitude is related to feelings, beliefs and actions that influence behavior (Pickens 2005). Perception is what one thinks or interprets about a phenomenon after analysing it. Perception involves appreciation and the capacity of comprehension. Although some researchers have made distinctions between these terms, the majority agree that both factors are close and it is not easy to draw a line (Banaji & Heiphetz 1985). It is therefore agreed that attitude includes perception and the evaluation of belief and actions. (Banaji & Heiphetz 1985; Pickens 2005). In my research, attitudes and perceptions are considered complementary. Throughout this chapter, I will use perception to refer to feelings, preference and the cognitive interpretation of conservation behavior by communities.

In my study, as reported in this chapter, I used the modified SDT framework (Figure 7.1) to analyse the roles of actors and the impact of governance regimes on local attitudes and relationships (Deci & Vansteenkiste 2004; Armitage et al. 2008; Mcginnis & Ostrom 2014; Plummer et al. 2014). Therefore, the objective for this part of my study was to understand how actors at local level perceive the governance and management of local landscapes and to view potential conflicts of interest. Key research questions included:

- How do local actors perceive protected area governance and management practices?

- How do management practices shape the perceptions of communities?
- How are actors involved in decision-making in the management of protected areas, and how are they are informed about decisions?
- How does the community perceive the integration of cultural values in management practices for respective protected areas?
- What are the existing and potential conflicts of interests, and whose interests count?

7.2 Methodological approaches

This research was conducted through mixed-method approaches and included household questionnaires, focus groups and key informant interviews (see Chapter 3, also Creswell 2003b; Franz 2009; Newing et al. 2011; Masadeh 2012). In this section of the chapter, I give a brief overview of the questions and key variables used that relate to perceptions and the governance of protected areas.

7.2.1 Household questionnaire

Questions related to the relationships between communities and protected areas included open-ended and Likert-item questions using three levels including agree, somewhat, disagree or good, fair, bad. The open-ended questions were coded based on emerging themes to allow analysis and the provision of subsequent explanations where required.

For this part of the study, questions were related to the perceptions of communities about protected area management (practices), decision-making processes (how decisions were made) and actors (who were involved in the decision-making process), information sharing, and existing conflicts between communities and protected area managers (see Appendix 1).

Protected area management related information (e.g., gazettement, community support, meetings) was shared in the three protected areas through various channels including: (1) meetings held in the area related to respective protected areas; (2) local chiefs attending decision-making forums that reported back to communities; (3) participants in meetings sharing information with other community members; (4) respondents who had never been informed about the establishment of the protected areas; (5) members of the community who might have been arrested by rangers who informed other members of the community about the any information related to respective protected areas; (6) radio programs as another mean

of communication on protected area activities and; (7) respondents who reported being informed through multiple channels.

7.2.2 Focus group discussions

Focus group discussions were carried out for each protected area as detailed in Section 3.2.1.1. Key themes discussed during these focus group discussions included the relationships between communities and protected area managers and the roles of different power-holders (see Table 7.2); the attitudes of communities towards the quality of management (see Section 7.3.2); and the cultural values of protected areas (see Section 7.3.3).

7.2.3 Key informants

Key informants included protected area managers, conservation workers, managers and local chiefs. In Kabobo, however, only traditional chiefs were consulted because there was no ICCN staff and only the WCS operates in the region. With key informants, discussion themes included collaboration amongst stakeholders, decision-making processes and the role of traditional chiefs as well as their perceptions regarding the support of communities of protected areas.

7.3 Results

7.3.1 Community perceptions of protected area management in DRC

7.3.1.1 Assessing overall perceptions of communities

Local perceptions of protected areas varied between landscapes (Table 7.1) regardless of social categories (*see Section 3.2.1.1*) and did not include bad perceptions.

Table 7.1. Percentages (%) of total respondents by protected area reporting on perceptions of the current management of protected areas. Responses are reported by social categories[1] (as indicated in Section 2.3.2.1).

	Itombwe (n=207)			Kabobo (n= 216)			Okapi (n=91)		
	Good	Fair	n	Good	Fair	n	Good	Fair	n
Natives	42	58	127	100	0	90	45	55	42
Migrants	18	82	28	98	2	42	71	29	31
Non-natives	48	52	31	98	2	83	61	39	18
Displaced	24	76	21	100	0	1	0	0	0
Total average	38	62		99	1		57	43	

[1] Social categories include natives who originate from the area, non-natives whose ancestors migrated in the area long time ago, migrants who have come recently to the area and displaced people who have fled from their area for security or natural hazards reasons.

Fair perceptions on protected area management were reported by half of respondents (62%, n=207) in Itombwe, more non-natives (48%) and natives (42%) respondents had good perceptions compared to migrants (18%) and IDPs (24%). Regardless of social categories, a good perception of protected area management in Kabobo was reported by the majority of the respondents (99%). During focus group discussions about Kabobo, the majority of the participants explained that the participatory gazettement process and the establishment of local governance structures (see Section 5.4.2) were the key motivating factors for their support of the management of Kabobo. Moreover, native and non-native respondents had good perceptions because, according to a participant in the focus group discussions, the protection of the region secured their heritage from external invaders (migrants) as long as clear rights and responsibilities were defined,

In Okapi, half of respondents (including Pygmies) had good perceptions of protected area management, while the remainder had fair perceptions. The existence of Okapi was the main determining factor for the good perceptions of respondents despite the top-down gazettement process in the early 1990s (see Section 5.4.3). However, access to resources through the establishment of management zones was another key influential factor. Participants in the focus group discussions explained why some community members had negative perceptions. The first reason was related to the decrease in the wildlife populations. One of the participants ascertained that wildlife species had been depleted and limited actions had been conducted to protect key remaining animals like elephant (*Loxodonta africana*). Another reason was related to the failure of protected area managers to manage immigration, which affected land ownership. “Community members have lost their land and now migrants own large portions in the agricultural zones”, said another participant. The third reason was associated with the loss of power and control over resources by natives due to protected area management approaches and immigration. Fair perceptions were influenced by the prevailing insecurity in the region (see Section 2.3), limited support to local development and corruption.

7.3.1.2 Management interventions influencing local attitudes and perceptions

Respondents were asked to identify a maximum of four good practices (Figure 7.2) and four bad management practices (Figure 7.3) that could influence local perceptions. Good management practices reported by respondents included the following (1) conservation outcomes related to protection of key wildlife and ecosystems, status of key ecosystems and

the establishment of the protected area; (2) incentives through social economic interventions, such as microcredit schemes, empowerment, capacity building and support to social infrastructure; (3) collaborative approaches that included the involvement of communities in decision-making, access to resources, and local agreements; (4) improved security through law enforcement interventions; and (5) wages that included salaries for conservation jobs from permanent contracts or temporary contracts (e.g., surveys and boundary marking).

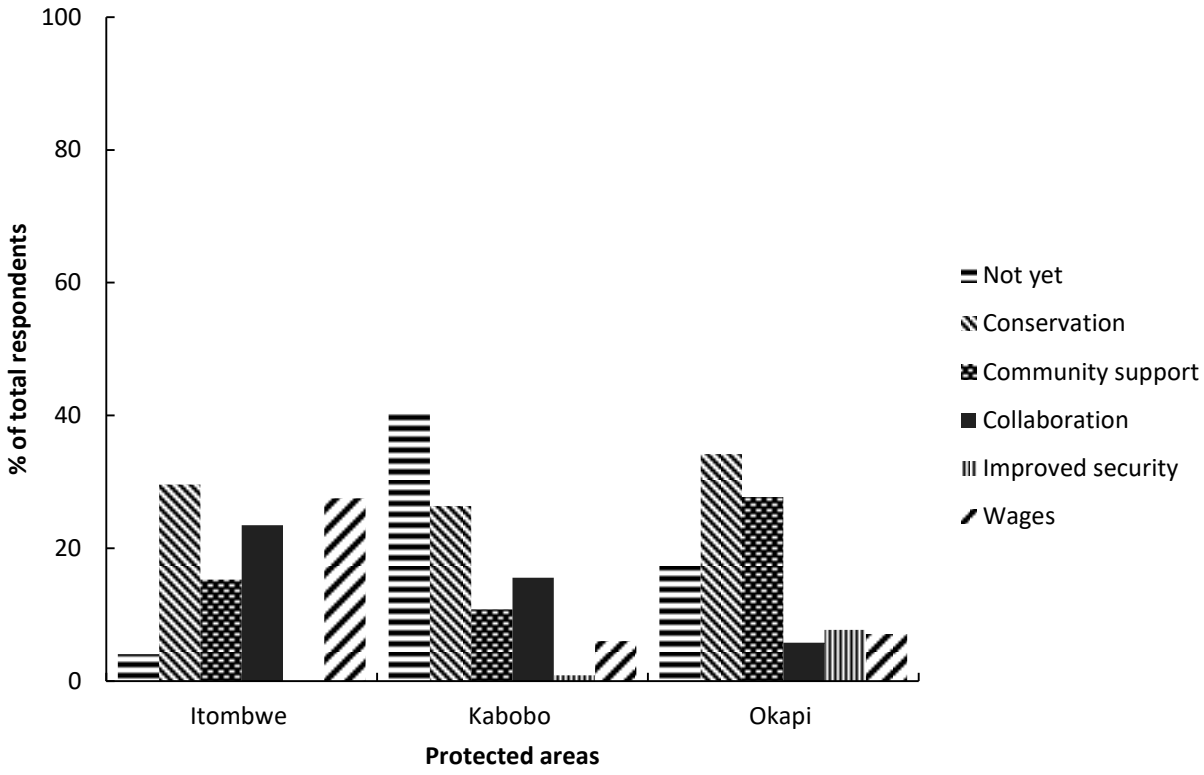

Figure 7. 2. Percentages (%) of total respondents by protected area assessing good management practices in the three protected areas including full and temporary employment, conservation interventions to protect biodiversity, collaborative interventions, the contribution to securing communities as well as community projects, and where no conservation interventions have been implemented

In Itombwe (n=44), the perceptions of respondents were influenced by cognitive factors including the level of their inclusion in conservation activities (collaboration: 23% of respondents) and the conservation outcomes (30%). Moreover, non-cognitive factors linked to their wellbeing included wages (28%) and economic interventions (15%) from the conservation community.

Forty percent of the respondents in Kabobo (n=209) reported that the newly created protected area (Kabobo) was at the early stage (ICCN staff have not yet been deployed in the area).

Therefore, it was difficult to appreciate good management practices. Another influential factor reported by respondents (28%) was the protection of biodiversity and ecosystems.

Similar to other two protected areas, respondents (34%) from Okapi (n=124) reported that the conservation outcomes for protecting biodiversity and ecosystem was one of the good practices that influenced local perceptions. In addition, social-economic support to local communities (28% of respondents) was reported to influence local perceptions. Unlike the other two protected areas where ecoguards were not deployed around and within protected areas, law enforcement operations conducted by rangers were reported (8% of respondents) to have contributed to the improvement in the security of villages located around the ecoguards posts.

There were also bad management practices reported by respondents from the three protected areas that conveyed conflict between communities and protected area managers. (Figure 7.3). Bad management practices included (1) bad governance which had various elements, such as corruption, violation of human rights by rangers and unclear staff recruitment; (2) unclear zoning whereby either protected areas had boundaries on maps but not marked on the ground (Itombwe) or management zones were defined but not marked on the ground; (3) poor enforcement related to a lack of capacity of ecoguards to cover the whole protected area and respond to threats; (4) small-scale interventions that included the space covered by community interventions as well as the volume of support; (5) no compensation for damages related to crop-raiding and human loss associated with wildlife or bad behavior or rangers; and (6) no involvement related to non-participatory approaches.

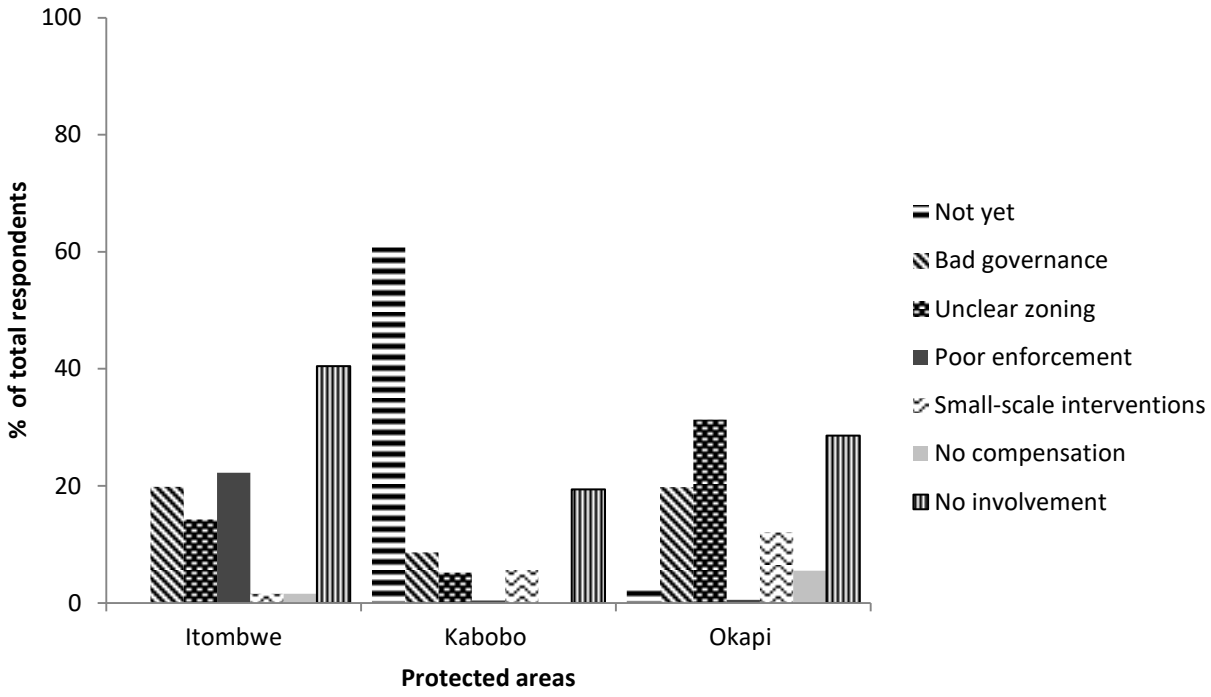

Figure 7. 3. Proportion of respondents reporting bad management and governance practices in Itombwe, Kabobo and Okapi. Key practices included violation of human rights and corruption (bad governance), uncomplete or unmarked boundaries of zones, ineffective law enforcement, inadequate community project interventions and lack compensation schemes for wildlife damages.

In Itombwe (n=52), bad practices that could negatively affect local perceptions were predominantly due to unclear zoning (14%) and bad governance (20%) with limited conservation outcomes (22%). Forty percent of the respondents reported limited involvement in conservation interventions. Participants in focus group discussion reported that "participatory zoning was conducted; related agreements were not developed and physical boundaries marked" The majority of the participants in the focus groups in Itombwe were not aware of existing agreements despite discussions held during the gazettement process (see Chapter 4). One of the participants in Itombwe reported, "We know that we agreed on different zones but nothing happened since then with regard to what were our rights and where the boundaries were".

During focus group discussions, participants reported that despite the establishment of the reserve and paramilitary training of rangers, enforcement interventions covered small areas of the reserve with ineffective staff. Areas that were not visited were witnessing a degradation of local ecosystems. Participants in focus group discussions asserted that, despite the

gazettement of the reserve, access to natural resources was not regulated, as anyone could freely access resources regardless of the zone and the legal status of Itombwe. Participants reported that as a consequence of corruption and a lack of professionalism of protected area managers, most conservation workers were themselves involved in the illegal extraction of resources (see Section 6.3.4.1). Respondents in Itombwe complained that hunting zones were not considered during zoning and other management zones had not yet been marked (see Section 5.4.1). Moreover, designated zones were not marked and enforced. Additionally, only a thin buffer zone was established. Therefore, communities perceived that current zoning could deprive them from accessing natural resources if appropriate agreements were not developed.

About half of the respondents (60% of 211 respondents) in Kabobo reported that it was not timely to assess management practices because the management body and structure were not yet in place. However, a few respondents reported limited involvement (19%) and poor governance (9%) as potential bad practices. During the focus group discussions, participants in Kabobo were concerned about the lack of regulations for management zones, the absence of detailed agreements related to resource access rights in respective zones, and the slow process of setting up management structures. In addition, communities were concerned about potential power conflicts between protected area managers and local established forestry services vis-à-vis traditional settings.

For Okapi (n= 142), the lack of clear agreements and physical marks of different management zones, limited involvement, as well as bad governance practices, were key negatives practices that affected local perceptions of individuals. During the focus group discussions, participants reported that agreements related to access rights were not revealed to communities. One of the reasons was that meetings related to development and the validation of agreements was attended solely by community leaders who did not report back to local residents (see Section 7.3.3). Additionally, participants reported that the above agreements were not implemented in full by conservation actors (ICCN and INGOs) on the ground. Participants in focus group discussions and some key informants in Okapi reported the small scale of community interventions, which did not cover the entire protected area. In areas where these activities were implemented the number of beneficiaries was reported small by communities. In addition, participants in focus group discussions mentioned conflicts of interests in Okapi where some rangers and wardens maintained illegal networks to extract

resources from the protected area. In addition, participants reported an indirect link between conservation workers and migrants to exploit the use of agricultural zone. Indeed, the conservation workers could access easily land in agricultural zones and had enough money to pay for labour. Therefore, more than gaining from their work, they owned large spaces in agricultural zones where they used more migrants than natives or non-natives

7.3.2 Decision-making processes and relationships between communities and conservation managers

7.3.2.1 Relationships between communities and conservation managers

The quality of relationships between communities and protected area managers varied from one protected area to another, as well as amongst conservation zones within the same protected areas (Figure 7.4). Specific perceptions were reported by management zone and by protected area.

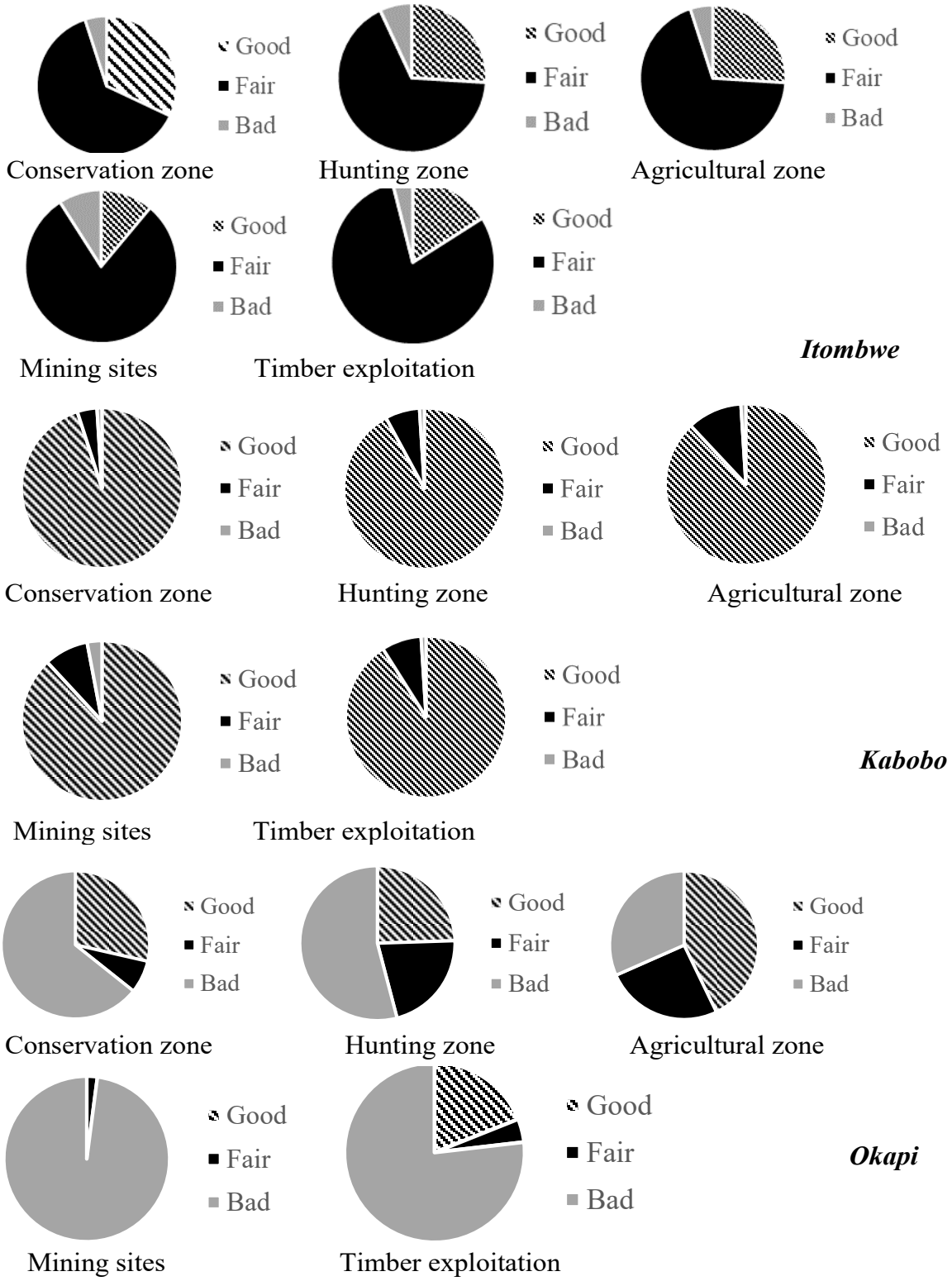

Figure 7. 4. Percentage of respondents reporting on the quality of their relationships with conservation managers by management zones (conservation, hunting and agricultural) and resource (mining and timber), and by protected area

In Itombwe, 71% (234 of respondents) reported that their relationships with protected area managers were fair while 23% reported good relationships regardless of management zone. The majority (91% of the 226 respondents) from Kabobo reported relationships to be good with protected area managers. Bad relationships between communities and protected area managers were reported for Okapi by 52% (157 of respondents) compared to 28% of the respondents who reported that relationships were good, and 20% reported having fair relationships. Good relationships were reported by 42% of the respondents regarding agriculture zones and 25% of respondents reported that relationships were fair. Bad relationships were mostly pronounced for mining sites. During my focus group discussions with communities in Okapi, a few participants expressed bad experiences of law enforcement operations in mining sites where people were arrested and their equipment and material confiscated. The exploitation of timber is another example where participants in focus group discussions claimed that they were prohibited from using timber located in the agriculture zone unless authorised by the park manager based on communicated needs.

7.3.2.2 Processes of decision making in protected areas

One of the factors that affected relationships between protected areas and communities was the level of involvement of community members in protected area management and decision-making (see Section 5.4.1). Decision-making for the three reserves involved different decision-makers including protected area managers, traditional chiefs, provincial authorities and families to a lesser extent, although the level of involvement varied between from one protected area to another (Table 7.2).

Table 7. 2. Percentages (%) of respondents' perceptions of whom they thought were involved in decision-making for protected areas (Itombwe, Kabobo and Okapi). The respondents were asked to identify who were involved in decisions about protected areas and natural resources.

	Itombwe (n=87)		Kabobo (n=209)		Okapi (n=112)		
	Agree	Somewhat	Agree	Somewhat	Agree	Somewhat	Disagree
Park managers	74	26	100	0	59	41	0
Local chiefs	52	48	100	0	70	28	2
Forestry services	49	51	88	12	63	34	3
Provincial government	70	30	93	7	62	13	24
Families/Clans	72	28	93	7	67	10	22
National government	84	16	95	5	86	13	1

In Itombwe, respondents reported that decisions about access to ES were made by multiple structures/actors (decision-makers) either separately (65%) or jointly (35%); none of the respondents disagreed on the involvement (see Table 7.2). However, the management of Itombwe seemed to be more influenced by protected area managers (see Table 7.2). Moreover, respondents reported a low involvement of forestry services in decision-making This might be related to the low profile of forestry services in the area when enforcing forestry legislation.

In Kabobo, none of the respondents contested (disagreed) about the involvement of several different actors in the decision-making process (See Table 7.2). The majority of respondents (95%) reported that multiple actors were involved in decision-making on ES uses. However, the powerful actors identified included conservation actors and traditional chiefs (see Table 7.2). Participants in the focus group discussions in Kabobo reported the existence of conflictual power relationships between traditional chiefs, provincial mining officers and forestry officers. Conflicts were essentially related to the control of mining, forestry products and related financial benefits. For example, traditional chiefs gave land to migrants (farming and pasture) based on traditional regulations (see Section 6.5.3.1, Table 6.5), whereas public services (mining and forestry departments) allowed mining extraction and exploitation of forest products on the part of other migrants. Indeed, it was not clear on the ground amongst power-holders who had more power than the other did, especially in Kabobo where the effective management of the reserve is not yet established.

Although respondents were unanimous regarding the predominant role of local chiefs and conservation bodies in the management of ES in Kabobo, my observations suggest that the power of traditional chiefs had been hindered by the presence of armed groups in some regions of Kabobo as well as the presence of public services. Similar to Kabobo, the majority of respondents in Okapi (62%) reported that multiple decision-makers were involved and influenced the management of Okapi and the use of ES. However, respondents thought that provincial government (24%) had a great deal of power to decide on ES, as well as the forestry department (17% of total respondents), traditional chiefs (16%) and families and clans (17%). During focus group discussions, one member said, “Although ICCN presumably identifies itself as the main decision-maker and responsible for the Okapi, other actors are making decision on ES and exploiting resources and products (e.g., mining, timber, bushmeat) with no consultation and consent from ICCN”.

Overall, the management of protected areas in the DRC involved both mandated and non-mandated decision-makers (see Table 7.2). Although the ICCN was in charge of managing protected areas, it is clear that ICCN had lost its exercising power on protected areas as the predominant decision-maker.

During discussions, the key informants identified that each actor had both positively and negatively influenced and contributed to protected area management (Table 7.3). The key informants reported that the ambiguous support shown by different decision-makers to conservation was because their actions were motivated by individual and political positioning.

Table 7. 3. Positive and negative contribution/attributes of actors to protected area management in the DRC as expressed by key informants

Local chiefs	
Positive	• Community awareness, • Traditional leadership to mobilise communities, • Piloting community interventions to foster community support, • Cooperation for conservation: information sharing, supporting, established conservation committees, • Conflict resolution on resource access issues, • Monitoring of encroachment of boundaries.
Negative	• Support for and sometimes involvement in illegal extraction of resources and products for tributes or remittances (e.g., land), • Infringing on conservation decisions when their stakes were threatened, • Corruption: i.e. misuse of funds and ambiguous selection of beneficiaries, • Conflict over land control and allocation (agriculture lands).
Provincial public services (military, mining and forestry)	
Positive	• Technical support to conservation (e.g., gazettement, field equipment), • Law enforcement of respective laws: i.e. joint patrolling, licensing, • Capacity building, i.e. paramilitary training, environmental laws, • Community awareness about environmental laws, • Provision of field equipment.
Negative	• Involvement in illegal resource extraction and trade (e.g., ivories, minerals), • Corruption: illegal licensing,

	• Confusion of roles and mandates, • Parallel decision making.
Provincial political authorities	
Positive	• Legal gazettement of protected areas, • Political support.
Negative	• Limited support and political interferences, • Conflict fueling for votes, • Campaigning against protected areas for electoral votes, • Corruption and financial interest.

As for other ACM processes, the three protected areas involved multiple actors with different powers and interests (Trimble et al. 2015a; Plummer et al. 2017a). Some key informants assumed that co-management in the DRC would ensure that collaborative interventions are delineated by actors and interests. For example, for communities, key informants suggested that agreements should be limited to those related to resource use and the management of extractive zones (i.e. hunting, agricultural zones). Key informants suggested that co-management processes should not include other actors (e.g., the army, forestry and mining departments) in decision-making associated with protected areas.

7.3.3 Community involvement and information sharing

7.3.3.1 Community involvement

This section of the research report assesses how communities were directly involved or represented. In addition, the section identifies the reasons for the exclusion of communities in decision-making processes in the respective protected area (see Figure 7.5). I considered that conservation interventions included law enforcement (where ICCN deployed ecoguards in Itombwe and Okapi), community wildlife monitoring (for Kabobo where there were no ecoguards), boundary demarcation, livelihood related-activities (e.g., improving local farming) and community meetings.

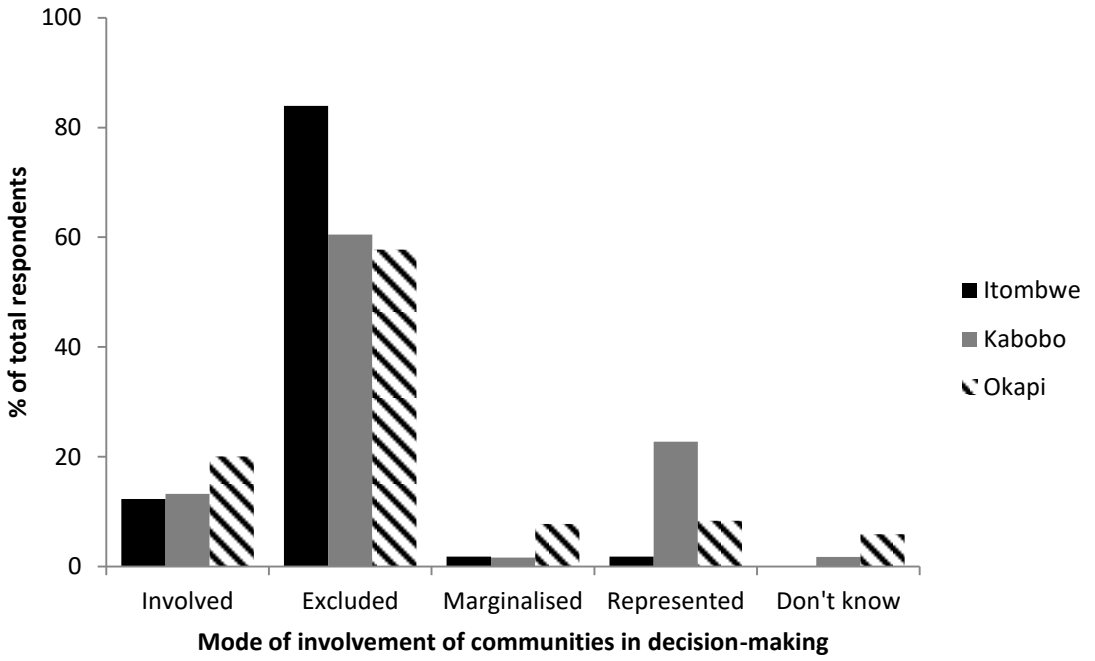

Figure 7. 5. Percentages (%) of total respondents reporting the level of involvement of communities in conservation activities in Itombwe, Kabobo and Okapi. Respondents were either involved directly, represented by either local chiefs or other members of the communities, excluded from activities happening or their opinions and claims not considered.

The majority of the respondents (84% of 206 respondents) in Itombwe reported that they were excluded from conservation interventions. Few respondents indicated that they were involved in the implementation of boundary demarcation activities (3% out of 12% of respondents). Likewise, a large number of respondents (61% of 208 respondents) from Kabobo reported that they were excluded from conservation interventions. For those who were involved, it was through their representatives (23%). Only 13% of respondents reported that they were involved in conservation interventions. They were more involved in wildlife monitoring interventions (4%).

About half of respondents (58% of 150 respondents) in Okapi reported being excluded, although some community members (20%) were involved in conservation interventions. Zoning (9% of respondents) and boundary demarcation (5% of respondents) were the main activities where communities were involved.

Respondents from the three protected areas reported five main reasons for the exclusion of communities in protected area management in the DRC (Table 7.4). The key discriminatory factors included: (1) people belonging to a tribe that was excluded in processes; (2) belonging

to other tribes than the reigning tribe (traditional chiefs or protected area manager); (3) being a member of a different political party than the decision-makers; (4) being identified as an individual opposed to decisions made by conservation management or not involved in conservation interventions; and (5) being excluded from participating in conservation interventions for unknown motives.

Table 7.4. Percentage (%) of respondents that reported on reasons to be involved in conservation interventions by protected area – Respondents were asked to justify why they should be involved in conservation interventions through a Likert-scaled question

Protected areas	Perceptions	Excluded tribe	non-reigning	Politics	Against management	Excluded
Itombwe	Agree	71	68	23	72	92
	Disagree	5	6	15	6	8
	Do not know	24	26	62	22	0
Kabobo	Agree	16	19	2	4	100
	Somewhat	8	3	4	3	0
	Disagree	66	67	81	79	0
	Do not know	9	11	13	14	0
Okapi	Agree	11	10	4	71	73
	Somewhat	35	16	10	10	0
	Disagree	52	72	86	10	0
	Do not know	1	2	1	10	27

About 1/3 of the respondents (30% of 95 respondents) reported that they were excluded for ethnic reasons or their perceived negative opinion of the management of Itombwe (16% of respondents). A few respondents (3%) reported their exclusion being related to political views and reasons.

In Kabobo, 2/3 of the respondents (n=195) felt that they should be involved because they were excluded in the decision-making process (see Table 7.4). However, some respondents (less than 20%) reported that the exclusion was related to ethnic identity.

Respondents in Okapi (n=148) thought that they were not involved due to their opinion that could oppose protected area manager's ideas (61%) while others community members were excluded without any reason (13%). A few respondents (13%) reported that tribal factors might have been one of the reasons for exclusion. During focus group discussions in Okapi, participants reported that members were excluded for ethnic reasons and for their divergent opinions during meetings held by conservation actors. Participants mentioned that

recruitment of staff and the selection of beneficiaries of community projects were based on tribes.

7.3.3.2 Information as a tool for inclusion

Information sharing is related to how participants were informed (see Section 7.2.1) about decisions made by protected area managers or what channels were used to share information (Figure 7.6).

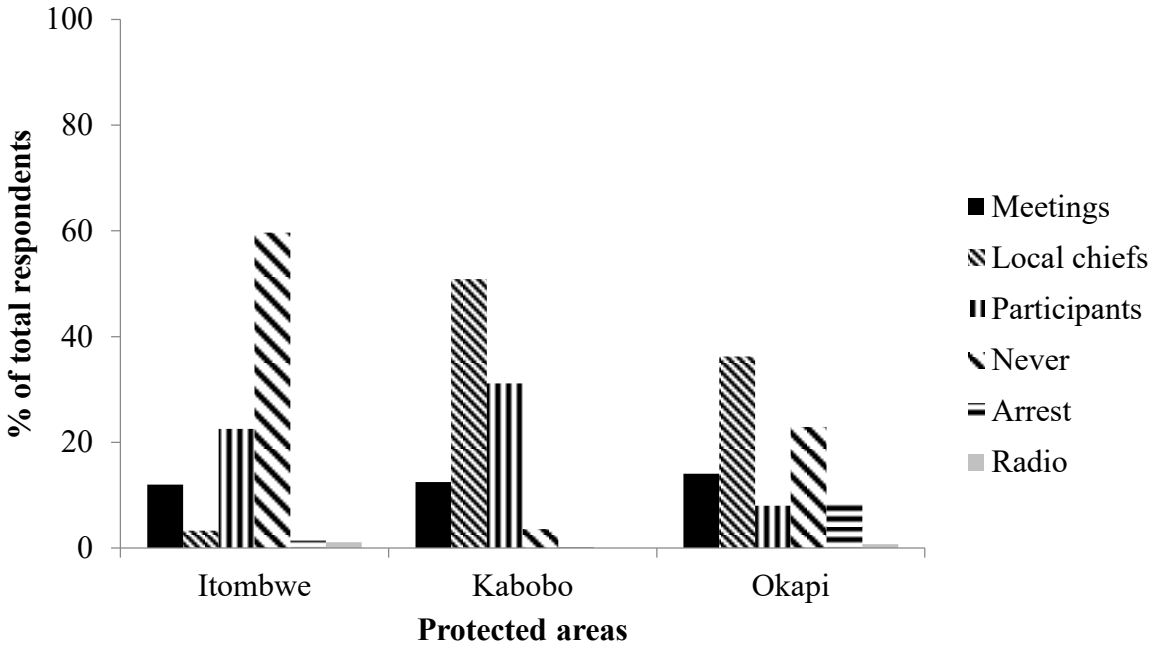

Figure 7. 6. Percentage of respondents reporting on channels of information in respective protected areas.

About half of the respondents (60%, n= 202) from Itombwe reported not accessing information about protected areas' activities. However, a few of the respondents accessed information either directly as participants in meetings (12%) or from other community members (23%) who attended meetings. During focus group discussions, one participant stated, "I had never been part of Itombwe conservation meetings and my focus group discussion was his first time to see people talking about Itombwe in their villages apart from listening to the radio programs".

Information regarding Kabobo was reported as being shared through local chiefs (51% of 212 respondents). Other information was accessed through other community members who attended meetings (31%). A few respondents mentioned that they attended meetings (13%).

Finally, in the case of Okapi (n=147), the information was shared either through local chiefs (37% of respondents) or meetings (15%) although some respondents (25%) had never been informed. Interestingly, a few respondents in Okapi (5%) were informed when or after they were arrested by rangers.

7.3.3.3 Cultural values and protected area management

Although cultural values were not considered as one of the factors influencing the perceptions of communities towards protected areas (Figure 7.3), I wanted to know how communities perceived the integration of cultural values in management practices for the respective protected area (Figure 7.7).

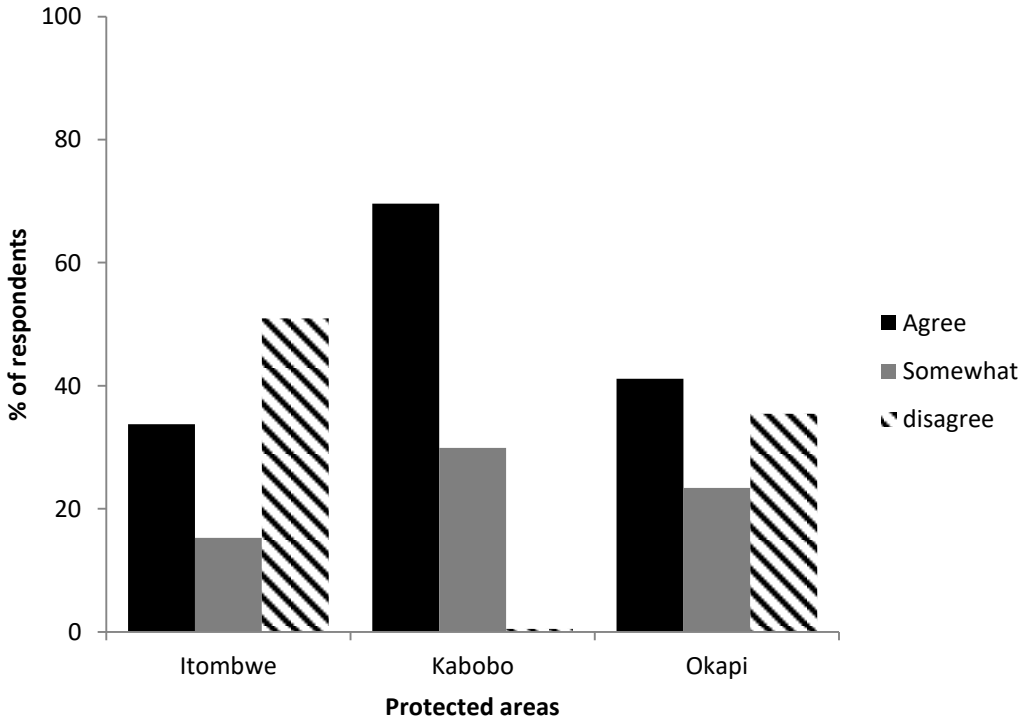

Figure 7. 7. Proportions of respondents reporting the inclusion of cultural values and rules in conservation management

Half of the respondents (51% of 154 respondents) in Itombwe disagreed that their cultural values and rules were integrated in the current management of the protected areas, while 34% of respondents agreed. During focus group discussions, one participant revealed, “It was difficult for managers to consider local cultural values and rules when even local communities do not respect traditional practices any longer”. The majority of the participants

reported that, while their culture did not allow them to hunt some species (e.g., pangolin, gorilla), local hunters were illegally killing any species regardless of their cultural value.

70 percent of the respondents (n=201) agreed that cultural values and traditional rules were integrated with the management practices of Kabobo. The involvement of traditional chiefs in decision-making was highlighted as proof of this by communities during focus group discussions (Table 7.1, also Chapter 6, Figure 6.6).

In Okapi (n=137), 41% of respondents agreed that cultural values and traditional rules were integrated in the current management practices while 35% disagreed. During focus group discussions, one of the participants mentioned, 'Traditional beliefs and cultural values have been eroded as some of them do not align any longer with conservation laws and regulations". For example, species that had healing attributes and cultural values had been classified as protected (*sensu IUCN*) and their use prohibited by law. An example was the use of okapi (*Okapia johnstoni*) skin to heal skin diseases and the use of elephant (*Loxodonta africana*) ivory and leopard (*Panthera pardus*) skins for cultural ceremonies. Moreover, Pygmies asserted that some of their traditional practices, such as hunting and a long stay in the forest for cultural ceremonies were not included in current conservation management interventions. One participant said, "Most conservation interventions practices related to Pygmies targeted to change their lives with unexpected effect on their culture".

7.4 Discussion

7.4.1 Motivation and relationships

My research revealed that positive local perceptions were influenced by both intangible (intrinsic motivations) and tangible benefits (exogenous motivation) provided by the protected areas. Positive perceptions were associated with individual satisfaction and the empowerment of local communities. Individual satisfaction was associated with the level of involvement of respondents in conservation interventions as well as in decision-making (see Figure 7.1 and Table 7.1). For example, communities in Itombwe may have supported conservation interventions that target effective conservation of resources involving local stakeholders and better practices for social-economic community projects. However, positive perceptions in Kabobo were explained by the inclusiveness of management practices and multilevel governance processes and structures (see Appendix 3). For Okapi, positive attitudes were linked to the participatory establishment of agricultural zones and access rights.

Additionally, the positive perceptions were related to the residual intrinsic and relational value of protected areas (see Figure 7.2). In fact, respondents from the three protected areas valued conservation management for protecting their heritage from migrants and other external resource users, such as mining companies and artisanal timber exploiters. Consequently, the negative perceptions of the respondents were sometimes linked to poor enforcement to protect biodiversity and ecosystems, and the biased gazettement process that included boundary identification.

Tangible benefits (community projects, access to ES) that affected local perceptions in the three protected areas (Figure 7.2) were related to economic activities that should sustain local livelihood activities. I found that the extent and the quality of livelihood activities can affect local perceptions towards protected areas both positively and negatively. For example, the small-scale livelihood activities negatively influenced local perceptions in Kabobo and Okapi. My results are similar to conclusions from previous studies (e.g., Bennett & Dearden 2014; Moreto & Lemieux 2015; Moreto et al. 2017). These studies found that the positive attitudes of communities towards protected areas were influenced by socio-economic benefits and social satisfaction (e.g., law enforcement and security[1]) as long as they responded to the autonomous needs and goal of individuals. Additionally, my studies align with Osbaldiston and Sheldon (2003) who found that livelihood projects for impoverished communities are related to social identity and personal satisfaction. My research found that respondents considered livelihood activities for their wellbeing as being attached to material rather than psychological well-being (see Section 7.1.2).

In addition, my research revealed the positive (good practices) and negative (bad practices) impact of conservation management approaches on local perceptions towards protected areas. Therefore, a conservation approach that combines intrinsic motivations related to community projects and management practices (as described by Osbaldiston and Sheldon 2003) with their extrinsic motivation characteristic (improving material assets) may positively influence local perceptions and ensure the long-term persistence of protected areas. Similar to Ngonidzashe et al. (2017) who identified seven determinant factors of local attitudes, my research revealed that the sharing of benefits, effective communication between communities and park staff as well as community involvement are the main motivational factors that motivate local communities to support conservation management.

[1] See subsection on militarization in DRC

7.4.2 Governance and power as an influencing factor

More than the key SDT patterns including autonomy, relatedness and competence (see Section 7.1.2), the perceptions of local communities in my research sites were affected by poor governance that included a lack of transparency, discriminatory resource access rights, corruption, an unclear agreement for decision-making and plurality of power (see Table 7.2).

Despite the legal mandate of the ICCN for managing protected areas, traditional chiefs and families are still powerful as far as access rights are concerned (Bisidi et al. 2008; Crawford & Kujirakwinja 2016) Local chiefs have been influencing and still influence local social systems and structures, and might affect the sustainability of protected areas. Therefore, the effectiveness of the management of protected areas in the DRC might be dependent on how other power-holders are involved in field operations and activities and how their negative impact is monitored and managed.

Power over ES in the three protected areas is scattered between multiple actors with limited coordination, collaboration and mutual trust. Therefore, the lack of cohesion between multiple structures and actors might have negatively influenced local communities' attitudes towards protected areas (see Table 7.2). In addition, this incoherent and pluralistic decision-making reality has weakened environmental mandated structures and agencies that failed to deliver conservation outputs. One participant in Okapi reported, "Although ICCN is legally mandated and prevail managing the reserve, illegal exploitation of resources is supported by other actors such as army members and traditional chiefs". Most protected areas were reported as being degraded (Figure 5.3) as a result of uncoordinated, multiple power-holders in governance practices and poor management of resources (see Chapter 4). In addition, the negative actions and attitudes of communities may result from the length of the non-physical distance between communities and the center of the power (conservation actors) as well as exclusive and inclusive processes (see Figure 7.5 and Reddy et al. 2017). The same features were found in a recent study in South Africa on bioprospecting (Morris 2016) whereby alliances are formed by dominant stakeholders who benefit from natural resources while communities are elusively included.

The plurality of power over resources in these landscapes might have reinforced the illegal exploitation of resources (see Section 5.4.3) based on the interests of specific decision-makers. For example, several reports have mentioned that mining sites, timber and wildlife products in the three landscapes are controlled by armed groups (including members of the

DRC army and rangers) where they enforce their own rules rather than traditional or legal regulations. This was proved by the recent study that covered Itombwe and Kahuzi-Biega (Spira et al. 2017) whereby the artisanal mining value chain involved various resource extractors including rangers.

7.4.3 Law enforcement of protected areas and collaboration

7.4.3.1 Law enforcement in the protected areas of the DRC

Armed law enforcement has been and still is the core of protected area management in the DRC in response to militarised poaching and the presence of armed groups. Armed law enforcement has been considered as the militarisation of protected areas or 'green militarisation' and defined by Lunstrum (2014) as 'the use of military and paramilitary (military-like) actors, techniques, technologies, and partnerships in the pursuit of conservation'.

The militarised law enforcement approach has been one of the popular practices worldwide to protect remaining and threatened biodiversity, especially in conflict and post-conflict countries like DRC. The approach has been criticised by some scholars (Marijnen & Verweijen 2016; Verweijen & Marijnen 2016; Duffy 2017; Marijnen 2017) and supported by others (Gaynor et al. 2016; Ripple et al. 2016; Mogomotsi & Kefilwe 2017). My research found that militarised law enforcement was amongst the negative (Figure 7.3) and positive (Figure 7.2) attitudinal factors that had an impact on the perceptions of local communities. Communities were not supportive of ineffective law enforcement interventions that failed to protect their heritages (see Figure 7.3) and implement good management practices (see Figure 7.3). Therefore, law enforcement interventions that are not properly handled by rangers (e.g., brutality, inequalities of applying laws, corruption) can negatively affect the local support of conservation and amplify degradation. The same findings were reported in Virunga and in neighboring countries, especially Uganda (Moreto & Lemieux 2015) where the perceptions of communities were related to conservation outcomes and the behavior of rangers.

In contrast, communities' perceptions were positive in my study sites (especially Okapi and Itombwe) whenever law enforcement interventions supported local social-ecological systems and contributed to local security (see Figure 7.2). This is similar to the findings from other studies across Africa (Newmark et al. 1993; Biggs et al. 2015; Moreto & Lemieux 2015;

Moreto et al. 2017) that found that communities would support law enforcement operations when such operations protected their assets (social and economic). In addition, communities will support militarised conservation operations when the latter demonstrate equity and effective law enforcement. Unlike the current criticism of the militarisation of protected areas in the DRC (i.e. Marijnen & Verweijen 2016; Verweijen & Marijnen 2016), this research revealed that militarised law enforcement could contribute to the improvement of local security in protected areas (Figure 7.2). This might be related to the dissuasive presence of rangers near to communities (Itombwe and Okapi), advocacy to local security forces (Itombwe and Kabobo) and political support to local social systems. Moreover, similar to findings in other countries in the region like Uganda and Kenya (Gondo 2011; Moreto et al. 2017), communities tend to support law enforcement when their cultural values and heritages are maintained.

7.4.3.2 Two sides of the same coin: collaboration and law enforcement

As described earlier (Figure 7.3), access to resources and products combined with ineffective or inadequate law enforcement can negatively influence the level of support of communities to conservation management. Whenever interests of both parties collide, negative impacts should affect protected area management and resources.

I argue that the gap between collaboration and law enforcement can negatively or positively influence relationships between stakeholders at protected area level (see Figure 2 and 3). Therefore, the large gap can convey degradation and conflicts as well as the ineffectiveness of protected area management (Figure 7.8).

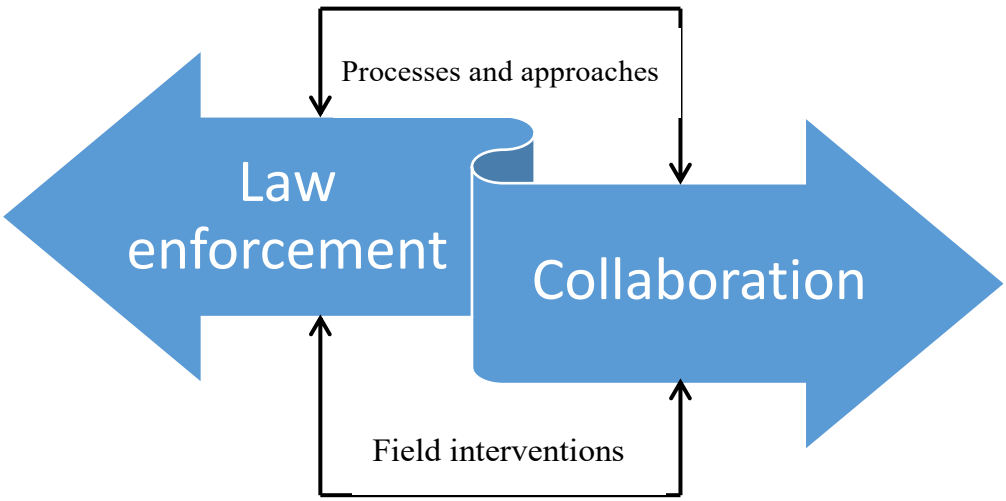

Figure 7. 8. Influence of law enforcement operations and collaboration processes/approaches on good relationships in the eastern DRC protected areas

Law enforcement and collaboration are seen as the two sides of the same coin for protected area management and governance. I found from my research that the way law enforcement interventions affect individuals could negatively affect their willingness to cooperate and support conservation. Although some researchers are pushing for fortress conservation approaches (Hutton & Adams 2005; Fischer 2008; Terborgh & Peres 2017), I argue that such approaches mainly undermine sustainable conservation because they use coercion.

Whilst this research agrees with the importance of law enforcement for compliance to the law and to protect the remnants of ecosystems and wildlife, it emphasises the critical positive influence of collaboration on the persistence of protected areas and the effectiveness of protected area management. Palomo et al. (2014) and Alexander et al. (2016) recognize the role of collaboration in protected area management as well as the compliance of protected area manager for law enforcement activities. Communities in the three protected area are supportive of equitable conservation approaches that include cooperation and law enforcement, especially when law enforcement interventions contribute to their goals and respond to their fears.

7.4.4 Conservation, marginalised groups and tribalism

The exclusion of communities in Itombwe was based on ethnic considerations and the divergent opinions of conservation managers as well as the political affiliation of community members. Indeed, Andrade & Rhodes (2012) confirm that when communities are excluded from protected area management and their aspirations are ignored, the enforcement of

conservation policies become difficult. I found that tribalism was an exclusionary factor for Itombwe essentially, although a few respondents in Kabobo and Okapi did mention tribalism (see Table 7.4). Other studies (see Darner 2012; Morris 2016) confirmed that tribalism can influence the motivation of people and the adoption of negative environmental behaviour that induces degradation of ecosystems. Although quantitative data showed a few respondents mentioning tribalism in Okapi, it was mostly evident in the qualitative data (focus group and key informant discussions) of my research. In most cases, participants in meetings and beneficiaries of community projects in Itombwe and Okapi reported that they were selected based on their ethnical identity (tribe) rather than needs, established criteria or transparent mechanisms (see Table 7.4, Figure 7.2, 7.3, also de Failly & Bandu 2010).

I argue that conservation interventions based on tribes and clans have generated unknown *'conservation marginalised groups*[1] *'*and weakened conservation outcomes and performances. These groups include people who are excluded for their opinions, tribes and leadership. Consequently, they do not support conservation management and can easily destroy the resources of protected areas in terms of sabotage or revenge. In fact, tribalism has been identified by political scholars as one of the signs of a corrupt system that promotes unbalanced power among interacting actors (see Section 7.3.1.2 and Hear 2006). I argue that the lack of clear information sharing mechanisms in these landscapes may have also affected local perceptions. Anton & Shelton (2011) argue that access to information is a prerequisite to effective participation in environmental activities as well as for ACM. Environmental information is essential in raising support for protected area management through intrinsic motivation (Goldstein 2003) because access to information empowers individuals. This is similar to the findings of Osbaldiston and Sheldon (2003) who found that information sharing has a high motivational impact on environmental actions. This was similar to the results for Kabobo where access to information positively influenced local perceptions and pride in conservation. As an intrinsic factor, communities felt that their cultural identity was included in the conservation by involving their traditional chiefs who were considered as custodians of their culture.

[1] Conservation marginalised groups can be found in different groups as their voices are not considered and they are not usually invited or selected for conservation interventions.

7.4.5 Kabobo as an emerging model

Although some studies (Fung 2006; Pieraccini 2015) found that representative participation can negatively impact on community perceptions, that was not the case for one of my sites, Kabobo. Although traditional chiefs and identified leaders represented the communities from Kabobo, they positively supported conservation interventions (Figure 7.5). One of the reasons might be the 'strong' traditional system recognised by communities (including incoming migrants). In addition, the traditional chiefs shared information with communities. I also found that cultural values were important for communities in Kabobo and Okapi as they valued traditional systems. Therefore, conservation interventions should consider traditional systems for sustainable conservation.

Indeed, Kabobo was unique amongst the three protected areas in that communities acknowledged the inclusion of cultural values and traditional rules in conservation interventions. This might be related to the long homogeneousness of the ethnic composition of the area (see Weyn 2010) and the integrative process for defining access rights. In addition, for a long time, the area has been occupied by Pygmies and Bantu (Holoholo) from different local tribes.

In my opinion, the gazettement process of Kabobo was the one that adhered most to ACM principles. Key factors to consider were the extent of local consultations and the participatory approach, regular responses to conflicts that arose as part of the conflict sensitive conservation approach (Hammill et al. 2009; Kujirakwinja et al. 2010b), the involvement of multiple stakeholders, social structures and the provincial political constituency supporting the process. Other researchers (Gondo 2011; Alexander & Armitage 2015; Butler et al. 2015) found that such process can be considered as a transitional partnership toward ACM given that these processes can prepare local leadership to emerge, be considered as a political window of opportunity and generate knowledge that can be shared with a broader society. Indeed, the Kabobo process might be used as the most appropriate approach and process for future gazettement of protected areas. The main recommendation here is that the involvement of communities in protected area management may lower costs of management in future given that conflicts may be reduced and embodied in the joint governance mechanisms (see Figure 8.2).

7.4.6 Missing the local context and ACM principles in the eastern DRC' protected areas

Although the management approaches of these protected areas have struggled to implement some of the ACM principles, I found that local enabling settings (Plummer et al. 2017a) were ignored. These included local needs, the value of resources, changes in perceptions, the use of resources, power dynamics and local agreements (Armitage et al. 2007). Therefore, key ingredients for ACM (see Plummer et al. 2014) were missing mainly for Itombwe and Okapi where there was a lack of transparency, insufficient equity, inadequate access rights and diluted shared responsibilities (Figure 7.2, 7.3). Kabobo was the key area that successfully experimented with ACM given that the gazettement and management processes included collaboration as well as conflict management and multi-level governance (see Section 5.4.2). However, ineffective enforcement interventions might affect local partnerships if clear guidelines are not clearly developed.

Moreover, my study revealed that conservation interventions in the DRC tended to comply more with 'international' guidelines (e.g., special rights to Pygmies) and to push for international environmental agendas than local social-cultural settings and needs (integrated resource use) (see Section 4.4). As a complex system (see Section 1.1), the influence of the local context for each protected area is very important if one wants to transform practices on the ground (Palomo et al. 2014). For example, while some conservationist practitioners and researchers are pushing against collaboration and law enforcement, I found that both approaches should be effectively implemented (see Section 7.4.3).

Protected area management and governance should consider traditional systems to build local trust and confidence. This is applicable essentially in Kabobo and Okapi. For Itombwe, the selection of participants for meetings and other conservation interventions should be the focus for successful conservation (see López-Bao et al. 2017).

With the plurality of power, corruption and the different exercising of power, conservation managers have been caught in the representative (elitist) participation that has increased ineffective conservation. Indeed, at local level, local representations and benefits were captured by traditional chiefs and public services. Therefore, community projects supposed to benefit communities were channeled towards relatives of local chiefs and conservation actors as well as community representatives coopted by power-holders (see section 7.3.3). Therefore, I argue that the legitimacy and transparency of decision-making processes were not effective

in protected areas in the DRC, especially Itombwe and Okapi. Processes did not consider the community's unsolved claims related to land and rights.

7.5 Conclusion

Amongst the motivations for conservation practitioners in the DRC to embrace co-management approaches were the degradation of protected areas, increased conflicts with local resource users and ineffective management (Hart & Hart 2003; Inogwabini et al. 2005; Kujirakwinja et al. 2010b; Kasereka et al. 2016). However, this research study revealed that the co-management approaches of protected areas in the DRC were far from enabling a suitable environment for ACM (see Chapter 4, 7). Most conservation interventions had limited collaboration with other stakeholders, limited power sharing, undefined roles and responsibilities for stakeholders, information sharing and communication, access rights and learning (Bown et al. 2013a; Trimble et al. 2015b; Plummer et al. 2017b). Meanwhile, Kabobo is one of the better examples of protected areas in the DRC that ranks higher than the others as far as motivational factors are concerned. It should be considered that for protected areas that has practiced the ACM approach, and much could be learned from this case. Furthermore, Okapi is moving towards reconditions for ACM (i.e. sense of place, time; see Plummer et al. 2017a).

Nevertheless, the lack of clear local agreements related to resource use, boundaries, the roles and responsibilities of communities and power-holders as well as the quality of management practices is a key barrier that may hinder ACM and effective conservation in DRC (Bennett & Dearden 2014; Moreto et al. 2017). In addition, discriminatory access rights within communities, polarised power, corruption and tribalism undermine conservation as they are considered as inhibitors or demotivation factors for individuals (Cetas & Yasué 2017). Despite negative perceptions of militarised law enforcement (Marijnen & Verweijen 2016), my research revealed that law enforcement operations that consider local needs and respond to the intrinsic values of protected areas may be supported by communities. For example, the degradation of protected areas was identified as one of the negative determining factors of support from communities for protected areas. While that could be contradictory with ongoing illegal resource extraction reported by managers, it is thought that major harm to these reserves was coming from immigrants. Finally, conflict management and resolution should be embodied in each intervention as it may help implement attitudinal monitoring in each landscape.

ACM approaches in DRC should be revised and incentive mechanisms should be developed. In addition, motivational conservation interventions should be designed that include local structures and values with defined roles and benefits/cost to bear (Lane 2001; Andrade & Rhodes 2012; Mutanga et al. 2017; Plummer et al. 2017b). Conservation interventions that target intrinsic values (incentives, rights, etc.) can motivate communities and improve positive cooperation.

PART III. TRANSFORMATIVE ADAPTIVE CO-MANAGEMENT

Chapter 8. Synthesis : Towards transformative ACM in DRC

8.1 Introduction

The aim of my research was to evaluate the impact of past and current conservation governance processes and management practices on the sustainability of three biodiversity-rich and conflict-affected protected areas in the eastern DRC (Itombwe, Kabobo and Okapi), and to explore options for transformative co-management (T-ACM). Key outcomes for a desired and long-term protected area management discussed in previous chapters include the role of history and stakeholders as detailed below (see Section 8.2, also Figure 8.1).

This chapter synthesises my research findings, and proposes practical management and governance processes for protected areas in the DRC. I suggest elements to be considered to operationalize and transform current approaches (see Figure 8.2) that focus on individuals' motivations, values and perceptions (Pelletier et al. 1998; Darner 2009; Deci & Ryan 2015; Cetas & Yasué 2017; Bennett et al. 2019). To fill the research gaps identified by my research, I suggest some questions to be addressed by future research related to protected areas in the DRC.

I used elements of different theoretical frameworks (SES, SLF, historical ecology, political ecology, SDT and ACM) to disentangle the complexity of management and governance of protected areas in the DRC as well as relationships amongst various stakeholders (see Figure 8.1). I constructed a framework that brings together historical understanding, personal motivation and political settings as key factors that can influence T-ACM (see Figure 8.2). In addition, given that the gazettement of protected areas is one of the critical steps in the establishment and management of protected areas, I propose an analytical framework for protected areas in the DRC that includes multiple levels and stakeholders (Figure 8.2).

Finally, using the ACM evaluative framework and SDT, I constructed a practical framework (Figure 8.2) to inform on better ways of managing protected areas in the DRC, provided that complex variables are considered. This framing included collaboration and cooperation among stakeholders through the inclusion of community governance structures and traditional systems.

8.2 Learning from the history of conservation and current protected area management in the DRC

My study has revealed five key learnings related to protected areas management and governance. Firstly, a historical understanding of protected areas in the DRC is critical for influencing current management practices (see Chapter 4) and define future governance systems (see Chapter 8). However, most conservation actors have ignored the social, political and economic changes that may influence how communities value and support protected areas. Secondly, political changes at national level have had a great impact on the effectiveness of protected areas regardless of international interventions and support (see Chapter 4). Thirdly, the level of community involvement in gazetting protected areas influences the positive or negative perceptions of communities towards protected areas (see Chapter 5 and 6). Fourthly, the limited coordination of power-holders and a lack of local arrangements for resource access and rights have contributed to the degradation of protected areas and increased animosity between conservation actors and other stakeholders (see Chapter 7). Finally, local perceptions that influence the effectiveness of protected areas are largely shaped by intrinsic motivations, such as personal satisfaction, freedom of choice and competence (see Chapter 7). The five learnings are represented in a framework that illustrates their relationships (Figure 8.1). Figure 8.1 shows the linkages between key variables that have influenced conservation management and can be considered as entry points for transforming ongoing co-management approaches. Details of the framework are discussed below.

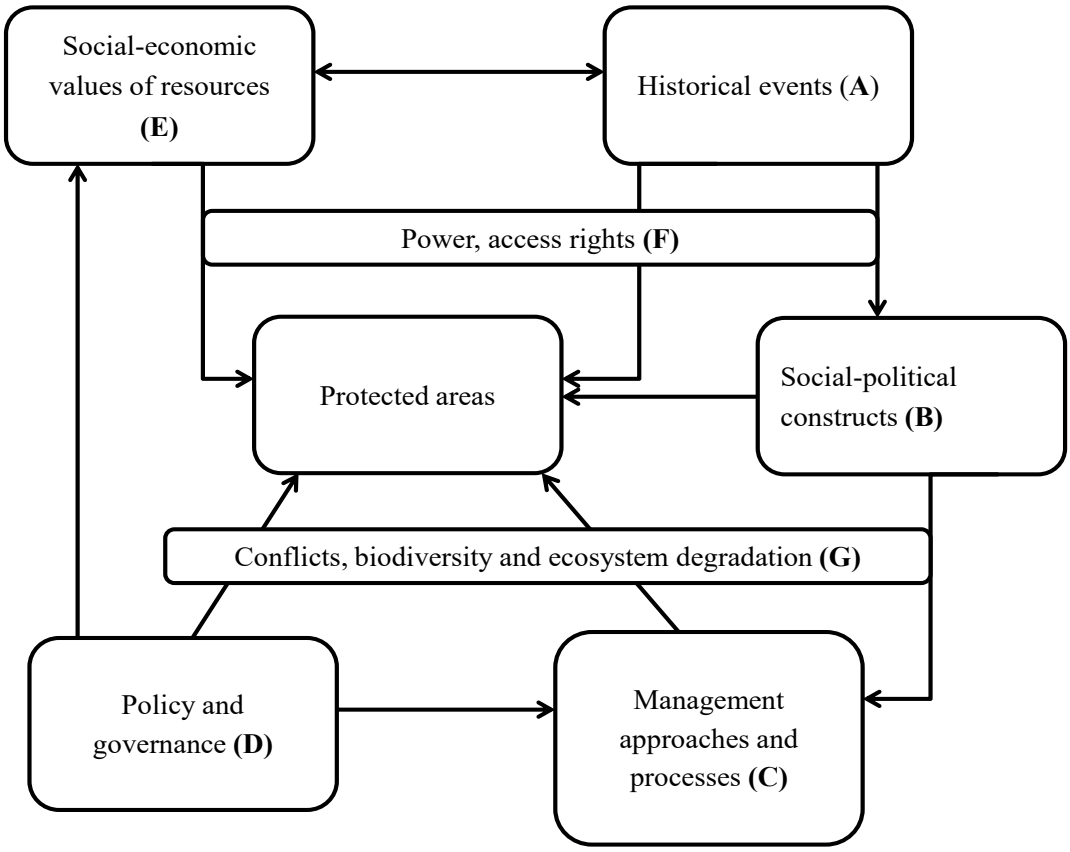

Figure 8. 1. Framework for understanding the influencing factors of protected area management in the DRC. Protected area management should consider historical information (A) based on social and political constructs (B) shaping protected areas to inform management practices (C) based on existing policies and governance regimes (D) that should guide social and economic value and use of resources (E). The latter should consider changes happened through the history of the protected areas. The overall management of protected areas should consider power sharing and access rights that involve communities (F).

8.2.1 History, policy and the governance of protected areas (Blocks A and D)

Throughout the DRC history of conservation (see Chapter 4), environmental policy and governance have been influenced by international stakeholders (e.g., donors, INGOs), the global ecological agenda (i.e. agreements and conventions) and the political context (Harroy 1993; Van Schuylenbergh 2009; Pouillard 2016). The international support of conservation in the DRC has maintained key protected areas and species through direct funding and technical support (Inogwabini 2014; Pelissier et al. 2015). However, other protected areas not benefiting from the international support are prone to disappear despite their social and ecological value (Pelissier et al. 2015).

This has resulted in a power-unbalanced situation for protected area management amongst local, national and international conservation actors (see Chapter 4). International actors have been and still are in a predominant position to directly (financial) and indirectly (technical) decide on management practices and governance approaches in the DRC (AGRECO 2013; Hatchwell 2014; Lindsey et al. 2014; Larsen & Brockington 2018). One example is the shift from state led co-management (Figure 4.1) towards PPPs (see Section 4.3.2, also AGRECO 2013; Hatchwell 2014; Scholte et al. 2018).

Meanwhile, international support is still needed to maintain protected areas in the DRC unless sustainable financing mechanisms are developed, transparent governance systems are in place within the ICCN and appropriate capacities are identified to drive internal changes (Figure 8.3). To ensure effective T-ACM and to minimise recurrent conflicts affecting protected areas, there is a need to redesign not only how the international support should intervene, but also to ensure that the government (ICCN) defines protected area strategies and actions based on achievable objectives and guidelines that enable equitable partnerships, conservation results and revenue sharing (AGRECO 2013; Kasereka et al. 2016; Scholte et al. 2018).

Moreover, throughout the DRC conservation history, there have been gaps between environmental approaches and practices on the ground and environmental policies (Van Schuylenbergh 2009; Pouillard 2016). Although conservation actors adjusted policies to respond to challenges on the ground (d'Huart 2001; Inogwabini 2014; Pelissier et al. 2015), I argue that such policies still lack proactive strategies and mechanisms that includes uncertainties to cope with ongoing changes within and around protected areas, as well as the challenges to be addressed by the management protected areas. For example, although policy mismatches led to the development of local arrangements among conservation actors (the ICCN and INGOs as discussed above, see Section 4.3) to address gaps in existing policies, no clear guidelines were designed to guide co-management and PPP as governance systems (see AGRECO 2013; Scholte et al. 2018). Additionally, environmental policies have not included provisions on local partnerships and access rights to resources by local communities until recently.

8.2.2 Social-political constructs of protected areas (Blocks A and B)

The establishment of protected areas aimed at protecting biodiversity, important ecosystems and habitats as a primary and revealed goal. Political and financial motivations were among unrevealed goals by respective governments throughout history (see Chapter 4, also Van Schuylenbergh 2009). The motives varied from one political era to another with clear impacts on local social systems (see Chapter 4). For example, the degradation of key ecosystems and the defaunation of wildlife species has been a result of both the lack of long-term vision and financing for protected areas throughout history (see Section 7.4.1).

Finally, changes in management approaches and practices have emerged from financial and political crises throughout history (d'Huart 2001; Hart & Hart 2003; Inogwabini 2014). For example, co-management approaches (see Section 4.3) were implemented to respond to the failure of the Mobutu regime to fund protected areas as well as the international support to high profile protected areas (Inogwabini et al. 2005; Inogwabini 2014; Pelissier et al. 2015).

8.2.3 Management practices and processes (Block C)

Centralised management by an established authority was the predominant conservation management approach implemented throughout the history of conservation in the DRC (ICCN) (see Chapter 4). This approach was dominated by militarised law enforcement (see Chapter 2, Chapter 4 and Section 7.4.3.1) and limited involvement of non-conservation stakeholders, including communities (see Figure 4.1, also Kujirakwinja et al. (2010b). These approaches have been identified as sources of conflicts with communities and led to the degradation of protected areas through the invasion of protected areas and the increased illegal extraction of resources by communities (Megevand et al. 2013; Inogwabini 2014; de Wasseige et al. 2015; Kasereka et al. 2016).

Despite the shift in conservation approaches (i.e. from coercive to co-management), implemented co-management approaches in the DRC did not fully involve communities in decision-making. For example, while conservation bodies (conservation organisations and the ICCN) were full members of established co-management forums (see Figure 4.1), communities and their leaders were either observers or elusive participants (see Section 7.3.3; also Kasereka et al. (2016); Scholte et al. (2018).

8.2.4 Social-economic value of ES (Block E)

The value of resources has shifted from relational and/or intrinsic values to utilitarian/financial values (see Section 6.5). For example, when most protected areas were gazetted, communities were not interested in mining and timber trade. However, with the increasing demand for raw materials (especially minerals) from neighboring countries and worldwide, most protected areas (especially my research sites) were invaded by locals for mining and timber exploitation (Crawford & Kujirakwinja 2016; Spira et al. 2017). I recommend that management practices and governance systems need to adjust to include current resource values and uses, especially given that one resource or product has multiple values for communities.

8.2.5 Why resource users matter in the DRC's conservation (Block F)

The establishment of protected areas in the DRC has been blamed for affecting local livelihoods by depriving communities for accessing resources such as land, forest products and cultural space (Vikanza 2011; Brockington & Wilkie 2015). Although access rights in protected areas have been identified as one of the factors that convey a negative perception of protected areas from local communities (see Section 7.3.1), I argue that local communities may support conservation interventions if they are involved in decision-making processes. Moreover, they may support interventions if transparent mechanisms for resource access and equitable guidelines are established, ethical conservation practices implemented, and information shared with communities (see Section 7.4).

In addition, without considering the needs of local resource users and their support, protected areas in the DRC are vulnerable to move from *paper-parks* (current) to *no-parks*. Protected areas and their ecosystems are prone to be transformed into farmland or human settlement with no hope for the restoration of current biodiversity and ecosystems. Therefore, the gazettement of protected areas should be designed in a way that considers future generations (the youth) in conservation programs and that involves local leaders at the ground level (i.e. villages for the DRC) in decision-making with clear responsibilities and mandates. To ensure their future, the management of protected areas should involve decision-makers at different levels and consider the changing environment (social, political and economic).

8.2.6 Key historical changes to be considered for ACM in the DRC context

Most of the frameworks (see Section 3.1) I used recommend historical information as the foundation for transforming management practices and approaches. Therefore, I identified key social-political factors that have affected conservation throughout history and identified enabling and blocking factors for T-ACM (Table 8.1).

Table 8.1. Key factors that can be drawn from the history of conservation to transform adaptive co-management regimes in the DRC

Historical elements	Factors for ACM (Plummer et al. 2017a)	Enablers	Barriers
– International support of conservation (funding and policy)	– Establish transparent collaborative mechanisms that define best practices, – Empower local community structures to streamline changes.	– Collaboration/partnerships – Strategic planning – Policy – Agreements – Funding	– Resistance to change by international stakeholders – intransigent funding – Lack of long-term vision for ICCN – Corruption in conservation bodies
– Discriminatory access rights – Centralised decision making	– Employ flexible and integrated approaches, – Empower co-management structures to decide on local matters – Design appropriate arrangements to govern resource access	– Capacity building – Empowered leadership for protected areas – Agreements on rights and responsibilities – Established community structures	– Inappropriate policies – Inadequate planning of conservation interventions – Tribalism
– Political regimes and leaderships affecting local SES	– Involve local resource users, policy makers, and decision makers in processes at different levels	– Cooperation with academic researchers – Democratic structures – Capacity building	– Lack of sustainable financing mechanisms
– Paradigm shift with limited deliverables	– Ensure multilevel monitoring of interventions on the ground – Apply social learning	– Local cooperation, – Defined safeguards	– Resistance to change – institutional factors
– Changes in natural	– Adapt local rules and regulations related	– Trust building between parties	– Lack of flexible and innovative

Historical elements	Factors for ACM (Plummer et al. 2017a)	Enablers	Barriers
resource values by resource users	to user rights – Monitor local attitudes and value of natural resources		options - conservation principles
– Local conflicts over natural resources – External resource users in respective SESs	– Establish specific manifesto for local user rights and responsibilities – Establish and support local established power systems (traditional chiefs) and community structures – Establish problem-solving/conflict resolution mechanisms	– Strong local decision making structures – Local community structures and leadership	– Policy and politics – Attitudes due to the history
– Policy mismatches	– Envision regular updates for policies and laws	– Decentralised entity can take sectorial decisions	– Resistance to change – loss of power by dominant stakeholders (ICCN, traditional chiefs

8.3 Transforming conservation management practices in the DRC

One of my objectives was to reflect on the key findings of my research with a view to proposing a practical framework that envisions the transformation of ACM practices for protected areas in the DRC based on motivation, skills, competence, collaboration and practices.

8.3.1 Motivating stakeholders for long term conservation

Motivation has been identified as one of the important factors for long term support and commitment to conservation and environmental management (see Section 7.1, also Darner 2009). Conservation practitioners involved in the management of protected areas in the DRC should move from purposive conservation to motivational conservation (evolving) (Cetas & Yasué 2017). This shift implies changes in the thinking of conservation practitioners about local stakeholders and protected area management practices. Although protected areas are about biodiversity, local communities should be included in most processes including decision-making and implementation of both conservation and development interventions associated to protected areas.

Motivational conservation considers intrinsic, exogenous and relational values as key ingredients to generate support from local stakeholders towards protected areas (see Figure 7.1). These ingredients require that conservation approaches consider local sociological systems and traditions, existing regulations and usages, the behavior changes of communities, international resource needs, the multiple values related to protected areas and the integration of multiple knowledge systems (Tengö et al. 2014, 2017). Moreover, conservation interventions should foster ethical militarised law enforcement, define rules and regulations for resource access and promote local development (Marijnen & Verweijen 2016; Duffy et al. 2019).

8.3.2 What partnership for sustainable conservation in DRC?

ACM in the DRC requires contextual responses to deliver adequate conservation outcomes. For transformation to happen, it should include tangible and intangible patterns (see Chapter 7). Therefore conservation interventions should be based on local motives (goals), effective power-sharing (cooperation and win-win solutions) and ethical conservation practices (Folke et al. 2005; Bown et al. 2013b; Trimble et al. 2015a; Plummer et al. 2017b). Indeed, as for other ACM processes, the use of ACM in the DRC will require effective information sharing, appropriate governance structures, local

agreements on mutual responsibilities and revenue/resource sharing (see Plummer et al. 2013, 2017; Trimble et al. 2015a).

Protected areas in the DRC cannot be effective without effective and transparent partnerships at different levels (Callahan 2007). Protected area partnerships in the DRC should consider stakeholders' identity, choices, needs and local valuation of resources. To achieve such a partnership, protected area managers should revise conservation approaches that emphasise collaborative decision-making, the social and ecological value of resources within the protected areas and shared governance principles (Holloway & Short 2014). The partnership should be operationalised within an agreed shared responsibility framework and integrated conservation and human-wellbeing agreements. Moreover, to respond to the failure of existing co-management approaches implemented in the DRC (see Section 4.3.1), sustainable partnerships should consider local communities as partners at the same level as INGOs and the ICCN. Moreover, donor-centered approaches should move towards contextual and adjustable models.

At this point, the design of co-management approaches should be based on agreements that have been crafted through a transparent consultative processes with communities (Armitage et al. 2007; Trimble et al. 2015b; Plummer et al. 2017b). These agreements should not only consider existing policies and law, and based only on resource access rights. But also, these agreements should value local systems and traditions as well as the changes of values from various stakeholders in future (Tengö et al. 2017). The formalisation of arrangements with communities should define the benefits, rights and responsibilities of communities based on performance indicators for the involved parties.

8.3.3 Pathways to T-ACM: governing protected areas with a wheel

To respond to negative determinant factors (see Table 8.1) affecting protected areas, conservation actors in DRC should move from reactive, virtual and centralised power towards realistic and cooperation approaches. Such approaches require a combination of attributes and principles of good governance (see Lockwood 2010; Shields et al. 2016), key motivation factors (see Chapter 7) and management options (see Figure 7.7) that favor local contexts and institutions (Folke et al. 2005; Plummer et al. 2013; Fabricius & Currie 2015).

The operational settings (Figure 8.2) of the T-ACM should be based on existing legislations and policies, local formal and informal institutions, traditional values and

practices (see Dawson et al. 2017; Zafra-Calvo et al. 2017). In addition, such approaches should include conflict management, transformed power relations[1] and power-sharing mechanisms that include multiple stakeholders: local community, traditional, administrative, political and economic leaders (Penker 2009; Plummer et al. 2014).

To ensure that transformation is happening, decision-making processes should maximise the social representation of communities as well as contextualised interventions and approaches. Local structures to be established should be based on local sociological structure rather than social identity and perceptions of conservation actors. Finally, conservation managers should identify appropriate information channels to avoid the distortion of information and include monitoring and evaluation to generate lessons and experiences to be shared (Thakadu 2005; Pieraccini 2015). For example, as a result from my research, I encourage Itombwe management to use local radio broadcasting for information sharing, whilst in Okapi and Kabobo where the traditional system is centralised and legitimated, information could be shared through traditional information sharing mechanisms (community meetings) (Figure 7.5).

The success of this approach (illustrated by the operational conservation framework – Figure 8.2) might depend on how the four motivational elements of individual and collective satisfaction (competences including local knowledge and activity-based capacities, economic interventions to improve local well-being, collaborative practices) operate within the social-political context and space at different scales.

[1] Conservation interventions should not consider purposive and traditional power structures such as traditional chiefs, INGOs for financial influence or the ICCN for the institutional power of protected areas. Power should not only be wighted against financial inputs but essentially on human capita

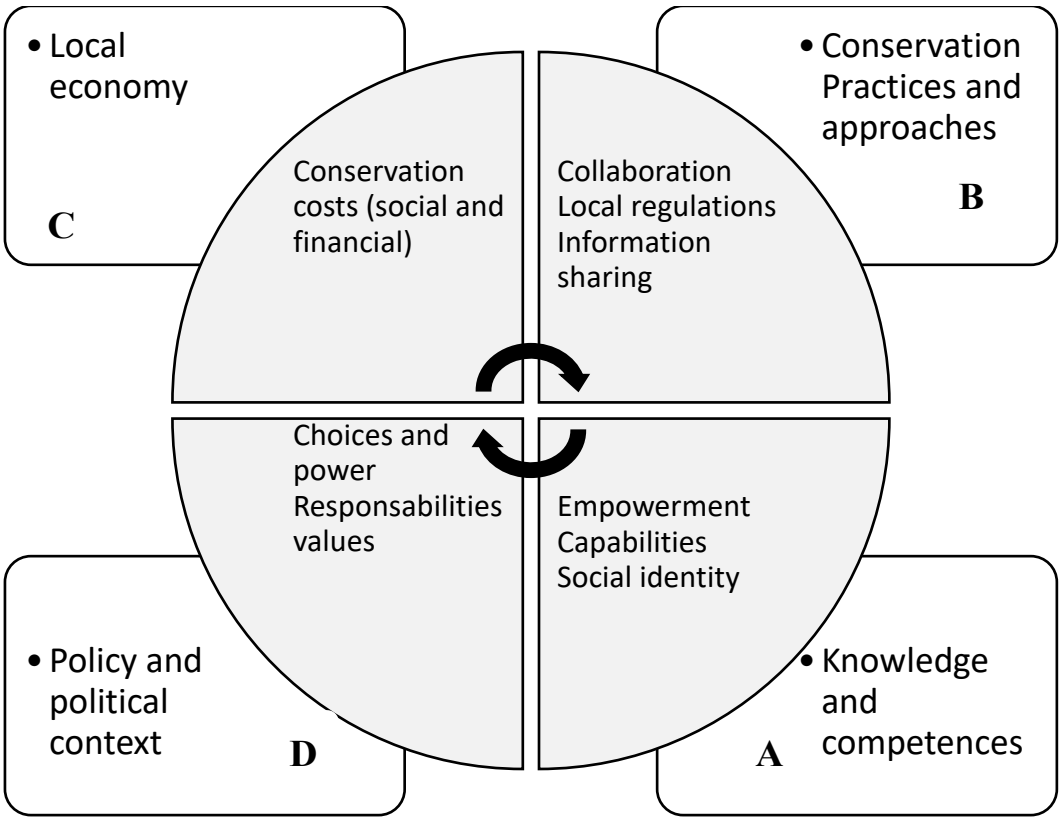

Figure 8. 2. Operational framework to improve conservation interventions and local perceptions on protected areas based on the motivation and transformation settings. The framework includes four key components: knowledge and competences (A) that should target empowering communities and ensure that the latter identify themselves to the social-ecological values of protected areas; conservation practices and practices (B) based on equity and information sharing, local development (C) to minimize unregulated resource uses and avail options to communities; and the political context based on existing policies (D).

The operational framework considers that improving competences and valuing local knowledge (A) should aim to avail skills needed and enhance the 'social identity' of local communities. The latter differ from tribalism as it is related to social values and long-term vision. Together with conservation practices and empowerment interventions (B), interventions should target to improve local livelihoods to enhance sustainable use of resources (C). The benefit of this attribute is that the social costs of conservation interventions will be lowered by cooperation, partnerships and skills (Osbaldiston & Sheldon 2003; Moreto 2015; Cetas & Yasué 2017). For example, key resources that are important for specific protected area should be identified and agreements signed among stakeholders for the sustainability of livelihoods and the protected areas. Local agreements and policies should consider social choices, balancing power and responsibilities (D) of stakeholders and local values (Stoll-Kleemann & O'Riordan 2002; Kaimowitz et al. 2003; Moreto et al. 2017; Reddy et al. 2017). Expected outcomes

should include individual and collective social-economic benefits and interests, the promotion of social collective identity and pride and sustainable landscapes.

The application of this proposed framework should be based on relationships between conservation actors, traditional leaders, communities and stakeholders at local levels through multi-scaled political contexts. I recommend that conservation interventions should consider social categories as known on the ground and that access rights be developed based on local traditions that are compatible and less harmful to local SES. In addition, learning should be considered as part of each of the components of the framework above.

8.4 Conclusion

Studies looking at ACM in protected areas in the subtropics have emphasised the importance of local context and power dynamics (Palomo et al. 2014; Trimble et al. 2015a; Plummer et al. 2017b), although most of these studies have missed the influence of historical evolvement of management and governance approaches (Carruthers 2013). My research shows that protected area management approaches in the DRC should be embodied in local social-ecological systems, context, and historical memories. Key factors to consider for transformative ACM in the DRC should be related to the exercising of power (Figure 8.2); community benefits; cognitive motivators of resource users; social dynamics between stakeholders; and collaboration at multiple levels and scales (Figure 8.2 also). Other factors include access rights to natural resources; conflicts over natural resources and control of funds; management of partnerships; local stakeholders' involvement in management; and policy mismatches. These attributes should include social learning, conflict resolution and involve multiple actors at different social-political levels as part of the successful practices. Additionally, failures should be considered as motivators for conservation practitioners to adapt to changes and improve management practices and governance styles.

The conservation of protected areas in the DRC still has a long way to go to ensure their sustainability and self-organisation in the future. International influence is still guiding both the practices and governance of protected areas (Scholte et al. 2018). Nevertheless, new cooperation guidelines based on key adaptive co-management principles need to be designed for each protected area and indicator-based monitoring needs to be implemented regularly (see Chapter 8).

I argue that conservation interventions should be conducted at a lower level (villages) to motivate positive local perceptions based on local needs and practices to ensure the sustainability of protected areas and related systems. However, to ensure effective and equitable protected area governance, conservation actors should consider the major limiting factors for the effective co-management approaches. These factors included inadequate stakeholder involvement, ineffective and corrupt leadership, the limited financial and technical capacities of the DRC protected area authority (ICCN) and the inappropriate partnership settings. Other factors are the lack of community support and a local political constituency as well as a rigid policy context (Kujirakwinja et al. 2010b; Kasereka et al. 2016; Verweijen & Marijnen 2016).Therefore, I propose that the cost of ACM practices (time, money and capacity) in protected areas be compensated by positive conservation outcomes, and vice versa.

My research considered the three protected areas as learning sites that should inform an emerging ACM for the DRC to streamline sustainable protected area management. Therefore, conservation managers should consider five key strategies to maintain the biodiversity and ecosystems of protected areas.

Firstly, conservation stakeholders should clearly define a comprehensive and step-wise process to gazette protected areas. The process should avoid the representativeness approach (Callahan 2007) and consider resource users and local social systems. Secondly, the management of protected areas should investigate places, resources and products that contribute to local livelihoods and develop appropriate guidelines and agreements to either regulate or use the resources to avoid uncontrollable consequences. Thirdly, conservation managers should develop community interventions based on social categories. Such an approach might enhance local support and positive perceptions of protected areas as well as sustain long-term conservation. Fourthly, conservation actors should revise the consequences of biosphere reserve approaches on land rights and properties. For example, local communities living in a biosphere reserve are considered as land users and not land owners. Fifthly, protected area managers should clearly involve local governance structures by defining the roles and responsibilities of these structures in protected area management. Such an approach may improve on the effective use of rangers in law enforcement. I argue that issues and interventions that include or oppose communities and protected area managers should be managed by local governance structures. These interventions should include the enforcement of local

agreements related to resource uses, conflict resolution and the management of economic returns.

Finally, to ensure that conservation actors consider contextual changes, specific studies should be carried out to assess the valuation changes of the use of ES and the performance of established local governance structures. Such studies should be conducted in a systematic manner based on specific methodologies and approaches. I argue that some of the existing evaluating tools have been missing local insights.

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Appendixes

Appendix 1. Household questionnaire

I am Mr. Deo Kujirakwinja, a PhD Student at Rhodes University, South Africa in the Department of Environmental Science.

I am conducting research on protected areas in DRC. The subjet of the research is about **Conserving lands and people: Towards transformative and Adaptive Co-Management for sustainable landscape conservation. The case of Ituri, Itombwe and Kabobo Landscapes, Democratic Republic of Congo (*DRC*)**

This is part of the research conducted to understand how natural resources and protected areas can be better managed with involvement of various stakeholders in a changing context. And how stakeholders can influence management and governance approaches and practices. The study will be conducted in three different protected areas in Eastern DRC (Okapi Faunal Reserve, Itombwe Nature Reserve and Kabobo Massif) with different histories, contexts and management practices.

This questionnaire aims at collecting information regarding historical information, management processes and attitudes of actors on management and governance of the landscape.

I ensure that the information collected from you will be confidential and no personal information of details provided will be disclosed to the public. Information collected will be processed anonymously to propose suitable scenarios.

I request therefore your consent to respond to different questions where you feel comfortable and free to add any comment

Questionnaire

1. General information

Code of questionnaire :	Date :	
Interviewer :	**GPS coordinates:**	
Village :	Latitude : Longitude :	
Groupement :	Code interwee :	
Collectivité :		If more than one wife – add comments
Site: Okapi FR…. Itombwe… Kabobo ……		

2. Household Background

2.1. Socio-demographic aspects and household profile

Age class	M	F	Education
0 - 5			
6 - 12			
13 - 20			
20 - 30			
31 - 40			
+ 40			

Légende

1: No education
2: Primary
3: some Secondary
4. Secondary
5. University

2.2. Ethnical groups and rights

1. Which of these social categories do you belong to	Tribe	Year arrived or nr of years	Village	Province	Country if different
i) native					
ii) Migrant					
iii) Non native					
iv) Displaced					

If ii and iv, what are the main reasons?		Agree	Somewhat	Disagree
	1. Farming.			
	2. Employment.			
	3. Business			
	4. Security			
	5. Mining			
	6. Timber			
	7. Others			

Do all tribes have same rights over resources?	1. Yes 2. No
What rights to natural resources does your tribe have?	1. …… 2. …… 3. ……

	4.

3. Household assets and livelihoods

3.1. Assets and livestock

2. Do you own some of these assets?		**Number**	**Value**	**Asset**	**Value**	**Number**
	Radio – small – medium - Big			Car		
	Bike			Boat/Canoe		
	Motorbike			Fishing nets		
	Sewing machine			Fire arm AK47/12mm		
	Solar panel			Television		

3. Do you own some of these livestock?	Number	Price (CF or USD)	Use
a) Goats			
b) Sheep			
c) Cow			
d) Chicken			
e) Rabbit			
f) Indian pig			
g) Pigs			
h) Duck			
i) Doves			
j) Others ……			

Legend (Use)

1 Subsistence (eating)	4 Diversifying activities (investing)
2 education	5 Social cultural needs
3 Medical care	

3.2. Household livelihoods

4. What are you main livelihoods activities (include employment)	Livelihood activities	Revenue	Frequence/Period
	Agriculture		
	Small livestock		
	Cash crops		
	Artisanal mining		
	Logging		
	Small business ……		
	Employee – ……		
	Others……..		

5. Are there some livelihood activities supported by the protected area management or related agencies?	1. …… 2. …… 3. …… 4. ……

3.3. Land property and use of land

Nr	Types (*)	Crops	Surface (ha)	Principal use (#)	Yield per year/season	Location zones (§)	Land tenure (¤)

Legend:

** **Type***	*# Principal use :*	*§ **Location zones***	*¤ **Land tenure type***
1. farming	*1. Subsistence*	*1. Within the forest/reserve*	*1. Own*
2. Pasture	*2. Cash crop*	*2. Around the forest: 0 – 5 km*	*2. Lease*
3. Forest/plantation	*3. Subsistence and cash*	*3. Far from the forest: 6 – 10km*	*3. Comunal*

4. Forest revenue

4.1. Current use of forest resources and frequency

Resources	Do you/ your family collect (YES/NO)	*Where do you collect (see location zones)*	*Distance from your village*	*How much*	Frequency	Principal use : 1. subsistence 2. cash (sell) 3. cultural	Price and unit (convert from field)
Firewood							
Charcoal							
Poles							
Medicinal plants							
Bamboo							
Honey							
Mushrooms							
Liana							
Planks							
6. Do you eat Bushmeat (specify species)? Yes …. No….							
Elephant							
Buffalo							
Gorillas							
Chimpanzee							
Small monkeys							

Bush pig							
Warthog							
Porc epik							
Okapi							
Hamster rat							
Others (specify) …… ….....							

5. Governance

5.1. Ecosystem services – Fill the all columns for four most important services

7. *What services/benefits are the most important in your area?*	*Importance (rank 1 – 8)*	*What are local rules to access*	What are restrictions:	Location on map (gridcell)	State –
1. Rivers					
2. Graves					
3. Firewood					
4. Timber					
5. Honey					
6. Bushmeat					
7. Minerals					
8. Medicinal plants					
9. Agricultural land					
10. Pasture					
11. Other NTFPs					

Legende –

Local rules	Restrictions	State of service
1. Free	1. Law	1. Very good
2. Authorization from chief	2. Zones	2. Good
3. Tribute to owner and chief	3. Agreed rules	3. Fair
4. Customery right access	4. Cultural	4. Bad/degraded
5. Sharing yields	5.	5.

8. Are there some restriction rules in place locally for some of these services/benefits?

……

……

……

9. Are there cultural features or values attached to these resources in your area? *(Add cultural sites if they are related to resource type)*	1. Forest ..... 2. Rivers ..... 3. Hills and mountains ..... 4. Animals .... Specific sites .....

5.2. History of the region

10. Do you know the history of this area related to forest and natural resource uses?

1. Yes *2. No*

Historical use of resources

11. What resources were mostly used by communities in the past and for what use? *1: subsistence* *2: local trade* *3: cultural* *4: medicinal plants* *5: Others*	Resource	Use				
		5 Years	10 years	20 years	30 years	+30 years
	Honey					
	Wildlife					
	Timber					

12. What did people have to do to access resources for local communities – *if different for migrants, explain* 1. *Tribute to chief* 2. *Buy* 3. *Free* 4. *Share yields*		Native	Non native	Migrants
	Land			
	Forest			
	Forest products			
	Hunting			
	Settlement			

13. Were there some traditional/cultural rules applied for sustainable use of natural resources --- YES ------- NO *If rules, cite specific resource*	1. ..... 2. ..... 3. ..... 4. .....

14. How were they implemented?		Agree	Somewhat	Disagree	Don't know
	Traditional Chiefs				
	Local commitee				
	Family				
	Others				

15. Do you think natural resource management has changed? *Explain*					
	Wildlife				
	Forest				
	NTFP				
	Rivers				
	Yields				

6. Protected area and Forest – Process and management

6.1. Creation of the area as reserve/Process

16. How people populated the area before creation of the protected area or research? *Stories and movement*	

of people.	

17. When was the place declared a protected area?	

18. Do you remember how the process was driven?	1. Government declaration without consultation 2. Government declaration with some consultations 3. Limited consultations with representatives 4. Full consultations from villages 5. Don't know

19. Were local communities or local chiefs involved in the process?		Agree	Somewhat	Disagree	Don't know
	Chiefs				
	Family representatives				
	Villagors				
	Community representatives				
	Educated people				

6.2. Changes and attitudes

6.2.1. General views

20. There have been some changes in your region from the past (*explain)*:		1	2	3	4	5
	Degradation of forests					
	Management of the area					
	Decision making					
	Population					
	Rights Responsibilities					

21. Do you know if there are management zones in this reserve? YES…. NO….. *If YES how were they designed? If NO, how do you know about reserve boundaries?*	

6.2.2. Attitudes towards current management and decision making

22. What are your feelings regarding the current management of the forest and natural resources	Good	Fair	Bad
23. Local people support protection of resources and the current management	Agree	Somewhat	Disagree

24. Can you give some examples related to your position (above question) ?	1. …… …… 2. …… …… 3. ……

	4. …… …… ……

25. How can you describe your relationships with current management of different zones? (Very Good, Good, Fair, Bad, Worse)

	Good	Fair	Bad
1. Protected area			
2. Hunting zone			
3. Agricultural zone			
4. Mining sites			
5. Timber exploitation sites			
6. Others a.			
b.			

26. How are current decisions made regarding natural resource management?

	Agree	Somewhat	Disagree	Zone if stated
Warden and rangers				
Local chiefs				
Forestry dpt				
Provincial government				
Families				

27. Are you or other members of your area involved/excluded in some of these activities?

	Involved	excluded	dominated	Representation
1. Boundary demarcation				
2. Zoning				
3. Law enforcement				
4. Livelihoods activities				
5. Management meetings				

28. Would you like to be involved? 1. Yes 2. No

Why?

	Agree	Sometimes	Never
Belong to an excluded tribe			
Not part of governing tribe			
Politics (parties)			
Disagree with current management			

29. How are you informed about decision made on natural resources

	Meetings	Local chiefs	Participants	Never	Arrest
1. Protected area					
2. Hunting zone					
3. Agricultural zone					
4. Mining sites					
5. Timber exploitation sites					
6. Others					

30. What are top four GOOD things that 1. .....

you know about current management of resources?	2. ..... 3. ..... 4. .....
31. What are four BAD things that you know about current management of resources?	1. ..... 2. ..... 3. ..... 4. .....

32. How your cultural values and rules are considered into current management?	1. Very good 2. Good 3. Fair 4. Bad/poor
33. How do you think communities can be happy regarding resource management in the area?	
34. Are there some conflicts between local communities and the management body?	1. Yes 2. No
What are kind of conflicts?	

35. What challenges do you know governing bodies face		Financial	Technical	Collaboration	Corruption	Cultural
	Protected area					
	Hunting zone					
	Agricultural zone					
	Mining sites					
	Timber exploitation					
	Others					

7. Changes in local environments

7.1. *Migrations – if respondent is a migrant, go to 39*

36. Are you aware of people migrating in this area?	1. YES 2. No				
37. How often do people from other areas settle in your village/Groupement?		Agree	Somewhat	Disagree	Don't know
	1. Regularly				
	2. Monthly				
	3. Annually				
	4. Punctual				
38. What negative impacts have you observed from migration? Describe impacts if possible					
39. What positive impacts have you observed? Please describe if possible					

40. Are migrants considering established systems and rules?	1. Cultural 2. Social 3. Political 4. Others
41. Are there some conflicts in place between migrants and native and non natives? Yes… NO….	
42. How do you think you'll solve existing issues with migrants?	

7.2. Mining

43. Are there some mining activities? YES... NO	1. Coltan 2. Cassiterite 3. Gold 4. Diamond 5. Others
44. When did the mining start in your area?	
45. Who is involved and what is his or their roles and rights?	

46. How do people access the mining site?		Agree	Somewhat	Disagree
	Local chiefs			
	Mining officers			
	Security groups			
	Sharing products			
	Tribute			
	Free			
47. Is the current management involved in mining activities?		Agree	Somewhat	Disagree
	Regulation			
	Exploitation			
	Management			
	Others			

48. Are there some conflicts in mining sites between locals and migrants?	
49. What impacts can you cite coming from mining that affect your household?	
50. Are there other activities conducted in mining sites?	

Appendix 2. Key informants and focus group discussion themes

a. Key informants

2. Roles of stakeholders in management
3. Cultural values and management
4. Natural resource uses and access in the region
5. Migration and natural resources
6. Community benefits
7. Conflicts
8. Impact of migration and external effects
9. Impact of traditional power on NR management
10. Options for improvement

b. Focus group discussion guiding themes

Historical information	1. Retrace the history of the creation of the reserve (give dates and events if possible) 2. What are the major actions to remember in history?
Creation processes	3. How the reserve was created – history? 4. Who have been involved from the beginning? 5. What are the related problems?
Relationship of actors and powers	1. Who are involved in the use of resources? 2. How ICCN works with other services and NGOs? 3. What is the influence of different services in the management of natural resources? a. Customary chiefs b. Utilities c. Military d. Provincial government. 4. Who currently and actually manages the reserve?
Ecosystem services and stakeholder roles	1. What are the benefits of having this reserve? 2. How do you plan to preserve them? 3. Who are the destroyers of the reserve? 4. How do you use these services in your life?
Attitudes and perceptions about the management of the reserve	1. What are the good things to remember about the creation of the reserve? 2. What are the bad things to remember? 3. Why don't people support the creation process?
Management Options	1. How do you think the reserve should be managed? 2. Who should be involved in day-to-day management? 3. What regulations should be enforced for different social categories?
Cultural values	1. Have there been any changes in the management of natural resources? 2. What cultural values have changed? 3. What are the cultural values that currently help protect natural resources from degradation? 4. How might managers use existing cultural values in current management?
Migrations and mining	1. What are the causes of migration in your area? 2. What problems does migration cause to natural resources? 3. What are the impacts of mining and migration on the reserve?

Appendix 3. Governance factsheet on community governance structures

WCS

Improving natural resource governance in Kabobo Wildlife Reserve

Fig. 1: Consultative meeting led by the Local Committee Governance in Mazonde

Governing differently

In Democratic Republic of Congo, governance of natural resources involves decision makers and financial partners with less consideration to local stakeholders and resource users. Either the management is purely led by armed rangers and decisions made by the warden or there are some alternative interventions and environmental education activities carried out with less involvement of some social groups. The Kabobo Wildlife Reserve governance style aims for improving governance of protected areas by involving resource users and traditional power holders in decision making process for conserving the Kabobo biodiversity.

Since November 2016, The Kabobo Wildlife Reserve has its provincial legal status.

For a better governance

Governance of natural resources, especially protected areas in DRC has evolved from unique state-mandated agency to manage and decide on protected areas to co-management approaches.

To test the changes in governance, WCS facilitated the gazettement of Kabobo Wildlife Reserve through a participatory approach that went from village to village up to the national level.

Throughout the co-management style, local communities maintain their involvement in the control of the region. Therefore, community structures are established to ensure better governance in the region.

The creation of the Local Governance Committee

The Local Governance Committee involve traditional chiefs, civil society, public services, community representatives and marginalized groups (indigenous and women). It is seen as the strategic board for community participation while local structures at lower administrative levels (villages) are implementers of activities.

Women feed-back meeting

USAID FROM THE AMERICAN PEOPLE · RAINFOREST TRUST · the Jane Goodall Institute · ICCN

Community governance structures for Kabobo Wildlife Reserve

Local Governance Committee (LGC)	•Governance structure to discuss and decide on key interventions to be implemented and policy regarding natural resources
Governance Committee for Community Conservation (GCCC)	•Elected members from CCC or community representatives to discuss conservation and development issues at the collectivity level.
Community Conservation Committee (CCC)	•Elected members from LCC at groupement level to represent communities and discuss on interventions to be implemented at the groupement level.
Local Conservation Committee(LCC)	Elected members of one or two villages to ensure implementation and monitoring of conservation related interventions

Involvement of communities and their leaders in decision making

- The legal gazettement act of Kabobo Wildlife Reserve includes Co-management approach and local governance structure as one of structure to involve in the management of the Reserve
- The Local Governance Committee as a decision-making body meets quarterly to discuss about natural resource management, conflicts and issues related to communities and resource use.
- The governance style involves the DRC protected areas Agency (ICCN) as a key player for the management of the reserve
- Decision making will be coordinated by a joint coordination unit that includes ICCN, LGC and conservation partners at quarter basis
- WCS has maintained daily contact with local leaders and decision made by Local Committee Governance are transmitted to local traditional chiefs through feed-back meetings.

Fig. 2 : Meeting with pygmies to elect their representative in the Local Committee Governance.

What is next?

- Develop a written agreement between ICCN, Local Governance Committee and Provincial Government regarding the governance style to be tested
- Develop the governance approach to be used by other protected areas and Reserves
- Enhance governance capacity for Local Committee Governance members to fulfill their roles in the management of the Reserve.

Some statistics

•84 villages consulted
•A total of 3319 people were consulted, of whom 1439 are women (43.3%) and 217 (6.5%) are indigenous peoples .
•80 villages mapped and set the limits of their agricultural zone.
•1 Local Governance Committee with 17 members.
•1 Conseil Consultatif Provincial des Forêts.
•4 Community Conservation Committee.
•46 Local Conservation. Committee.
•780 people of whom 430 women and 118 Batwa peoples -sensitized and involved to natural ressources governance.

COORDONNEES

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"Governance of natural resources can be understood as a way interested parties are involved and participate to define goals and make decisions regarding the use and protection of natural resources".

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Appendix 4. Itombwe published paper

See link: https://global.wcs.org/Resources/Publications/Publications-Search-II/ctl/view/mid/13340/pubid/PUB24338.aspx