



Livelihood interventions in conservation

*Expectations and reality around
protected areas in Cameroon*

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Declaration of originality

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Juliet Wright, July 2021

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Abstract

Livelihood interventions are often implemented in villages adjacent to protected areas with the aim of reducing the biodiversity impacts of local livelihood practices by promoting substitute activities. Despite uncertainty regarding the effectiveness of these so-called ‘alternative livelihood projects’, they still remain a go-to strategy in both the terrestrial and marine conservation realms. In this thesis, I critically reflect on the role of livelihood interventions in conservation by examining key assumptions made during their design and implementation, their mechanisms of impact, and the social-ecological systems in which they are embedded. Drawing insights from livelihoods research and behavioural science, I specifically investigate how livelihood projects aimed at reducing bushmeat hunting in Cameroon function in practice and consider how a broad range of factors influence livelihood decision making.

Using qualitative research methods, I compare the perceptions and experiences of participants and implementers in relation to twenty alternative livelihood projects implemented around two protected areas. I scrutinise the theories of change underlying these projects and explore where breakages in the chain of logic occur. Using a comprehensive behavioural science theory – the COM-B model – as a diagnostic framework, I identify barriers to behaviour change as well as potential enablers. I then present an illustrative case study focused on urban-based out-migrants to demonstrate the importance of intervention targeting by highlighting how natural resource use and reliance can differ between community sub-groups, and the ways in which this can evolve under different economic scenarios.

My research shows that key assumptions, such as those based on the notions of substitution, the homogenous community and impact scalability, are flawed. The development of more nuanced and realistic theories of change that clearly articulate how interventions are expected to have an impact is critical to enable greater scrutiny and further develop an evidence base for what works. Project implementers typically underestimate the time and resources required, as well as the complexity, of intervening to alter people’s livelihood strategies. Motivation is key to determining whether promoted livelihood practices are adopted, yet what motivates people to do what they do is often overlooked. Moderating expectations and integrally involving the resource users to be targeted from the outset is essential. Livelihood interventions require deep thought, collaboration, a thorough analysis of the situation, more precise targeting and a greater understanding of livelihoods and behaviour change processes to be effective. Factors that can enhance or limit a project’s impact are outlined in a set of guiding principles to inform the design and implementation of livelihood interventions moving forward.

This thesis is dedicated to my parents

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‘It always seems impossible until it is done’ – Nelson Mandela

Contents

1. Introduction	12
1.1 Problem statement	12
1.2 Aims and objectives	14
1.3 Thesis outline	15
1.4 A note on my background and philosophical perspective	17
1.5 Research ethics and approvals	18
2. Background	20
2.1. Social-ecological systems in the developing world	20
2.2. People-focused conservation approaches	21
2.3. Livelihood interventions in conservation	23
2.4. Understanding the factors underlying conservation outcomes	25
2.5. Bushmeat hunting in the forests of West and Central Africa	27
3. Study area context	29
3.1. An introduction to Cameroon	29
3.1.1. Environmental and cultural heritage	29
3.1.2. The colonial legacy	30
3.1.3. Population and economy	36
3.2. Biodiversity conservation in Cameroon	40
3.2.1. Historical underpinnings	40
3.2.2. Current conservation priorities	42
3.3. Takamanda National Park	44
3.3.1. Conservation importance	44
3.3.2. History	45
3.3.3. Local population	47
3.3.4. Management interventions	52
3.4. Dja Faunal Reserve	53
3.4.1. Conservation importance	53
3.4.2. History	55
3.4.3. Local population	57
3.4.4. Management interventions	60
4. Reframing the concept of alternative livelihoods	62
4.1. Introduction	62
4.2. Types of livelihood interventions	64
4.3. Assumptions underlying alternative livelihood projects	65
4.4. Understanding the complexity of livelihoods	67

4.5. Moving forward by realigning livelihood projects with the current conservation agenda	69
5. Local experiences of participating in livelihood interventions associated with a protected area: case study projects in villages around Takamanda National Park	71
5.1. Introduction	71
5.2. Methods	75
5.2.1. Study area	75
5.2.2. Data collection	78
5.2.3. Data analysis	86
5.3. Results	88
5.3.1. Socio-demographic characteristics of the sample	88
5.3.2. Determinants of household-level participation in livelihood projects	89
5.3.3. Case study 1: Oil palm farming	91
5.3.4. Case study 2: Pepper and ginger farming	95
5.3.5. Case study 3: Snail farming	97
5.3.6. Case study 4: Beekeeping	99
5.3.7. Case study 5: Bush mango cultivation	104
5.3.8. Case study 6: Cassava farming and processing	108
5.3.9. Case study 7: Cocoa farming	119
5.3.10. Framework of guiding principles for livelihood interventions in conservation	126
5.4. Discussion	127
5.5. Conclusion	134
6. Livelihood interventions in theory and practice: a theory-based assessment of alternative livelihood projects with insights from behavioural science	136
6.1. Introduction	136
6.2. Methods	141
6.2.1. Study sites	141
6.2.2. Data collection	145
6.2.3. Data analysis	149
6.3. Results	150
6.3.1. Socio-demographic characteristics of the sample	150
6.3.2. Alternative livelihood projects identified at the three study sites	152
6.3.3. Alternative livelihood projects – a reconstructed theory of change	153
6.3.4. Factors that influence the uptake of livelihood activities – applying the COM-B model	155
6.3.5. Is the typical theory of change underlying alternative livelihood projects being realised?	163
6.3.6. Livelihood interventions in conservation – an alternative framing	165
6.4. Discussion and conclusion	168

7. Out-migration, rural-urban linkages and the implications for tropical forest conservation in Cameroon	173
7.1. Introduction	173
7.2. Methods	177
7.2.1. Study area	177
7.2.2. Data collection	179
7.2.3. Data analysis	181
7.3. Results	184
7.3.1. Socio-demographic characteristics of the sample	184
7.3.2. Rural-urban migration	184
7.3.3. Urban livelihood activities	186
7.3.4. Livelihood aspirations	188
7.3.5. Rural farming	190
7.3.6. Rural hunting	193
7.3.7. Urban-only livelihoods	195
7.3.8. Responses to economic stresses and shocks	195
7.4. Discussion	198
7.5. Conclusion	200
 8. Discussion	 202
8.1. The context of livelihood interventions – a crisis mindset	202
8.2. The key findings of this thesis	203
8.3. Considerations for a more positive relationship with local people	204
8.4. Policy recommendations: general	206
8.5. Policy recommendations: site-specific	207
8.6. Further research	208
8.7. Conclusion	209
 <i>References</i>	 <i>211</i>
 <i>Appendix A: Research ethics and permits</i>	 <i>245</i>
<i>Appendix B: Supplementary material for Chapter 5</i>	<i>261</i>
<i>Appendix C: Details of unmatched-count technique survey</i>	<i>274</i>
<i>Appendix D: Supplementary material for Chapter 6</i>	<i>286</i>
<i>Appendix E: Supplementary material for Chapter 7</i>	<i>295</i>

List of figures

Figure 3.1: Change between 1961 and 2015 in a) revenue from crop exports in USD and b) quantity of crop exports in tonnes. Palm oil is not one of the main export crops but is included for comparison. Data: FAO (2017)	39
Figure 3.2: Map showing the location of Takamanda National Park and Dja Faunal Reserve in Cameroon	44
Figure 5.1: Map locating Takamanda National Park within Cameroon and showing the three study villages	76
Figure 5.2: Reconstructed theory of change for the oil palm project implemented by PSMNR-SWR	92
Figure 5.3: Reconstructed theory of change for the pepper and ginger project implemented by PSMNR-SWR	95
Figure 5.4: Reconstructed theory of change for the snail project implemented by PSMNR-SWR	98
Figure 5.5: Reconstructed theory of change for the beekeeping project implemented by PSMNR-SWR	100
Figure 5.6: Reconstructed theory of change for the bush mango project implemented by PSMNR-SWR	105
Figure 5.7: Reconstructed theory of change for the cassava project implemented by PSMNR-SWR	109
Figure 5.8: Reconstructed theory of change for the cocoa project implemented by PSMNR-SWR	120
Figure 5.9: Framework of guiding principles for implementing livelihood interventions in conservation	126
Figure 6.1: A diagrammatic representation of the interacting components of the COM-B model. Adapted from West and Michie (2020) under the terms of the Creative Commons Attribution Licence (CC BY 4.0). The original version can be viewed here: https://doi.org/10.32388/WW04E6.2	140
Figure 6.2: Map of study sites showing a) Takamanda National Park and the three study villages, and b) Dja Faunal Reserve and the four study villages adjacent to the western and northern sectors	142
Figure 6.3: A simple linear theory of change for an alternative livelihood project (upper section) and the underlying assumptions associated with each stage of the theory (lower section), with important higher-level assumptions noted in the hashed box	154
Figure 6.4: An abandoned pig enclosure	157
Figure 6.5: A basin of <i>garri</i> made from cassava	159
Figure 6.6: Demonstration farm used by the Cocoa Farmer Field School in Nfakwe	162
Figure 6.7: A schematic depicting key individual and contextual factors that influence a cyclical process of livelihood decision making within a protected area context: M = motivation, C = capability, SO = social opportunity	166
Figure 7.1: Map of study area showing Takamanda National Park, respondent villages of origin and the location and relative size of study towns within Manyu Division and South West Region ..	177
Figure 7.2: The data management and analysis steps outlined in the Framework method, as detailed in Ritchie and Spencer (1994) and Ritchie et al. (2014). The hashed box indicates the step which differentiates the Framework approach from typical thematic analyses	182

Figure 7.3: Livelihood trajectories based on current and anticipated main livelihood activity in 5 years, differentiated by whether the activity is urban- or rural-based	189
Figure 7.4: Current (a) and anticipated (b) farm size grouped by current main livelihood activity (with three outliers removed for anticipated farm sizes over 10 ha)	191
Figure 7.5: Rural resource use under different scenarios: a) current, b) in 5 years, c) economic stress, d) economic shock	197

List of tables

Table 5.1: Characteristics of the three study villages around Takamanda National Park in 2014	78
Table 5.2: Sample size, sampling effort and non-response rates in the villages around Takamanda National Park	83
Table 5.3: Socio-demographic determinants of household-level participation in livelihood projects ...	90
Table 6.1: Characteristics of the seven study villages around Takamanda National Park and Dja Faunal Reserve	144
Table 6.2: Sample size, sampling effort and non-response rates in the villages around Takamanda and Dja	147
Table 6.3: Socio-demographic characteristics of the sample across the three study sites	151
Table 6.4: Alternative livelihood projects implemented in the Takamanda, western Dja and northern Dja villages	153
Table 6.5: An indication of which of the key assumptions set out in Figure 6.3 were met for each alternative livelihood project, and ultimately where they reached along the reconstructed theory of change	163

List of boxes

Box 6.1: The pig farming project in northern Dja (Project No. 17)	157
Box 6.2: The cassava farming and processing project in Takamanda (Project No. 6)	159
Box 6.3: The cocoa farming project in Takamanda (Project No. 7)	162
Box 7.1: Extract from the framework matrix showing colour-coded data summaries for one respondent	183

Chapter 1

Introduction

1.1 Problem statement

Despite the commitment of world leaders to reduce the rate of biodiversity loss, through the Convention on Biological Diversity (CBD) and associated targets, indicators suggest that global biodiversity has continued to rapidly decline with no significant reduction in rate (Butchart et al., 2010, Díaz et al., 2019, IPBES, 2019). Instead, anthropogenic pressures on biodiversity have increased and, although there have been some successes, the main drivers of biodiversity loss have not been adequately addressed by conservation efforts (Hoffmann et al., 2010, Ceballos et al., 2015, IPBES, 2019, Bolam et al., 2021). Between 1970 and 2016, it is estimated that mammal, bird, amphibian, reptile and fish populations declined by 68% on average (WWF, 2020). Given the limited resources available for biodiversity conservation and the growing sense of urgency, determining the effectiveness of current conservation approaches in order to guide future investment is essential.

The number of vertebrates threatened with extinction is disproportionately high in tropical regions (Hoffmann et al., 2010), and there is a distinct overlap between key areas of biodiversity and areas afflicted with high levels of poverty (Fisher and Christopher, 2007). One of the main drivers of biodiversity loss is overexploitation (Maxwell et al., 2016), which occurs at many levels, but at the local level it can be caused by the poorest who rely on biodiversity to meet their day-to-day survival needs. This can result in a vicious cycle of dependence on natural resources and their degradation (Roe et al., 2011). Since many conservation interventions operate in these environments, there has been much debate among academics, practitioners and policymakers about the degree to which the conservation community should address the complex issue of poverty and its relationship with natural resource use (Adams et al., 2004, Walpole and Wilder, 2008, Roe, 2010).

Since the 1970s, many conservationists have sought to achieve 'win-wins' between biodiversity conservation and poverty reduction (Roe, 2008), and much of the conservation-poverty debate has centred on the successes and failures of these approaches (e.g. Wells et al., 2004, Blom et al., 2010, Muradian et al., 2013). There have been polarised opinions, with some authors arguing that conservation strategies with a focus on reducing poverty have had counter-productive impacts on biodiversity, and that there should be a return to more traditional forms of conservation centred around law enforcement

(Sanderson and Redford, 2003, Oates, 2006). While others have argued that limiting local use of nature can criminalise daily activities which play a vital role in rural livelihood strategies, creating conflict and breaching human rights, and as a minimum, conservation should seek to 'do no harm' to impoverished communities (Brockington and Schmidt-Soltan, 2004, Homewood, 2005, Barrett et al., 2011). However, much of this debate has been based on anecdotes, personal experience and subjective judgment rather than empirical evidence, since the monitoring and evaluation of these 'win-win' approaches has been limited (Brooks et al., 2012).

Ultimately, deciding whether to engage with local people is not a policy choice, it is a necessity (Adams and Hulme, 2001). Yet how to effectively incorporate people's needs and priorities into conservation interventions is still open to discussion. A plethora of strategies with combined biodiversity conservation and poverty reduction goals have been criticized as being overambitious and underachieving (Adams et al., 2004). Davies et al. (2014) suggest that inappropriate measures of success have rendered true conclusions about the impact of different conservation strategies impossible, whereas Berkes (2007) argued that when considering different conservation strategies, looking for success-failure generalisations is too simplistic. There are no panaceas when it comes to complex social-ecological problems (Ostrom, 2007). The links between biodiversity, livelihoods and governance are dynamic and locally specific. Nevertheless, the search for blueprint approaches that offer simple solutions to multifaceted problems continues unabated in conservation.

Livelihood interventions are an example of a 'simple' solution that have been implemented time and again in conservation, often under different guises. Usually referred to as 'alternative livelihood projects', they are popular in situations where biodiversity is an overexploited common pool resource harvested by local people for food and income. The central aim is to change the livelihood strategies of the target population in order to reduce behaviours that are considered environmentally damaging and unsustainable. This often involves promoting alternative income-generating activities to reduce reliance on natural resources of conservation concern. Although the motivations for and assumptions behind individual projects may differ (McShane and Newby, 2004, Walpole and Wilder, 2008), by providing local people with more sustainable alternatives the expectation is that the dual goals of biodiversity conservation and poverty reduction can be achieved. However, both implementers and participants can be left disappointed when the expected benefits fail to accrue due to insufficient consideration of the complexity of livelihoods, the socio-economic context and the social-ecological systems within which these are embedded.

Despite uncertainty regarding the effectiveness of livelihood interventions, they remain a key strategy in both the terrestrial and marine conservation realms. It is therefore important to understand how livelihood activities promoted by conservation organisations align with the needs, aspirations and changing realities of target groups, whilst also taking into consideration the evolving nature of biodiversity threats. Conservation has seldom considered the factors that motivate human behaviour, yet it is human decision-making that can have significant and potentially counterintuitive impacts on biodiversity (St John et al., 2010b, Milner-Gulland, 2012). Understanding the nature of local responses to livelihood interventions and the circumstances that cause these responses is essential, especially since conservation interventions are experienced, perceived, and understood differently by different people (Hirsch et al., 2011). Interventions should also be viewed in the context of socio-economic change at the local and national level. The range of livelihood options available, associated barriers and benefits, and how these are changing over time all influence individual choice, and must be explored if interventions are to remain relevant.

The hunting of terrestrial wild animals for meat, known as ‘bushmeat’, is widespread and thought to be increasingly unsustainable across the equatorial forest belt of West and Central Africa (Abernethy et al., 2013, Benítez-López et al., 2017). This is a classic example of a complex social-ecological system at the interface of biodiversity conservation and poverty reduction agendas. Livelihood interventions aimed at reducing hunting effort in this region have focused on alternative income-generating activities such as pig-rearing, beekeeping and cocoa farming. In Central Africa, this approach continues to be heavily promoted through the intergovernmental regional organisation COMIFAC (*Commission des Forêts d’Afrique Centrale*), with substantial investment from many donors and NGOs (COMIFAC, 2015). Attempts have been made to collate secondary evidence on the effectiveness of livelihood interventions aimed at reducing bushmeat hunting, but findings are inconclusive due to the dearth of monitoring and in-situ evaluations (van Vliet, 2011, Wicander et al., 2014). A more nuanced understanding of the role and function of livelihood interventions in conservation could steer the development of future policies aimed at changing the livelihood strategies of local people for social and ecological benefit. Meaningful policy recommendations relevant to the bushmeat context are desperately needed by conservation practitioners, donors and policymakers who want to be able to make evidence-informed decisions.

1.2 Aims and objectives

The overall aim of the research presented in this thesis is to critically reflect on the role of livelihood interventions in conservation by examining the assumptions made during their design and implementation, their mechanisms of impact, and the systems in which they are implemented. Applying insights from livelihoods research, behavioural science theories, and the qualitative evaluation of twenty

case study projects, I investigate how alternative livelihood projects function in practice. I place the livelihoods of people living adjacent to protected areas in the context of the complex social-ecological systems in which they are embedded and the broader societal changes that affect them, and consider the factors that influence the uptake of promoted livelihood activities in these settings and ultimately the effectiveness of livelihood interventions at reducing unsustainable natural resource use.

The main research objectives of this thesis are to:

- 1) Deconstruct the concept of 'alternative livelihoods' by scrutinising the assumptions underlying this approach and drawing insights from the sustainable livelihoods literature;
- 2) Determine how alternative livelihood projects are implemented and how people respond to them by comparing the reflections of participants with those of project implementers;
- 3) Reconstruct a typical theory of change for alternative livelihood projects, identifying what the key uncertainties are and exploring where breakages in the causal chain occur;
- 4) Examine alternative livelihood projects through a behaviour change lens using a behavioural theory as a diagnostic framework to identify barriers and potential levers to change;
- 5) Illustrate how natural resource use and reliance differs between different community sub-groups using the example of urban-based out-migrants;
- 6) Develop a set of guiding principles to inform the design and implementation of livelihood interventions around protected areas.

The empirical basis for this research focuses on two protected areas in Cameroon where hunting for bushmeat is a common livelihood activity that is considered by conservationists to be a biodiversity threat. This research contributes to the evidence base for the effectiveness of livelihood interventions in conservation and key findings are translated into practical policy advice.

1.3 Thesis outline

Following this introductory chapter, the thesis is structured as follows:

Chapter 2 situates the research within the broader debate about biodiversity and poverty linkages, describes the evolution of people-focused approaches in conservation, and discusses the need to develop an evidence base for their effectiveness. In this chapter, I review a series of meta-analyses looking at the predictors of success for these types of projects before focusing on the implementation of livelihood interventions aimed at reducing bushmeat hunting in West and Central Africa.

Chapter 3 provides a detailed overview of the environmental, historical, social, political and economic context for the implementation of conservation interventions in Cameroon. I specifically examine the differing ecological, social and conservation management conditions at the two sites that are the empirical focus of this thesis – Takamanda National Park and Dja Faunal Reserve. Situated in the anglophone and francophone zones of Cameroon respectively, the differences between these sites are placed within their historical context as former British and French colonies.

Chapter 4 differentiates between different types of livelihood interventions to better understand their roles in conservation and intended impacts, before examining some of the shortcomings of the ‘alternative livelihood’ approach. Key assumptions relating to how alternative livelihood projects are thought to have an impact are examined. By drawing on insights from the livelihoods literature, I discuss why it is necessary for conservation practitioners to more thoroughly understand the complexities of people’s lives and rural livelihood strategies before intervening to alter their livelihood activities.

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Chapter 5 examines how seven alternative livelihood projects were implemented in villages around Takamanda National Park and how people responded to them. By comparing the perceptions and experiences of participants and other community members with those of project implementers, I identify key factors, also known as effect modifiers, that can either enhance or limit a project’s impacts. These factors are presented in a conceptual framework of guiding principles which can be used to inform the design and implementation of livelihood interventions around protected areas moving forward.

Chapter 6 determines whether the typical assumptions underlying alternative livelihood projects hold in practice by drawing insights from twenty case study projects implemented at three sites around Takamanda National Park and Dja Faunal Reserve. By using an established theory of behaviour – the COM-B model – as a diagnostic framework, I identify the individual and contextual factors that function as barriers or enablers to behaviour change, discuss how different elements of the system interact and highlight key uncertainties along the causal chain from project implementation to conservation impact.

Chapter 7 deconstructs the concept of ‘community’ and illustrates how natural resource use and reliance differs for different community sub-groups by specifically focusing on the multi-spatial livelihoods of urban-based out-migrants. By exploring the livelihood strategies, aspirations and trajectories of urban

men that originated from villages around Takamanda National Park, I reveal how rural resource use can function as a fallback or diversification strategy, as well as a means of accumulating wealth, depending on individual circumstances, and examine how this could change under different economic scenarios.

Insights from this chapter appeared in the publication:

McNamara, J., Robinson, E.J.Z., Abernethy, K., Midoko Iponga, D., Sackey, H.N.K., Wright, J.H. & Milner-Gulland, E.J. 2020. COVID-19, systemic crisis, and possible implications for the wild meat trade in Sub-Saharan Africa. *Environmental and Resource Economics*, 76, 1045-1066.

Chapter 8 brings together the different strands of this research and discusses the implications of the findings for biodiversity conservation in general, and management of the bushmeat situation in Central Africa in particular. Recommendations are made regarding the practical application of the research findings as well as potential areas for future research.

1.4 A note on my background and philosophical perspective

My interest in livelihood interventions began in 2007 when I was conducting research on bushmeat hunting practices in the South West Region of Cameroon for my masters dissertation. Having spent two months interviewing hunters in villages across Lebiale Division, I was invited to a community engagement meeting by the Cameroonian NGO with which I was collaborating – the Environment and Rural Development Foundation (ERuDeF). During the break, a group of hunters I had interviewed beckoned me to the back of the community hall where they explained to me that they wanted to learn how to do beekeeping as an alternative to hunting. It seemed like a strangely specific request, and on enquiring further it turned out that someone else from the UK had visited a few years earlier and had discussed starting a beekeeping project. However, the project had not come to fruition and the hunters had been left disappointed. I subsequently identified and arranged to meet the British beekeeper who had visited Lebiale, and that was the start of a four-year foray into the world of African beekeeping.

I was aware from the outset that many beekeeping projects implemented for conservation purposes had not worked, however I was interested to know whether it was the notion that hunters could become beekeepers that was flawed, or whether previous projects had simply been implemented badly. In a bid to design a beekeeping project that avoided past implementation failings, I engaged with beekeeping initiatives across Cameroon and eventually started working for a UK-based NGO called Bees for Development to learn more about best practice approaches in Africa. In partnership with ERuDeF, I established and coordinated the Lebiale Hunters' Beekeeping Initiative from 2008 to 2011. I later started working for the Zoological Society of London (ZSL) on a bushmeat alternatives project in

Equatorial Guinea. The research for this thesis was born out of these earlier experiences and a perceived need to critically review and reflect on the use of alternative livelihood projects in conservation. More specifically, I wanted to be able to collate evidence and lessons from multiple alternative livelihood projects and have the intellectual space to look beyond the conservation sector to draw ideas, insights and explanations from other disciplines and schools of thought.

The research presented in this thesis is predominantly qualitative and inductive, which reflects a shift in my research approach and philosophical perspective during the course of my PhD. Initially I had envisaged my research being more quantitative, with the central focus being to determine whether alternative livelihood projects can have a measurable conservation impact. I explored a range of approaches that I could have used to determine their effectiveness, including designing a form of recall-based before-after-control-impact (BACI) study. However, having spent several years as a conservation practitioner based in Central Africa prior to my PhD, I have always kept in mind the kind of information practitioners need to be able to design projects better. Knowing whether a project has had an impact is certainly important, but I wanted to gain more of an understanding of how and why. My aim throughout has been to determine how livelihood interventions in conservation can be done better in the future so that I can subsequently use this learning to actively guide project design and implementation on the ground. I ultimately felt that in-depth qualitative approaches helped me to better fulfil this aim.

I now consider my research philosophy in relation to the social world to most closely align with interpretivism, whereby knowledge arises through interpretation as well as observation (Ritchie et al., 2014). Ontologically, I am a critical realist and consider reality to exist independently of people's beliefs and understandings of it, yet consider it only accessible through the perceptions and interpretations of individuals (Moon and Blackman, 2014). In terms of methodology, I am very much a pragmatist and have chosen my methods based on my research aims rather than having been influenced by one specific discipline. My career and pursuit in life to date has focused on conservation, with a particular interest in great apes. However, I have always taken an interdisciplinary approach, starting by studying human geography as an undergraduate, because I realised then the importance of understanding and working with people in order to have a lasting conservation impact, and I still hold that view today.

1.5 Research ethics and approvals

Before field research commenced, I obtained ethics approval from ZSL's Ethics Committee, which assessed the potential human impacts of the proposed research. As detailed in the 'ZSL guidelines for ensuring appropriate ethical standards in projects involving direct impacts on live animals, or data collection from humans, for research purposes', the ZSL Ethics Committee is composed of seven

members of ZSL staff and four external members with a mix of expertise in human subjects research and animal welfare (ZSL, 2009). Prior to completing my application to this committee, I referred to the ethics guidelines published by various professional social science bodies, including the Association of Social Anthropologists of the UK and the Commonwealth (ASA, 2011) and the American Anthropological Association (AAA, 2012). In addition, I reviewed the code of ethics of the Society for Conservation Biology (SCB, 2004) and the chapter in Newing (2011) on ethical issues associated with social science research in conservation. My research received initial approval from the ZSL Ethics Committee prior to my first field season in 2014 and a subsequent amendment was approved in early 2015 prior to my second field season to cover additional research components. The final approved ethics application is included in Appendix A. At this time, it was not necessary to get approval from the Imperial College Research Ethics Committee since the research involved the use of interview procedures and had already received ethics approval from ZSL. Once in country, my research assistants were trained in how to adhere to research ethics best practice and were provided with a code of conduct based on my ethics approval (Appendix A). All of my research assistants signed a declaration agreeing to adhere to this ethical code of conduct. Further details about my research ethics are provided in the methods sections of Chapters 5 to 7.

To conduct research in Cameroon, I obtained annual research permits from the Cameroon Ministry of Scientific Research and Innovation (MINRESI), which are included in Appendix A. My first application was supported by the Wildlife Conservation Society's Takamanda-Mone Landscape Project and the second by the International Research and Training Center in Yaoundé (now the Congo Basin Institute). In addition, research permission was granted by the relevant regional delegations of the Ministry of Forestry and Wildlife (MINFOF), the Conservators of both Takamanda National Park and the Dja Faunal Reserve, and the appropriate local government representatives in all research locations. Details of the process undertaken to gain research approval at the village level is provided in section 5.2.2. of Chapter 5.

Chapter 2

Background

2.1 Social-ecological systems in the developing world

The distinction between social systems and ecological systems can be considered arbitrary and artificial, given that biodiversity and other elements of nature are used as resources by human societies (Berkes and Folke, 1998). Therefore, biodiversity and human wellbeing should be thought of as components of a complex and adaptive social-ecological system (SES) composed of multiple interacting agents (Nuno et al., 2014, Walker and Janssen, 2002). The seminal work of Ostrom (2009) subdivides SESs into four interacting subsystems, namely the resource system (e.g. a specific protected area), the resource units (e.g. vertebrate species hunted for meat), the users (e.g. hunters) and the governance system (e.g. the local, national and international institutions that govern hunting in that protected area). All elements of the overall system, and the feedbacks between these elements, must be considered when designing policies aimed at improving the sustainability of resource use from both a social and ecological perspective.

Within complex SESs there are competing value systems and multiple agendas. Berkes (2007) argues that biodiversity conservation should be treated as a multi-level commons problem whereby biodiversity is a global commons with current and future importance for humanity, a regional commons with potential to generate revenue, for example through ecotourism, and a local commons which provides ecosystem services essential for human well-being. There has been much debate in the literature about the importance of biodiversity to those living in poverty. An extensive recent study which used a standardised method to collect quarterly household recall data over 12 months from 7,978 households in 333 rural villages across 24 tropical and subtropical developing countries found that on average 28% of total household cash and non-cash income came from biodiversity-based resources, particularly those sourced in natural forests (Angelsen et al., 2014). This can be compared to 29% of total household income coming from agricultural crops, which had previously been thought to be of greater overall importance to rural households in developing countries than biodiversity (Ellis, 1998).

The relative percentage of total household cash and non-cash income from biodiversity-based resources is the predominant indicator used to measure dependence (Angelsen et al., 2011). The generally accepted view is that the poorest households in a community are those most dependent on biodiversity to meet their cash and consumption needs, and this is supported by several empirical studies (e.g. Mamo

et al., 2007, Béné et al., 2009, Kümpel et al., 2010). However, biodiversity dependence is not the same as use, and a review of the evidence suggests that there may be a U-shaped relationship between biodiversity use and wealth, with the poorer households in a community dependent on low value resources and the wealthier households capitalising on high value resources (Vira and Kontoleon, 2010). In terms of absolute income, Angelsen et al. (2014) found the biodiversity income of the richest 20% of households to be five times higher than that of the poorest 40% of households. This finding questions the assumption that poverty is one of the main drivers of overexploitation, as do studies by a number of authors which show that those who benefit most from bushmeat hunting are mid- to high-income households (e.g. Kümpel, 2006, Coad et al., 2010). By addressing the issue of poverty rather than the underlying drivers of overexploitation, conservation managers may risk exacerbating overexploitation even if the logic is to reduce the poverty of the biodiversity-dependent and break the vicious cycle of unsustainable use and degradation.

There have been several conceptual typologies developed to categorise conservation-poverty relationships. Building on three earlier typologies, Walpole and Wilder (2008) propose five rationales for addressing poverty in conservation: 1) biodiversity provides ecosystem services which underpin local livelihood strategies – poverty reduction can be achieved through conservation; 2) poverty is the main driver of biodiversity loss through unsustainable use – reducing poverty reduces biodiversity dependence; 3) conservation actions can negatively affect the poor through resource access restrictions – a moral obligation to offset costs; 4) the process of development drives biodiversity loss – reducing poverty can have negative consequences for biodiversity; and 5) the long-term conservation of biodiversity needs local support – reducing poverty generates goodwill and trust. Despite similarities, each social-ecological system is unique and the relationships between conservation and poverty are complex. Different actors in a system will have different views and motivations which must be considered, but ultimately the circumstances in any given context will determine the link between biodiversity and poverty.

2.2 People-focused conservation approaches

Before the 1970s, the livelihoods of local people were rarely taken into consideration by conservation practitioners with protectionist ideals (Roe, 2008). However, following the launch of the UNESCO Man and the Biosphere programme in 1971, the rights of local people to access natural resources and conduct their livelihood activities were more widely acknowledged (Salafsky and Wollenberg, 2000). The paradigm shift from protectionism to people-focused conservation was marked by the publication of the World Conservation Strategy (IUCN, 1980). This report emphasised the connection between poverty and the overexploitation of biodiversity by local people with limited livelihood options. The popularisation of

the sustainable development concept in the 1980s led to the rise of integrated conservation and development projects (ICDPs), which were receiving the majority of conservation funds available from bilateral development agencies and the Global Environment Facility by the early 1990s (McShane and Wells, 2004).

ICDPs are typically associated with protected areas and use a variety of strategies to link the conservation of biodiversity with the social and economic development of neighbouring communities (McShane and Wells, 2004). They have tended to be large in scale and budget, for example the annual work plans of five ICDPs in Madagascar in 1995 listed 40 key activities on average (Ferraro, 2001). ICDPs often aim to reconcile the exclusion of local people from state-owned protected areas by educating them about and involving them in project activities (Barrow and Murphree, 2001, Robinson and Redford, 2004). In the majority of cases, the conservation of biodiversity is the primary objective. Robinson and Redford (2004) describe a 'menu' of approaches used by ICDPs aimed at 1) alleviating poverty (e.g. through the promotion of local enterprises), 2) building the capacity of community-based institutions (e.g. through establishing tenure rights), 3) empowering local people to participate in conservation (e.g. involvement in decision-making), 4) involving local people in protected area management (e.g. direct employment as park guards or joint management arrangements) and 5) managing the sustainable use of natural resources (e.g. through quotas).

A sequel to IUCN's World Conservation Strategy, titled *Caring for the Earth*, was published in 1991, and shifted attention towards sustainable use and the conservation of natural resources for the benefit of people (IUCN/UNEP/WWF, 1991). This triggered concern that biodiversity conservation goals were being sidelined by a predominantly poverty-focused agenda (Robinson, 1993). The CBD signed in 1992 also emphasised sustainable use defined as 'the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations' (United Nations, 1992a, p. 4). A variety of other terms were coined during this period to describe a suite of approaches involving local people in conservation, including community-based natural resource management (CBNRM), integrated coastal management (ICM) and community-based conservation (CBC). The types of approaches broadly range from community involvement in protected area outreach (e.g. ICDPs) to collaborative management and community empowerment (Barrow and Murphree, 2001, Roe et al., 2006).

In contrast to ICDPs, CBC projects tend to be smaller in scale but they also take a diverse range of forms (Brown, 2002). Little (1994) defined CBC interventions as local-level, voluntary, people-centred, participatory and decentralised. The involvement of communities is the basis for conservation, rather

than a means of achieving it (Campbell and Vainio-Mattila, 2003). Rural development through the sustainable use of biodiversity is often the primary objective. Barrow and Murphree (2001) identify three common components of CBC projects: 1) devolution of control over natural resources to local communities, 2) establishment of institutions that enable the effective local management of natural resources, and 3) development of enterprises that create economic incentives to conserve resources. As apparent from the cross-over between the descriptions of different types of approaches, the 1980s and 1990s left a legacy of ambiguous and interchangeable terms, which have gone in and out of favour, to describe a conservation approach that essentially involves engaging local people. One common theme running through each of these strategies on-the-ground is the implementation of livelihood interventions aimed at reducing behaviours of conservation concern.

Another purported 'win-win' approach are payments for ecosystem services (PES). Advocated by Ferraro (2001) as a radical alternative to the use of livelihood interventions, direct payments to individuals and communities for 'not doing something' was seen as a more cost-effective approach with more immediate biodiversity benefits (Ferraro and Kiss, 2002). However, the implementation of PES schemes has not been without challenges. Problems associated with direct cash payments resulted in a renewed interest in the provision of indirect and in-kind incentives based on cooperative and reciprocal arrangements (Cranford and Mourato, 2011). Indirect and in-kind incentives often equate to livelihood interventions attempting to replace or diversify the livelihood activities of resource users, for example through the distribution of beehives in Bolivia as in-kind payments (Wunder, 2005). Muradian et al. (2013) warned that PES schemes would be besieged by the same problems as ICDPs due to the similar political, socio-cultural and institutional contexts within which they operate. In response, Wunder (2013) highlighted that PES schemes are based on negotiated compensation logic, which is often absent from ICDPs, but conceded that the conditions needed for PES to function effectively, i.e. organised resource users, a trustful negotiation climate and well-defined tenure regimes, has limited the spread of PES in developing countries where solutions to degradation are often needed the most.

2.3 Livelihood interventions in conservation

In relation to the conservation-poverty typology discussed in section 2.1, the rationale for implementing livelihood interventions tends to be based on two main assumptions, that bolstering income from other activities will reduce financial reliance on biodiversity and therefore the need to exploit it, and that this income will offset some of the financial losses incurred as a result of resource access restrictions (corresponding to rationales no. 2 and 3 in the typology). However, taking account of human needs is not the same as attempting to reduce poverty and despite the rhetoric, many livelihood interventions may not be about reducing poverty at all. In many instances, communities are only involved in conservation

measures and provided with development benefits in order to reduce local resistance (Berkes, 2007). In the typology, this is termed fostering 'goodwill' (rationale no. 5). As well as increasing incomes from alternative activities, a secondary motive behind implementing livelihood interventions is often to occupy the time of resource users. This is described by Ferraro (2001) in his critic of ICDPs as 'conservation by distraction'.

A typical trait with livelihood interventions is that communities are viewed as homogenous (McShane and Newby, 2004). The naïve assumption that communities are groups of similarly endowed households with common characteristics that live in harmony within spatial boundaries has been disputed extensively within the social sciences but often prevails in conservation practice (Agrawal and Gibson, 1999). Although people living in the same location do have shared experiences, they also have multiple, varied, interacting and potentially conflicting interests which have an effect on the social and ecological outcomes of conservation projects (Waylen et al., 2013). Equity has been flagged up as an important determinant of conservation effectiveness (Halpern et al., 2013), yet the fair distribution of benefits associated with livelihood interventions can be impeded by elite capture, long-standing interpersonal conflicts and variable opportunity costs at the individual level (Sommerville et al., 2010). A critical question is who gets to participate in livelihood interventions and why? Those who get to participate may be different from the target population for an intervention, for example the poorer members of a community who are biodiversity dependent may be excluded by more powerful actors. If project benefits are monopolised by the already wealthier households, further increasing incomes may have negative impacts on biodiversity if it increases ability to exploit high value resources.

Ironically one of the criticisms of livelihood interventions is the distinct lack of benefits that accrue to community members who may have been enticed to participate with unrealistic claims about potential gains, resulting in high expectations that are inadequately fulfilled (Winkler, 2011). This can do more harm than good in terms of fostering community support for conservation. There are many concerns about the counterintuitive impacts of livelihood interventions, particularly on biodiversity (Oates, 1999, Terborgh, 1999). Yet these concerns are usually based on individual experience or are hypotheses produced by models which lack empirical validation (e.g. Damania et al., 2005). One of the few in-depth empirical evaluations of a livelihood intervention was conducted by Hill et al. (2012) who examined seaweed farming as an alternative to coastal fishing in the Philippines. Seaweed farming is a rare example of a livelihood intervention activity that has proven to be more profitable than the unsustainable exploitation activity it is often intended to replace. Hill et al. (2012) looked at the impact of seaweed farming on fisher numbers as an indication of change in fishing pressure. Fisher numbers were found to have increased overall due to human population growth and despite greater potential for

income generation through seaweed farming, the perceived level of risk and delayed returns limited uptake. For households to acquire the assets necessary to bear the risk, an initial increase in fishing effort was reported. This example highlights some of the complexities involved with attempts to manipulate livelihood strategies.

2.4 Understanding the factors underlying conservation outcomes

The academic literature highlights widespread uncertainty about the effectiveness of conservation investments (Ferraro and Pattanayak, 2006). Possingham (2012) describes an emerging evidence-based conservation movement catalysed by the efforts of Pullin and Knight (2001) and Sutherland et al. (2004), which aims to determine what works and when through the systematic evaluation of conservation policies. Pullin and Knight (2001) go as far as to say that donor organisations ‘should no longer give unqualified support to conservation practices untested by proper scientific methods and justified purely on personal experience or anecdotal evidence’ (p.53). The absence of rigorous measurement and reporting on both successes and failures has resulted in a trial-and-error approach to project implementation (Redford and Taber, 2000). Although greater emphasis has been placed on the importance of monitoring and evaluation in conservation since the 1990s, the focus has predominantly been on inputs and outputs rather than on conservation outcomes (Kapos et al., 2009). Kleiman et al. (2000) note that few evaluations examine several case studies together to assess the effectiveness of specific conservation strategies.

Sutherland et al. (2004) appealed for the systematic appraisal and meta-analysis of conservation evidence to assess patterns, and stressed the need to make synopses of evidence accessible to practitioners to enable evidence-based decision-making. Several authors have responded to this call in relation to people-focused conservation approaches, which have been frequently criticised due to the apparent lack of evidence for effectiveness (Garnett et al., 2007). Brooks et al. (2006), Brooks et al. (2012), Oldekop et al. (2010) and Waylen et al. (2010) all conducted meta-analyses of published data to determine which factors predict the success and failure of people-focused conservation initiatives (primarily focused on ICDPs and CBCs). The systematic reviews of Waylen et al. (2010) and Brooks et al. (2012) built on the methodology developed by Brooks et al. (2006) which defined success in terms of reported impacts on attitudes, behaviours, ecology and economics, ranked as ‘success’, ‘limited success’ or ‘failure’. In these studies, success was determined based on the judgement of the source, which may or may not have been supported by empirical evidence. Oldekop et al. (2010) focused specifically on conservation outcomes ranked as ‘high’, ‘low’ or ‘none’ based on various measures of environmental health, including land-cover change and biodiversity data. Collectively these studies examine a range of potential predictor variables based on assumptions about determinants of success as published in the

literature. Latterly, Brooks et al. (2012) used a nested, multi-tier framework of variables devised by Ostrom (2007) to systematically collate data on 20 variables associated with national context, project design and community characteristics.

From a sample of 28 projects, Brooks et al. (2006) concluded that success is enhanced by permitting the use of natural resources, market access and greater community involvement. Waylen et al. (2010) focused on social and cultural variables at the community level and from a sample of 68 projects found that the local institutional context and engagement with local institutions were the only variables tested that had an influence on intervention outcomes. Similarly, out of five variables (land tenure, population size, social heterogeneity and institutional arrangements), Oldekop et al. (2010) using 116 project case studies concluded that strong institutional arrangements for resource management was the only variable positively correlated with better conservation outcomes. At the level of higher-tier variables, Brooks et al. (2012) using a sample of 136 projects identified project design, particularly in terms of capacity-building at the local level, as a key determinate of project success, more so than national context. Tenure regimes and supportive institutions were also deemed to be important. Brooks et al. (2012) also examined the impacts of different types of economic benefits, considering ecotourism, community-based conservation, substitution or compensation schemes, and the enhanced market value of target resources. However, results were inconclusive and ensuring equitable benefit distribution was deemed more important than benefit type.

There is a degree of consistency between the four meta-analyses on the determinants of success in the realm of people-focused conservation. These studies add further weight to the argument that local institutions are profoundly important in regulating the use of biodiversity, as previously emphasised with respect to common pool resources by Ostrom (1990). However, the quantitative process of meta-analysis in these examples simplifies incredibly complex variables into binary and ternary variables, losing a lot of the subtle variations that would actually be of more practical use to policy makers. For example, in the Brooks et al. (2012) study, national context was considered very broadly by looking only at internationally recognised indicators such as the Human Development Index rather than at the national policies, institutions and support structures directly relevant to conservation. The measures of 'success' are also questionable since they lack consistency and are based on reported outcomes from studies of varying quality. Furthermore, making a clear-cut distinction between success and failure in conservation is usually not feasible nor desirable. Different livelihood activities serve a range of functions and it is therefore necessary to take a holistic approach when considering the effectiveness of livelihood interventions. Ultimately, the conclusions of any meta-analysis can only be as robust as the data provided in the literature reviewed, with due consideration also given to publication bias. The authors of

these studies all commented on the lack of evidence on which to base their conclusions. In the long-term, increased rigour is needed in both the conceptualisation and implementation of monitoring and evaluation frameworks at the project design stage, yet post hoc evaluations and meta-analyses can yield useful insights. However, they need to be on a more regionalised scale targeting specific thematic areas to provide meaningful policy recommendations to conservation practitioners.

2.5 Bushmeat hunting in the forests of West and Central Africa

The equatorial forest belt of West and Central Africa stretches across 15 countries and can broadly be subdivided into two zones, the Guinean forests of West Africa and the Congo Basin forests of Central Africa (Myers et al., 2000). A wide variety of terrestrial vertebrates are consumed as bushmeat across this region, with ungulates, rodents and primates constituting the majority (Fa et al., 2005). Estimates suggest that 4.6 million tonnes of wildlife is extracted for bushmeat in the Congo Basin each year (Nasi et al., 2011). The hunting of bushmeat has become a large-scale commercial activity due to rapid human population growth, socio-economic change, infrastructure development and technological improvements (Bennett and Robinson, 2000). Although hunting for household consumption may be locally sustainable, demand associated with the commercial trade in bushmeat exceeds what the forests can sustainably supply (Bennett et al., 2007). Fa et al. (2002) define unsustainable harvesting as extraction which exceeds 20% of production, and in using this criteria estimate that 60% of mammalian taxa in the Congo Basin are exploited unsustainably. However, the extent to which the bushmeat trade is sustainable or unsustainable is complex, dynamic and locally specific (Ling and Milner-Gulland, 2006).

The threat of wildlife extinctions, particularly with regard to charismatic species such as great apes, raised international awareness of the bushmeat issue in the 1990s (Ape Alliance, 1998). As such conservation funds have been channelled towards bushmeat management interventions for more than 20 years but, as Nasi et al. (2008) argue, bushmeat continues to be an unmanaged commons problem due to inadequate governance and policy frameworks. In much of West Africa, where many large-bodied species have already been extirpated, the bushmeat crisis now has more of a human dimension, with the main threat being to food and livelihood security (Bennett et al., 2007). Empirical studies focusing on the role of bushmeat in livelihoods suggest that income-generation is often the primary incentive for people to hunt (de Merode et al., 2004, Kümpel et al., 2010, Wright and Priston, 2010), but bushmeat also provides an important supply of protein. Fa et al. (2003) warn of a decline in bushmeat protein supply by 81% in less than 50 years across all Congo Basin countries if production of non-bushmeat protein is not increased. The anticipated 'protein gap' could result in serious food security issues across West and Central Africa where the productivity of domestic livestock is low (Fa and Brown, 2009).

As a livelihood activity, bushmeat hunting has many positive characteristics. There are low barriers to entry and relatively high levels of social inclusion, labour inputs are flexible which makes hunting compatible with the agricultural cycle and it also plays an important safety net function during short-term crises (Brown and Williams, 2003, Schulte-Herbrüggen et al., 2013a). Bushmeat has excellent storage qualities and a high value to weight ratio when smoked, making it economical to transport to distant markets, and the unregulated and decentralised nature of the trade means that a fair proportion of the value of bushmeat (e.g. 73% of the final sale price in Ghana) is retained by the hunter (Cowlshaw et al., 2005, Inamdar et al., 1999). Declines in world prices for some agricultural crops, particularly cocoa and coffee, have had an adverse effect on smallholder farmers in Africa, causing many to abandon their farms and migrate to urban centres (Hallam, 2003). Hunting has functioned as an important fallback option for rural farmers who have been driven to seek alternative sources of income (Nasi et al., 2008). or when preferred alternative income-generating activities such as paid employment are unavailable (Kümpel et al., 2010). Many livelihood interventions have sought to promote alternatives to hunting in West and Central Africa, but identifying livelihood options that share many of the important characteristics of hunting has proven to be a challenge. There are also well founded concerns as to the potential negative impacts on biodiversity of increasing wealth through livelihood interventions, since this has been shown to correlate with increased bushmeat consumption (Brashares et al., 2011) and hunting by more efficient methods (Damania et al., 2005, Kümpel et al., 2009).

Although it is likely that there have been hundreds of livelihood interventions implemented by conservation practitioners across West and Central Africa over the last 40 years, a systematic review conducted by Brooks et al. (2012) identified only two articles from this region in the peer-reviewed literature that empirically evaluated outcomes. These articles consider the effectiveness of two livelihood interventions in Cameroon using qualitative methodologies to assess changes in attitudes and behaviour (Abbot et al., 2001, Malleson, 2002). Abbot et al. (2001), who surveyed project participants to determine attitudes towards conservation and levels of self-reported behavioural change, deemed the Kilum-Ijim Forest Project in Northwest Region to be a success. Malleson (2002), who in contrast conducted a long-term ethnographic study on behavioural change, deemed the Korup Project in Southwest Region to be a failure. In a later review, Wicander and Coad (2015) attempted to map out the characteristics of livelihood interventions aimed at reducing hunting pressure in Central Africa. After compiling a database of 64 projects, 15 were examined in more detail using a comparative framework to identify commonalities. Contrary to expectations that projects would be large-scale and implemented by external agencies, the majority of projects were run by national NGOs funded through small, short-term grants. Many projects were deemed to be struggling to meet their objectives with the time, funding and capacity available, and only a handful of projects were found to be monitoring impacts.

Chapter 3

Study area context

3.1 An introduction to Cameroon

3.1.1 Environmental and cultural heritage

The Republic of Cameroon is located in Central Africa, bordered by Nigeria to the west, Chad to the north-east, the Central African Republic to the east and Equatorial Guinea, Gabon, and the Republic of Congo to the south. Cameroon covers an area of 475,650 km² and is situated on the west coast of Africa, along the Gulf of Guinea, with a 402 km stretch of coastline bordering the Atlantic Ocean (UN DESA, 2017b). Located slightly north of the equator, Cameroon is a large and varied country both ecologically and culturally. The main ecosystem type in the southern part of Cameroon is tropical humid dense forest, which transitions to tropical wooded savannah then semi-arid landscapes in the northernmost parts of the country (Republic of Cameroon, 2012). The mountainous area bordering Nigeria also features a variety of montane habitats, with the highest altitude being 4,095 m at the peak of Mount Cameroon – an active volcano and the highest mountain in western and central Africa.

The belt of tropical humid dense forest in the southern half of Cameroon lies between latitudes 2° and 6°N (Cerruti et al., 2009). In 2012, dense forest (with more than 75% tree cover) covered a total area of 172,721 km² – 36% of the country's total surface area (Hansen et al., 2013). Three distinct ecoregions, considered to be of global importance, are contained within the country's tropical forest belt: the Cameroon highland forests along the Nigeria-Cameroon border, the Congolian coastal forests along the Atlantic Ocean, and the western Congo Basin moist forests contiguous with the forests of Equatorial Guinea, Gabon, and the Republic of Congo in the south (Olson and Dinerstein, 2002). There are marked differences in climate between these ecoregions. While the stretch of Congo Basin forest has an equatorial climate with two peaks in rainfall during the year, separated by a long and a short dry season, the highland and coastal forests have one long rainy season lasting eight months, followed by a short dry one (Gartlan, 1992). With rainfall in excess of 3,000 mm per year, and up to 10,000 mm at the foot of Mount Cameroon, the highland and coastal forests receive more rainfall than anywhere else in Africa (White, 1983). With such a diversity of climates and habitats, Cameroon is renowned for its species richness and particularly for the high number of primate species found in the country (Gartlan, 1992).

With more than 250 ethnic groups, Cameroon is one of the most ethnically diverse countries in the world (Fearon, 2003). These groups can broadly be clustered into five cultural regions, which correspond with the different ecosystem zones. The western highlanders, also known as grassfielders, live in the Cameroon highland forests along the Nigeria-Cameroon border and in the area that transitions to tropical wooded savannah; the coastal tropical forest peoples live in the Congolian coastal forests zone; the southern tropical forest peoples in the Congo Basin forest; the people of the central highlands in areas of tropical wooded savannah further north; and finally the Islamic northern peoples in the semi-arid zone (Mbaku, 2016). Cameroon has a political discourse which places emphasis on ethnicity. People are defined by their ethnic group and ancestral village, with access to opportunities often determined by ethnic and regional affiliations rather than merit (Monga, 2000). While political and economic power in Cameroon is not controlled by one particular group, three ethnic groups do have disproportionate influence – the Bamileke from the western highlands, the Beti from the southern tropical forests and the Fulani from the northern semi-arid region. Individuals often reconfigure their ethnic identities for political and economic purposes, with minority groups forming strategic alliances with, and taking the label of, the more powerful ethnic group within their cultural region (Monga, 2000).

3.1.2 The colonial legacy

Aside from ethnicity, Cameroonians also place great emphasis on their anglophone or francophone identities – a prominent legacy from the colonial era. Cameroon was initially colonised by Germany in 1884 amidst the European scramble for Africa, and reportedly after the German Chancellor received news that the British planned to imminently annex an area where German trading companies were based (Pakenham, 1991). Taking advantage of the rich and fertile soils around Mount Cameroon, German companies established 1,068 km² of plantations in what is now the South West Region of Cameroon (Mbaku, 2005). Palm oil, bananas, cocoa, coffee and rubber were the main products of interest to the Germans (Ngoh, 1979). To ensure enough labour was available for the plantations, a head tax was imposed on all adults in German Kamerun deemed capable of performing work (Rudin, 1938). This encouraged people to migrate to engage in paid work or face forced labour as a penalty (Pakenham, 1991). Kamerun was governed by Germany for thirty years until the outbreak of World War I. The Germans were eventually expelled from Kamerun in 1916 by the Allied powers of Britain and France (Mbaku, 2016). The German colonial period transformed Kamerun into a monetary exchange economy and exposed the population to European political, economic, social and judicial institutions. During German rule, multiple regions and ethnic groups were merged into a single entity, urban centres developed, and a network of ports, roads and railways was created (Mbaku, 2005).

In 1916, the territory of German Kamerun was partitioned by Britain and France, with four-fifths designated as French Cameroun and the remaining one-fifth as the British Cameroons (Elango, 2014). The League of Nations officialised the new boundaries in 1922, granting mandates to Britain and France to administer the two territories (Ardener, 1962). The French imposed a centralised system of governance, known as 'direct rule', which was based on the principles of assimilation and standardisation (Gonidec, 1957). Local institutions were suppressed and replaced by colonial structures. To simplify administration, the French colonial authorities appointed individuals as 'chiefs' to represent and promote French views within their communities (Ngoh, 1979). In so doing, they created a new assimilated elite made up of cooperative locals trained in French language, culture and administration (Blanton et al., 2001). The whole population was governed by the same legal code, with all laws and decrees in French civil law extended to Cameroun. As the Germans had done before them, the French administered justice in two separate courts – one for Europeans and the other for the local population, with French administrators presiding over both (Fombad, 2015). The authority of traditional leaders was superseded by the centralised powers of the colonial state (Blanton et al., 2001). To facilitate trade, the French expanded the transport system created by the Germans, constructing the Douala-Yaoundé railway with extensive use of forced labour (Mbaku, 2005). With better transport links, production of cocoa, coffee, bananas, palm oil and groundnuts increased, and cocoa became the main export crop (Ngoh, 1979). To generate revenue for the French colonial administration, a head tax was introduced which applied to everyone, including children (Mbaku, 2005).

The British mandate consisted of two discontinuous strips of territory along the Nigeria border, thus the British Cameroons was divided into Northern Cameroons and Southern Cameroons (Ardener, 1962). Rather than being administered as a separate territory, the British Cameroons were integrated into the British protectorate of Nigeria. British colonial policy notably differed from that of France. The British employed a decentralised system of 'indirect rule' whereby local institutions were left intact and colonies were governed through traditional local elites co-opted or coerced into serving as agents of the colonial administration (Wilson, 1994). The preservation of pre-colonial social institutions enabled the British to adopt a 'divide and rule' strategy (Morrock, 1973). Exaggerating difference disguised the existence of an oppressed majority and prevented the formation of multi-ethnic anti-colonial alliances (Mamdani, 1996). However, as with the French, the British transplanted their legal system in British Cameroons. The common law, doctrines of equality and statutes of general application in force in England in 1900 were transferred to Nigeria and extended to the British Cameroons. Justice was administered in two parallel court systems – modern and customary – which were not segregated on racial grounds (Fombad, 2015). The customary courts were presided over by traditional chiefs or councils, referred to by the British as Native Authorities (Egbe, 2014). These authorities applied their own laws and customs, and had absolute

power over their subjects (Mamdani, 1996). The British Cameroons were not colonised by large numbers of British citizens, and the indirect rule approach meant that many inhabitants considered the colonial power to be Nigeria (Ngoh, 1979). During the British mandate period, transport infrastructure and social services were neglected and the economy stagnated (Mbaku, 2005).

In 1946, after World War II, the newly established United Nations designated French Cameroun and the British Cameroons as territories under trusteeship, whereby France and Britain were instructed to promote the political, economic, social and educational advancement of the inhabitants of the territories, ensure equal treatment of all nationals in the administration of justice, and progressively increase local involvement in government (United Nations, 1947). In French Cameroun, continuing the centralised system of governance, the population were given the right to elect representatives to the National Assembly in Paris. Within the territory, more positions in the administration were opened up to nationals and political parties formed. Demands increased for French Cameroun to be made independent and for it to be reunited with the British Cameroons. This escalated into violent uprisings against the administration in 1955 (Ngoh, 1979). In January 1960, French Cameroun was declared an independent state and renamed the *Republique du Cameroun*, with Ahmadou Ahidjo as president. Meanwhile in the British Cameroons, the British government took over the former German plantations established at the base of Mount Cameroon and created the Cameroon Development Corporation (CDC) in 1947, which remains one of the main contributors to Cameroon's economy – second only to the state in terms of the number of people employed (CDC, 2019). In 1954, a new constitution based on federal principles was enacted in the British protectorate of Nigeria (Amah, 2017). Southern Cameroons requested to become an autonomous region and gained a limited degree of self-governance in 1954, followed by full regional status in 1958 (Konings and Nyamnjoh, 2003). Once Nigeria was granted independence in October 1960, the United Nations asked the people of the British Cameroons to decide, in order to gain their own independence, whether they wanted to remain with Nigeria or join the *Republique du Cameroun* (United Nations, 1959). Separate referendums were held in Northern Cameroons and Southern Cameroons in February 1961.

The population of Northern Cameroons voted to remain in Nigeria by a substantial majority (United Nations, 1961). However, in Southern Cameroons the referendum proved to be more contentious. The traditional chiefs initially called for the complete independence of Southern Cameroons, but this was deemed politically undesirable and economically unviable by the United Nations General Assembly (Konings and Nyamnjoh, 2003). There was then a division of opinion between the two main political parties in Southern Cameroons, with the party representing the coastal and forests peoples advocating for integration with Nigeria, while the party representing the grassfielders advocated for reunification

with the rest of the territory of former German Kamerun (Konings and Nyamnjoh, 1997). The population of Southern Cameroons ultimately voted to merge with the *Republique du Cameroun*. In so doing, Southern Cameroons gained independence from Britain on 1 October 1961 and became part of the Federal Republic of Cameroon (United Nations, 1961).

The terms of the reunification had been negotiated between representatives of Southern Cameroons and President Ahidjo at the Foumban Constitutional Conference in July 1961. The Southern Cameroons delegation proposed a loose federal union that would allow the preservation of separate anglophone and francophone identities, however they were in a weak negotiating position because of the small size of the anglophone population and the fact that their independence depended on their merge with the already independent *Republique du Cameroun*. The constitutional package that Ahidjo proposed granted almost total authority to the centralised federal state, with no autonomous financial resources for the federated states of West Cameroon (the name given to the anglophone state) and East Cameroon (the francophone state), thus depriving them of any means to exercise real power (Konings and Nyamnjoh, 2003). In contrast to the Southern Cameroons request to have a ceremonial head of state and bicameral federal legislature, Ahidjo advocated for an executive with the power to legislate by decree and the authority to make appointments without legislative approval. He also proposed a unicameral system of fifty representatives limited to meeting just twice per year for a maximum of thirty days. Ahidjo made a few concessions based on the requests of the Southern Cameroons delegation, but the final version of the constitution was only ever approved by the parliament of the *Republique du Cameroun* and not by both parties (Konings and Nyamnjoh, 2003). However, the new federal constitution imposed no significant changes to the governance structures already in place in Southern Cameroons and allowed for the existence of a bicameral legislature at the federated state level and thus a House of Chiefs. The court systems in both federated states also remained unaltered, allowing for the coexistence of French civil law and English common law (Fombad, 2015). Both French and English became official languages of the Federal Republic and anglophones were allowed to maintain other social and cultural institutions.

However, with a francophone majority and overarching power centralised in the executive branch of government in Yaoundé, a process of assimilation began almost immediately after the Federal Republic was formed. In December 1961, President Ahidjo passed decrees to give him more direct control and oversight over the federated anglophone state of West Cameroon, as well as five newly created regions within East Cameroon. He appointed francophone federal inspectors for each region and gave them more extensive powers than the West Cameroon government, including control of the army and police (Konings and Nyamnjoh, 2003). Ahidjo signed cooperation agreements with France but terminated West Cameroon's trading links with the Commonwealth. However, while he succeeded in undermining the

administrative and economic autonomy of West Cameroon, Ahidjo faced strong backlash when he tried to replace or reform institutions considered by anglophones as part of their cultural inheritance from the British. Although, in a bid to harmonise legislation across the country, reforms led to the adoption of a series of uniform laws in 1967 based on French civil law, this did not completely undermine the English common law system which prevailed in the anglophone region (Fombad, 2015). Equally, the General Certificate of Education (GCE) and other aspects of the British education system were strongly defended and retained with some modifications (Konings and Nyamnjoh, 1997).

In East Cameroon, Ahidjo already had a near political monopoly at the time of reunification, therefore the political opponents with the greatest capacity for mobilisation were the anglophone political parties in West Cameroon (International Crisis Group, 2017). In 1966, capitalising on rivalries between political parties in the anglophone region, Ahidjo persuaded key political figures of the merits of forming a single national party and all other political parties were dissolved (Konings and Nyamnjoh, 2003). In 1972, after a referendum marred by irregularities, President Ahidjo abolished the federation altogether, creating a unitary one-party state called the United Republic of Cameroon (Arnold, 2017). The anglophone government and institutions such as the House of Chiefs were abolished, and West Cameroon was divided into two provinces, administratively distinguishing the coastal and forest peoples of the newly created South West Province from the grassfielders of the North West Province (Konings and Nyamnjoh, 2003). In 1982, Ahidjo was succeeded by the incumbent president Paul Biya who has increasingly centralised power in the hands of members of his own ethnic group – the Beti, which encompasses closely related peoples from the southern tropical forests in the francophone zone (Monga, 2000). In 1984, President Biya changed the name of the country back to the Republic of Cameroon, suggesting that the people of Cameroon had finally overcome the divisions caused by European colonisation (Biya, 1987). In response to internal and external pressures, including from the French government, to advance democratic processes in Cameroon, Biya reinstated a multiparty political system in 1990 (Mokam, 2012). This move decriminalised the holding of public meetings and demonstrations, and allowed for a degree of press freedom. People began openly expressing their grievances, particularly the anglophones who, since independence, had felt increasingly ‘marginalised’, ‘exploited’ and ‘assimilated’ by the centralised francophone-dominated state (Konings and Nyamnjoh, 1997: p.207).

Feelings of political, economic and cultural marginalisation led to a prolonged period of protests and civil disobedience in the two anglophone provinces of Cameroon in the early 1990s, which included the 1991-1992 ‘ghost town’ campaign (Konings and Nyamnjoh, 2004). Several political parties and unions were formed to represent anglophone interests, and they had some successes, particularly the teachers’ unions which lobbied for and secured the future of the GCE. The anglophone political parties sought a

return to federalism, but with genuine autonomy devolved to the federated states (International Crisis Group, 2017). President Biya eventually agreed to hold talks on constitutional reform in 1993. In preparation, an All Anglophone Conference was organised in the South West Province, during which ethnic divisions were largely put aside and over 5,000 delegates from across the anglophone political parties and unions attended. A federal constitution was drafted which drew inspiration from the federal systems in the United States and Nigeria, however the Technical Committee put together by Biya refused to give it any consideration (Konings and Nyamnjoh, 2004). This incited some of the anglophone political parties to change tack and push for secession from the Republic of Cameroon. At a second All Anglophone Conference in 1994, it was decided that if the government persisted in its refusal to engage in meaningful constitutional talks, the newly formed Anglophone Council would proclaim the independence of Southern Cameroons on the grounds that the federal constitution of 1961 had not been agreed by all parties and Biya had unilaterally seceded the francophone part of Cameroon from the union when he reverted the country's name back to the Republic of Cameroon (Konings and Nyamnjoh, 2004). Renewed attempts to enter into negotiations with the Biya government failed. The anglophone representatives nominated at the second All Anglophone Conference were not allowed to take part in the constitutional reform discussions. Instead, in 1995, an anglophone delegation went to the United Nations to raise the international profile of the 'anglophone problem' and lobby for independence. The outcome of the constitutional reform process was an amendment in 1996 which allowed for a degree of decentralisation across the ten provinces of Cameroon (Republic of Cameroon, 2008). However on 1 October 1996, the dissatisfied Anglophone Council (renamed the Southern Cameroons National Council) self-proclaimed the independence of Southern Cameroons, but amidst ongoing repressive tactics by the Biya government, momentum for the anglophone movement was lost (Konings and Nyamnjoh, 2004).

Twenty years later in October 2016, after fieldwork was completed for this thesis, tensions once again mounted in the anglophone provinces (now known as regions). What started as peaceful demonstrations by lawyers and teachers protesting the dilution of the anglophone legal and education systems by the dominant francophone systems has now led to separatist groups taking up arms. The government security forces' indiscriminate and disproportionate use of live ammunition against unarmed protestors and other civilians, as reported by International Crisis Group (2017), Amnesty International (2018) and Human Rights Watch (2018), has resulted in renewed calls for independence and an ongoing humanitarian crisis. The UN Refugee Agency reported in October 2018 that 26,000 anglophone Cameroonians had sought refuge in Nigeria, while 160,000 people are thought to be internally displaced (Human Rights Watch, 2018, UNHCR, 2018). Atrocities have been committed on both sides, with separatist groups coercing the population into maintaining acts of civil disobedience, including repeat use of the 'ghost town' tactic deployed in the 1990s. In addition, separatist groups, known colloquially as

'Amba boys', have maintained a boycott of schools in the two anglophone regions, assaulting and kidnapping teachers and others who refuse to comply (BBC News, 2018). Many villages purported to be rebel strongholds have been burned to the ground by government security forces, with those unable to flee being killed (Human Rights Watch, 2018). One of the villages in which fieldwork was conducted for this thesis is named by Amnesty International (2018) as having been affected. President Paul Biya has yielded to demonstrators by creating a National Commission for Bilingualism and Multiculturalism and making other concessions based on the demands of anglophone lawyers and teachers, but this is seen by many as too little too late (International Crisis Group, 2017). With support from the diaspora, the unrecognised state of Ambazonia, the name now given to Southern Cameroons, became a member of the Unrepresented Nations and Peoples Organization (UNPO) in March 2018 (UNPO, 2018). The divergent systems of the British and French colonial administrations have therefore had very real implications for the Cameroonian people which continue to the present day.

3.1.3 Population and economy

The population of Cameroon, like much of Africa, has surged in recent decades, roughly quadrupling in the last 50 years from 5,987,671 in 1965 to 23,344,179 in 2015 (World Bank, 2017). Population growth is currently estimated at 2.4% per annum (UN DESA, 2017a). The density of the population nationwide is approximately 51 people per square kilometre of land (World Bank, 2017). However, Cameroon has become increasingly urban and the majority of people now reside in towns and cities. The proportion of the population living in urban settlements is expected to rise further, from 54% in 2015 to 70% by 2050, with the urban population expected to grow by 600,000 people per year on average (UN DESA, 2015). Much of this growth can be attributed to fertility rates and the reclassification of settlements as urban once they reach the threshold of 5,000 inhabitants, however approximately 30% can be attributed to net rural-to-urban migration (IOM, 2015, UN DESA, 2015). The largest urban settlement in Cameroon is Douala, with a population of 2.95 million, closely followed by the capital Yaoundé, with a population of 2.87 million (UN DESA, 2017a). Both of these cities are in the francophone part of the country. In 2015, gross national income (GNI) per capita based on purchasing power parity (PPP) was 2,894 USD, and Cameroon ranked 153 out of 188 countries with a Human Development Index (HDI) of 0.52 (UNDP, 2016). In 2014, 45% of the population were considered to be in multidimensional poverty based on health, education and standard of living indicators (UNDP, 2018). The Gini coefficient for Cameroon was 0.47 in 2014, up from 0.42 in 2001, suggesting that inequality is increasing (World Bank, 2017).

The gross domestic product (GDP) of Cameroon was 30.9 billion in 2015, when GDP was growing at 5.7% per annum (World Bank, 2017). Economic growth rates had been increasing since 2009, however due to falling oil prices, rising security spending and devaluation of the Nigerian currency, which reduced the

competitiveness of Cameroon products, the growth rate reduced to 3.5% in 2017 (AfDB et al., 2017, World Bank, 2017). Cameroon's economy has gone through three main phases since independence in 1960/1961. During the first 25 years of independence, from 1960 to 1985, Cameroon's economy grew at an average rate of 7% due to high commodity prices on the international market and the discovery of oil in 1977 (MINEPAT and UNDP, 2013). The government encouraged increased production of cash crops by building infrastructure and creating agricultural development agencies, such as the *Société de Développement du Cacao* (SODECAO), which distributed inputs to farmers and marketed agricultural products. Public expenditure was high during this period with money invested in a wide range of public services, including health centres, schools and universities. By 1982, oil accounted for 46% of exports but oil production peaked in 1985 and oil prices crashed in 1986 (MINEPAT and UNDP, 2013). Cameroon experienced a major economic crisis from 1986 to 1994. International prices for the country's main export crops – cocoa and coffee – slumped during this period. In 1988, Cameroon requested assistance from the International Monetary Fund (IMF) and the World Bank (MINEPAT and UNDP, 2013). Countries around the world were experiencing similar problems and loans from the international financial institutions were provided on the condition that recipient countries reformed their macroeconomic and fiscal policies. Loans were therefore granted as part of a Structural Adjustment Programme (SAP) and Cameroon committed to five SAPs between 1988 and 1994 (Tchoungui et al., 1995). The reforms encouraged were based on the neoliberal principles of minimal state intervention, decentralisation, deregulation, market liberalisation, privatisation and macroeconomic stabilisation. The list of reforms deemed necessary by the IMF and World Bank have become known as the 'Washington Consensus' (Williamson, 2005).

Prior to structural adjustment, governments in Africa largely took a socialist, government-driven approach to development (Heidhues and Obare, 2011). However, with reduced export revenue and limitations to raising funds through taxation, governments were pressured into dramatically reducing public spending by taking austerity measures. In Cameroon, public sector support for education and healthcare reduced substantially (MINEPAT and UNDP, 2013). The agricultural extension services provided by the state, which had helped increase the incomes of rural farmers by providing training, distributing subsidised farm inputs and marketing agricultural produce, were privatised, scaled down or withdrawn (Tchoungui et al., 1995). The fall in agricultural commodity prices on the world market coupled with the increased costs of production hit rural farmers hard, leading to the widespread abandonment of cocoa and coffee farms. This resulted in a significant increase in the rate of deforestation as rural farmers cleared additional land to plant food crops to improve their own food security as well as take advantage of increased urban demand due to a decline in food imports (Sunderlin et al., 2000). The number of rural farmers increased due to return and in-migration as unemployment

rose and many could no longer afford the cost of living in urban areas (Gubry et al., 1996). Across the country, per capita income reduced by 40% (MINEPAT and UNDP, 2013). The number of rural households considered to be below the poverty line rose from 49% to 71% between 1986 and 1993 (Tchoungui et al., 1995). Many rural dwellers turned towards hunting and fishing to generate an income, while in urban areas the informal sector rapidly expanded.

In January 1994, the CFA franc (originally known as the *Franc des Colonies Françaises d'Afrique* – a legacy of the French colonial era) was devalued by 50% by the IMF and the French Treasury (Clément et al., 1996). Currency devaluation was a common component of SAPs because it lowers the price of domestic goods in relation to foreign goods and makes exports more competitive (Paloni, 2009). However, being in a monetary union with other francophone countries in Central Africa precluded the devaluation option until multilateral consensus was reached. After devaluation, the Cameroon economy entered a recovery phase (MINEPAT and UNDP, 2013). The doubling of the official purchasing prices for cocoa and coffee in Cameroon aroused interest among farmers but many were hesitant to recommence production given the uncertainty as to whether such prices would be maintained (Tchoungui et al., 1995). The Cameroon government continued to implement further SAPs, as well as the reformulated next generation of SAPs known as Poverty Reduction Strategy Papers (PRSPs) (AfDB, 2008, Heidhues and Obare, 2011). The performance of SAPs and PRSPs have both been below expectations, with projected economic growth rates falling short and poverty having increased in rural areas (MINEPAT and UNDP, 2013). Reviews of the impacts of SAP policies worldwide have found that they have had adverse effects on vulnerable populations in developing countries. They are thought to have reduced incomes and food availability while at the same time undermining access to affordable healthcare (Thomson et al., 2017). Public spending on social services remains low in Cameroon, leaving the population to bear much of the costs. For instance, in 2015, only 3% of the country's budget was allocated to health expenditure, equating to 165 USD per person (WHO, 2016). As part of the push towards privatisation by SAPs, the international financial institutions redirected funds away from governments towards non-governmental organisations (NGOs), creating a decentralised patchwork of service providers to replace state interventions (Pfeiffer and Chapman, 2010). It was within this policy context that grassroots participation in socio-economic development through micro-projects was promoted and a proliferation of NGOs occurred.

Economic growth since 2001 has been driven almost entirely by the development of the service sector, particularly communication and transport networks (MINEPAT and UNDP, 2013). The contribution of agriculture, forestry and fishing to GDP had fallen dramatically by 1993, and has remained at a similar level, accounting for 15% of GDP in 2015 (World Bank, 2017). The main export crops in 2015 by value in USD were cocoa, cotton, bananas, rubber and coffee (FAO, 2017; see Figure 3.1a). While the amount of

cocoa exported has increased exponentially since the economy recovered from recession, exports of coffee, which was Cameroon's main cash crop from 1976 to 1995, have continued to decline (see Figure 3.1b). Although production of palm oil has increased from 37,200 tonnes in 1961 to 249,000 tonnes in 2013, on a comparable trajectory to cocoa, this is not reflected in export data since palm oil production has primarily been for domestic consumption (FAO, 2017). The contribution of industry, including mining, to GDP reduced from 35% pre-recession to 25% in 2015 due primarily to declines in oil production (MINEPAT and UNDP, 2013, World Bank, 2017). Nevertheless, oil remained the main export earner in 2015, followed by cocoa, timber, cotton, aluminium, bananas and rubber (UN DESA, 2019).

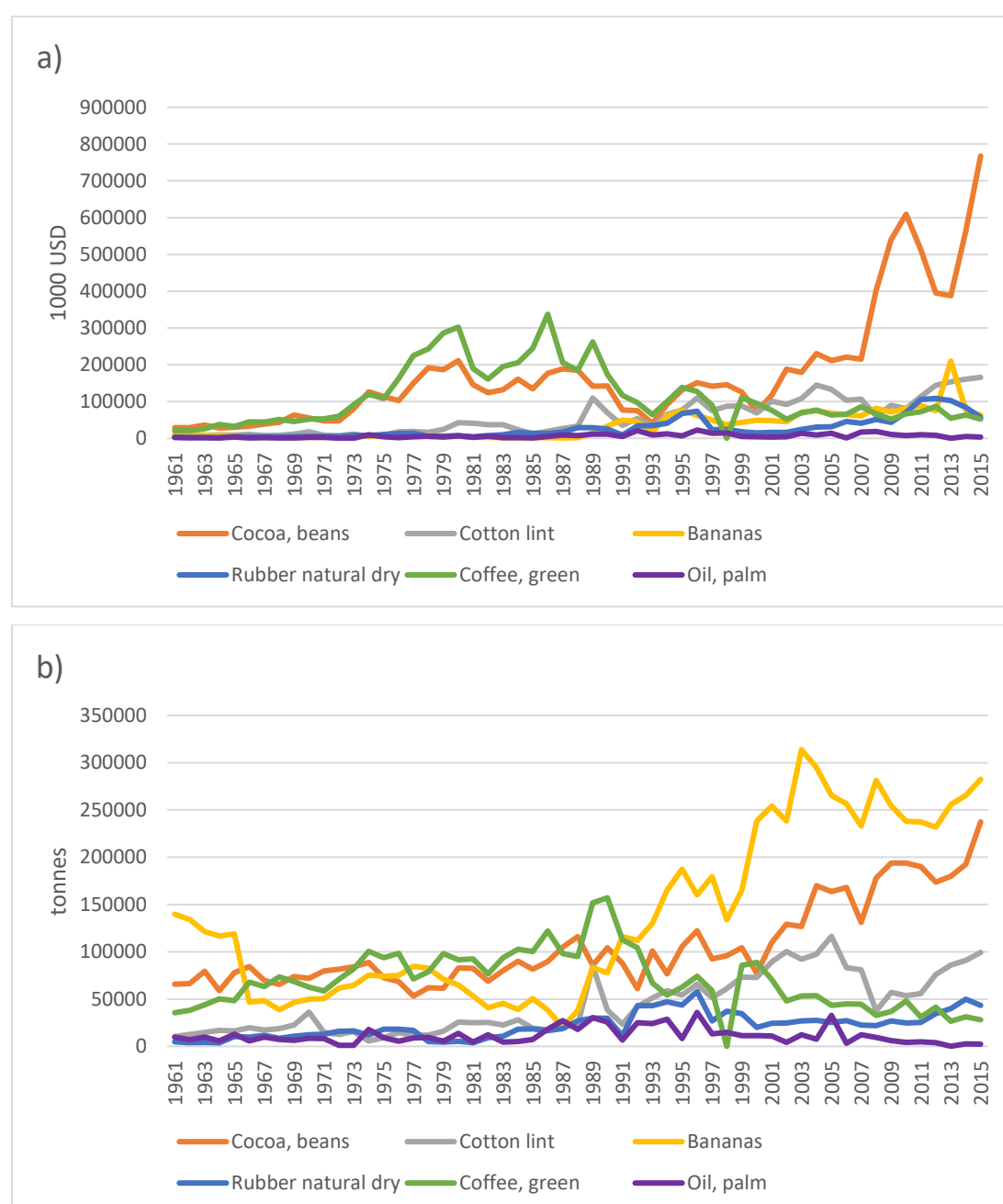


Figure 3.1: Change between 1961 and 2015 in a) revenue from crop exports in USD and b) quantity of crop exports in tonnes. Palm oil is not one of the main export crops but is included for comparison. Data: FAO (2017)

Although the proportion of people engaged in agriculture, forestry and fishing has declined over time, the primary sector still occupies 62% of the Cameroon labour force (World Bank, 2017). The proportion engaged in industrial work in the secondary sector has remained relatively stable at around 9%, whereas those employed in the increasingly prominent service sector, which accounted for 52% of GDP in 2015, has increased to 28% of the labour force (World Bank, 2017). Indeed in urban areas, the majority (65%) of the economically active population are occupied in trade and service activities, predominantly in the informal sector (INS, 2010). In 2010, 81% of the urban labour force were engaged in the informal sector, with only 19% formally employed in the public or private sectors (INS, 2010). As the IMF continues to urge the Cameroon government to implement fiscal and structural reforms, and further reduce public spending, the number of civil servant positions has continued to decline and insufficient jobs have been created in the private sector to fill the void (IMF, 2018). However, as part of the government's vision to transform Cameroon into an emerging economy by 2035, there has been substantial recent investment in infrastructure projects, such as a deep sea port and hydroelectric dam, with a focus on using labour-intensive approaches to boost employment (Republic of Cameroon, 2009, IMF, 2018). As well as supporting growth in the secondary sector, the government is promoting industrial agriculture to bolster the primary sector and achieve its annual economic growth target of 5.5% (MINEPAT and UNDP, 2013). Although Indonesia and Malaysia are named in the Vision 2035 document as emerging economies to emulate, the government's current strategy for developing industrial agriculture has centred around creating small-scale 'agropoles' by mobilizing private sector investment in-country, rather than developing large areas of land with foreign investment (Picard et al., 2017). The vision is ultimately for Cameroon to become 'an emerging and democratic country united in diversity' (MINEPAT, 2009: p.16).

3.2 Biodiversity conservation in Cameroon

3.2.1 Historical underpinnings

Before European powers colonised Cameroon, natural resources were managed locally through traditional authorities at the village level. Those wishing to access the forest typically had to seek the permission of the chief and abide by relevant customary practices, such as sharing bushmeat on return to the village (Mengang, 1998). However, during the colonial period, ownership of forested land was transferred to the state (Sayer et al., 2005). This policy was motivated by commercial interests. The commercial exploitation of forests began during the German colonial period and was continued by the French and British colonial administrations to meet the demand for timber in Europe (Oyono, 2005, Enuoh and Bisong, 2015). Although concerns grew in Britain, France and other European countries about environmental degradation in the colonies, these concerns tended to centre around the practices of indigenous peoples (Ford, 2004). In 1900, acknowledging that the over-exploitation of wildlife was a problem, the British government convened an international conference in London at which a system of

game laws was devised (Jepson and Whittaker, 2002). Closed hunting seasons, licence requirements and lists of protected species were defined, and the establishment of game reserves was encouraged. However, the Convention on the Preservation of Wild Animals, Birds and Fish in Africa, which was signed at the conference by Britain, France, Germany and other countries, was not ratified by all states and therefore never came into force (IUCN, 2004). Yet the game law system was applied in British colonies for more than thirty years (Jepson and Whittaker, 2002). In France, by the 1920s, the focus was shifting to the preservation of complete ecosystems, which it was deemed necessitated the exclusion of indigenous people (Ford, 2004). This led to renewed interest in having a legally binding international convention. In 1933, the British government hosted a second international conference at which the Convention Relative to the Preservation of Fauna and Flora in their Natural State was adopted. This committed signatory states to the creation of protected areas in Africa, and stipulated a suite of protected area categories with different purposes and levels of protection (IUCN, 2004).

After independence, the highly centralised forest service established by the French colonial administration in Cameroon, and the network of protected areas across the country, remained in place. In the South West Region alone, there were multiple ‘forest reserves’ demarcated by the British colonial administration that were retained, including Takamanda (created in 1934), Korup (1937), Rumpi Hills (1938) and Mount Cameroon (1939) (Movuh, 2012). The newly independent state kept ownership of all forested land, despite the tensions this created with local communities, because the government relied on revenues generated by forest exploitation (Enuoh and Bisong, 2015). By the 1970s, logging had become mechanised and timber exploitation was occurring on an industrial scale across Central Africa and in other tropical regions of the world. As such, tropical deforestation began to attract international attention as a global conservation problem, and the mitigation approaches encouraged by the international community focused on regulating logging and rapidly expanding the network of protected areas, largely at the exclusion of local communities (Sayer et al., 2005). However, when the economic crisis hit in the late 1980s, the ministry responsible for protected areas experienced budget cuts like other ministries, and the World Bank put pressure on the Cameroon government to decentralise forest management as part of structural adjustment. This included allowing NGOs to play a greater role in conservation activities, and Law No 90/053 was passed in 1990 to enable NGOs to operate in Cameroon.

Delegates from Cameroon attended the United Nations Conference on Environment and Development (also known as the Earth Summit) in Rio de Janeiro in 1992 (United Nations, 1992b). Cameroon became a signatory to the CBD, which was launched at the Summit, and ratified the treaty in 1995 (CBD, 2019). In line with the central premise of the CBD, and the associated global shift towards involving local people in conservation, Cameroon reformed its forest management and conservation policies in the early 1990s.

The World Bank closely monitored the drafting of a new forests, wildlife and fisheries law which came into force in 1994 (Egbe, 2001). The decentralisation principles enshrined in Law No 94/01, and Decree No 95/466/PM which guides its implementation, allow for the involvement of local communities in the management and protection of forest resources through community forests or co-management arrangements (Republic of Cameroon, 1994). Local communities are also granted use rights under the law, which states that traditional hunting is allowed throughout the country, except in protected areas. However, only species of least concern, classified as Class C, can be hunted, the purpose must be for subsistence and not financial gain, and the term ‘traditional hunting’ refers only to hunting using material of plant origin, therefore all hunting using guns and wire snares is prohibited (Egbe, 2001). Throughout the 1990s, the influence of NGOs in Cameroon increased as international donors provided them with more financial support (Sayer et al., 2005). In 1999, President Paul Biya hosted the Yaoundé Forest Summit organised by WWF (WWF, 1999). This regional meeting was attended by heads of state or representatives from Cameroon, Equatorial Guinea, Central African Republic, Chad, Congo and Gabon, as well as those from NGOs, the World Bank and other donors. The Yaoundé Declaration was signed at the Summit, committing signatories to collaborate across borders and provide greater protection to forests while supporting the livelihoods of indigenous people (WWF, 1999). The Declaration led to the creation of COMIFAC, the regional body that oversees implementation of these commitments and helps to facilitate the harmonisation of forest policies across Central Africa.

3.2.2 Current conservation priorities

To adhere to commitments made under the CBD, the Cameroon government has produced two National Biodiversity Strategy and Action Plans (NBSAPs) to outline the country’s biodiversity conservation goals and targets (Republic of Cameroon, 1999, 2012). The first strategy, validated in 2000, was revised and updated in 2012 to reflect the latest priorities of the CBD, as agreed at the Conference of the Parties held in Nagoya, Aichi Prefecture, Japan in October 2010. The strategic biodiversity priorities of the CBD, over the period 2011-2020, are outlined in twenty targets, known as the Aichi Biodiversity Targets. By 2020, these targets commit governments to halving the rate of forest loss (Target 5), protecting at least 17% of terrestrial land area (Target 11), preventing the extinction of threatened species (Target 12), safeguarding ecosystem services essential for the health, livelihoods and wellbeing of local communities (Target 14), respecting the customary use of biological resources by ensuring the full participation of local communities in conservation (Target 18), and integrating biodiversity values into national development and poverty reduction strategies (Target 2) (CBD, 2010). The aim of the Cameroon government is to ‘take all necessary measures to reduce the rate of national biodiversity loss and ensure long-term sustainability of critical ecosystems in order to guarantee by 2020 the continuous contribution of biodiversity and other ecosystem services to wealth creation ... with the involvement of indigenous

and local communities' (Republic of Cameroon, 2012: p.79-80). This reflects the utilitarian stance of the Cameroon government towards biodiversity, which is strongly evident in the country's Growth and Employment Strategy Paper (GESP). The GESP, which is guiding national policies over the 2010-2020 period, places emphasis on natural resources as a key asset, the exploitation of which has the potential to lead to a prosperous emerging economy (Republic of Cameroon, 2009). While there is little evidence of biodiversity mainstreaming across Cameroon ministries at present, biodiversity policies proposed in the 2012 NBSAP include increasing the coverage of protected areas to 30% of national territory and promoting the use of community-based conservation approaches by 2020 (Republic of Cameroon, 2012).

There has been a global push to increase the proportion of land with protected area status for over 20 years (UNEP-WCMC and IUCN, 2016). As a result, between 2000 and 2012, the number of protected areas in Cameroon almost doubled from 17 to 30 (Republic of Cameroon, 2012). The proportion of terrestrial land covered by protected areas, administered by the Ministry of Forestry and Wildlife (MINFOP), currently stands at 11%, but international pressure for Cameroon to expand protected area coverage remains (Saura et al., 2018). Yet reducing unsustainable practices in existing protected areas, facilitating the effective and equitable participation of local communities in protected area management, and mitigating the negative social impacts associated with resource use restrictions remain a challenge. The full range of people-focused conservation approaches described in Chapter 2 have been implemented in Cameroon. An almost countless number of conservation and development projects, both externally and internally driven, large and small, have been implemented over the last few decades. The majority of these are associated with protected areas. Whether considered to be an ICDP, CBNRM, CBC or PES project, many of these initiatives have involved a range of livelihood interventions. Cameroon therefore was an ideal country in which to conduct the empirical research for this thesis. Two contrasting sites with both historical and ongoing livelihood interventions were selected for conducting detailed fieldwork. Takamanda National Park in the anglophone South West Region is the main focus of my research, with the Dja Faunal Reserve in the francophone South and East regions used as a comparative site (Figure 3.2). The varying social-ecological contexts across these two study sites allow lessons to be learnt that are not only relevant for Cameroon, but also more widely across West and Central Africa and elsewhere. The remainder of this chapter provides more details of the two study sites, with additional chapter-specific contextual information provided in Chapters 5, 6 and 7.

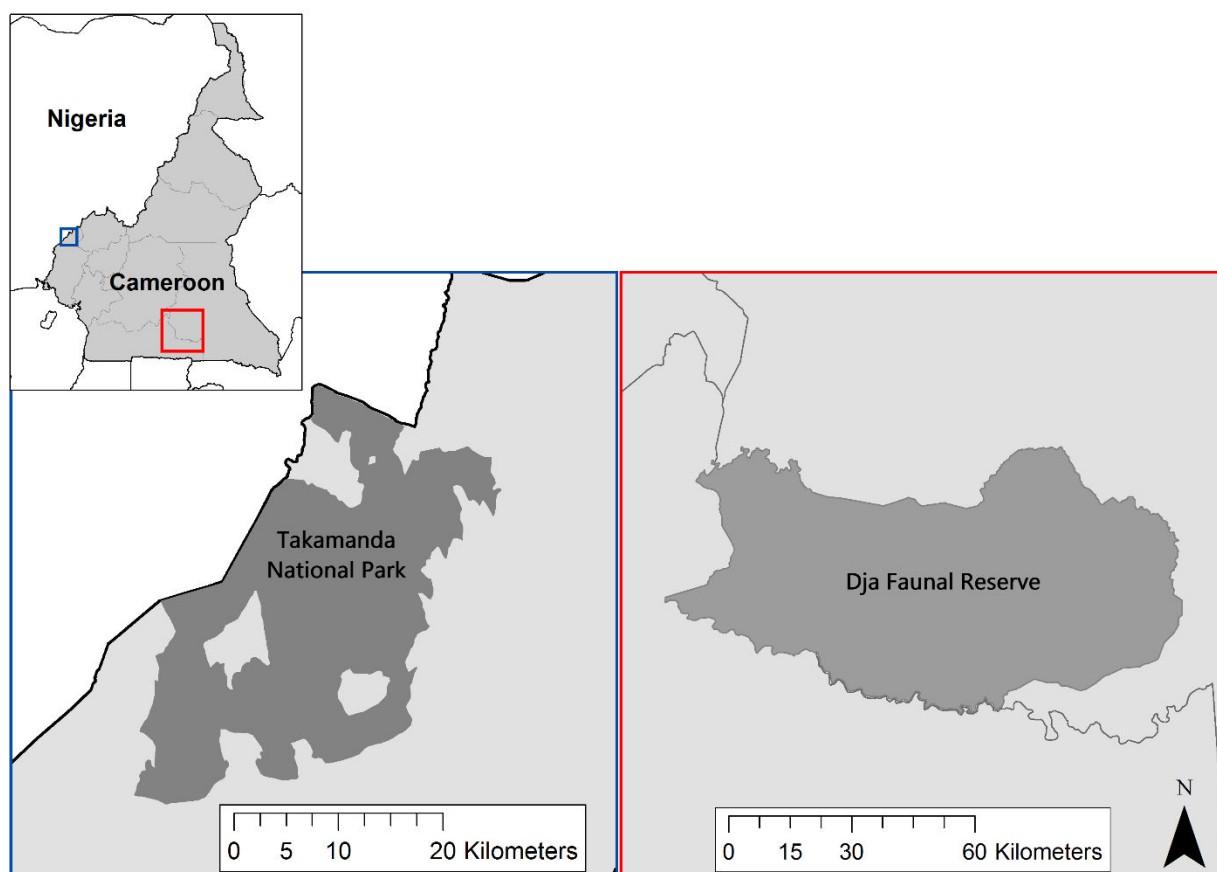


Figure 3.2: Map showing the location of Takamanda National Park and Dja Faunal Reserve in Cameroon.

3.3 Takamanda National Park

3.3.1 Conservation importance

Takamanda National Park, which covers an area of 676 km², is located in Akwaya Sub-Division of Manyu Division, the northernmost division of the anglophone South West Region. It lies along the international border with Nigeria and is part of a transboundary conservation landscape that includes the contiguous Okwangwo Division of Cross River National Park in Cross River State, Nigeria. Mamfe, the administrative centre of Manyu Division, is the last sizable town before the official border crossing with Nigeria at Ekok. The tropical forest zone along the southern portion of the Nigeria-Cameroon border is renowned for its unusually high species richness and levels of endemism across many taxa (Oates et al., 2004). The border lies adjacent to a chain of volcanoes that stretch from the coast to the interior, creating a range of habitats at different altitudes. The majority of Takamanda National Park is lowland forest, but the vegetation transitions into montane savannah and reaches an altitude of 1,500 m in the north. The forested section of the protected area is floristically part of the Cross-Sanaga-Bioko coastal forest ecoregion (Sunderland-Groves et al., 2003). There are relatively high human population pressures in the South West Region of Cameroon, with an average population density of 60 people per km² (INS, 2015). However, population pressures are higher across the border in Cross River State with 178 people per km²

on average (NBS, 2019). The total population of the South West Region in 2014 was 1.5 million, with the main population centres located towards the coast, around the cities of Limbe, Buea and Kumba (INS, 2015). Human pressures in the region, particularly from conversion of forest to farmland and hunting for bushmeat, have resulted in a high proportion of endangered species, and the Nigeria-Cameroon border area being recognised as a global conservation priority (Oates et al., 2004, Burgess et al., 2007).

Takamanda National Park has attracted international conservation attention because it is considered a priority site for the conservation of the critically endangered Cross River gorilla (*Gorilla gorilla diehli*) (Dunn et al., 2014, Bergl et al., 2016). The Cross River gorilla was identified as a distinct subspecies of gorilla by a German taxonomist in 1904 (Dunn et al., 2014). The Cross River gorilla is endemic to the Nigeria-Cameroon border area and genetic evidence indicates that the population has undergone a recent rapid decline, likely due to an increase in hunting for bushmeat facilitated by an increase in the availability of firearms (Bergl et al., 2008). The remaining population of Cross River gorillas, estimated to be less than 300 individuals, is restricted to rugged hilly areas due to high levels of hunting and other human activities at lower elevations (Bergl et al., 2012, Dunn et al., 2014). The presence of Cross River gorillas has been recorded at 14 sites totalling 600 km², however these sites are spread across an area of 12,000 km² with varying degrees of connectivity between them (Imong et al., 2014). Around two-thirds of the remaining Cross River gorilla population is in Cameroon. The largest intact forest within the Cross River gorilla's current range is contained within Takamanda National Park and the adjoining Cross River National Park (Bergl et al., 2012). The long-term viability of such a small and fragmented population depends on the maintenance of dispersal corridors (Bergl and Vigilant, 2007). Yet the expansion of farmland outside protected areas, coupled with human activity in the forest, is thought to be limiting the gorillas' movements (Etiendem et al., 2013a). A landscape-scale, transboundary conservation approach has been advocated, with efforts focused on safeguarding Cross River gorilla habitat and reducing human activity in the forest to maintain functional connectivity between sites (Oates et al., 2007, Dunn et al., 2014, Imong et al., 2014).

3.3.2 History

Takamanda National Park was originally designated as a forest reserve by the British colonial administration in 1934, with the aim of restricting agricultural expansion in order to conserve forest for future logging (Sunderland-Groves et al., 2003). The local population retained the right to harvest non-timber forest products (NTFPs), including bushmeat, inside the reserve, and were also granted rights of way. The current boundaries of the protected area were defined in 1957, following appeals made to the colonial authorities by communities wanting to expand the area of land available for farming (Burren et al., 2011). Until the 1980s, management of the reserve consisted of boundary clearing and surveillance

to monitor for encroachment, however with the advent of SAPs during the economic crisis, funding available to forestry officials in Mamfe was cut and their presence in the reserve reduced dramatically (MINFOF, 2010). Conservation interest in Takamanda Forest Reserve increased in 1996 when ecological surveys, supported by the World Wildlife Fund (WWF) and the Wildlife Conservation Society (WCS), were initiated to confirm the continued existence of Cross River gorillas (Oates et al., 2004). Then in 2000, two complementary projects were launched with a focus on Takamanda Forest Reserve. The Takamanda Project, funded by the Smithsonian Institute, conducted multi-taxa biodiversity and community resource use assessments in and around the reserve (see: Comiskey et al., 2003), while the then Ministry of Environment and Forests (MINEF), in collaboration with GTZ, the German government's technical cooperation agency, launched the Project for the Protection of Forests around Akwaya (PROFA). PROFA commissioned a socio-economic baseline survey (see: Schmidt-Soltau et al., 2002) and drafted a management plan for Takamanda Forest Reserve which provisioned for the traditional use of forest resources by local communities.

The biodiversity surveys conducted in and around Takamanda Forest Reserve highlighted the ecological importance of the area as well as the degree of natural resource exploitation, which had resulted in endemic species becoming critically endangered. Upgrading the protection status of the reserve became a conservation priority, and the management plan drafted by PROFA was therefore never validated. Instead, a consultation process began with community representatives in 2004 and the decision was taken by the government to reclassify Takamanda Forest Reserve as a national park to elevate it to the same status as the adjoining Cross River National Park in Nigeria (van Vliet et al., 2009). A broader initiative to preserve high-value ecosystems across the South West Region was launched in 2006, co-financed by the Cameroon government and the German Development Bank, KfW. The Programme for the Sustainable Management of Natural Resources in the South West Region (PSMNR-SWR) adopted a landscape scale approach by creating and managing three Technical Operation Units (TOUs) comprised of protected areas, logging concessions and community forests (Nyieh and Stenmanns, 2011). The Takamanda-Mone TOU was created in 2007, initially encompassing two forest reserves – Takamanda and Mone – and a logging concession (FMU 11-004). In November 2008, Takamanda National Park was classified by Prime Ministerial Decree No. 2008/2751/PM, and a management plan detailing user rights in different zones of the park was published in 2010 (see: MINFOF, 2010). Under the umbrella of PSMNR-SWR, Takamanda National Park is managed by MINFOF, in partnership with WCS, GLZ and the consulting firm GFA/DFS. The objective, as stated in the management plan, is 'to conserve the biodiversity of Takamanda National Park and its periphery with the participation of all stakeholders while contributing towards the sustainable development of local communities' (MINFOF, 2010: p.46). The management

approach taken, with its dual conservation and development objectives, makes Takamanda National Park part of a new generation of ICDPs.

3.3.3 Local population

There are 43 villages around the periphery of Takamanda National Park, located on either side of the Nigeria-Cameroon border (12 in Nigeria and 31 in Cameroon). In 2001, the population of these villages was estimated at 15,707 (Schmidt-Soltau et al., 2002). Eighteen of the villages on the Cameroon side of the border share a boundary with, or are enclaved within, the national park. These are considered to be 'direct impact' villages because their people carry out activities inside the protected area (MINFOF, 2010). As the vegetation transitions from lowland forest in the south to montane savannah in the north, the cultures and practices of the people living in and around Takamanda National Park change. The line separating the forest from the grasslands represents an important cultural and political boundary (Johnson, 1970). The Becheve and Assumbo ethnic groups are found in the savannah section of the protected area, alongside pastoral Fulani in-migrants (MINFOF, 2010). The main ethnic groups in the forested section are the Boki in the southwest, the Anyang in the south and central enclaves, and the Basho in the east (Schmidt-Soltau et al., 2002). The Ovande share a common ancestry with the Becheve but, having moved south, are based within the northern limits of the forest. Prior to the arrival of the Germans, the Basho were in longstanding conflict with the Ovande over territory, with the Basho attempting to gain a foothold in the grasslands and the Ovande in the forest (Ardener, 2009). However, ultimately the Ovande prevailed in retaining territory in the forest.

Due to a long history of intermarriages between the Boki, Anyang and Basho of Akwaya Sub-Division, they share many elements of a common culture, and linguistic boundaries are blurred (Ardener, 2009). However, the Boki are a sizable ethnic group across the border in Cross River State (Olson, 1996). The Local Government Area in which the Okwangwo Division of Cross River National Park is located is named Boki in acknowledgement of the dominant ethnic group in the area. The Boki speak a dialect of the Bokyi language, which is part of the Bendic group of Southern Bantoid languages (Hammarström et al., 2019). Anyang are also found across the border in some of the Nigerian villages neighbouring Takamanda National Park, but their stronghold is in Cameroon. The Anyang and Basho speak different dialects of the Denya language, which is part of the Mamfe group of Southern Bantoid languages (Hammarström et al., 2019). However, in Akwaya Sub-Division, the Boki, Anyang and Basho can typically understand, if not speak, the respective languages and dialects of their neighbouring groups, and like people throughout the South West and North West regions of Cameroon, as well as the whole of Nigeria, they use pidgin English as the lingua franca. The villages associated with these ethnic groups are clustered into clans based on patrilineal ancestry, i.e. the founders of each village shared a common male ancestor (Malleon

et al., 2005). Intermarriages between villages, including those of different ethnic groups, are patrilocal, whereby the couple settle in the husband's ancestral village (Niger-Thomas, 2009).

Although the structure and function of village institutions is broadly similar between the closely related ethnic groups of Akwaya Sub-Division, there are subtle differences at the village level. The main decision-making body within each village is the village council, which is composed of elected representatives from the community. The village council has members and observers as well as an executive, for which individuals are typically nominated for the roles of chairman, secretary, treasurer and technical advisor, with deputy positions also often available. Village councils usually have various committees, with each committee having a representative within the village council itself. For instance, there are women's committees, youth committees, tax forces, vigilante groups, councils of elders and entertainment committees within the villages around Takamanda National Park. With support and direction from PSMNR-SWR, there are also now forest management committees within the eighteen direct impact villages identified in the protected area management plan (Nyieh and Stenmanns, 2011). Each village has a male chief who is selected by 'king makers' within the village council. The chief is the main spokesperson for the village, and it is his job to liaise between the village council, which is the traditional authority at the village level, and the government officials of Akwaya Sub-Division. The chief receives a salary from the state for fulfilling this role, so is often considered a representative of the government.

Another power within the villages is their secret societies. The Ekpe and Makwo societies are both found in the Takamanda area (MINFOF, 2010). These are all-male societies with a hierarchical structure based on age and family lineages, that require members to complete rituals at various life stages (Willcox, 2002). The Ekpe society in particular transcends ethnic group and is widespread throughout the South West Region, as well as in Cross River State and as far afield as Cuba where it continues to be practiced by the descendants of slaves (Argenti and Roschenthaler, 2006). The secret societies convene whenever there are problems within the village, such as conflicts between individuals or in cases of adultery, abuse or death (van Vliet et al., 2009). After the cause of a problem is identified, 'juju', a form of witchcraft, is used to resolve matters (Ngoufo et al., 2014). Belief in the spiritual world remains strong in the area, particularly in more remote villages, with people holding onto their traditional beliefs despite also adhering to Christian faiths. Traditional songs and dance associated with each secret society are performed during rituals and when necessary to solve problems and ensure the welfare of the community. Secret societies play an important role in enforcing traditional rules, including those relating to the use of natural resources, and generally impose order within the village (Alagoa, 1992, Ingram et al., 2011). There is also one other increasingly influential group of individuals within the power structures of village life – the 'elites'. These are typically well-educated, wealthy individuals who originated from the

village but are now based in urban areas. Using their connections and financial resources, they often unofficially act as brokers on behalf of their village with politicians or development agencies, gaining political influence at the village-level which they otherwise might not have had based on traditional hierarchies and structures (Mberu and Pongou, 2016).

Until recently, many of the villages in and around Takamanda National Park were only accessible on foot, necessitating transport of goods by headload. Most were within a day's trek of the nearest road, but for northern and central villages the nearest roads were in Nigeria, resulting in economic dependence on the Nigerian towns of Ikom and Amana, and often unfair treatment by Nigerian officials (MINTP et al., 1999). The main footpaths to the border pass through the protected area (Sunderland-Groves et al., 2003). Since independence, when the area became part of Cameroon, improving transport links to Mamfe has been a priority for the population (MINTP et al., 1999). Although construction of an earth road to the east of the national park linking Mamfe to the northern town of Akwaya began in 1964, progress had been slow. At the time of fieldwork in the villages in 2014, the Mamfe-Akwaya road reached the village of Badshama, approximately 60 km from Mamfe and 40 km short of its target, but the lack of a bridge over the Mone (aka the Mawne) River continued to limit access to during the dry season (Burren et al., 2011). During the rainy season, vehicles could not pass beyond the village of Nyang, 32 km from Mamfe. To the south of the national park, the 36 km Mamfe-Kajifu road had recently been extended by PSMNR-SWR to reach the enclaved villages of Obonyi I and Obonyi II. However, the condition of the road network, particularly in the rainy season, and the number of rivers lacking bridges often limits access to motorbikes only, which are a relatively expensive means of transport for the local population. Since 2014, PSMNR-SWR has continued to extend the road network as part of its development assistance to the communities around Takamanda National Park. The construction of 'farm-to-market' motorbike roads by PSMNR-SWR is in response to the demands of villagers who want to increase production and trade in agricultural produce (Nyieh and Stenmanns, 2011).

Due to transportation difficulties, the local population around Takamanda National Park has traditionally been economically reliant on trading in NTFPs with a high value to weight ratio. There is strong demand for many such NTFPs in Nigeria, which has resulted in a thriving informal cross-border trade (Ingram et al., 2011). Bush mango, eru, njansang, bush onion and bushmeat in particular have been significant contributors to the incomes of many households, with some studies suggesting that bush mango and eru provided as much as 82% of household income in the early 2000s (Sunderland et al., 2003). The situation is gradually changing as access to the area improves and more people are establishing or expanding their cash crop farms. Research for this thesis suggests that around 44% of households now get their main income from cocoa, which was introduced to the area relatively recently, although the importance of

bush mango and other NTFPs is still very apparent. Oil palm is the other main cash crop in the area, which has long been cultivated for economic and subsistence purposes, with palm oil, palm wine and a distilled spirit called 'afofo' being sold between villages as well as further afield. The staple food crops are cassava, cocoyam and maize (Malleon et al., 2005). Almost all hunters own locally made guns, and many also use wire snares to obtain bushmeat (Sunderland-Groves et al., 2003). The main hunting period traditionally coincides with the fruiting season for bush mango, during the peak of the rainy season from June to August, during which time entire families relocate to bush sheds in the forest (van Vliet et al., 2009, Etiendem et al., 2013b). Although the harvesting of bush mango is considered relatively sustainable, that is not the case for all NTFPs (Sunderland et al., 2003). The amount of bushmeat hunting in the area in particular is considered to vastly exceed sustainable offtake levels, with the abundance of large mammals already reported to be very low in 1999 (Sunderland-Groves and Maisels, 2003).

Hunting pressure is thought to have increased over the last two decades with the gradual expansion of the road network, and it is widely acknowledged by the local population that wildlife has become scarce (MINTP et al., 1999, Etiendem et al., 2013b). According to customary rules, villagers have a right to use the forest within the territory of their village but are not permitted to cross village boundaries. Vigilant groups protect village territory and control the use of forest resources by outsiders (van Vliet et al., 2009). If 'strangers' want to exploit resources within a community's forest, they must first seek permission from, and give a gift to, the village council (Malleon et al., 2005). Land is still considered relatively plentiful, except by those living in the enclaves of Takamanda National Park, and can be obtained for farming by selecting as large an area of forest as a person is able to clear, providing it is within their village territory and does not overlap with land already selected by another person (van Vliet et al., 2009). Once land has been 'improved' by the owner, it can be inherited by their descendants, and any NTFP producing trees on the land become private property. Households often pay farm labourers, usually young men from the area, to assist with the job of clearing forest to create new farms. Informal social support networks exist that provide financial or in-kind assistance to members at key points during the farming calendar or when there are other needs, such as in times of emergency. Known as 'njangi' groups, these support structures are built around friendships, family ties or other commonalities. In the absence of any accessible financial services, they enable people to borrow or save money, as well as receive reciprocal aid on one another's farms. Women who settle in the village after marriage for instance, find support and solidarity by forming njangi groups with other women in the same situation.

Due to the remoteness of the area, infrastructure is relatively limited. None of the villages are connected to the electricity grid or have piped water. Instead, some wealthier individuals own generators for use during special occasions and the people rely on streams for drinking water. There is 'spot network' in

Kajifu I and neighbouring villages, whereby a weak mobile phone reception can be obtained in certain locations, but the network coverage of Cameroon's mobile phone providers does not extend beyond this area south of the park. Although national TV and radio signals do not reach the area, those able to afford to purchase a radio can listen to two local radio stations broadcast from Mamfe and a selection of Nigerian stations (MINFOF, 2010). However, the main form of communication with the outside world is by word-of-mouth, including use of a messenger when necessary. At least eleven of the villages have primary schools, and there is a secondary school in Kajifu I, but these schools are understaffed and under-resourced (MINFOF, 2010). Some children cannot go to school until they are old enough to swim across the river between their home village and the village with the nearest school. Kajifu I has a health centre, but it is only operational for a couple of days per month when a mobile health practitioner visits. Trained personnel are often unwilling to remain in the area due to its relative isolation. The population therefore rely on a combination of traditional medicine and pharmaceuticals of dubious origin sold by itinerant traders, with the nearest hospitals being in Mamfe and Akwaya. Motorbikes now enable quicker access to these facilities for those who can afford the cost of transportation. Many of the villages have small provisions stores selling tinned foods, salt, biscuits, small sachets of milk, alcohol etc. Most villages also have bars selling bottled beers from *Les Brasseries du Cameroun*. The villages are visited by a variety of itinerant traders who come from nearby villages, Mamfe or Nigeria to buy and sell goods.

The villages in and around Takamanda National Park are permanent settlements, traditionally characterised by thatched, wattle and daub houses. Increasingly the houses are made from locally made mud bricks; plastered with concrete if the inhabitants can afford it and transport access allows. Similarly, thatched roofs are gradually being replaced by corrugated iron. Large houses, with around eight bedrooms, constructed from concrete and corrugated iron, are beginning to appear in villages with improved road access. These houses are often owned by urban-based elites. The people in the villages are generally very mobile, travelling frequently to trade, work or obtain an education in nearby towns within Cameroon and Nigeria or further afield. Out-migration is prevalent, particularly among young men, with remittances sent back to the village if the person is successful in generating sufficient income in their new location. In-migration, on the other hand, is uncommon. Most inhabitants were either born in the village in which they live or, in the case of wives, a neighbouring village. The area has thus far proved to be too remote and inaccessible to attract in-migrants. The notable exception being in the north where, over the last 30 years, Fulani herders have moved to the area from Nigeria to graze cattle in the grasslands (MINFOF, 2010). Settlers are also found along the road towards Nyang in the south, which suggests that in-migration may increase as access to the area improves (MINTP et al., 1999). In-migrants can acquire land for farming by gaining permission from, and fulfilling the requirements of, the village council. This typically gives them temporary customary ownership, with land returned to the

village on departure. However, if the land available for opening up new farms becomes increasingly scarce in other areas, in-migrants may seek to gain land titles in order to retain ownership permanently, as has been the case in more accessible parts of the South West Region (Malleon et al., 2005).

3.3.4 Management interventions

PSMNR-SWR has implemented two main strands of interventions in relation to Takamanda National Park. The first strand being interventions associated with protected area management, for which MINFOF and WCS are the partners responsible. Following the upgrading of the protected area to a national park, and validation of a protected area management plan, management activities have included: 1) recruitment, training and deployment of park staff, including ecoguards to enforce a ban on hunting and other outlawed practices inside the protected area; 2) construction of a headquarters and guard posts covering different areas of the park; 3) establishment of village forest management committees to encourage local participation in ecoguard patrols and other forest protection activities; 4) monitoring of wildlife population densities and human activities in the forest; and 5) conservation education aimed primarily at school children, but complemented with films used to engage communities as a whole in discussions about wildlife conservation (Wright, 2010, Nyieh and Stenmanns, 2011). In 2010, selection of a village in which to construct the national park headquarters caused significant conflict between villagers and park management, which effectively curtailed the deployment of ecoguards and other activities for more than a year. The headquarters was eventually built in Kajifu I, which is relatively accessible from Mamfe, and construction had just been completed when fieldwork for this thesis was conducted in 2014. However, at that time, park staff were yet to be relocated from Mamfe to Kajifu I, and the newly constructed guard posts were also not in full-time operation.

The second strand of interventions are those associated with village development, for which MINFOF and GIZ are the partners responsible. During Phase I of PSMNR-SWR, 23 villages were assisted in preparing village development plans, whereby community members outlined their priorities. After reviewing the plans, the PSMNR-SWR partners selected several projects which were deemed feasible and aligned with their conservation objectives. Twenty-two villages received a package of development interventions. These packages typically included various 'income-generating micro-projects' as well as an infrastructure project (Nyieh and Stenmanns, 2011). The main infrastructure project around Takamanda National Park has been the construction of farm-to-market motorbike roads, but due to the enormity of this task, construction continued beyond the first phase of the programme. The livelihood projects took various forms and are discussed in detail in Chapter 5. The first phase of PSMNR-SWR lasted from 2006 to 2011 and it is the livelihood interventions started during this period that are the focus of empirical research for this thesis. Phase I was followed by a second and third phase, which continued programme

activities up to 2017. More recently, a fourth phase was announced following confirmation of continued funding from KfW until 2022. To ensure long-term funding for the protected area, PSMNR-SWR has been seeking to raise the profile of Takamanda National Park internationally by applying to attain UNESCO Biosphere Reserve status, and ultimately create a transboundary reserve incorporating the Okwangwo and Oban Hills divisions of Cross River National Park in Nigeria with the national parks of Korup and Takamanda in Cameroon (Dupuy, 2016). In 2018, the Cameroon government also began the nomination process to have Takamanda National Park recognised as a World Heritage Site (UNESCO, 2019).

Lessons learnt during each phase of PSMNR-SWR have led to adaptations in the programmes approach to protected area management and village development. Since Phase I, conservation and development activities have focused more closely on the 18 villages deemed to have a direct impact on Takamanda National Park. To better manage and prevent conflict situations, PSMNR-SWR launched a new community engagement approach in 2014 aimed at improving transparency and the degree of involvement of local people in protected area management. The direct impact villages were thereby clustered together into five conservation zones, each with a facilitator recruited from one of the villages whose task is to coordinate meetings of the ‘cluster platform’ – a forum where representatives from the villages can keep abreast of developments and discuss concerns with park management (PSMNR-SWR, 2014). Greater conditionality has been placed on development assistance, with villages being required to sign new written agreements stating that they will adhere to certain conditions associated with receiving development benefits, such as agreeing to report illegal activities to park management. Further incentives have also been provided to encourage villagers to report illegal activity and participate in forest protection, through boundary demarcation, wildlife surveys and ecoguard patrols. In particular, two PES schemes have been introduced whereby funds are allocated to communities based on their level of collective involvement. These funds are not transferred to the villages in cash but as a credit that can be used to request specific livelihood interventions or assistance with small-scale infrastructure projects, such as the roofing of community halls or the building of classrooms (Agbor, 2017). It is within this adaptive management context that lessons learnt from evaluating the effectiveness of the livelihood interventions around Takamanda National Park can be incorporated into the design of future projects implemented by PSMNR-SWR and within conservation more broadly.

3.4 Dja Faunal Reserve

3.4.1 Conservation importance

Dja Faunal Reserve has had international recognition as an area of global conservation importance for many years. Encircled along its northern, western and southern boundaries by the Dja River, this relatively inaccessible protected area was recognised for its species diversity and ‘exceptionally pristine

condition' in the 1980s (IUCN, 1987: p.14). Covering an area of 5,260 km², Dja Faunal Reserve is one of the largest protected areas within the forest belt of West and Central Africa, and is almost eight times the size of Takamanda National Park (MINFOF, 2004). Floristically, the Dja is in a transitional zone where coastal forests transition into the forests of the Congo Basin. It is situated on the southern Cameroon plateau, with an average altitude of 600 m, and mainly consists of dense, humid, evergreen forest (MINFOF, 2004, IUCN, 2017). The Dja has both terra firme and seasonally flooded forests, as well as rocky outcrops and swampy forest clearings known as 'bais' (Bruce et al., 2018b). Annual rainfall in the area is around 1,600 mm, less than half that of the South West Region, with a short rainy season from March to May, a long rainy season from August to November, and two dry seasons in-between (IUCN, 1987, Bruce et al., 2018a). Unlike Takamanda National Park, the Dja Faunal Reserve does not have many endemic species, but the protected area and surrounding landscape represents one of the few extensive tracts of Congo Basin forest that could sustain populations of large mammals, such as forest elephants, western lowland gorillas, central chimpanzees and leopards, over the long-term. The Dja is considered to be one of the most species-rich reserves in Africa, with 109 mammal, 360 bird and 62 fish species identified, including at least fourteen species of primate (MINFOF, 2004, IUCN, 2017).

Located in the francophone part of Cameroon, one fifth of the Dja Faunal Reserve is within the South Region, while the remaining four-fifths are within the East Region. The population density of the South and East regions is relatively low compared to the South West Region, with 16 people per km² in the South and 8 people per km² in the East (INS, 2015). In 2014, the total population of the South and East regions combined was estimated at 1.6 million, which is similar to the number of inhabitants in the South West Region, except they are spread across an area six times the size. The Dja straddles two administrative divisions (known as *départements* in French), the Dja-et-Lobo and Haut-Nyong divisions, located in the South and East regions with the main towns being Sangmélina and Abong-Mbang respectively. The north-western boundary of the reserve is approximately 120 km from Yaoundé, with the southern boundary approximately 65 to 80 km from the international borders with Gabon and the Republic of Congo. Due to the relative proximity of the reserve to Yaoundé, the Dja is one of the main source areas for bushmeat destined for the capital (Edderai and Dame, 2006). Bushmeat traders from Yaoundé will visit the towns of Sangmélina and Abong-Mbang multiple times a week to buy bushmeat, preferably fresh rather than smoked, to satisfy the burgeoning urban demand (Randolph, 2016). The continuous increase in hunting inside the Dja Faunal Reserve is considered the greatest threat to the integrity of the protected area (IUCN and UNESCO, 2015).

Although most animals are hunted for bushmeat, the hunting of elephants for ivory, as well as meat, has also increased (Randolph and Stiles, 2011, IUCN, 2017). Sangmélina is a key trafficking route for ivory

coming from the Dja as well as from the Republic of Congo (Nkoke et al., 2017). Increased hunting pressure has had a dramatic impact on elephant and great ape populations inside the reserve. Between 1995 and 2018, the forest elephant population is thought to have declined by 85% from 2,945 individuals to only 219 (Bruce et al., 2018b). Over the same period, the western lowland gorilla population is similarly thought to have declined by 83%, from 8,971 individuals to 1,371, and the central chimpanzee population by approximately 30%, from 4,155 to 2,262 individuals (Bruce et al., 2018b). The dramatic decrease in wildlife populations due to overhunting was highlighted in a 2015 report by MINFOF and IUCN (see: MINFOF and IUCN, 2015). Listed as a UNESCO World Heritage Site in 1987, the publication of this report was followed by a joint mission by UNESCO and IUCN to assess the threats facing the reserve. Other significant threats include the construction of the Mékin hydroelectric dam and the expansion of large-scale industrial agriculture, mainly rubber, around the reserve's periphery (IUCN and UNESCO, 2015). Although, compared to Takamanda National Park, wildlife population densities are still relatively high in the Dja and the species assemblage remains intact, the rate of population declines, as well as the emergence of new threats, prompted the UNESCO World Heritage Centre to propose in 2016 that the reserve be classified as a World Heritage Site in Danger. Although this proposal has not yet been adopted by the UNESCO World Heritage Committee, it has raised awareness internationally of the threats facing the Dja Faunal Reserve and increased pressure on the Cameroon government to act (UNESCO, 2018).

3.4.2 History

Dja Faunal Reserve was originally designated as a *Reserve de Faune et de Chasse*, a wildlife and hunting reserve, by the French colonial authorities in 1950 (MINFOF, 2004). It initially retained this status after independence but was reclassified as a *Reserve de Faune* in 1973 (UNEP-WCMC, 2011). The ecological importance of the Dja Faunal Reserve received international recognition in 1981 when it was designated as a Biosphere Reserve under the UNESCO Man and the Biosphere (MAB) Programme (UNESCO, 2015). The MAB Programme started to create a World Network of Biosphere Reserves (WNBR) in 1976 with the aim of gazetting 'undisturbed natural areas for scientific study' that are representative of 'each of the major or otherwise relevant ecosystems within [a] nation's boundaries' (UNESCO, 1970: p.23). Biosphere reserves typically consist of three zones – a strictly protected core area, a buffer zone in which research, education and activities deemed to be compatible with sound ecological practices are conducted, and a transition zone which can be used to enhance the socio-economic development of the local population (UNESCO, 2017). The 5,260 km² Dja Faunal Reserve constitutes the core area of the Dja Biosphere Reserve, which in addition has a 2,740 km² buffer zone, and therefore a total surface area of 8,000 km² (UNESCO, 2015). Having a protected area designated internationally as a biosphere reserve places a moral, rather than a legal, obligation on the country concerned to manage it effectively. The primary purpose of biosphere reserves has been to safeguard the genetic diversity of species and provide sites

and facilities for ecological research, education and training (Batisse, 1982). However, the scope of research within biosphere reserves has broadened to better understand the interactions between social and ecological systems in order to reconcile the conservation of biodiversity with its sustainable use. The Dja is now part of a global network of 701 biosphere reserves across 124 countries (UNESCO, 2017).

The Dja Faunal Reserve was nominated for and attained UNESCO World Heritage Site status in 1987 due to its species diversity, rare species, scenic landscapes and pristine condition (IUCN, 1987). This designation helped to further raise the profile of the Dja and attract international financial support. At the time of the nomination, the reserve had a warden and four ecoguards, who conducted sporadic anti-poaching activities, but had no infrastructure except for one incomplete building (IUCN, 1987). That changed with the launch of the European Union funded ECOFAC (*Ecosystèmes Forestiers d'Afrique Centrale*) programme in 1992, which aimed to contribute to the conservation and rational use of forest ecosystems in six (then later seven) Central African countries (European Commission, 2006). The ECOFAC approach was to focus on specific protected areas in each country and promote collaboration between them. The Central African Network of Protected Areas (RAPAC) was created in 2000 to enable those involved in the management of other protected areas in the region to learn from the ECOFAC experience. The primary objective of the ECOFAC programme in the Dja Faunal Reserve was to strengthen protected area management arrangements by creating the necessary institutional structures, building infrastructure and recruiting, training and equipping a team of management staff and ecoguards (MINFOF, 2004). The early phases of ECOFAC involved direct bilateral cooperation with MINEF, and later MINFOF, during which time four operational units were created – the northern, eastern, southern and western sectors – to help facilitate management of such a large protected area. Each sector has its own headquarters, in the towns of Somalomo, Lomie, Djoum and Meyomessala respectively, as well as ecoguard posts located around the periphery of the reserve (MINFOF, 2004). In addition, ECOFAC created a research centre with accommodation for visitors at the Somalomo site. The later phases of ECOFAC (ECOFAC VI is ongoing and will continue until 2020) have continued to support the management of Dja Faunal Reserve but funds are now distributed through grants to international and local partners.

Although the focus of the ECOFAC programme in the Dja Faunal Reserve was almost exclusively on biodiversity conservation during Phase I, which lasted from 1992 to 1996, the second phase launched in 1997 started to place increased emphasis on the socio-economic development of local communities. During this period, ECOFAC became more widely recognised as an ICDP (Solly, 2002). A three year 'Accompanying Measures' project was launched in 2003 to specifically develop alternative income generating activities in the villages around the periphery of the Dja and improve the road infrastructure to facilitate the transport of goods to market (MINFOF, 2004). The protected area management plan for

the Dja, which was validated in 2004, states the objective as being to ‘promote sustainable development in the Dja region through the rational use of biodiversity resources and the preservation of these resources for present and future generations’ (MINFOF, 2004: p.58). The Dja Faunal Reserve then became part of a broader conservation initiative advocated for by WWF, WCS and ECOFAC (Devers and Vande weghe, 2006). Under the auspices of COMIFAC, an intergovernmental collaboration agreement was signed in 2005 between Cameroon, the Republic of Congo and Gabon to manage the transboundary Tri-National Dja-Odzala-Minkébé (TRIDOM) Landscape. Encompassing nine protected areas, the TRIDOM landscape covers 191,541 km², the majority of which is earmarked for logging concessions (de Wachter et al., 2009). With sizable concentrations of large mammals, low human population densities and few roads and navigable rivers, taking a landscape approach and strengthening collaboration between governments, NGOs and logging companies was deemed necessary to preserve corridors between existing protected areas, reconcile conservation and development trade-offs and maintain the long-term viability and evolutionary capacity of the Congo Basin’s fauna.

3.4.3 Local population

There are both sedentary, village-based peoples and semi-nomadic forest peoples living in and around the Dja Faunal Reserve. A survey conducted by ECOFAC in 1998 identified 105 villages around the periphery of the Dja that were considered to be within the intervention zone of the programme, with a population estimated at 22,507 (Seme, 1998). These villages are inhabited by four different ethnic groups, which are all broadly categorised as Bantu. The Badjoué, also spelt Badwe’e, are found in villages adjacent to the northern sector of the Dja, while the closely related Nzimé group predominate in the eastern sector (MINFOF, 2004). Both of these groups speak different dialects of the Koonzime language of the Makaa-Njem group of Bantu languages (Hammarström et al., 2019). In the western sector of the Dja, the villages are inhabited by people from the Bulu (or Boulou) ethnic group, while the southern sector has both Bulu villages and those belonging to members of the related Fang group (MINFOF, 2004). Bulu and Fang are both languages of the Yaunde-Fang group of Bantu languages (Hammarström et al., 2019). In addition to the permanent Bantu settlements, there are Baka ‘Pygmy’ camps in and around the Dja Faunal Reserve, often attached to Bantu villages. The Ubangian-speaking Baka are thought to have inhabited the southern forests of Cameroon for around 100,000 years, while the Bantu are thought to have migrated south and settled in the area at least 1,000 years ago (Köhler and Lewis, 2002, Hammarström et al., 2019). The hunter-gatherer Baka and their farming, village-based Bantu neighbours have had a long and complex relationship involving the bartered exchange of goods and services, as well as deep-seated discrimination and exploitation of the former by the latter (Pyhälä, 2012).

The Baka were originally completely nomadic, moving every few days, and were reliant solely on hunting, fishing and the gathering of wild foods in the forest. Only occasionally would they visit villages to exchange goods with their Bantu neighbours, however this changed during the colonial period with the enforcement of a policy of sedentarisation (Nguiffo, 2001). The French colonial authorities, as well as missionaries, believed 'pygmies' to be at 'a primitive stage of evolution' and that they should integrate into the 'mainstream of ... national culture and economy to become productive members of ... society' (Bailey et al., 1992: p.206). Missionaries and local authorities were actively involved in sedentarisation efforts in the area that is now the Dja Faunal Reserve in the 1940s, and government policy remains largely unchanged today (Nguiffo, 2001, Pyhälä, 2012). The Baka have therefore been encouraged and/or forced to settle in the Bantu villages along the roads that encircle the Dja, and this has changed their relationship with the Bantu, putting them in a subservient position whereby the Bantu are their 'patrons' (Couillard et al., 2009). This has been to the economic advantage of Bantu groups who use the Baka as free, or low cost, farm labourers and benefit from their hunting skills and extensive knowledge of medicinal plants (Nguiffo, 2001). Despite pressure to culturally and economically assimilate, discrimination leads to continued segregation between Bantu and Baka. Although many Baka now engage in subsistence farming, the forest remains of primary importance for their wellbeing, and most families leave their village-based camps and return to the forest for several months a year, particularly during key periods for the collection of NTFPs (Leclerc, 2012). This mobility creates a degree of fluidity in their relations and interactions with the Bantu and helps maintain their egalitarian culture (Joiris, 2003).

The Bantu ethnic groups around Dja Faunal Reserve have more of a hierarchical governance structure than the non-hierarchical political structures of the Baka, yet they are more acephalous than the chieftaincies around Takamanda National Park. The Badjoué, Nzimé, Bulu and Fang villages are subdivided into patrilineal lineages, each with family heads or 'kin chiefs', who share power via consensus at the level of the village (Joiris, 1998, Yakan, 1999, Wilmé, 2002, MINFOF, 2004). Kinship is therefore the basis of most socio-political interaction, with villages not having a centralised authority in the form of a village chief until this was imposed during the colonial period (Bailey et al., 1992, Mbaku, 2016). All the villages now have male chiefs who convene meetings with the other notables of the village to seek solutions to any problems that arise. However, the credibility of the chief and the trust placed in him to be an effective representative of the community varies (Bailey et al., 1992). The Bantu groups around the Dja are said to have a strong tendency towards individualism, and there was cynicism expressed in the villages visited during fieldwork for this thesis that some chiefs primarily represent the interests of their own lineages and not those of the village. Lineages extend beyond the village, which means that urban-based elites retain a great deal of influence within their kinship groups, and as such the village as a whole (Joiris, 1998, Seme, 1998). President Paul Biya is a Bulu and was born in the village

of Mvomeka'a to the west of the Dja Faunal Reserve, beyond its immediate periphery (DeLancey et al., 2010). His appointment created many political and economic opportunities for Bulu and those from closely related ethnic groups, collectively referred to as the 'Betî' (Monga, 2000). There are therefore likely to be many urban-based elites exerting an influence over village-level decisions in the region.

As in the villages around Takamanda National Park, the Bantu around the Dja organise themselves into informal njangi networks, referred to as 'tontines' in the francophone area, to save money and/or benefit from the financial and in-kind assistance of members. Secret societies also exist, with villagers believing in the spiritual world as well as adhering to the Christian faith (Olson, 1996, Yakan, 1999). Southern Cameroon was an important region for cocoa production during the French colonial period, therefore, in contrast to the Takamanda area where cocoa farming is relatively new, the Bantu around Dja Faunal Reserve have been engaged in cocoa farming for more than 50 years. During this time, they have benefited from post-independence state-funded agricultural development assistance, such as from SODECAO, but have been affected badly by falls in international commodity prices. When the price of cocoa fell in the late 1980s, many farmers abandoned their cocoa farms, making them more dependent on forest resources (Wilmé, 2002). Taking advantage of high demand for bushmeat in towns and cities, cocoa farmers turned to hunting to make up the shortfall in their incomes, transforming a predominantly subsistence activity into a commercial one (Solly, 2000). The Bantu often rely on their Baka neighbours to assist them on hunting expeditions, or they provide the Baka with guns to hunt on their behalf (Nguiffo, 2001). By the late 1990s, bushmeat was one of the main products being transported for sale outside the villages and was central to the local economy (Solly, 2004). Hunting has remained an important income generating activity for Bantu men around the Dja, many of whom have been reluctant to return to cocoa farming, even with the increase in purchase price. Food crops, particularly groundnuts, cocoyams and plantains, are also an important source of income, as well as being used for subsistence.

Most of the villages around the Dja Faunal Reserve are situated along earth roads, some of which can provide access to cocoa export company trucks, but the condition of many roads and bridges have deteriorated (Solly, 2000). Some roads were rehabilitated during phases II and III of ECOFAC, but many are only accessible by motorbikes and remain problematic during the rainy season. The villages adjacent to the northern and western sectors of the Dja which were visited during fieldwork for this thesis are not connected to the electricity grid, nor do they have piped water. However, some individuals own generators, which are typically used to power lights and music systems in the village bars. Drinking water is obtained from either wells or streams. Hand-pumps have been installed in some villages, but these often fall into disrepair. Mobile phone reception is largely absent. There are primary schools in all of the sizable villages, some of which also have secondary schools, but often they lack teaching staff. It is a

similar situation for health centres, with much of the population relying on traditional medicine, often seeking advice from the Bakas (MINFOF, 2004). Most villages have small provisions stores and are visited by itinerant traders selling rice, salt, soap, alcohol and other goods bought in nearby towns (Solly, 2004).

3.4.4 Management interventions

The ECOFAC programme has been the most significant management intervention in the Dja Faunal Reserve. During the first three phases, ECOFAC jointly managed the reserve with MINFOF and invested heavily in building up the institutional capacity of the Dja Conservation Service. The ultimate aim being for the Cameroon government to finance and manage the reserve, independent of technical and financial support from the European Union. However, at the end of Phase III, when ECOFAC funding and involvement in protected area management ceased, activities came to a standstill. The government, anticipating a fourth phase of ECOFAC, did not take over funding and management responsibilities as agreed (ECOFAC, 2010). For a period of almost two years, staff either continued unpaid or resigned, buildings were abandoned and looted, equipment was damaged and archives lost. When ECOFAC IV launched in July 2007, the *modus operandi* changed. ECOFAC resumed joint management of the reserve and rebuilt the Dja Conservation Service but the budget was more restrictive and a transition period had begun (ECOFAC, 2010). The Cameroon government, through MINFOF, is now fully in charge of the Dja Conservation Service but is supported by various local and international NGOs, many of which have received grants from the European Union through the subsequent phases of ECOFAC. The Zoological Society of London (ZSL) and the African Wildlife Foundation (AWF) are the lead partners now supporting MINFOF with protected area management and ecological monitoring activities in the Dja. In particular, they have introduced the SMART (Spatial Monitoring and Reporting Tool) system to help the Dja Conservation Service organise more targeted and effective anti-poaching patrols, and have recently completed a comprehensive faunal inventory to assess the current status of wildlife populations in the reserve (Bruce et al., 2018b, ZSL, 2018).

UNESCO World Heritage Site status and the efforts of ECOFAC have succeeded in raising the profile of the Dja Faunal Reserve. Over the years, many international organisations have implemented both conservation and development projects in and around the reserve, including IUCN, SNV, Living Earth Foundation and Bristol Zoo. Long-term ecological research sites have been established in the forest by the University of California, Los Angeles (UCLA) and the Royal Zoological Society of Antwerp (RZSA). There has also been a proliferation of local NGOs working on development and awareness raising activities in the surrounding communities. While overall jurisdiction for the management of the reserve comes under MINFOF, there is no umbrella institution financing and coordinating the activities of different actors in the Dja like there is in Takamanda. Instead, activities are being financed by multiple

donors and there are NGOs of various sizes applying different approaches in different sites. It is the range of different projects that have been implemented over a long period that make the Dja Faunal Reserve an interesting comparative study site. The Cameroonian NGO *Fondation Camerounaise de la Terre Vivante* (FCTV) operates in the '*Boucle de Mekas*' in the western sector of the Dja Faunal Reserve, while a project linked to the RZSA called *Projet Grands Singes* (PGS) operates in the periphery of the northern sector alongside the Cameroonian NGO Tropical Forest and Rural Development (TF-RD). All three organisations are involved in ongoing livelihood projects in areas with a history of similar initiatives, and it is these sites in the western and northern sectors that are the focus of my research in the Dja.

Chapter 4

Reframing the concept of alternative livelihoods

4.1 Introduction

There has been much debate among academics, practitioners, and policy makers with regard to the degree to which conservationists should focus on social issues (Roe, 2008, Miller et al., 2011). In developing countries, both pragmatic and ethical arguments can be made as to why conservation should address issues such as poverty, human welfare, social justice, livelihood enhancement, and economic development (Robinson, 2011). Broad social concerns have been receiving attention from conservation practitioners since the 1980s, when integrated conservation and development projects gained popularity as a 'win-win' strategy linking biodiversity conservation with the social and economic development of neighbouring communities (McShane and Wells, 2004). A paradigm shift toward people-focused conservation in the 1990s resulted in a suite of other approaches aimed at involving local people in conservation, including community-based conservation, community-based natural resource management, and integrated coastal zone management. Interventions that aim to change or enhance the livelihoods of local people often form part of these approaches. The so-called alternative livelihood project is one such intervention, which has been implemented in a range of contexts to reduce reliance on natural resources, generate economic benefits, and increase local support for conservation.

Designed to reduce the prevalence of behaviours that are considered environmentally damaging and unsustainable, alternative livelihood projects promote substitute, or lower impact, livelihood activities. However, the effectiveness of alternative livelihood projects, and people-focused conservation approaches in general, has been questioned. Disenchantment began in the mid-1990s when these approaches were criticized as having minimal, or even adverse, effects on biodiversity conservation (Oates, 1995, Noss, 1997). One of the few quasi-experimental studies exploring the causal impacts of alternative livelihood projects, conducted in the Brazilian Amazon, found no discernible conservation outcomes (Bauch et al., 2014), yet such studies are rare and in general the amount and rigor of outcome monitoring is low (Brooks et al., 2012, Wicander and Coad, 2015). Although substantial evidence of the potential for 'win-wins' is yet to materialize, conservation still needs to engage with local people, so people-focused conservation approaches continue to evolve and alternative livelihood projects reappear in different guises (Redford et al., 2013).

The 'new conservation' paradigm focuses on the economic value of nature and seeks to engage people in conservation for utilitarian rather than moral or aesthetic reasons (Kareiva, 2014). Market-based incentives, such as payments for ecosystem services (PES), have been advocated as a direct and cost-effective approach to people-focused conservation (Ferraro and Kiss, 2002). However, problems associated with direct cash payments have resulted in a renewed interest in the provision of indirect and in-kind incentives based on cooperative and reciprocal arrangements (Clements et al., 2010, Cranford and Mourato, 2011). These incentive schemes often share many similarities with alternative livelihood projects, despite not being branded as such. Therefore, even though there is uncertainty regarding the effectiveness of alternative livelihood projects, they continue to be a key strategy in both the terrestrial and marine conservation realms, and the sharing of lessons learned remains essential.

At the International Union for Conservation of Nature (IUCN) World Conservation Congress in 2012, a resolution was passed calling for a critical review of alternative livelihood projects and the development of best practice guidelines to ensure sustainable benefits to species, ecosystems and people (IUCN, 2012). This call resulted in renewed interest in searching for evidence of the success or failure of alternative livelihood projects, reinforcing the timely nature of my PhD study. The resolution prompted the Center for International Forestry Research (CIFOR), the International Institute for Environment and Development (IIED), the Zoological Society of London (ZSL) and the University of Oxford to collaborate on a systematic review of the available evidence to assess whether or not alternative livelihood projects have positive conservation outcomes. I discuss the results of this systematic review, and my involvement with it, in Chapter 5 (see: Roe et al., 2014, Roe et al., 2015). The outcomes associated with any conservation project are the result of a conceptual design as well as an implementation process, but the conceptual designs of alternative livelihood projects are often based on inaccurate assumptions about the social systems within which they operate. These assumptions may be based on the perceptions and values of managers and policy makers removed from local realities (Cundill et al., 2011). In addition, the term 'alternative livelihood project' is ambiguous; the role and function of alternative livelihood projects within broader conservation strategies are poorly defined. Without clearly defining what a project aims to achieve, it is very difficult to measure its impact (Salafsky et al., 2001).

In this chapter, I identify different types of livelihood interventions (a broad category of conservation interventions which includes alternative livelihood projects) and discuss their role in conservation and intended impacts. I then examine some of the conceptual shortcomings of alternative livelihood projects by considering key assumptions made during their design and implementation. Next, I glean insights from the livelihoods literature to determine how conservation practitioners' understanding of the social context at their project sites could be improved to enable them to design more effective livelihood

interventions. Finally, I critically evaluate the usefulness of the term alternative livelihood project in light of these insights.

4.2 Types of livelihood interventions

Livelihood interventions can be grouped into three broad and overlapping categories: alternatives, compensation, and incentives. Alternatives partially or completely substitute for the benefits (monetary and non-monetary) that would normally be obtained from the exploitation of particular natural resources. The assumption often underlying this approach is that pressure on natural resources is primarily caused by poverty and a lack of options (Brown, 2002). Roe et al. (2014) subdivide alternatives into three categories: those that provide an alternative resource to the one being exploited, for example promoting imported animal protein as an alternative to locally hunted bushmeat; those that provide an alternative occupation so as to reduce the need to exploit natural resources for income, for example promoting butterfly farming as a substitute for expanding agriculture (Morgan-Brown et al., 2010); and those that encourage an alternative method of exploiting a resource that has a lower impact than the original method, for example promoting fuel-efficient stoves to reduce the need to fell trees for firewood (DeWan et al., 2013) or changing marketing strategy to increase incomes from the sale of wild coffee thus reducing the need to convert more forest into farmland (Liliehalm and Weatherly, 2010). Alternative occupations may also be described as alternative income-generating activities, and projects promoting any of these forms of alternatives are generally referred to as alternative livelihood projects.

Interventions that provide compensation or incentives may promote very similar alternatives under the banner of in-kind payments but the conditions under which these are implemented differ. Compensation schemes involve explicit acknowledgment of the social and individual costs of conservation, particularly with regard to access restrictions that negatively affect local people's livelihoods, and aim to adequately compensate for the losses incurred. Such schemes may be based on the principles of social justice and human rights or they may be implemented as palliative measures specifically to reduce conflict (Springer, 2009). In contrast, incentive schemes such as PES only provide alternatives as in-kind payment if people change their behaviour in accordance with agreements negotiated in advance (Wunder, 2013). Payments for ecosystem services therefore link the promoted alternatives more directly to conservation objectives. For example, in Cambodia, two PES schemes were implemented that could be described as alternative livelihood projects. One provided alternative occupations through an ecotourism venture and the other an alternative method of selling rice at a premium price through village-based associations. Both schemes aimed to enhance household incomes without the need to hunt or convert important bird habitat into agricultural or residential land, but participation was contingent upon adherence to locally agreed no-hunting rules and land-use plans (Clements et al., 2010).

4.3 Assumptions underlying alternative livelihood projects

Although motivations for and assumptions behind individual projects differ, three key assumptions underlie many alternative livelihood projects. The first assumption is that providing alternatives will reduce people's need and desire to exploit natural resources (Sievanen et al., 2005). If given the choice, it is assumed that individuals dependent on unsustainable practices will decide partially or completely to substitute an environmentally damaging activity for the more environmentally sustainable activity being offered. This can be conceptualized in terms of the alternative making the opportunity cost of the environmentally damaging activity higher, assuming that the promoted activity is indeed a more productive use of labour than the original activity or that the individuals concerned have an appreciation of trading short-term losses for long-term gain. This refocusing of effort away from unsustainable activities is also assumed to increase household resilience in the long term (Marschke and Berkes, 2006). A recent study reviewed 15 alternative livelihood projects in Central Africa and showed that eight had been based on the hypothesis that the alternatives would provide the same or more income than hunting, which would mean hunters no longer needed to hunt (Wicander and Coad, 2015). However, the evidence suggests that the assumption of substitution rarely holds; the alternatives instead become supplementary sources of income and exploitation of the resource continues at similar levels (Torell et al., 2010). The additional income may even subsidize higher levels of exploitation by enabling the purchase of more efficient equipment (Damania et al., 2005).

To be a genuine substitute, the promoted alternative must align with the needs and aspirations of the people concerned and fulfil the same range of functions characteristic of the original activity. For instance, as well as providing cash or non-cash income, the alternative may need to function as a safety net or offer similar levels of prestige and job satisfaction (Pollnac and Poggie, 2008). Hunting for bushmeat, for example, has many positive attributes as a livelihood activity in West and Central Africa. Barriers to entry are low and labour inputs are flexible, making hunting compatible with the agricultural cycle (Brown and Williams, 2003). The ability to generate income quickly means hunting also plays an important safety net function during short-term crises (Schulte-Herbrüggen et al., 2013a). Developing a good understanding of why people engage in a particular activity and its importance along a range of dimensions is therefore vital.

The second assumption is that communities are homogenous, composed of similarly endowed households with common characteristics (Waylen et al., 2013). It is therefore assumed that alternative livelihood projects implemented at the community level will have widespread uptake and reach the resource users of interest. Yet there are social and political structures that control access to resources and opportunities at the community level (Béné et al., 2009). There is also substantial evidence that

natural resource use differs according to the relative wealth of community members and that the poorest households in a community are often those most dependent on natural resources (Kümpel et al., 2010). However, dependence is not the same as use. In a recent study, 7,978 households across 24 developing countries were surveyed, and the results showed that the use of biodiversity by the richest 20% of households was five times higher than that of the poorest 40% of households (Angelsen et al., 2014). It is therefore necessary to be clear about the overall objectives of an intervention. To be effective purely in terms of conservation outcomes, alternatives need to generate benefits for the right people (i.e. those most heavily exploiting the target resource). If, however, the primary aim is to compensate for the negative impacts of resource use restrictions on those most dependent on natural resources, then the alternative should target, or at least be accessible to, the most vulnerable members of a community. A detailed understanding of the ways in which natural resources are used by different sectors of society is therefore essential.

The third assumption is that targeting interventions at individuals will scale up to population-level reductions in impact on the natural resources of conservation concern. This assumes the individual will influence a shift away from the environmentally damaging activity at the household level and shifts by individual households will then scale up to population-level change. However, intra-household livelihood activities are dynamic. If one individual within the household is able to gain an income from an alternative activity, this may lead to a reallocation of labour and increased effort exploiting the target resource by another household member (Allison and Ellis, 2001). Even if households do change their behaviour, there are many exogenous factors that may undermine the conservation benefits of an intervention at the community and population levels. For example, in the Philippines, seaweed farming has been promoted as an alternative occupation for fishers, but Hill et al. (2012) showed that while some households did change from fishing to seaweed farming, the overall effect on fisher numbers was diluted by the growth in human population through births and in-migration.

External stimuli, such as markets, are also highly influential at the community level and can even change the nature of the conservation threat. For example, the increase in the price of cocoa has encouraged many smallholder farmers in Cameroon to create or expand their cocoa farms. Whilst this has resulted in a shift from non-timber forest product harvesting to cocoa farming in certain areas, it has also resulted in increased degradation of high conservation value habitats (van Vliet, 2010). It is therefore important to be mindful of the dynamic, multilevel nature of the social-ecological systems within which livelihood interventions are implemented (Berkes, 2007). Engendering change at one level may not necessarily scale up to result in the desired conservation outcome at a higher level and change is not guaranteed to be stable over time. Dialogue with individuals and groups at multiple levels can help in understanding the

evolving nature of opportunities and threats from different perspectives so that management approaches can be adapted accordingly (Cundill et al., 2011).

The prevalence of inaccurate assumptions such as these highlights insufficient consideration of the complexities of livelihoods by conservation practitioners. Livelihood interventions that fail to recognize these complexities are likely to fail in achieving their conservation objectives.

4.4 Understanding the complexity of livelihoods

Livelihood interventions in conservation often mistakenly equate the wants and needs of local people with monetary benefits and economic substitutes (Berkes, 2012). Focusing on livelihoods in monetary terms masks the complexity of rural livelihoods in developing countries. Just as the concept of poverty has been redefined as multidimensional (Davies et al., 2014), so too has the concept of livelihoods. To conceptualize the multiple influences on people's livelihood strategies, a number of sustainable livelihoods approaches (SLAs) have been developed since the 1990s. They tend to consist of a theoretical framework alongside a set of principles that guide livelihood analyses and subsequent interventions (Toner and Franks, 2006). The most notable SLA was developed by the UK Department for International Development (DFID) (Carney, 1998), which was inspired by earlier work by Chambers and Conway (1992). Following SLA principles, a livelihood can be defined as the living gained through the productive use of assets in activities to which access has been granted through social, institutional, and political processes. A livelihood is considered sustainable when it can withstand and recover from stresses and shocks, and maintain or enhance a household's assets while not undermining the natural resource base (Scoones, 1998).

Sustainable livelihoods approaches highlight the range of activities a household engages in as part of a dynamic livelihood strategy and draw attention to the fact that a portfolio of activities is likely to be needed if a household is to achieve its livelihood goals. There are multiple reasons for households to diversify their livelihood activities. Some are voluntary and proactive in response to new opportunities or as a means of reducing vulnerability by anticipating and ameliorating risks, others are necessary coping mechanisms resulting from deteriorating conditions or sudden shocks (Ellis, 2000). Households in developing countries often lack access to insurance, so many prefer livelihood strategies that spread risk rather than maximize returns (Barrett et al., 2001). Engaging in a wide range of activities is one of the best ways of spreading risk because it allows households to change the mix and relative importance of activities depending on their circumstances at any point in time. In the context of uncertainty, permanently abandoning a particular livelihood activity and substituting it for a newly introduced activity would be considered risky. For example, evidence from Thailand, Nicaragua, and Tanzania suggests that

if households are used to getting a small daily income from fishing, they are unwilling to abandon this activity to focus on activities such as aquaculture that require significant investment and can take months to generate revenue (Torell et al., 2010). However, it cannot be assumed that all livelihood choices are made solely with the aim of achieving the optimal balance between material gains and risk. Attitudes to risk vary among individuals, and people engage in activities for a multitude of reasons, including enjoyment (Pollnac and Poggie, 2008). Ultimately, what people do has meaning for them, and this should not be ignored (Gough et al., 2007).

In seeking to understand livelihood strategies, it is necessary to move beyond simply considering a household's current portfolio of livelihood activities and acknowledge that the livelihood trajectory of each household will be different. Some households will be 'hanging in', continuing with the same activities purely to maintain their current standard of living, whereas others will be 'stepping up', investing in and enhancing their current activities or 'stepping out' by accumulating sufficient assets to launch into completely different activities (Dorward et al., 2009). The strategy of a household at any given time is determined by its goals and aspirations, stage in the demographic life cycle, assets, and the constraints imposed or opportunities provided by social and political structures (Niehof, 2004, Gough et al., 2007). Households in the stepping out category are more likely to have the capacity and assets to mitigate the risks involved in moving from an environmentally damaging activity to an alternative. In contrast, those hanging in are likely to switch only at severe levels of resource depletion or if they are under substantial pressure due to resource access restrictions. In either case, this could lead to considerable hardship.

Sustainable livelihoods approaches highlight that a single activity promoted by an alternative livelihood project is unlikely to fully substitute for the range of tangible and intangible benefits provided by the environmentally damaging activity it was intended to replace. However, by adopting a SLA and acknowledging the diversified nature of livelihood strategies in developing countries, conservation practitioners can improve their understanding of the role and function of environmentally damaging behaviours within household livelihood portfolios. Exploring the range of activities conducted by different households according to their asset profiles can help in determining which households have the greatest environmental impact and those most vulnerable to conservation-imposed resource access restrictions. Such information can help improve the targeting of future interventions. Finally, SLAs provide a framework for exploring the social-ecological system within which the livelihood strategies of households are embedded. This includes giving due consideration to endogenous and exogenous trends, as well as the power relations, politics, and institutions both within conservation programmes and the

broader landscape that determine the differential access to livelihood opportunities by different groups (de Haan and Zoomers, 2005).

4.5 Moving forward by realigning livelihood projects with the current conservation agenda

One critique of alternative livelihood projects describes them as ‘initiatives that promote unsustainable solutions that are poorly adapted to people’s capacities, have limited market appeal and fail to reflect people’s aspirations for their future’ (IMM, 2008: p.7). Here I have highlighted that poorly conceived projects result from shortcomings in conceptual design and inadequate understanding of the social context. Some conservation programmes already give thorough consideration to the complexity of livelihoods (e.g. IMM, 2008, FFI, 2013), but outdated assumptions are still prevalent in conservation on the ground. It is therefore important to recognize the complexity inherent in intervening to alter people's livelihood strategies. For instance, even if a promoted activity is adopted, it may only provide a degree of substitution within the target population. For example, a previous study around Takamanda National Park in Cameroon found that cocoa farming appeared to be shifting the focus of men away from forest-based activities such as hunting, but only for a proportion of the year. van Vliet (2010) explained that because the main income from cocoa is in October and November, the majority gets spent over the festive period leaving households reliant on income from other activities, including hunting, for much of the following year.

As conservationists are increasingly reminded through international forums of their ethical responsibility to do no harm to local people, it may be more appropriate to target livelihood interventions at those most vulnerable to resource access restrictions as a form of compensation. A focus on enhancing the existing livelihood strategies of this group, by making livelihood activities more effective, more efficient, or lower risk, can also help make them more resilient to change (Torell et al., 2010). Livelihood interventions targeted at other groups should be designed carefully to ensure they address real, locally defined needs and lead to positive social outcomes, but it is unlikely that these interventions alone will suffice when it comes to achieving conservation outcomes. Experience from Uganda indicates that the real value of livelihood interventions from a conservation perspective is in improving local attitudes toward conservation, thus reducing conflict and increasing cooperation between resource users and protected area authorities (Blomley et al., 2010). Building good community relations through effective livelihood interventions that establish a clear link to conservation may be a more appropriate and realistic aim than using these interventions as a direct behaviour-change tool. Such interventions could be considered a form of incentive to collaborate with conservation.

Whichever approach is used, it is important not to lose sight of the broader context because it is often macro-level processes, which are usually beyond the scope of livelihood interventions, that determine how livelihood pathways evolve. For instance, it was the international price of gold that eventually led to a switch from rattan harvesting to gold panning in North Sulawesi (Clayton et al., 2002). External trends may also ultimately offset the conservation gains of an intervention, even if local livelihood strategies do change as a result (Hill et al., 2012). The wider processes of social and ecological change must therefore be considered if livelihood interventions are to remain locally relevant and effective in conservation terms.

Finally, terminology is important. Shifting from the term 'alternative livelihood project' to the broader term 'livelihood-focused intervention', or simply 'livelihood intervention', removes the key, and simplistic, assumption of substitution. I believe this shift will lead to more realistic and nuanced theories of change in project design and evaluation. This small terminological change would be a step toward working more holistically with local people to improve both their well-being and the conservation status of the species and ecosystems upon which they depend.

Chapter 5

Local experiences of participating in livelihood interventions associated with a protected area: case study projects in villages around Takamanda National Park

5.1 Introduction

In Chapter 4, I discussed the concept of, and assumptions underlying, alternative livelihood projects. However, empirical evidence is needed on the extent to which these assumptions are met in the real world. Recognition of the need for an evidence base for the effectiveness of interventions in conservation has grown over recent decades, spearheaded by Pullin and Knight (2001) and Sutherland et al. (2004). The approach considered the 'gold standard' for compiling such an evidence base is the systematic review. Developed in the healthcare sector by the Cochrane Collaboration in the early 1990s, the systematic review process involves using explicit criteria to identify, appraise and synthesise all the empirical evidence available to answer a specific research question (Higgins and Green, 2011).

In 2012, the IUCN World Conservation Congress passed a Resolution (111) noting concern that 'a systematic review of alternative livelihood projects has not been undertaken to determine the extent to which they are meeting their goals for both people and biodiversity', which was considered alarming given the significant funds committed globally in conservation to develop such projects (IUCN, 2012: p.162). In response to this call, a partnership was formed between CIFOR, IIED, ZSL and the University of Oxford in early 2013 to begin the process of conducting a systematic review on the effectiveness of alternative livelihood projects, using protocols developed by the Collaboration for Environmental Evidence (CEE). As part of this review, I conducted an initial search of the published and grey literature to explore the history and continued use of alternative livelihood projects in conservation and developed a preliminary typology to distinguish alternative livelihood projects from other types of people-focused conservation and development initiatives (see: Wright, 2013). I maintained contact with the core team as the systematic review progressed and have now co-authored three journal articles with them; providing comments and input to Roe et al. (2014) and Roe et al. (2015), while conceptualising, researching and writing Wright et al. (2016) as part of my PhD research.

One of the inclusion criteria decided upon for the systematic review was that empirical studies had to focus on livelihood projects specifically designed to conserve a biodiversity target through the mechanism of substitution, thus excluding livelihood-focused development projects, which may be

similar in nature but ultimately have social rather than conservation goals. Furthermore, for studies to be incorporated into the evidence of effectiveness synthesis, they had to report on the achievement of biodiversity conservation outcomes. The effectiveness of projects in terms of socio-economic outcomes was not specifically assessed. The primary aim of the systematic review was to answer the question ‘Are alternative livelihood projects effective at reducing local threats to specified elements of biodiversity and/or improving or maintaining the conservation status of those elements?’ – thus determining whether or not such projects work. Secondary aims were to assess the state of the evidence base, understand more about the types of projects and contexts in which they are implemented, and determine the influence of specific effect modifiers (i.e. aspects of project design or implementation that influence effectiveness).

Roe et al. (2015) concluded that there is not compelling evidence that alternative livelihood projects work, and noted that the current evidence base does not allow conclusions to be drawn as to why they usually don’t work, or why they occasionally do. After filtering through 22,146 documents found in literature searches, and reading 839 studies in full, the systematic review team identified 97 studies, describing 106 projects, which met the basic criteria to be included in a map of the evidence. Of those, 20 studies, describing 21 projects, included an assessment of conservation effectiveness judged to be of sufficient quality to warrant inclusion in an evidence synthesis. Reporting conservation outcomes either in terms of changes in attitudes or behaviours, or using direct measures of change in conservation status, nine projects were said to have had positive impacts, nine neutral impacts and three negative impacts. Most of these studies were conducted by third party evaluators, but the three studies conducted by project implementers all reported positive outcomes, suggesting potential bias. However, the heterogeneity of effects detected should not have been surprising given the range of different types of projects captured in the systematic review and the variety of implementation contexts.

Of the 106 projects included in the evidence map in Roe et al. (2015), 44% were implemented in Asia and 32% in Africa, with most projects (65%) implemented in forest ecosystems. The majority of projects (82%) promoted alternative occupations, or a combination of alternative occupation and alternative resource and/or method. The types of projects were incredibly varied, promoting activities such as beekeeping, livestock rearing, intensified agricultural production, the cultivation and commercialisation of NTFPs, tree planting, butterfly farming, tourism, handicraft production and skilled trades (such as tailoring). Few projects were stand-alone interventions, with 88% implemented as part of a broader package of conservation activities. Most commonly, the biodiversity target was a named protected area, with 62% implemented alongside resource access restrictions. The livelihood activities which projects often sought to replace, or limit, included extraction of forest resources (timber and non-timber) (46% of

projects), agricultural expansion or livestock grazing (45%), hunting and trapping of wildlife (38%) and fishing (25%), with many projects addressing a range of threats simultaneously.

Of the nine alternative livelihood projects Roe et al. (2015) identified as having had a positive conservation outcome, two promoted an alternative method in the form of alternative cooking stoves to reduce fuelwood consumption (Nautiyal, 2011, DeWan et al., 2013), two were ecotourism initiatives which provided alternative sources of income (Langholz, 1999, Stronza, 2007), two involved micro-credit schemes which enabled participants to engage in a range of alternative activities (Rahman and Begum, 2011, Novriyanto et al., 2012), and the remaining three promoted farm-based practices involving butterflies, stall-fed cattle and betel leaf (Morgan-Brown et al., 2010, Engh, 2011, Islam and Nath, 2014). Most of these studies assessed changes in behaviours through interviews, with some studies relying on responses to direct questions about participation in illegal behaviours, which are notoriously prone to social desirability bias (St John et al., 2010a). Of the nine projects that were reported to have had no impact, two found that participant-level changes did not scale up to population-level change (Hill et al., 2012, Bauch et al., 2014), and other studies noted limited uptake of promoted activities (Eastmond and Faust, 2006, Varma, 2009), insufficient income generation (Brown, 2013), and time lags in income generation (Engh, 2011) as reasons for the lack of impact. Even when no behavioural change was reported, some projects were said to have at least improved attitudes towards conservation and protected areas (Herrold-Menzies, 2006, Blomley et al., 2010). However, three projects were reported to have had negative effects, either due to the additional sources of cash being used to increase exploitation of natural resources (Brock, 2013), or the projects leading to the complete breakdown in relations between local communities, NGOs and protected area authorities (Martinez-Reyes, 2014).

Systematic reviews are often conducted with the intention of developing evidence-based interventions (EBIs). This is particularly the case in fields such as child protection and social care, where EBIs have well-developed implementation strategies, with detailed manuals, delivery guidance, accreditation schemes and a body of scientific evidence to justify the approach. In such fields, smaller-scale, practitioner-developed interventions, which may actually be better suited to the local context, are generally considered inferior by policy makers. However, two decades into the development and promotion of EBIs within social services, and calls are now being made for a middle ground – locally designed, evidence-supported interventions (Ghate, 2018). Evidence-based conservation has not reached the extremes of other sectors, but the search for blueprint approaches is still prevalent. The systematic review by Roe et al. (2015) focused on alternative livelihood projects as a type of intervention, when in actual fact the term covers many different types of interventions, implemented for different reasons, in a variety of contexts. Systematic reviews looking at the effectiveness of a very specific approach to a

specified problem in a particular context are more likely to yield conclusions as to whether or not the approach works, but in the case of alternative livelihood projects, there have simply been too few evaluations of effectiveness to disaggregate findings at a more meaningful level. Furthermore, seeking to identify a single type of alternative livelihood project that works better than others in order to develop a model approach, or even on EBI, for wide-spread application within conservation would be misguided given the range of problems such projects attempt to address across a variety of different contexts. Yet there is clearly a need to improve the evidence base by documenting and assessing more conservation-focused livelihood interventions that promote substitute activities, and a need to develop a set of guiding principles that should be considered before engaging in the development of such a project.

Systematic reviews typically give more weight to quantitative outcome assessments over qualitative descriptive case studies (Murad et al., 2016). But while investigating the outcomes of livelihood interventions is clearly important for informing investment decisions, current and future project managers can learn more of relevance to improving project performance from detailed evaluations of process, i.e. how a project was implemented and how people responded to it (Moore et al., 2015). As discussed in Chapter 4, the outcomes associated with any conservation project are the result of both a conceptual design and an implementation process. Failure may be attributable to the intervention design or to poor implementation. Therefore, success depends on how well a project is implemented (Durlak and DuPre, 2008). Qualitative assessments can help others to visualise how a project worked in practice and can be used to explain, or even predict, the outcomes (Moore et al., 2015). Case studies can explore the strengths and weaknesses of a project from the perspectives of both project participants and project implementers, and can reveal the differing experiences of different groups (Patton, 2015). Although Roe et al. (2015) focused exclusively on the conservation outcomes of alternative livelihood projects, if the substitution assumption underlying the conceptual design of these projects is to hold, then certain social needs must be fulfilled by the new activity to replace whatever had previously been obtained from the old. Therefore, socio-economic outcomes are in theory necessary for conservation success.

Roe et al. (2015) specifically sought to explore whether certain aspects of project design, which they defined a priori, may function as effect modifiers and influence project outcomes. The four potential effect modifiers considered were 1) the presence of a contractual agreement, 2) the design of projects by local people, 3) the dependence of the promoted activity on the conservation of biodiversity, and 4) the specific targeting of groups considered a biodiversity threat. However, there was insufficient evidence in the documents assessed by the systematic review team to draw any conclusions, nor were additional potential effect modifiers identified. Qualitative, inductive research approaches based on

empirical observations can help in identifying and understanding the influences of effect modifiers, enabling a better appreciation of why some livelihood interventions have an impact and others do not.

In this chapter, I build on the systematic review carried out by Roe et al. (2015) and the recognised need for improved understanding of the mechanisms underlying the outcomes of livelihood interventions. I introduce seven case study projects implemented in villages around Takamanda National Park in Cameroon to illustrate what alternative livelihood projects can look like in practice. Capturing the perspectives and experiences of project participants and other community members, I compare these to official project reports and the perceptions of project implementers. For each case study project, I investigate how it was implemented and how people responded to it, discuss what social and conservation impacts it is likely to have had, and identify factors that appear to have enhanced or limited these impacts. The case study projects share many of the characteristics prevalent among the alternative livelihood projects described in Roe et al. (2015). They were designed to address a combination of threats, but principally hunting and the extraction of forest resources. The main conservation focus is a protected area, with projects implemented alongside a package of other conservation-focused interventions, including law enforcement to restrict resource access. All the case study projects were designed to provide an alternative source of income, with some also promoting an alternative resource or method. While the case studies do not capture the same diversity of project types described in the evidence map in Roe et al. (2015), they illustrate a variety of the types of farm-based alternative livelihood projects prevalent within Central Africa. The insights gleaned from these projects are likely to be applicable more broadly, particularly across the three landscapes in Cameroon in which the project implementer operates, but also across the Central Africa region and further afield. I therefore present the lessons learnt as a framework of guiding principles which can inform the design and implementation of livelihood projects in conservation moving forward.

5.2 Methods

5.2.1 Study area

The empirical research for this chapter was conducted in three villages in and around Takamanda National Park, which is located in the anglophone South West Region of Cameroon, adjacent to the international border with Nigeria (Figure 5.1; see section 3.3 of Chapter 3). Takamanda was upgraded from a forest reserve to a national park in 2008, which imposed resource use restrictions on the local population. Hunting and other livelihood activities deemed environmentally damaging are no longer permitted within the boundaries of the park. The collection of NTFPs is permitted, as is passage through the national park on agreed paths, but villagers are no longer allowed to remain in the forest for extended periods living in bush sheds while they harvest bush mango, since it was during these periods

that people also used to hunt (MINFOF, 2010). Under the umbrella of PSMNR-SWR, which launched in 2006 with funding from the German KfW, Takamanda National Park is managed by MINFOF in partnership with WCS, GIZ and the consulting firm GFA/DFS. PSMNR-SWR is an ICDP with both protected area management and village development objectives. MINFOF and GIZ are responsible for the village development component of the programme. In order to reduce the economic reliance of the local population on hunting and other forest-based activities, a package of livelihood interventions was implemented across 22 villages in and around Takamanda National Park during Phase I of PSMNR-SWR which lasted from January 2006 to June 2011 (Nyieh and Stenmanns, 2011). Many of the same livelihood interventions were also implemented in villages adjacent to Korup National Park and Mount Cameroon National Park by PSMNR-SWR over the same period.

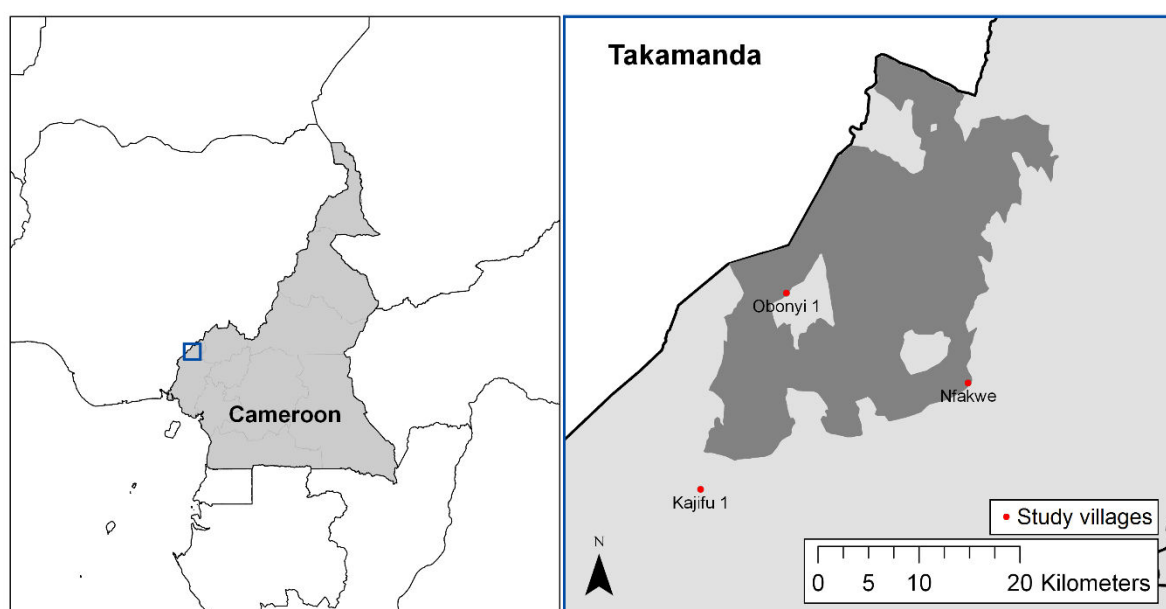


Figure 5.1: Map locating Takamanda National Park within Cameroon and showing the three study villages

Villages deemed to have an impact on the integrity of Takamanda National Park were visited by the PSMNR-SWR village development partners early during Phase I to assess their willingness to collaborate with the programme in order to achieve its conservation objectives. During these visits, the villages were informed about the ecosystem protection goals of PSMNR-SWR and the conditions they would have to meet in order to be eligible for village development support (Nyieh and Stenmanns, 2011). The chief and representatives from the village council were asked to sign a letter of commitment if they wished to proceed, specifically stating their commitment to collaborate on protected area management issues in exchange for development assistance. Those villages that signed a letter were later visited by consultants, recruited from Cameroonian NGOs, that helped each village prepare a village development plan. The consultants, who received training from GIZ, organised village meetings to ascertain the

development needs of each community and solicit ideas for appropriate livelihood and infrastructure projects. The priorities identified by each community were noted in their village development plan, which received sign-off from the chief and members of the village council at an adoption ceremony. PSMNR-SWR reviewed the suggestions put forward by the communities and retained those that had the potential to reduce pressure on the protected area by providing an alternative income and/or protein source. Preference was given to projects that could also help to improve natural resource management, for example by encouraging the use of agroforestry systems. Cost-benefit analyses were conducted for each potential intervention before a package of livelihood interventions were selected by PSMNR-SWR that could be rolled-out across many different villages with the intention of creating marketing economies of scale (Nyieh and Stenmanns, 2011). The final package of interventions that each village received therefore did not directly match the list of interventions identified in their village development plan. Partnership agreements signed by the village chiefs formalised the collaboration between each village and PSMNR-SWR, and signalled their acceptance of the development package offered. Existing groups in the villages were identified to take ownership of the different livelihood interventions when possible, assuming this would ensure their long-term sustainability (Nyieh and Stenmanns, 2011).

The seven farm-based alternative livelihood projects implemented in three villages around Takamanda National Park during Phase I of PSMNR-SWR are the focus of this chapter. These projects provided guidance and materials to support oil palm farming, pepper and ginger farming, snail farming, beekeeping, bush mango cultivation, cassava farming and processing, and cocoa farming. Service providers, such as the International Institute of Tropical Agriculture (IITA), were contracted by PSMNR-SWR to deliver training programmes, some of which were attended by local technicians from the Ministry of Agriculture and Rural Development (MINADER) who were trained as supervisors. The oil palm, beekeeping and bush mango projects were implemented in a subset of PSMNR-SWR's target villages initially before being rolled out to other villages, resulting in some villages receiving two 'doses' of the intervention, sometimes in a modified form (Nyieh and Stenmanns, 2011). Data collection for this chapter was conducted in 2014 – three years after the end of Phase I and while Phase II of PSMNR-SWR was still ongoing. Livelihood interventions focused on bush mango commercialisation, cassava farming and processing, and cocoa farming were continuing to receive support from PSMNR-SWR at that time. When these interventions were a continuation of the activities implemented during Phase I, as was the case for the cassava and cocoa projects, details of participant experiences were captured. However, the recently launched Forest Resources Processing and Marketing Cooperative (FREPROM-NTFP), which aimed to collectively buy and sell bush mango to secure a better price for harvesters, was not assessed because it was still in the early stages of implementation.

In order to select three representative villages to visit for this research, I first obtained details from PSMNR-SWR about the livelihood projects implemented in each village during Phase I and then identified which were considered to be direct impact villages that the programme had continued to engage during Phase II. Focusing in particular on livelihood interventions implemented as an alternative to bushmeat hunting, I excluded those villages in the grassland to the north of the protected area and instead focused on the Boki, Anyang, Basho and Ovande villages within the forest zone. Out of the 15 direct impact villages within this zone that had received two or more livelihood projects, I randomly selected two villages on the periphery of the park (Kajifu 1 and Nfakwe) and one within the enclaves (Obonyi 1; see Figure 5.1). Protected area management activities during Phase II of PSMNR-SWR included the construction of park infrastructure, and at the time of fieldwork the headquarters of Takamanda National Park had recently been constructed in Kajifu 1 and an ecoguard post had been completed in Obonyi 1, but neither were fully operational. As part of the village development component of Phase II, a new motorbike road linking Obonyi 1 to Kajifu 1 and the town of Mamfe had been completed, significantly reducing travel time to the administrative centre of Manyu Division. In contrast, Nfakwe was yet to be connected to the road network and was a 2-hour trek from the Mamfe-Akwaya motorbike road to the east of the national park. All of the livelihood projects assessed were implemented across all three villages, except the snail farming project which, out of the study villages, was only implemented in Kajifu 1. Two of the study villages received a double dose of some projects, with Obonyi 1 being a pilot village for the oil palm, beekeeping and bush mango projects, and Kajifu 1 for the beekeeping project. A summary of the characteristics of each study village is presented in Table 5.1 using data from the village census and village survey conducted in 2014 as part of the research for this thesis.

Table 5.1: Characteristics of the three study villages around Takamanda National Park in 2014

Village	Pop. size	Ethnicity	Road	Time to Mamfe [‡]	Park infrastructure
Nfakwe	233	Anyang	No	6 hours	None
Obonyi 1	356	Anyang	Yes	4 hours	Ecoguard post
Kajifu 1	819	Boki	Yes	2 hours	Headquarters

[‡] Estimated travel time to the divisional capital Mamfe using the fastest means of transport available

5.2.2 Data collection

Data were collected in the three study villages around Takamanda National Park in June and July 2014. Research ethics approval was obtained from the ZSL Ethics Committee and a research permit was granted by the Cameroon Ministry of Scientific Research and Innovation (MINRESI) before fieldwork commenced (see section 1.5 of Chapter 1). To conduct research in villages around a protected area, it was necessary to obtain permission from the Regional Delegation of MINFOF located in Buea, as well as

from the Conservator of Takamanda National Park based in Mamfe. For security reasons, it was stipulated by MINFOF that being accompanied to the field by an ecoguard was compulsory. An ecoguard therefore travelled with the research team to each of the study villages but was not involved in any aspects of the research. At the village level, permission to stay and conduct research was sought on arrival from the chief. A village meeting was arranged for early the next morning, with the '*town crier*' announcing the meeting at dawn to ensure everyone was made aware before going to their farms. During the village meeting, the purpose of the research, methods to be used, time involved, and anticipated outputs were explained in the local language in a way that those in attendance could understand (see the village information sheet in Appendix A). It was emphasised by my research team that I was a doctoral student and therefore an independent researcher not working for PSMNR-SWR. It was also made clear that participation in the research was completely voluntary, that the village was not obliged to grant access to potential research participants and refusing permission would not have any negative consequences. The role of each member of the team was explained, including the necessity to be accompanied to the field by an ecoguard, and assurance was provided that the data would be kept confidential and only anonymised, amalgamated research findings would be shared with the PSMNR-SWR partners. To moderate expectations as to the benefits that might result from the research, we explained that the purpose was to understand the effectiveness of livelihood interventions in conservation in general and that there would be no direct benefits for the community. The villagers were then given the opportunity to debate and ask questions. When permission to work in the village was granted, a small contribution of 10,000 XAF (21 USD¹) was donated at the village meeting to the community's village development fund as a token of appreciation.

My research team consisted of three members: myself as the lead researcher (female, white, British), Catherine Chopjou as my research assistant (female, anglophone Cameroonian, Bangwa) and a local facilitator (male, anglophone Cameroonian, Anyang) who went by the name '*Tiger Wood*'. Catherine was from the South West Region of Cameroon but from a different division and was unfamiliar with the Takamanda area. She had recently graduated from the University of Buea and was recruited through a Cameroonian NGO based in Buea called the Resource Centre for Environment and Sustainable Development (RCESD), which provides training opportunities for students and graduates interested in working in the conservation sector. Tiger Wood was a local facilitator recommended by WCS who was familiar with the villages around Takamanda National Park having worked with several international researchers before. Catherine and I conducted the research, working together as a team. Tiger Wood's role was to accompany us to each village and help explain who we were and the purpose of the research, as well as preparing food each day. We were accompanied by an ecoguard called George, an anglophone

¹ 1 USD to 481 XAF on 1 June 2014

Cameroonian from the North West Region, who attended each village meeting but otherwise kept out of the way whilst the research was in progress. The team developed a good rapport with the communities despite there being some animosity towards the PSMNR-SWR partners. Before travelling to the villages, Catherine received training from me on the research methods and in research ethics. The informed consent process and the need to ensure confidentiality were also explained to Tiger Wood and George.

Although interviewer bias, whereby respondent answers are influenced by interviewer characteristics, is more of a risk when a researcher comes from a different cultural background, I deemed my involvement in all aspects of the research to be advantageous overall for the deeper understanding of the study context and individual circumstances that this enabled (Browne-Núñez and Jonker, 2008). My previous experience of having spent prolonged periods of time living in rural villages approximately 85 km southeast of the study area meant that I was already very familiar with the way of life and many aspects of the local culture, as well as being able to comprehensively understand the lingua franca, pidgin English. I also made an effort to learn basic greetings, means of showing appreciation and vocabulary relevant to the research topic in the two local languages spoken in the study villages – Denya in the Anyang villages and Bokyi in the Boki village. Hearing me speak in pidgin English, Denya and Bokyi caused surprise and amusement, but people appreciated it and speaking the local language helps with building rapport (Drury et al., 2011). I deliberately recruited a research assistant with no prior experience of, or ties to, the study area or the PSMNR-SWR partners to increase the confidence of research participants in our impartiality and ability to maintain confidentiality. Respondents are often more willing to open up and disclose information, particularly on sensitive topics, to strangers who will leave the area than to people with whom they are familiar (Lund et al., 2011). Tiger Wood, who was known to many of the research participants, was not involved in data collection except in rare circumstances when the respondent was unable to communicate in pidgin English. In each village, the team stayed with a family based on the recommendation of the chief. This was preferable to sleeping in tents, as it helped us to feel part of the village rather than separate from it, and further enabled my immersion in the research setting (Moon et al., 2016). Due to the multi-site nature of this research project, the length of time spent in each study village was limited to seven or eight days.

To get an unbiased insight into people's perceptions and experiences of the livelihood interventions implemented by PSMNR-SWR around Takamanda National Park, interviews were conducted with households selected at random in each study village. This was to avoid the selection bias that may have occurred if a more opportunistic sampling approach had been used, whereby households with a higher degree of involvement with or interest in the livelihood projects could have distorted the results. Instead, I wanted to ensure that all perspectives present in the population were captured within the

sample, including those of non-participant households. Using a random sample increases confidence that the findings can be generalised to the population-level, which in this case consists of households across the 15 livelihood intervention villages in and adjacent to the forested portion of Takamanda National Park (Drury et al., 2011). Originally, I had planned to use a stratified random sampling approach, selecting an equal number of households that had participated and not participated in the livelihood interventions (Shively, 2011). However, it became clear after speaking with key informants at MINFOF and GIZ, and was verified on arrival in the first village, that there were no easily available lists of participant households and that, given the number of livelihood projects implemented, most households had participated in at least one of them. A simple random sample was therefore deemed to be the best option, with households later categorised according to how many livelihood projects they had been involved in. To facilitate the random selection of households, a village mapping exercise and census were carried out as soon as approval was granted to conduct research in the village. At each village meeting, we identified someone with extensive knowledge of the community who could assist with the mapping process so that a comprehensive list of households could be created for use as a sampling frame.

Defining a household is notoriously difficult in many African contexts where households are not discretely bounded entities and it is often hard to establish membership. The number of people residing together may be in constant flux as members of a large extended family depend on or fulfil obligations towards each other in different ways and at different times (Randall and Coast, 2015). Emic perceptions of household membership tend to be more inclusive than typical survey approaches and this is deemed important for understanding household resilience, however, for the purpose of this study, smaller household units were preferable to understand the perspectives of different generations towards the livelihood interventions implemented by PSMNR-SWR. Therefore, despite it being common for extended families to live in the same compound in the villages around Takamanda National Park, the residents in these compounds were divided into smaller nuclei consisting of married couples or widows and the unmarried children that reside with them most of the time. Young couples living in the same house as their parents were therefore considered a separate household. Polygamous families were divided up, with each wife considered to be semi-autonomous, and careful attention was paid to not double count men. Every woman who had been married tended to have her own kitchen, so the number of kitchens within a compound was a good indicator of the number of households. Absent family members, including children away at school, were excluded from the census.

The research in each village therefore began with Catherine, myself and the village assistant walking around the entire community drawing a sketch map indicating the location of each building relative to roads, paths, bridges and local landmarks, such as schools, churches, small provisions stores and bars.

We visited each house and made enquiries as to who lived there. This enabled us to determine how many households lived in each building, and each household was then numbered on the map. The materials used to construct the walls and roof of the main living space for each household were indicated to help facilitate locating the household again afterwards. At the same time, the full names of both the male and female head of each household were recorded in a notebook, along with the number of other male and female household members, indicating how many of these were aged 16 and older. If there was no one inside the compound at the time of the mapping exercise, nor any neighbours that could help, we noted down who lived there based on the information provided by the village assistant. We made an effort to cover each village in full, continuing down roads and paths to the village boundaries to ensure that all households were captured. The mapping and census activity took a full day to complete in each village but was also used as an opportunity to introduce ourselves and the purpose of the research to members of each household individually. During this process, we were able to familiarise ourselves with the village setting, including its infrastructure, and begin to note such details on a village survey form (included in Appendix B). Taking a tour of the entire village allowed me to gain a better understanding of the context for livelihood project implementation. Collecting the full names of household heads during the census and noting how many households resided in each compound ensured that links between extended families were retained despite using a relatively narrow definition of a household for sampling purposes. Family connections play a key role in determining the level of influence a particular household has, and its degree of access to resources, therefore it was deemed important not to lose sight of how the different households were interconnected.

Once the sketch map of the village and household census were complete, pre-printed random number tables generated in Microsoft Excel were used to randomly select numbered households for interview. Thirty households were selected in Nfakwe, the smallest village, and 40 in Obonyi 1 and Kajifu 1. The sketch map and names of household heads were used to relocate selected households. Households were visited in the order they were selected as much as was practically possible, with some households further down the list visited ahead of time if they were close to one just interviewed. Interviews were conducted with the male and/or the female household head, depending on availability. If neither were available, a suitable time to return was arranged with those present. Households were visited again at a later stage if there was no one around, which was common during the day when everyone had gone to their farms. Aware of how people's daily routines revolved around farming, we maximised the hours most convenient for respondents, typically in the early morning and late afternoon (Lund et al., 2011). Interviews were paused and resumed at a more convenient time if necessary. Since interviews took place at the respondent's home, it was hard to insist on privacy and indeed it was advantageous to have other

members of the household present to provide details of the livelihood projects they had been involved with. If more than one person answered the questions, a note was made of who provided each response.

Repeat visits were made until 24 of the 30 selected households had been interviewed in Nfakwe, 29 of the 40 households in Obonyi 1, and 28 of the 40 households in Kajifu 1. Additional households were randomly selected in Nfakwe and Kajifu 1 to substitute for those unavailable for interview, but in each case only one substitute household was interviewed due to time limitations. Following a rule of thumb suggested by Shively (2011), I aimed for a minimum of 25 household interviews per village. The final sample size was 25, 29 and 28 households in Nfakwe, Obonyi 1 and Kajifu 1 respectively, resulting in a total sample of 82 households across the three villages and a mean sampling effort of 44% (Table 5.2). The mean non-response rate was 26%. This was largely due to household heads having temporarily travelled outside the village or otherwise being absent whenever Catherine and I visited. Most were likely at their farms or in the forest. Nobody refused to participate in the study, but it is possible that one or two household heads avoided being interviewed by being absent when we visited.

Table 5.2: Sample size, sampling effort and non-response rates in the villages around Takamanda National Park

Village	No of HHs		Sample size		Sampling effort	Non-response rate
Nfakwe	37		25		68%	20%
Obonyi 1	65		29		45%	28%
Kajifu 1	157		28		18%	29%
		Total	82	Mean	44%	26%

Household interviews were structured with a mix of open-ended and closed questions. The intention initially was to completely standardise the household survey and for it to have a more quantitative leaning, following guidance in Angelsen et al. (2011). However, it became apparent whilst piloting and implementing the survey that more flexibility was needed to really understand how the livelihood interventions were perceived and experienced by households. Using open-ended questions and encouraging a more conversational response, taking detailed notes both on the datasheet and in an accompanying notebook, proved to be considerably more insightful, as has been experienced by other researchers studying attitudes and perceptions in an African setting (Browne-Nuñez and Jonker, 2008). Shifting to a more qualitative approach, priority was ultimately given to ensuring the internal validity of the data over the replicability of the survey (Drury et al., 2011). A series of standard questions was still asked of each respondent following the order in the household survey datasheet in Appendix B, but supplementary questions and probes were used to encourage a fuller response. Sections of the interview collecting factual information about the household remained structured, while those soliciting opinions about the livelihood interventions were essentially semi-structured. Asking the same core questions of

each respondent ensures that comparable data is collected from each household, whilst probing to follow up on leads helps capture complexity and ensure data accuracy (Bernard, 2006).

Interviews began with a series of questions on household composition and characteristics, main income-generating activities and use of forest resources. Respondents were then asked questions to explore their knowledge of the livelihood interventions implemented in their village. They were asked to indicate which interventions members of their household had been involved in. Each project was listed in turn, which prompted respondents to briefly express their opinions on each, whether members of their household had participated or not. These initial reactions were noted down, then respondents were asked to reflect on their personal experiences of having participated in one or more of the interventions. Their accounts of how the projects functioned were recorded as well as details of what they felt they gained or lost through participating, and whether they perceived access to project benefits to have been fair. A question was also asked to understand what respondents thought about Takamanda National Park, specifically the positives and negatives associated with park management and village development activities. This enabled me to get a sense of how much respondents valued the livelihood projects and to what extent these were seen to have offset the resource access restrictions imposed. The interview questions were initially pre-tested on willing volunteers in Mamfe before the full process of gaining village permissions, mapping and conducting a census of the village, completing the village survey, randomly selecting households and conducting household interviews was piloted in a village close to the periphery of Takamanda National Park. During the pre-testing phase, Catherine and I worked together to appropriately phrase the questions in pidgin English, using terminology the respondents would easily understand. Interview questions were then piloted as fully as possible in the village chosen; however, this was not a livelihood intervention village in which PSMNR-SWR had worked, and as such not all questions in the survey were relevant in this context. Nevertheless, going through the full research process in the field was valuable practice for all members of the team, and led to several modifications being made to the research protocol before we began data collection in the first study village.

Free, prior and informed consent was obtained from respondents before each interview commenced. The purpose of the research, how long the interview would take and anticipated outputs from the study were explained in a way everyone could understand (see the participant information sheet in Appendix A). It was emphasised that participation in the research was completely voluntary, and the person could refuse to partake, or refuse to answer specific questions, and was free to withdraw from the study at any time without giving a reason. Assurances were provided that the data would be kept confidential and that the research findings would be anonymised. It was also made clear that there would be no benefits or negative consequences from participating in or refusing to partake in the research. Prospective

respondents were given the opportunity to ask questions or consult a family member or friend before agreeing to participate in the study. Respondents were then asked if they would be happy for the interview to be audio recorded, and in most cases they were. The interviews were conducted in pidgin English, a language I understand very well but cannot fully converse in. Therefore, a one-way translation process was used whereby Catherine asked the questions while I made detailed notes and asked for clarification if there was anything I did not understand. Being able to follow the interview meant that I was able to ask additional questions and cue Catherine to probe further when interesting or unusual responses were given. The duration of interviews was kept to one hour as much as possible to avoid taking up too much of the respondent's time. At the end of each interview, a small handful of Maggie stock cubes was given to the household as a courtesy gift to thank them for participating in the study.

A limitation with using interviews as a research tool is that the responses people give may not be entirely accurate. Uncritical acceptance of the information provided can compromise the value of interview-based research, therefore it is important to acknowledge potential sources of bias (Drury et al., 2011). Attitudes and opinions are internal, so it is difficult to verify whether what a respondent says is what they actually think. There may be perceived advantages to answering questions strategically, particularly when the research topic is about development assistance and the lead researcher is from a different country. To minimise this risk, care was taken to moderate expectations by being completely transparent about the aims of the research and the likelihood of there being any direct benefits for the community. At the end of each interview, based on observations of the respondent's body language and the way in which they worded or modified their responses, I assigned reliability scores to indicate the extent to which I perceived them to have answered honestly and accurately. Two scores were assigned to each household, one relating to their answering of the questions in general and another specifically focused on the answers provided to questions about hunting. Of the 82 interviews conducted in the villages around Takamanda National Park, the information provided during two interviews was considered to be potentially unreliable and was treated with caution during data analysis. In addition, a further five households were suspected of having provided unreliable information about their hunting practices while providing reliable information in the rest of their interview.

The reason why hunting is particularly likely to have unreliable information is that the efforts of the PSMNR-SWR partners to raise awareness of the illegality of hunting within Takamanda National Park has made some respondents hesitant to talk openly about this behaviour for fear of repercussions. This is likely to have caused some additional systematic measurement error due to the underreporting of hunting within the sample, over and above the five interviews already mentioned. In order to minimise this bias as much as possible, so as to understand whether the livelihood projects have had an effect on

the hunting behaviour of households, the topic of hunting was treated sensitively through use of a casual questioning approach (Lund et al., 2011). In the context of a discussion about livelihood activities in general, probing was used to enquire about the different forest-based activities that were important for each household. This encouraged many households to open up about their hunting activities without being directly asked. Specific questions about hunting were only asked later in the interview once a rapport had been built with the respondent. The series of direct questions about hunting began with a question about whether anyone in the household had ever hunted, and this led on to being able to ask the more sensitive question of whether anyone in the household continued to hunt. If respondents appeared hesitant to answer, I alleviated concerns as much as possible by providing assurances about confidentiality and reiterating my independence as a researcher and that no data would be shared with the PSMNR-SWR partners. However, being cognisant of the sensitivity of this topic, I later conducted a follow-up survey to get a better understanding of the prevalence of hunting in the PSMNR-SWR villages. This involved use of a quantitative sensitive questioning approach called the unmatched-count technique (Nuno et al., 2013, Nuno and St. John, 2015). Although the findings are not presented in this thesis, a brief overview of the study is provided in Appendix C.

To triangulate interviewee statements, information about the livelihood projects was also collected at the village level. Informal conversations were held with project focal points, as well as village leaders, and whenever possible any ongoing activities associated with the livelihood projects were observed. Tangible aspects, such as demonstration farms, beehives and cassava grinding machines, were visited and photographed to verify their continued functionality and degree of use. Details of discussions and observations were recorded in a notebook or on the village survey form. Although the length of time spent in each village limited the opportunity for direct observation, it enabled me to gain an insight into the legacy and longevity of each project. Informal key informant interviews with project managers and/or field staff from GIZ, MINFOF, GFA/DFS, WCS and MINADER helped me to understand the perspectives of project implementers and other PSMNR-SWR partners. All project documents that were made available by the PSMNR-SWR partners or were publicly available online were reviewed. This included the official final report from Phase I of PSMNR-SWR by Nyieh and Stenmanns (2011), the quarterly newsletter published by PSMNR-SWR called Conservation Echoes and the PSMNR-SWR website (<http://psmnr-swr.org/>). This information enabled comparisons to be made between the perceptions of project implementers and the perceptions of participants, as well as helping to clarify technical details.

5.2.3 Data analysis

The detailed notes written on the datasheets and in the accompanying notebooks during household interviews were typed up in full in Microsoft Excel, with separate spreadsheets used for the socio-

demographic variables and the open-ended responses to questions about the livelihood interventions. The audio recordings were not transcribed but were checked if clarification was needed. Use of the long play setting on the digital voice recorder to ensure enough memory capacity to record all interviews unfortunately resulted in poor quality audio. Descriptive statistics were conducted on the household-level socio-demographic variables to characterise the final sample. Cross-tabulations and chi-squared tests were then used to assess whether any socio-demographic factors were associated with household-level participation in the livelihood projects. These quantitative analyses were conducted in SPSS version 25 (IBM Corporation, 2017). The qualitative data on participant experiences of each project were analysed using a thematic analysis approach (Braun and Clarke, 2006, Ritchie et al., 2014). This is a systematic method of analysing qualitative data that involves comparing and contrasting the views and experiences of different respondents in relation to a series of themes and concepts pertinent to the research questions. The aim of thematic analysis is to comprehensively map the range and diversity of views and experiences to produce data-driven descriptions as well as identify more abstract concepts that could be applicable in similar contexts elsewhere.

Once I returned from the field, I printed out the notes entered into the Excel spreadsheet and immersed myself in the data project by project. While familiarising myself with the data relating to the beekeeping project, I highlighted different aspects of the data and created an initial thematic framework. I then applied and refined this framework while reading through data on the pepper and ginger project. The revised thematic framework consisted of seven themes: 1) reasons for participation, 2) issues related to access to the project, 3) how the project was implemented, 4) perceptions of the quality of implementation, 5) whether the project led to uptake of the promoted activity, 6) whether a cash or non-cash income resulted from the project, and 7) whether forest use behaviours changed as a result of participation. I then went through the printed data for the remaining projects and colour-coded all text relevant to these themes. This enabled the review of all data relating to each theme for each project.

In qualitative research, data analysis continues throughout the write-up process. To allow others to understand the realities of livelihood projects on the ground, I decided to write detailed descriptive accounts of the data, with interpretative discussion, for each of the seven case study projects. These narratives draw data from project documents, informal conversations and direct observations, as well as from household interviews, and are presented as answers to a series of key questions about each project. Project documents and notes from key informant interviews with project staff were scrutinised to pick out the logic underlying the implementation of each livelihood project and any assumptions that were made explicit. This information was used to construct a simple theory of change and summarise the aims, implementation strategy and reported outcomes for each project. Reviewing the household

interview data coded to each theme of the thematic framework, I documented the range of perceptions, views and experiences described by different respondents, including contradicting perspectives, and used quotations to illustrate the recurrent, or otherwise pertinent, points raised. During this process, I started to think more conceptually about the underlying issues illuminated by the data and considered potential explanations for the patterns observed. As I prepared the descriptive narratives one project at a time, I identified key factors from across the dataset that appeared to have an impact on the effectiveness of the livelihood projects and added these to an initial list of higher-level concepts.

This list of concepts was later structured into a hierarchical coding framework in the qualitative data analysis software MAXQDA 2018 (VERBI Software, 2017). The narrative descriptions of each project were then imported and coded according to this framework – with codes added, merged, reordered, renamed or deleted as appropriate (Silverman, 2014). Through an iterative process of review and refinement, the main factors that should be considered by conservation practitioners during livelihood project design and implementation were distilled from the data and clustered into four overarching dimensions. The final version of this conceptual framework represents a first attempt to develop a comprehensive set of guiding principles for the implementation of livelihood projects in conservation, with broad applicability beyond the research context.

5.3 Results

5.3.1 Socio-demographic characteristics of the sample

Of the 82 households interviewed across the three study villages, 67 (82%) recognised a male member of the family as being the household head, with 15 (18%) recognising a female head of the household. The average age of male household heads was lower than that of females at 49 years compared to 64 years. Female-headed households were more likely to be struggling to fulfil their basic needs than male-headed households, with most female household heads being widows. The education level of household heads was generally low, with a relatively high proportion (26%) having never gone to school. The majority (56%) had attended primary school for at least a year, but relatively few (18%) had continued onto secondary school. This is largely a reflection of age, since the people in these villages aged 56 and over appear not to have had the opportunity to receive a secondary education. For women over 56, 69% did not receive any formal education. Most household heads (90%) originated from the village. Those who had in-migrated typically came from neighbouring villages and had moved because of marriage or other family connections. However, two households captured in the sample had moved to the village because of work, with one male household head being the headteacher of a primary school and another being the pastor at a church. The mean household size was six, with the ratio of adults to children being 50:50, so the average household was comprised of three adults and three children aged under 16. Fifty-seven

percent of the households interviewed had at least one person with an official position in the village council, ranging from leadership positions, such as chairman, secretary or treasurer, to membership of a committee, such as those representing the interests of women or the youth (aged ≤ 35 years).

Cocoa was the main source of income for 44% of households, with 37% getting their main income from bush mango, 10% from paid work, 5% from cassava and 4% from other activities. However, the majority (73%) of households received some form of income from cocoa, even if it was not their main income source. Many had planted cocoa trees but were still waiting for them to mature. Farm sizes ranged from 0.25 to 15.5 ha, with households having 4 ha (± 3) of farmland on average, usually made up of separate 1 ha patches which they had cleared or inherited over the years. Thirty-nine percent of households in the sample can be considered forest dependent because their main income in 2014 came from NTFPs. No households specified that their main income was from hunting, but 49% of households had at least one member who knew how to hunt and had hunted in the past. Ninety-four percent of households either owned their own home, which they had built themselves, or lived in the family compound. The majority (65%) of houses were built from locally made mud bricks rather than traditional wattle and daub, with 70% having corrugated iron, rather than thatched, roofs. However, this differed between villages, with 80% of houses in Nfakwe being made from wattle, daub and thatch. This is likely due to having to carry goods to Nfakwe by headload in the absence of a road and motorised transport.

Due to the relative isolation and lack of mobile phone reception, relatively few people (22%) had mobile phones in Nfakwe, but 48% and 68% had them in Obonyi 1 and Kajifu 1 respectively, where connectivity was marginally better. There was a similar pattern for radios, with less households owning one in Nfakwe (38%) compared to Obonyi 1 (66%) and Kajifu 1 (68%). However, 83% of respondents in Nfakwe perceived that the livelihood security of their household had improved over the last 5 years – a higher proportion than in Obonyi 1 and Kajifu 1, where 66% and 61% perceived improvements but others thought their situation had either not changed or gotten worse. The majority (84%) of the randomly selected households interviewed had participated in one or more of the livelihood projects implemented by PSMNR-SWR. Households participated in 3 (± 2) projects on average. Answers to the questions asked about the livelihood projects were mainly provided by the 50 men and 32 women who were the primary respondents in their respective households, although contributions were also made by other household members in some cases. The average age of the primary respondents was 49 (± 15) years.

5.3.2 Determinants of household-level participation in livelihood projects

Without baseline data, it is not possible to describe the characteristics of the households prior to participation in the livelihood projects, however some inferences can still be made based on household

characteristics at the time of the interviews, keeping in mind that the livelihood projects may have had an influence on farm size, perceived livelihood security and forest dependence. The households most likely to have participated in four or more livelihood projects had: 1) a male household head, 2) a household head aged 36-55, 3) three or more adults, 4) someone with an official position in the village council, 5) more than 4 ha of farmland, 6) a relatively secure livelihood, and 7) someone with a history of hunting (see Table 5.3). They were also more likely to be based in a smaller village, where there are likely more opportunities to get involved in whatever is happening. Conversely, the households most likely to have not participated in any livelihood projects had: 1) a female household head, 2) a household head aged 56 and over, 3) one or two adults, 4) no official positions in the village council, 5) less than 2.5 ha of farmland, 6) difficulties meeting basic needs, 7) more dependence on the forest, and 8) no one with a history of hunting. They were also more likely to be based in the largest village, Kajifu 1. Overall, the factors that appear to determine the likelihood of a household having participated in one or more of the livelihood projects were whether the household had someone in the village council, a secure livelihood portfolio and a large farm. Households with a history of hunting were also significantly more likely to be involved in several livelihood projects, which could reflect the degree of targeting by project implementers or be a general reflection of the number of physically active men in the household.

Table 5.3: Socio-demographic determinants of household-level participation in livelihood projects

	Number of livelihood projects						Total <i>n</i>
	0		1-3		4-7		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Sex of household head $\chi^2 = 3.331$, df=2, n=82, p=0.189							
Male	9	14%	29	43%	29	43%	67
Female	4	27%	8	53%	3	20%	15
Age of household head $\chi^2 = 6.888$, df=4, n=82, p=0.142							
16-35	3	17%	10	55%	5	28%	18
36-55	2	7%	10	36%	16	57%	28
56+	8	22%	17	47%	11	31%	36
Education of household head $\chi^2 = 0.500$, df=2, n=82, p=0.779							
<Primary	11	17%	29	43%	27	40%	67
>Secondary	2	13%	8	53%	5	33%	15
Number of adults (≥ 16) $\chi^2 = 1.243$, df=2, n=82, p=0.537							
1-2	8	20%	17	44%	14	36%	39
3+	5	12%	20	46%	18	42%	43
Position in the village council** $\chi^2 = 12.377$, df=2, n=82, p=0.002							
Yes	5	11%	16	34%	26	55%	47
No	8	23%	21	60%	6	17%	35
Farm size*** $\chi^2 = 17.693$, df=4, n=79, p=0.001							
<2.5 ha	11	34%	14	44%	7	22%	32
2.5-4 ha	1	4%	13	57%	9	39%	23
>4 ha	1	4%	8	33%	15	63%	24

Perceived livelihood security*** $\chi^2 = 19.131$, df=4, n=82, p=0.001							
Comfortable	0	0%	11	44%	14	56%	25
Coping	5	13%	20	50%	15	37%	40
Struggling	8	47%	6	35%	3	18%	17
Forest dependant $\chi^2 = 3.075$, df=2, n=82, p=0.215							
Yes	7	22%	16	50%	9	28%	32
No	6	12%	21	42%	23	46%	50
Hunting household*** $\chi^2 = 16.069$, df=2, n=82, p=0.000							
Yes	1	3%	16	40%	23	57%	40
No	12	29%	21	50%	9	21%	42
Village size** $\chi^2 = 17.347$, df=4, n=82, p=0.002							
Small (Nfakwe)	1	4%	8	32%	16	64%	25
Medium (Obonyi 1)	3	10%	14	48%	12	42%	29
Large (Kajifu 1)	9	32%	15	54%	4	14%	28

Asterisks indicate the level of significance: * P<0.05; ** P<0.01; *** P<0.001

5.3.3 Case study 1: Oil palm farming

What was the aim of the project and who was targeted?

Oil palms are native to the humid lowland forest areas of West and Central Africa. As such, oil palm already plays an important role in subsistence farming systems and the cash economy in the South West Region of Cameroon. Yet the yields of palm oil from traditional forms of oil palm farming are relatively low. The aim of the oil palm project was to introduce improved varieties of oil palm that can produce higher yields of palm oil, which can then be sold locally to satisfy national and regional demand. The project mainly targeted men.

How did the implementers of the project envisage it having an impact?

In targeting men, the oil palm project aimed to increase incomes so as to reduce dependence on hunting, fishing and the collection of NTFPs inside Takamanda National Park. This impact was expected to be achieved through the activities, outputs and outcomes detailed in Figure 5.2. The project was implemented in 17 villages, with 340 individuals participating in total. Approximately 800 pre-germinated seeds of the improved variety of oil palm were provided to a newly created group in each village. The oil palm project was expected to have an impact in the longer-term (after 3-4 years) once the palms distributed reached maturity. The project began in 2008.

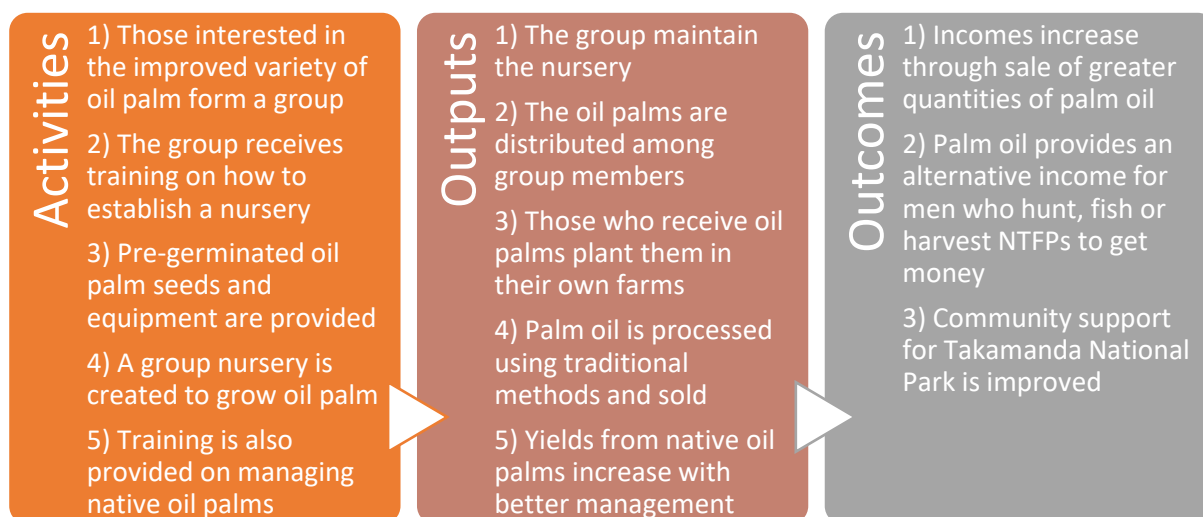


Figure 5.2: Reconstructed theory of change for the oil palm project implemented by PSMNR-SWR

Who participated and why did they participate?

Across the three villages, 23 individuals (from 28% of the households sampled) took part in the oil palm project. Participants ranged in age from 25 to 75, with an average age of 48. All participants captured in the sample were male, however one female participated indirectly by receiving training and equipment from her brother. One of the reasons people decided to participate in the project was because the implementation team explained in a village meeting that the introduced variety of oil palm would ‘*produce plenty oil*’ compared to what is known as ‘*country banga*’, the local variety of oil palm traditionally grown in these villages. However, one respondent who did not participate explained that he did not see any reason to do so because they did not need more oil palm seeds – ‘*banga plant themselves, we do not need to add them again, I have so many that I kill some*’ (male, 38, Obonyi 1).

How was the project implemented? How were participants selected?

As was the case with most of the projects, a village meeting was organised by the implementation team and everyone who wanted to take part in the oil palm project were asked to form a group – ‘*they said we needed to be in a group, so a group was formed when wildlife* (the term used to describe anyone associated with the national park) *came and I joined*’, ‘*they only train people for groups*’. In general, the project appears to have been open to all – ‘*it was open to everybody to join with no restrictions*’, but those who wanted to join the newly formed group had to pay a registration fee – ‘*to join the project you had to register to a group, pay 1,000 [XAF] (2 USD) and abide by the laws of the group. The group can expel you depending on conduct*’. The implementation process was slightly different in Obonyi 1, as compared to Nfakwe and Kajifu 1, because the oil palm project was rolled out in two phases. Obonyi 1 was involved in both phases whereas the other villages were only involved in the second phase. In Obonyi 1, the pre-germinated seeds were initially given to the group and a group nursery and farm were

created. However, participants reported that the group farm did not function well – *‘they gave to a group but people didn’t put effort and the group farm was abandoned’*, *‘we gave the group farm to the village council, the group people were not serious’*. However, the village council appears to have maintained this farm – *‘the village now has the group farm, and everyone has to go work the agric banga in the village farm’*. During the second phase of the project, a group nursery was created but this time the oil palms were divided amongst members of the group to plant in their own farms – *‘the second time we shared among individuals’*. This was the model that was later replicated in the other villages. The group in Obonyi 1 discontinued meetings once the palms had been divided between them.

Did participants think that the project was implemented well?

Respondents in Obonyi 1 described receiving training on how to nurse the seedlings, and how to harvest the local variety of oil palm once the plants grow too tall to be harvested in the traditional way. Some people from Obonyi 1 were also given the opportunity to attend a 3-day training workshop in a nearby village. However, the villages that only took part in the second phase of the project did not report receiving the same level of training. In Nfakwe and Kajifu 1, respondents stated that they did not receive much training and were just given the seeds and the polythene bags to plant them in – *‘they never taught anything, just brought seeds and polythene bags’* (male, 60, Nfakwe), *‘no one came to train in banga, they just gave improved seeds which we planted in a group and later shared to members’* (male, 40, Kajifu 1). The group in Nfakwe appears to have had the least success with the oil palm project because the seedlings in the nursery were eaten by rodents – *‘rats chopped all’*. The respondents from Nfakwe stated that they had informed *‘wildlife’* and requested more seeds but that the implementation team had not provided them with any. As such, several of the respondents in Nfakwe complained that the training had not been sufficient since they should have been taught how to protect the nursery from animals, and the lack of follow-up support was an issue. Although the group farm idea was not successful in Obonyi 1 and the implementation team adapted their strategy accordingly, one respondent was left disappointed by this – *‘I expected we would have a specific farm to learn from, like with cassava, but now each stem is in someone’s farm’* (male, 32, Obonyi 1).

Did participants apply what they learnt? Did they continue with it? Did they expand production?

In Obonyi 1 and Kajifu 1, those who received oil palms planted them in their farms and at the time of the interviews were still waiting for the plants to mature and start producing palm nuts. The number of oil palms received by members of the group in Obonyi 1 varied substantially, with one of the younger members (male, 29) claiming to have received four, while two of the older group members (males, 52 and 60) received 50 and 100 palms respectively. Aside from the limited number of oil palms of the improved variety that were supplied by the project, no one had sought to acquire additional seeds from

elsewhere. Instead they had continued with their local variety of oil palm, which is valued for the production of palm wine as much as it is valued for palm oil – *‘I have not tried to get the new variety from another place, I have forgotten, I don’t care, I have the small local ones which provide wine for house’*. Some stated that they had applied the techniques they had learnt – *‘I continue with local banga but prune more than before and get more oil’*, but others had decided to continue as they always had done – *‘we were trained in how to use a spear to cut the cones up high, but I do not understand why you would do that, I do not use this techniques in my farm, when my palms are tall I cut them down to make palm wine’*. In terms of project participants teaching others in the community about the new techniques they had learnt, this was at least evident in one case where a 33-year-old woman had been trained and had received 10 seeds of the improved variety of oil palm from her brother. She had followed his direction and planted the palms in rows, with a specific distance between each plant.

Is there any evidence that the intended project outcomes were achieved?

In Nfakwe, since the seedlings of the improved variety were largely decimated by rodents, the impact of the project was limited to any improvements participants made in managing the local variety of oil palm. Only two of the 10 respondents who participated in the project in Nfakwe had successfully planted their palms and were waiting for them to mature. However, most respondents from the other villages had oil palms which were maturing and which they hoped to be able to harvest from in the near future. The individual who received 100 palms appears to have benefited more than most. He had a prominent position in the village council, which is likely to have helped him secure a larger number of palms – *‘I have benefited from the project because I now own a much bigger banga farm than before’*. However, the project does not appear to have made any difference to participants use of forest resources, since at the time of the research any increases in incomes had been marginal. Eight participants stated that they received an income from either palm oil, palm wine or a distilled version of palm wine known as *‘afofo’*, but since this income was from *‘country banga’* and all receiving an income from it were over the age of 50, it would be tenuous to deduce that this income can be attributed to the oil palm project rather than traditional practices. Attitudes towards the national park by participants were mixed, but the oil palm project was seen as positive by most respondents, only those in Nfakwe were left feeling disappointed.

How was the success of this project perceived by PSMNR-SWR?

The final report portrays the oil palm project very positively, suggesting that each individual who participated will receive an average income increase of 105,367 XAF (219 USD) per year. This figure is based on the assumption that each farmer received and planted 35 oil palms and that the price of palm oil will remain constant at 500 XAF (1 USD) per litre. In reality, these benefits are likely to be skewed towards certain individuals and the figure may overestimate the number of palms provided by the

project that survive to maturity. Nevertheless, this represents a project that is likely to produce some benefits, but the extent to which the new variety of oil palm is perceived to be better than the local variety remains to be seen, since it would need to also produce palm wine of similar quality for it to fulfil the same range of functions. Yet if farmers do embrace the improved variety of oil palm and create their own nurseries in which to grow it, the final report suggests that they could earn 426,307 XAF (886 USD) per year for every hectare planted. However, despite being mentioned in the final report as one of the most financially viable livelihood activities supported by PSMNR-SWR, no follow-up activities relating to oil palm have been conducted since Phase 1. Some respondents in Obonyi 1 had the impression that PSMNR-SWR was planning to establish a palm oil cooperative if the improved variety of oil palms produced sufficient oil, but there was no mention of this in the project documents reviewed.

5.3.4 Case study 2: Pepper and ginger farming

How did the implementers of the project envisage it having an impact?

No specific details about the pepper and ginger project are provided in the official final report, except that the project was implemented in 17 villages. A theory of change has therefore been constructed based on the general aims of the livelihood interventions and interviews with participants (Figure 5.3).

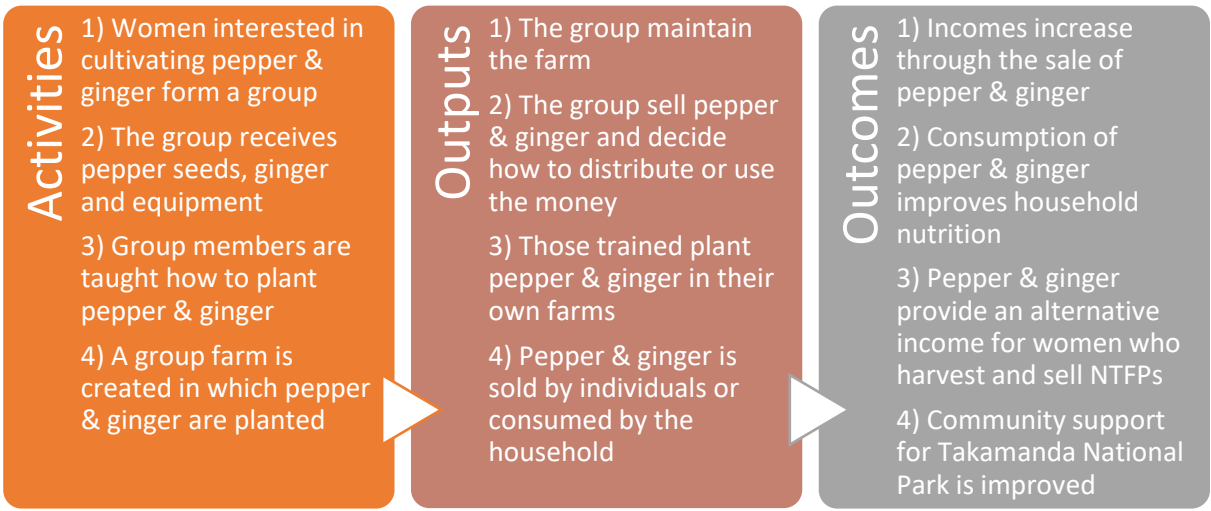


Figure 5.3: Reconstructed theory of change for the pepper and ginger project implemented by PSMNR-SWR

Who participated and why did they participate?

Across the three villages, 22 individuals (from 27% of sampled households) joined groups that received training in the cultivation of pepper and ginger. Participants captured in the sample ranged in age from 24 to 70, with an average age of 47. The project was targeted at women, so all participants were female. Seven women aged 45 and over were widows and the heads of their respective households. These

individuals tended to be involved in multiple projects. A few of the participants planted pepper in their farms before the project started but many did not, and no one had previously planted ginger. One participant explained that her reason for joining the training was because if she wanted pepper she had to buy it in town - *'pepper is scarce in the village, we buy it in Mamfe, so I wanted to be able to plant pepper here'* (female, 57, Kajifu 1). Several respondents were influenced to join by women they were in an existing group with, such as their *'njangi'* (village-based savings) group.

How was the project implemented? How were participants selected?

The women in each community were called to a meeting organised by *'wildlife'*. All those interested in taking part in the pepper and ginger project were instructed to form a new group. Although these were newly created groups, in some cases they were dominated by members of one or more existing groups. One individual (female, 60, Obonyi 1) explained that she could not take part because they used a different group to the one that she was in. Participation is likely to be heavily influenced by intra-village politics, with particular friendship or family groups being in a position to monopolise the benefits. This may vary from village to village depending on its size and the degree of cohesion amongst its women. Group projects rely heavily on trust and cooperation between members, which may be an incentive to keep projects within particular social groups. Once the group had formed, an area of land was cleared to create a group farm, which was planted with the pepper seeds and ginger provided. An extension worker visited the villages on three occasions to provide training.

Did participants think that the project was implemented well?

Several interviewees complained that the trainer did not teach them enough and that the training stopped too early, with the timeframe not reaching up to a year. Participants from Nfakwe and Kajifu 1 mentioned that their group had received a sprayer to fertilise the pepper but had not been given any fertiliser and were not told which type of fertiliser was required. However, one respondent countered the claim about insufficient training saying that the training was *'correct'* but the participants had not *'put interest'* (female, 57, Kajifu 1).

Did participants apply what they learnt? Did they continue with it? Did they expand production?

In both Nfakwe and Obonyi 1, the group farm failed because the pepper *'got rotten'* and *'died all'*. One respondent (female, 46, Obonyi 1) explained that she thought this was due to environmental factors because the place where they planted the pepper was not ideal. However, several women in Obonyi 1 stated that they had continued planting pepper in their own farms – *'I used to just grow cassava but now I plant pepper with cassava. I plant them in 1-1 metre as we were taught'*. The group farm was slightly more successful in Kajifu 1, in that the seeds developed and produced peppers, but there were other

reasons why the group farm did not serve its purpose. According to respondents there were no more visits from the trainer once the pepper and ginger had been planted, so it just remained in the farm. Eventually people *'thieved the pepper and put them in their own farms'*. One interviewee in Kajifu 1 claimed that a member of the group had *'harvested alone and chopped (ate/took) all the ginger'*. Another explained that *'group work is hard, we cleared the farm and planted but when we called everyone to gather again, they did not come. If they don't work, they have to pay a fine, but then people get vexed and leave the group, so we didn't clear the grass again and the pepper just remained under grass'*. Although some of the respondents now farm pepper, none of them mentioned that they continue to farm ginger – *'I did not do ginger before, and I do not do it now'*. Those who still grow pepper in Kajifu 1 are mainly those who used to grow pepper before, and some still prefer to grow it in their own way – *'I had pepper before the project came, and they brought the same kind of pepper. Theirs is just bigger due to fertiliser. They told us to mix the seeds with wood ash to make the pepper grow fine, but I still do the old method, I clear forest and burn sticks (trees)'*.

Is there any evidence that the intended project outcomes were achieved?

All respondents had been left disappointed by the pepper and ginger project. Many blamed the problems they had experienced on the lack of follow-up support – *'they gave pepper and said they would come back and do more training, but they never came back'*. No one said they had made any income as a result of the project, with some complaining about the money they had lost by having to pay a fee to join the group – *'we have lost because we worked the farm and wasted time, and we each gave 2,500 [XAF] (5 USD) to register the group'*, *'we did not get bags of pepper as we expected'*. When asked if the project had changed their use of resources in the forest, all who responded said no. This disappointment has led to some negative feeling towards the national park and those who implement the livelihood projects – *'when they took the forest, they said they would teach us but they don't come back. I now don't care if I don't see those people again. They made lots of promises and they haven't done anything'*.

How was the success of this project perceived by PSMNR-SWR?

This project is not specifically reported on in the final report but had been discontinued.

5.3.5 Case study 3: Snail farming

What was the aim of the project and who was targeted?

Snails are considered to be an excellent source of protein that is both valued as a food source by the local population and can be sold to satisfy demand in urban areas. Evidence of the perceived value of snails came from a socio-economic survey conducted in the villages around Takamanda National Park in

2001 (Schmidt-Soltau et al., 2002). However, snail stocks are said to have been depleted due to overharvesting. The snail project was targeted at both men and women with the dual aim of providing a source of income and an alternative source of animal protein to bushmeat.

How did the implementers of the project envisage it having an impact?

The snail project was expected to contribute to reducing pressure on Takamanda National Park by providing an alternative resource as well as an alternative source of income, with benefits expected to be realised in a relatively short space of time. The activities, outputs and outcomes are detailed in Figure 5.4. The project was implemented in 9 villages, including Kajifu 1, but not in Nfakwe and Obonyi 1.

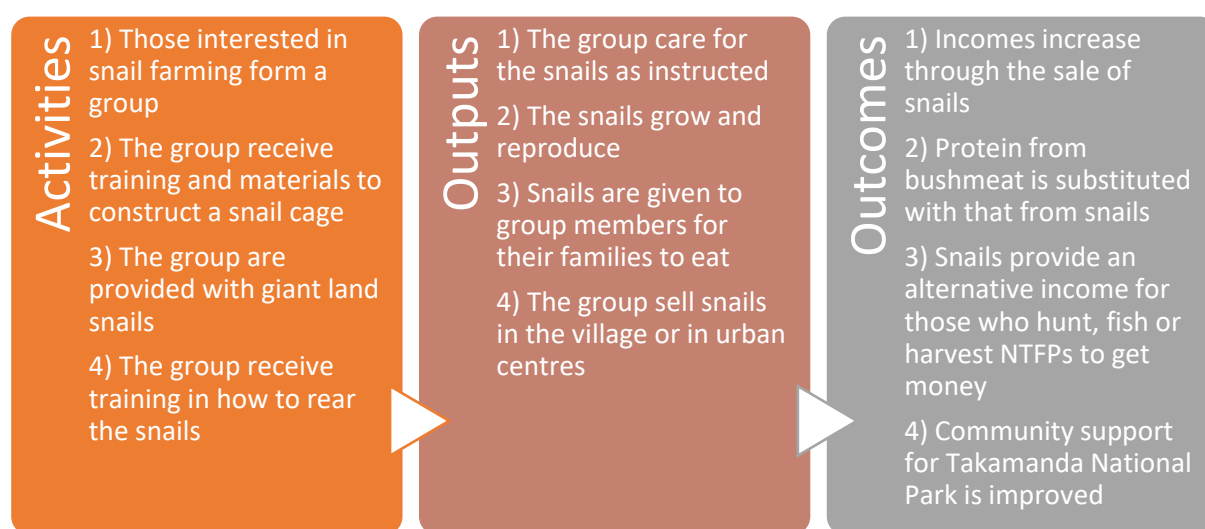


Figure 5.4: Reconstructed theory of change for the snail project implemented by PSMNR-SWR

Who participated and why did they participate?

The snail project was only implemented in one of the three study villages and no project participants were captured in the random sample of households interviewed. However, respondents from 25 of the 28 households interviewed in Kajifu 1 had heard about the snail project, and 12 provided comments. Some of them said that they had not liked the idea of keeping snails.

How was the project implemented? How were participants selected?

According to respondents, the snail project was only offered to a small group of people within the village and had not been open to everyone to join. Likely based on a study conducted in Cameroon, which compared the productivity of three edible snail species reared in cages said to mimic their natural habitat (Kingsley et al., 2008), the implementation team selected a species known locally as the 'garden snail' (*Archachatina archachatina*). Participants were shown how to construct snail cages and how to

rear this type of snail. One respondent, who did not participate in the project, decided to make his own box and add snails from the forest (male, 75).

Did participants think that the project was implemented well?

Non-participants stated that the project did not last a month because all the snails died. The reason why all the snails died is unclear. One respondent suggested that people ate all the snails, another that the snails were eating themselves. Research conducted elsewhere in the South West Region of Cameroon showed that snails are often not fed appropriately (Ngenwi et al., 2010), therefore starvation may have been a cause of mortality. Project staff confirmed that the snails were dying or not growing well across all the project villages and attributed this to the species of snail not being suitable for the area. Participants were later encouraged to find local snails but were not able to find enough of them.

Did participants apply what they learnt? Did they continue with it? Did they expand production?

There is not sufficient evidence to conclude whether or not the participants applied what they had been taught, but the snails died and the project came to an end in all villages. The respondent who constructed his own cage and filled it with snails from the forest also said that all of his snails died, which suggests that there were husbandry issues rather than it just being the wrong type of snail.

Is there any evidence that the intended project outcomes were achieved?

The snail project did not achieve its intended outcomes, and an unintended outcome has been the negative feeling the project has created towards PSMNR-SWR and Takamanda National Park. The snail project was often cited by respondents as an example of the inadequacy with which the protected area authorities have upheld the pledges they made when persuading the local communities to agree to the establishment of the national park – *‘we prepared a village development plan then all they brought were these snails’*, *‘the snails and all other things they have brought except the road have not worked’*.

How was the success of this project perceived by PSMNR-SWR?

Project staff stated that the project had been unsuccessful and had been discontinued, but this was not documented in the final report.

5.3.6 Case study 4: Beekeeping

What was the aim of the project and who was targeted?

The beekeeping project was designed mainly to target those who harvested honey from wild bees in the forest. Honey hunting is perceived to represent a threat to the national park as there is a risk of causing

forest fires while smoking bees when harvesting. By providing a means of obtaining honey without entering the forest, the beekeeping project aimed to provide a direct substitute to honey hunting. It also aimed to reduce other types of forest use by providing a source of income to other members of the community. The beekeeping project was targeted at both men and women.

How did the implementers of the project envisage it having an impact?

The beekeeping project was expected to contribute to reducing pressure on Takamanda National Park through the activities, outputs and outcomes detailed in Figure 5.5. The project was implemented in 2010-2011 and involved 18 villages, with 189 beekeepers trained in total. Participants were expected to receive monetary benefits from beekeeping within the first year, therefore this project was anticipated to have an impact in a relatively short space of time. The project was intended to provide an alternative source of income for participants, as well as being an alternative method to honey hunting.

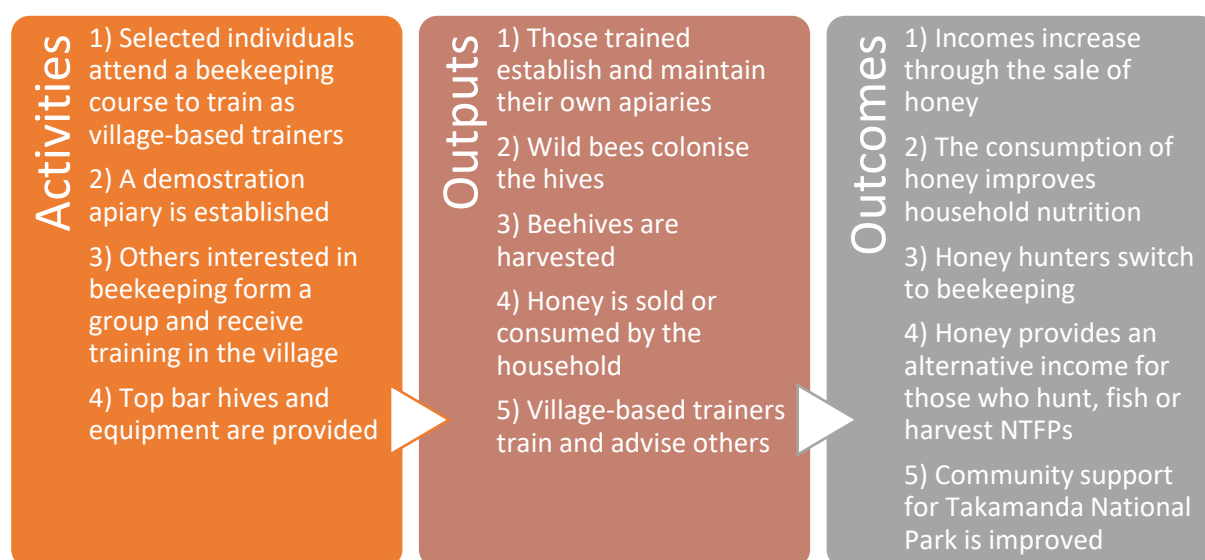


Figure 5.5: Reconstructed theory of change for the beekeeping project implemented by PSMNR-SWR

Who participated and why did they participate?

Relatively few of the households interviewed participated in the beekeeping project compared to some of the other projects implemented. Across the three villages, 15 individuals (from 18% of sampled households) received training in beekeeping. Participants captured in the sample ranged in age from 21 to 75, with an average age of 50. Most of the participants interviewed were male but three were female. Some of the participants had experience of harvesting honey from wild bees but most had no prior experience of working with bees. One of the main reasons stated for partaking in beekeeper training was to be able to obtain honey for medicinal purposes, particularly to treat coughs. The ability to earn money from beekeeping was stated less often as a primary motive for involvement in the project. This likely

reflects the fact that honey harvested from wild bees in the forest is primarily, if not entirely, for home or local consumption. The commercialisation of honey at scale is a new concept in these communities.

How was the project implemented? How were participants selected?

Rather than begin the project by organising beekeeper training in each village, individuals nominated in village meetings attended a two-week intensive training course in Bamenda, a city in the North West Region of Cameroon. Five of the interviewees had been given the opportunity to travel to attend this training. All of them had positions of influence in the village, with four having roles in the village council and one being a pastor. There was a relatively equal gender balance among those who travelled to Bamenda, possibly at the request of the project. Bamenda is one of the main centres for beekeeping in Cameroon, where a proliferation of beekeeping cooperatives have formed and established brands over recent decades. Unlike in the north of Cameroon where an extensive form of beekeeping, using local style hives made of grass, produces large volumes of honey for export, in Bamenda the Kenyan top bar hive has been heavily promoted as a more intensive 'modern' form of beekeeping. The aim of the top bar hive system is to maximise output per hive but, due to the cost of making the hives, actual yield may be lower overall than from traditional forms of beekeeping (Lowore and Bradbear, 2009). A well-respected beekeeping group called Apiculture and Nature Conservation (ANCO) was selected by PSMNR-SWR to conduct the intensive beekeeper training course.

The aim of the intensive training was to equip individuals with the knowledge and practical skills to train others in their communities to become beekeepers. Each participant on the course was given a number of top bar hives, either constructed out of timber or raffia palms, to install in a demonstration apiary they were instructed to create in their respective villages. Trainers from Bamenda later visited the villages on four occasions to check on progress and conduct training with other community members. Villagers were able to participate in this village-based training if they joined a newly formed beekeeping group. However, several respondents said that they had not been able to participate because a pre-existing social group, of which they were not a member, effectively took control of the beekeeping group – *'when I learnt about the beekeeping project they had already formed a group, it was a family something, they turned a meeting group into the beekeeping CIG (Common Initiative Group)'*. As with all projects implemented by PSMNR-SWR, participants were required to pay a joining fee which is designed to make them take ownership of the project. This fee is not paid to PSMNR-SWR but is instead used to legally register each group. Of those interviewed, ten individuals received their training in the village as part of one of these beekeeping groups. The individuals trained as village-based trainers were offered additional hives as a bonus to encourage them to train other members of their beekeeping group.

Did participants think that the project was implemented well?

Both those who travelled to Bamenda and those who received training in the village thought that the training was good. However, although there were several follow-up visits by trainers over a 12-month period, these visits then ceased and the trainee beekeepers received no further support, which many participants felt they needed. Several complained of difficulties they had experienced with beekeeping; the main issues being attracting bees to colonise the hives and hives being destroyed by termites. Applying beeswax is one of the most effective means of attracting bees to colonise a hive, but this is usually difficult to obtain in areas where beekeeping is being introduced as a new activity. One respondent stated that the trainer had promised but failed to bring anything to attract bees to the hives.

Did participants apply what they learnt? Did they continue with it? Did they expand production?

There was a general perception among respondents that the beekeeping project had long since finished and had never really functioned well because most hives remained empty – *‘we have not succeeded until today, the bees disappoint, the bees are not coming’*. Some of the individuals who trained as trainers admitted that they had not trained anyone else in the village in beekeeping, while others claimed that members of their village had not really take an interest in it. Those who appear to have benefited the most from the beekeeping project are the ones who trained in Bamenda, all of whom continued to practice beekeeping and had earned money from selling honey. Due to a lack of community interest and uptake, the demonstration apiaries are managed by those who went to train in Bamenda, who also now keep the produce. One individual (male, 52, Kajifu 1) harvested 80 litres of honey one year and sold it for 60,000 XAF (125 USD), but most were harvesting much less. The beehives continued to be checked monthly by some individuals and had been completely abandoned by others. With relatively limited amounts of honey being produced, those who do have a harvest can easily sell it within the village where honey is valued for medicinal purposes. Although most people just continued to use the hives they were given by the project, some had taken the initiative and made the investment to produce between two and eight additional hives. Many people appear to have been inspired and enthused by the training initially, especially those who travelled to Bamenda and saw the potential of beekeeping first-hand. Yet many had since become disillusioned – *‘I added eight hives, but no bees entered, so I have left them all for bush. I never got any honey. I spent 32,000 [XAF] (67 USD) on planks of timber and have lost all that money’*. In general, beekeeping had failed to live up to people’s expectations, even though a few people had benefited from the project. One respondent (female, 48, Kajifu 1) claimed she had yet to recoup the money paid to join the beekeeping group despite having harvested from her one colonised hive.

Is there any evidence that the intended project outcomes were achieved?

The beekeeping project has had limited success in raising incomes. Those who were selected in the initial village meeting for training in Bamenda have received the most benefits, but even then, these benefits have been modest. As such, there is widespread feeling of disappointment which may have contributed to negative sentiment towards PSMNR-SWR – *‘I got involved in the first two projects but refused the third. Everything they bring now we feel discouraged’*. One individual who claimed to have liked the beekeeping project the most out of all the projects said that he was benefiting from small quantities of honey, but only enough for household consumption. He admitted that the beekeeping project had had no influence on his use of forest resources, and another participant stated that the project was not relevant in terms of changing people’s use of the forest – *‘only the project’s laws have affected me’*. It appears that if community members are to be convinced of the potential of a livelihood activity that is newly introduced to them, they need some proof of its potential, and seeing how beekeeping is done elsewhere seems to have instilled an interest in those who went to train in Bamenda. This is not evident in the community more broadly. Those who trained in Bamenda also received training over a longer period, which was then complemented by the four follow-up sessions in the village. However, due to the number of individuals who were unsuccessful at colonising their hives, a negative perception of the beekeeping project has been created among non-participants, which has likely dissuaded them from investing time and money in beekeeping.

How was the success of this project perceived by PSMNR-SWR?

The final report notes the issues associated with the low rates of hive colonisation and the low levels of honey production. A honey production assessment was made by PSMNR-SWR in 2011, prior to the first honey harvesting season. Out of the 142 hives distributed in 12 of the villages around Takamanda National Park, 70 were reported to have been colonised. While having only 49% of hives colonised may have been less than hoped, this was a higher proportion than in the villages around Korup National Park and Mount Cameroon National Park, which had colonisation rates of 38% and 20% respectively. The honey production assessment around Takamanda National Park concluded that each colonised hive could have yielded 0.8 litres of honey on average prior to the main harvesting season, providing an income of 1,430 XAF (3 USD) per hive. A forecast of potential annual yield and income per hive was not made. However, it is noted in the report, and was mentioned by project staff, that levels of success varied. Since a large proportion of the 189 individuals trained in beekeeping in these villages did not succeed in colonising their hives, it can be assumed that most people did not see any benefits from this project. The beekeeping project had been discontinued.

5.3.7 Case study 5: Bush mango cultivation

What was the aim of the project and who was targeted?

Bush mango is one of the most important NTFPs for income generation in the villages around Takamanda National Park. The kernel is widely used as a thickening agent in sauces and is in high demand in Cameroon and Nigeria. Due to its high market value, more than 90% of households around Takamanda are engaged in the harvesting of bush mango (Ingram et al., 2011; this study). Two species are found in the South West Region of Cameroon: *Irvingia gabonensis*, the most common species found in Takamanda National Park, is harvested during the rainy season from June to September; *Irvingia wombolu* is less common but fruits during the dry season from February to April (Sunderland et al., 2003). Due to their economic importance, both species of bush mango tree are retained in farms, and come under the customary ownership of the farmer once the land around them has been cleared (Ingram, 2014). The bush mango project promoted the planting of *Irvingia wombolu* (dry season bush mango) in farms. Dry season bush mango fetches a higher price than *Irvingia gabonensis* (rainy season bush mango) because it is available at times when bush mango is relatively scarce. The aim of the project was to increase the number of native trees in farms to 16 trees per hectare in order to create corridors for wildlife, while at the same time providing additional cash income for farmers in the dry season. The community as a whole was the target of this intervention.

How did the implementers of the project envisage it having an impact?

Bush mango and cocoa are important sources of income to households in the villages around Takamanda National Park, yet income from these activities is generally only available in the rainy season. The bush mango project was expected to contribute to reducing pressure on Takamanda National Park by providing an additional source of income and economic safety net during the dry season, thus reducing the need for households to engage in other forest-based activities during this period. The activities, outputs and outcomes associated with the bush mango project are detailed in Figure 5.6. The project was implemented in 17 villages, with an average of 1,300 dry season bush mango seeds given to each village. Economic benefits were envisaged over the long-term once the trees planted reached maturity, which takes approximately 10 years.

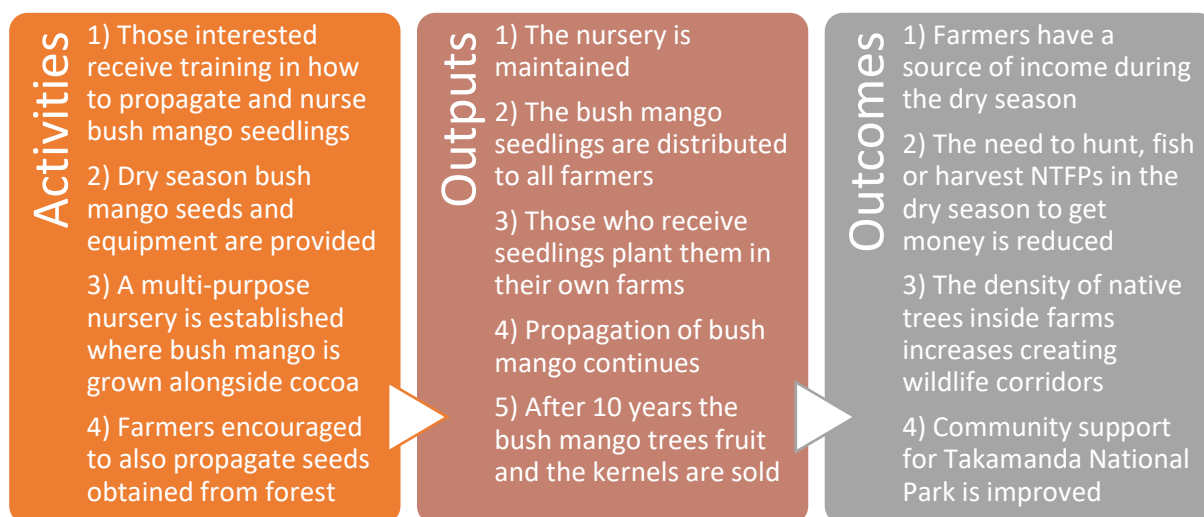


Figure 5.6: Reconstructed theory of change for the bush mango project implemented by PSMNR-SWR

Who participated and why did they participate?

Across the three villages, more than half (52%) of the households interviewed had been involved in the bush mango project and had received bush mango seedlings. However, the proportion of households that participated in the bush mango project ranged from 76% and 69% in Nfakwe and Obonyi 1, to only 14% in the largest village, Kajifu 1. The notion of planting dry season bush mango trees in farms was well received, with some farmers having done so previously, since bush mango is known to generate relatively large sums of money and having the trees on land under customary ownership gives the farmer exclusive access to the harvest. Because dry season bush mango is comparatively rare, respondents stated how they were keen to gain access to seedlings of this type to have a new high-value cash crop. Having bush mango trees on the farm was also mentioned as a fall-back strategy should the price of cocoa fall or other factors limited the income from their primary crop.

How was the project implemented? How were participants selected?

Unlike other projects, the bush mango project aimed to involve all households within each community. This was more feasible than with other projects since the main activity was the distribution of bush mango seedlings to all those with customary ownership of land on which to plant them (typically land planted with a perennial crop such as cocoa). However, a subset of those who participated in the project were involved in the establishment and maintenance of a nursery. Some training was provided on how to nurse the bush mango seeds, but most households stated that they did not receive any training. As with the oil palm project, the implementation process was slightly different in Obonyi 1 as compared to Nfakwe and Kajifu 1, because the bush mango project was rolled out in two phases. Obonyi 1 was involved in both phases and therefore received bush mango seeds on two occasions instead of one. In Nfakwe and Obonyi 1, the distribution of the seedlings seems to have been in line with the project's

objectives, with seedlings being distributed across most households in the community – *‘they were planted in one nursery place then shared among the community’*, *‘bush mango was shared around every house, not one specific group’*, *‘gave stems to each individual mature person with a farm’*, *‘every man collected his own’*. However, fewer households benefited from the bush mango project in Kajifu 1, with some non-beneficiaries suggesting that seedlings were only given to members of a particular group – *‘wildlife gave mango to one group’*. Yet others in Kajifu 1 contradicted this assertion, saying that an announcement was made that anyone who wanted bush mango could go to the hall and collect seedlings – *‘we nursed the dry season and divided it to plant in personal farms. It was only given to people that had interest’*. It appears that more than one individual from each household was able to collect bush mango seedlings. The number of seedlings each individual received ranged from 3 to 10 in Nfakwe, 2 to 20 in Obonyi 1, and 2 to 100 in Kajifu 1, suggesting that certain individuals in an influential position in the village council in Kajifu 1 were capturing a greater proportion of the benefits from this project.

Did participants think that the project was implemented well?

Since the bush mango project mainly just involved distributing seedlings, few respondents had comments about how it was implemented. Most perceived it to have been a one-time exercise rather than a project in which they had participated. However, several respondents said that they would have liked to have received more bush mango seedlings. Some commented that there had been less quarrelling with the bush mango project than with projects that encouraged participants to form groups. Yet not everyone wanted to receive the bush mango seedlings they were given. One individual (male, 52, Obonyi 1) who was clearly unhappy about the national park and the restrictions imposed by the *‘wildlife’* people stated that he threw the two seedlings he was given away. Others complained that they already had all the things *‘wildlife’* brought and that *‘god gives mango free in the bush’*.

Did participants apply what they learnt? Did they continue with it? Did they expand production?

The majority of respondents who received bush mango seedlings planted them in their farms. Although many have grown, some individuals reported that some had died. Since it takes 10 years for bush mango trees to mature and begin to bear fruit, no one had benefited financially from the project at the time of the interviews. However, respondents were confident about future benefits since they are aware of market demand and how much money bush mango can generate – *‘the dry season bush mango has not started to bear but I know it will help in the future’*. Some respondents had taken the initiative to acquire dry season bush mango seeds from elsewhere – *‘I got more dry season bush mango seeds from another village’*, *‘I took seeds from inside another person’s farm, from a dry season mango that had already borne fruit’*. However, it is unclear whether these individuals were inspired by the project to source additional dry season bush mango seeds or by other villagers – *‘people already had dry season mango. It is in the*

forest and people take it from the forest and plant', 'I've had dry season bush mango planted in my farm for 25 years'. Nevertheless, there is sufficient interest in cultivating bush mango that some respondents said they might even abandon cocoa if they can plant enough bush mango trees in their farm.

Is there any evidence that the intended project outcomes were achieved?

Since there are no short-term financial rewards from planting bush mango, the project has yet to have an impact on incomes during the dry season. However, with the bush mango trees planted and growing in people's farms, the project is on track to provide some financial benefits in the long-term as well as increase the biodiversity value of farmland. Yet, like with other projects, some individuals will receive more income as a result of the project than others, since there is a big difference between having two bush mango trees and having one hundred of them. Also, the benefits are likely to be skewed towards those who already have perennial cash crop farms, rather than those without such farms who are likely to be most dependent on forest resources. The project is likely to fall short of the target of increasing the number of trees in farms to 16 per hectare, since according to the figures published in the official report farmers received five trees each on average. Whether farms contain the desired amount of tree coverage will probably depend more on how many trees are retained than on how many are planted. However, in terms of short-term outcomes, the bush mango project has been well received by participants and was mentioned by some as one of the positive things associated with Takamanda National Park. Although the collection of bush mango inside the national park is still permitted, aligning with the theory of change behind these projects, several respondents had understood the motive to be to discourage them from entering the forest to collect bush mango – *'they said to take dry season mango so we don't need to go forest again', 'they said don't disturb animals by picking bush mango'.*

How was the success of this project perceived by PSMNR-SWR?

The final report estimates that the bush mango project could have the biggest financial benefit for participants out of all the projects implemented, assuming that participants only plant the seedlings provided and do not take measures to increase the number themselves. Based on an average of five bush mango trees per farmer, it is estimated that after waiting 10 years for them to mature each farmer's income could increase by 190,753 XAF (397 USD) per year on average. This figure assumes a constant selling price of 30,000 XAF (62 USD) per 12 kg basin of dry season bush mango. While in reality these benefits are likely to be skewed towards certain individuals, it does appear that this project will bring some financial benefits to farmers in the long-term. The potential realisable income from bush mango is also likely to be more predictable given that high demand exists locally, and prices are less susceptible to international market price fluctuations as is the case with cocoa. If farmers increase the

number of bush mango trees in their farms to 16 per hectare, as encouraged by the project, their income from cultivated bush mango could potentially increase to 622,392 XAF (1,294 USD) per hectare per year.

Although no further bush mango seed distributions have taken place since Phase 1 of PSMNR-SWR, the programme has started to intervene further along the bush mango value chain by developing the FREPROM-NTFP cooperative to buy and sell bush mango, with sellers promised a loyalty bonus for selling to the cooperative rather than to independent traders. Although interviewees were not asked specific questions about their experiences of selling to FREPROM-NTFP, since at the time of the interviews it was still in the early stages of development, some respondents did express disappointment at having not received the bonus they were promised. This appears to have been due to the timing of when the bush mango was sold on by the cooperative, and the limited profit that was realised. While this may be considered a teething problem, it highlights the risk of disillusionment if promises are not fulfilled – *‘I am still waiting for the bush mango bonus, if they come again this year I will sell to some other person’*, *‘they said they would bring bonus for bush mango but they haven’t given any bonus. We wasted time in meetings for nothing’*. PSMNR-SWR later acknowledged these issues and decentralised the buying process by recruiting and training village-based agents and working closer with village councils.

5.3.8 Case study 6: Cassava farming and processing

What was the aim of the project and who was targeted?

Cassava is one of the most important food crops in the South West Region and is cultivated by virtually all households in the villages around Takamanda National Park. Nationally, it accounts for 45% of food crop production, with 90% of producers being rural women whose farms are typically less than 2 ha (Emmanuel, 2013). The starchy tuberous cassava roots are either boiled and eaten shortly after harvesting, grated and processed into *‘garri’*, fermented and made into *‘water fufu’*, or pounded and steamed inside banana leaves to create cassava *‘sticks’*. The fresh roots are highly perishable, making them a difficult crop to transport to market, but processing cassava into garri greatly extends its shelf life. Cassava is grown primarily for household consumption, but any surplus tends to be manually processed and sold locally as garri, providing an important revenue stream for women. Because cassava heavily depletes the nutrients in soil, extensive rotational farming systems are the norm, with the local variety of cassava having a relatively long production cycle (12-16 months) and low yield (10-12 tonnes per hectare) (Emmanuel, 2013). In contrast, improved varieties of cassava have shorter production cycles (10-15 months) and higher yields (25-30 tonnes per hectare), while measures taken to improve soil fertility can enable a more intensive farming approach thereby reducing the area of land needed for cultivation. By introducing improved varieties of cassava, teaching about means of enhancing soil fertility

and providing motorised processing equipment to transform fresh roots into garri, the cassava project aimed to increase women's incomes from the sale of garri and water fufu while reducing the levels of deforestation by intensifying cassava production on existing farmland.

How did the implementers of the project envisage it having an impact?

Replenishing soil nutrients enables farmland to recover quicker between harvests, reducing the duration of fallow periods and therefore the need to clear additional forest using 'slash and burn' methods. Similarly, increasing the yield of cassava per hectare means that less forest needs to be cleared for the same or greater output. Increased yields are also expected to increase incomes as cassava farmers have more surplus, as well as the means to quickly and easily process the surplus into garri for sale in local markets. Increasing incomes from cassava through the adoption of alternative methods is expected to reduce dependence on the collection of NTFPs inside Takamanda National Park. Figure 5.7 shows the activities, outputs and outcomes through which these impacts are expected to be achieved. The introduction of high-yield cassava varieties and improvements in farm techniques were expected to reap rewards in a relatively short space of time (within 1 year), while the cassava processing equipment was expected to have an immediate effect on income earning opportunities. The cassava project was implemented in 17 villages during Phase 1 of PSMNR-SWR and expanded to other villages in Phase 2. All the villages involved during Phase 1 received cassava processing equipment. Across these villages, 255 farmers participated in the cassava project, and between 1,500 and 10,000 cuttings of the improved varieties of cassava were provided to each village during Phase 1. The project began in 2009 and was relaunched under Phase 2 of PSMNR-SWR in 2012.

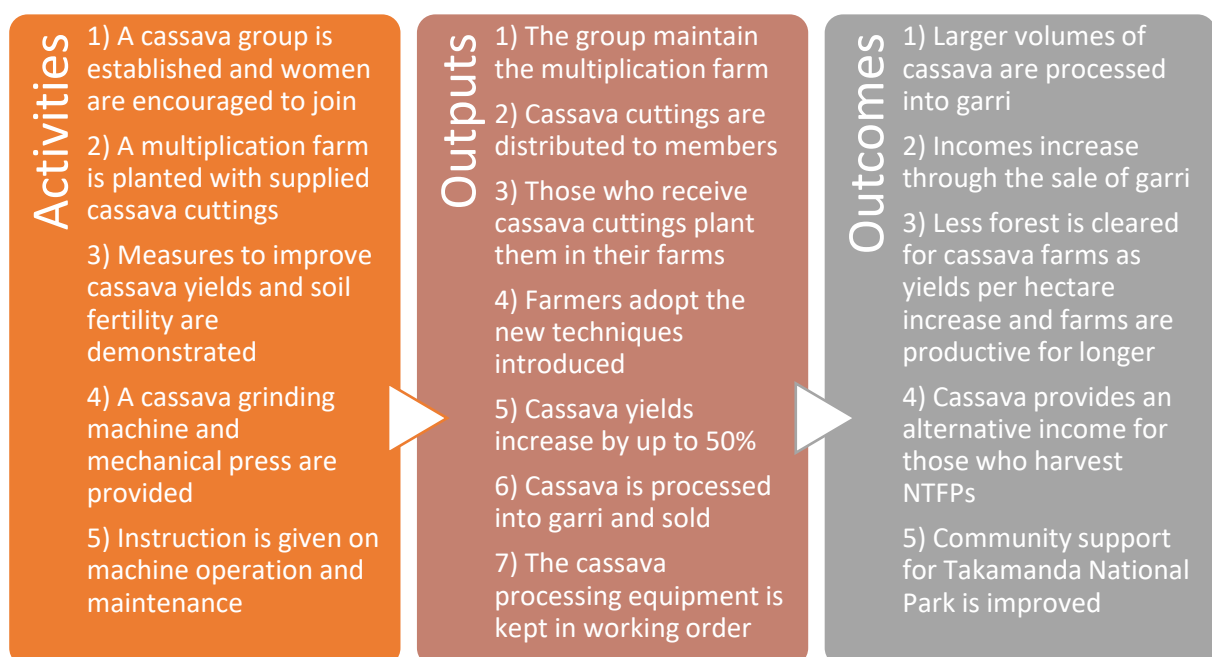


Figure 5.7: Reconstructed theory of change for the cassava project implemented by PSMNR-SWR

Who participated and why did they participate?

The cassava project had the highest participation rate out of all the projects implemented by PSMNR-SWR, with 62% of the households sampled across the three villages having had at least one member involved in the project. However, as with the bush mango project, the proportion of households that participated ranged from the vast majority in Nfakwe (84%) and Obonyi 1 (72%) to less than a third (32%) in the larger village of Kajifu 1. The 55 participants captured in the sample ranged in age from 20 to 70, with an average age of 43. All were female in Nfakwe and Obonyi 1, however two male interviewees also participated in the project in Kajifu 1. Cassava farming and processing is usually conducted by women, however a male entrepreneur in Kajifu 1 had made a business out of transforming cassava into various more unusual marketable products, such as spaghetti, flour and animal feed, thereby demonstrating the economic potential of cassava as a cash crop, and somewhat shifting gender norms. The importance of cassava as a food staple and its central role in existing livelihood strategies meant there was a lot of interest in this particular project, with respondents stating how cassava is *'close to their heart'*. Some explained that they participated in order to learn about the new farming techniques and varieties of cassava promoted by the project, and because they generally *'wanted to see how wildlife do it'*. Some respondents also specified that they had wanted to be involved to see if the project implementers would *'dash (give) things relating to cassava'*. The cassava processing equipment had been specifically requested by individuals in Kajifu 1, but it is not clear whether that was the case in the other two villages, which are further away from potential markets for garri. However, the main drivers of participation in this project appear to have been social, both in terms of solidarity amongst women and through coercion – *'all women were told to join the group', 'if not in the group, you not be person for village'*. Yet some women did refuse to join because they *'didn't want to do those kinds of techniques in their farms'*, while others had to overcome pressure from their husbands in order to be able to participate – *'my husband was strongly against', 'he didn't want me to go for training outside the village'*.

How was the project implemented? How were participants selected?

The cassava project was another one of the projects implemented by PSMNR-SWR that required those interested in participating to form a group. In Nfakwe and Obonyi 1, all the women in the village were encouraged or *'told by the village council'* to join the cassava women's group. In these two villages, the project was considered to be exclusively for women but was open to all women who wanted to join. However, in the larger village of Kajifu 1, where there was a mixed sex group, there were female respondents who said they hadn't been informed about the project – *'they started the group and didn't even tell me, I only heard about it after'*, and there is evidence to suggest that this project, like some of the others in Kajifu 1, may have had more restricted access – *'they gave the project to a group of relatives who were not even interested, most projects here are given to family people'*. However, one of

the participants in Kajifu 1 indicated that the cassava group had been open for anyone to join but that there had been a form of assessment process – *‘people from different [existing] groups could participate, and even those without a group could still join, but only if that person is correct, we know people’s fashion’* (male, 70). The people who joined the cassava groups in each village were expected to make a financial contribution to legally register the group as a CIG. If any newcomers wanted to join at a later date, they had to fulfil certain requirements that were not always attainable – *‘my wife came to the village and tried to join, they gave her conditions she couldn’t meet’* (male, 37, Obonyi 1).

IITA was the service provider contracted by PSMNR-SWR to implement the cassava project, with staff from MINADER also involved in training activities. The cassava groups in each village were encouraged to create a multiplication farm up to 1 ha in size where the cuttings supplied by the project of improved varieties of cassava could be cultivated and multiplied. These farms were then used for demonstration purposes during training sessions. The groups called their members together whenever trainers visited their village, which was at various points during the cassava production cycle, including during clearing, planting, weeding and harvesting periods. The groups were also encouraged to organise regular meetings amongst themselves to ensure the upkeep of the multiplication farm, and most of the groups took this very seriously. To mobilise members to work in the multiplication farm, some of the groups devised a set of rules that typically included imposing a fine on anyone who refused to take part in the group work – *‘if person doesn’t go to farm, they pay fine of 2,000 [XAF] (4 USD)’* (Nfakwe), *‘pay fine for 500 [XAF] (1USD) if don’t go farm’* (Obonyi 1). The group in Obonyi 1 initially held meetings every month but switched to having them every two weeks – *‘we met every month on a Thursday, but changed to two weeks because otherwise the group dies’*, and these regular meetings had already continued for a period of 5 years by the time the interviews were conducted. The meetings appear to be about female solidarity as well as cassava farming, since not all meetings revolve around visits to the multiplication farm. The group in Nfakwe had been similarly active for a prolonged period, meeting whenever there was a need to attend to the multiplication farm – *‘the group leader calls meetings when grass is there, we don’t wait for the trainers, she inspects the farm and calls the women’*.

Regular repeat visits from external trainers appear to have helped maintain the motivation of the groups. However, the mixed sex group in Kajifu 1 seems to have been less consistent, visiting the farm once every two months, then twice per year before eventually harvesting and then abandoning it. The group in Kajifu 1 is reported to have lasted for 2 years before it was disbanded. Respondents explained that the trainers *‘didn’t come back after harvest, so we carried the cassava to our own farms’* and that *‘money made the group scatter’*. However, the ‘active’ members of the original group had recently been asked by PSMNR-SWR to reconvene for further training during Phase 2. The purpose of the group

multiplication farm, as perceived by IITA and PSMNR-SWR, was primarily to produce enough cuttings for farmers to switch to using the higher yielding varieties of cassava in their own farms to enable them to increase their personal incomes through the sale of garri (Hanna et al., 2017). So, in that sense, the multiplication farm in Kajifu 1 served its purpose. Whereas in Nfakwe and Obonyi 1, the cassava project was still perceived primarily as a group exercise, with activities centred around the multiplication farm for the purpose of collective benefits. During their first harvest, the group in Nfakwe *'removed all the tubers and grated garri...without leaving some stems in the farm to increase the cassava'*. They *'sold the garri and put money for group for people to borrow'* and *'used money to build community hall'*. These were clearly welcome short-term gains from the project but harvesting everything that was in the multiplication farm undermined the longer-term aim of each farmer being able to switch to higher yielding varieties of cassava. In Obonyi 1, the cassava project was widely perceived as not being for personal gain – *'money enters for group, it not be for personal gain'*. When the group members in Obonyi 1 harvest cassava from the multiplication farm, they *'make garri, sell and give money to council'*, *'the village council supervise every project, so a quarter of income from projects go to the council'* then the remaining money is *'put into group'*. Some of this is used to *'pay to clear farm and plant cassava again'*.

The groups in Obonyi 1 and Nfakwe now appear to be in the routine of replacing their multiplication farm every 1-2 years just after the harvest. In Obonyi 1, they were already onto their third multiplication farm – *'we removed some from the first farm and planted for another farm, we put four types of cassava in the second farm, then cut and transferred two types into this year's farm'*. Respondents indicated that around 40-60 people continued to work in the cassava farm in Obonyi 1 and that they had also now started sharing cuttings among group members – *'we shared 5-5 sticks'*, *'we cut stems from group farm, each got five stems'*. At least some members of the group in Nfakwe had also taken cuttings since their multiplication farm was replenished – *'got plenty stems inside group farm now, I cut the sticks and plant [in my farm]'*, which shows that continued support from project implementers helped the Nfakwe group get back on track despite earlier mistakes. All three villages received a motorised cassava grinding machine and a mechanical press, which the groups use to process the cassava roots from the multiplication farms into garri. Several respondents from each village mentioned that they had also benefited from being able to use this equipment to process cassava from their own farms. A fee is payable to the group for personal use of the equipment – *'you pay 500 [XAF] (1 USD) for each basin of garri and also need to buy petrol for 800 [XAF] (1.70 USD)'* (Nfakwe). Non-members can also use the equipment for a higher fee and the money is supposed to go towards future maintenance costs, however this is not always the case – *'the group gets money each time the machine is used, this is for buying food for the trainer, giving drinks and removing small money'* (Obonyi 1). When the cassava

project was relaunched under Phase 2 of PSMNR-SWR, 4-5 individuals were nominated by each functional group to attend further training in Mamfe to become village-based trainers.

Did participants think that the project was implemented well?

Respondents described receiving training on how to plant cassava to increase yields, how to improve soil fertility by mixed cropping and how to avoid cassava diseases by weeding regularly. The trainers explained that they should *'not cover the eye [of the cassava]'* when planting and that they should *'plant in lines'*, *'plant one metre apart'* and *'plant 1-1, not 2-2 [per hole]'*. They were also told to *'plant beans to improve fertility'* and *'move grass (weed) regularly to avoid sick (cassava disease)'*. Participants generally thought that the cassava project had been implemented well and that the training they received had been sufficient. The main issues mentioned by respondents relate to the cassava processing equipment and the type of cassava introduced. Nfakwe only received processing equipment in 2010/2011 during the final year of Phase 1 of PSMNR-SWR, which was quite a while after the cassava project launched. The equipment unfortunately did not arrive in time for the group's first harvest – *'the cassava was producing but didn't have machine, so it just got rotten in bush'*. This links to the issue about the type of cassava promoted by the project, since the improved variety was only suitable for processing into garri or water fufu and not for cooking and eating as a root – *'the local we can roast and cook, but theirs is only for garri and fufu'*, *'they said our own was not fine, but we can chop that one for fire'*. IITA and PSMNR-SWR have since tried to rectify this problem by introducing four different types of cassava, which the two functional groups have planted alongside their local variety in their multiplication farms. They had been encouraged to compare the advantages and disadvantages of the different varieties and select the ones that work best for them. Obonyi 1, which was further ahead than Nfakwe in this process, had decided to plant two varieties moving forward – one that produces more cassava and a bitter one that can be planted as a protective barrier to dissuade wildlife, such as cane rats, from eating the main crop.

The cassava processing equipment had developed faults in all three villages by the time I visited them. PSMNR-SWR had tried to mitigate against this by training local mechanics in how to maintain the equipment, supplying spare parts and encouraging the groups to collect and reserve processing fees to cover the costs of repairs and eventual replacement of the equipment. PSMNR-SWR estimated that the cassava grinding machine would have a lifespan of 10 years, however 4-5 years later and the machine in Nfakwe was said to have been *'spoiled'* with the group *'waiting for council to give money to fix problem with engine'* and the grinder in Obonyi 1 was out of action because there was a *'need to buy new rubbers'* for it. However, the groups in these two villages did at least plan to repair their cassava grinding machines, whereas in Kajifu 1, respondents explained that the *'cassava machine was poor quality'*, *'it did not last long'* and was *'spoiled due to poor management'*. There did not appear to be any plans afoot in

Kajifu 1 to get the cassava grinding machine repaired, partly because there were two other privately owned machines in the village. Overall, the respondents in Obonyi 1 mentioned fewer issues with the cassava project than those in Nfakwe and Kajifu 1. One of the issues unique to Nfakwe was the lack of a motorable road and therefore the limited ability to sell garri. The village of Nfakwe had been promised a road as part of the village development activities funded through PSMNR-SWR but construction had yet to begin – *‘they said they would bring road and cassava machine, have machine but no road, where are we supposed to sell garri’*, *‘we wanted to dissolve the cassava group because no road’*, *‘if we make garri, we go sell for which side’*. In Kajifu 1, where there is already a road and access to market, participants instead complained about the functionality of the cassava group – *‘people didn’t put power for farm, every man for his own’*, *‘not everyone has same heart’*.

Did participants apply what they learnt? Did they continue with it? Did they expand production?

Since one of the aims of the cassava project was to increase women’s incomes so as to reduce their financial dependence on harvesting NTFPs within the national park, participants were asked if they had applied any of the techniques learnt in their own farms – the responses in each village were mixed, with older women appearing to be the most resistant to change. Many women did not see the need or want to put additional effort into replicating the techniques used in the multiplication farm in their own farm – *‘for own bush I plant anyhow, it wastes time to do it the way they trained us’*, *‘for line, for line – I don’t do it like that in my farm, I just put randomly, it’s quicker, but it is easier to weed and uproot when in line’*. Others felt that doing it the way they were taught was effectively cheating – *‘their style be lazy way to do it, no one does their style in own farm’* (female, 30, Obonyi 1). However, many women were open-minded or already convinced of the benefits of the new techniques – *‘I now plant in one metre gaps and the cassava gets bigger, used to plant in half metre but there is more cassava now’*, *‘I step in line and plant, don’t disturb stems when entering farm now, I don’t plant as many as before and the harvest is less but they are bigger’*, *‘I’ve started to copy wildlife, they grow plenty past my own’*. Some were still waiting to see the difference – *‘I did as they taught and next year I will know the difference’* (female, 25, Nfakwe), while others claimed to have tried but not seen any change – *‘planting in line makes no difference, get same as before’* (female, 70, Kajifu 1). As with other projects, it appears to be a case of seeing is believing – *‘when they came, there was no seriousness, but people now see improvements, must see before we believe’* (female, 24, Nfakwe). Some participants said that they now count the number of cassava roots harvested so that they know whether or not their yield has changed.

In terms of whether participants had started using the improved varieties of cassava in their own farms, responses were once again mixed. Most people in Nfakwe said they were still using the local variety – *‘they grow their own and we grow our own, the one they introduced can be used to make water fufu and*

garri but can't be used to eat', however this group was still waiting to compare the different types of cassava that IITA subsequently brought – *'once we have compared the different varieties, I will know which to use'*. In Obonyi 1, where the different varieties had already been assessed, uptake was greater – *'I now throw any bad cassava and replace with the new type'*, and people were starting to use the bitter variety to protect their existing crop – *'cutting grass (cane rats) eat country style cassava, so I now plant bitter cassava around the boundary to stop them eating the local one'*. The choice of cassava variety ultimately depends on each person's primary motivation for cassava farming. Those who want to continue farming cassava purely or primarily for subsistence purposes seem to prefer the local variety, since the others are considered by some to be *'not fit for chop (consumption)'*, while those who want to earn an income from cassava were starting to *'mix own stems with their stems'*. This may necessitate extending the surface area of the farm, since the local and improved varieties of cassava serve different purposes – *'I need to add to the farm to plant the new stems, I'll get the youths to clear more farm'*, *'in future, I will have half acre of cassava for chop and half for sell'*. This may undermine the project's objective to reduce the amount of land under cultivation if growing cassava for income is essentially a separate and additional activity to growing cassava for food. Since Kajifu 1 had not received a selection of cassava to evaluate because their group had ceased to function, participants had either rejected the introduced variety – *'their cassava not be better than our local one'*, or they had decided to plant both – *'I use both the local and their species in different sections of my farm'*.

Many respondents across the three study villages had benefited from the cassava grinding machine and mechanical press provided by the project, although not everyone had used it to process their own cassava. The arrival of the cassava processing equipment had encouraged some individuals to produce and sell garri for the first time. Respondents that had used the equipment to process their cassava had typically done so on up to three separate occasions – *'I've used it three times, first produced four basins, then two, then three, and have sold all'* (female, 70, Nfakwe), *'I used the garri machine two times during the dry season last year, sold garri for 10,000 [XAF] (21 USD) each time'* (female, 48, Obonyi 1). The cost savings, both in terms of time and money, of using the equipment versus processing cassava manually were noted – *'I used to grate by hand or pay 2,000 [XAF] (4 USD) for people to do it, now pay 500 [XAF] (1 USD) to use the machine'*. Respondents in Nfakwe and Obonyi 1 generally seemed to appreciate having received the cassava processing equipment – *'I will continue to use the machine'*, *'the machine has benefited us plenty'*. In Kajifu 1, where the cassava grinding machine had been out of action for some time and the processing equipment owned by two villagers was in operation, there was some confusion among respondents as to which cassava processing equipment was being referred to. Processing cassava into garri seems to have already been an established practice in this village, likely due to higher demand for garri from passing trade given its location along the road to Mamfe. There was said to be an increase

in demand for garri *'when people have money from [bush] mango'*, with some individuals in Kajifu 1 processing as many as 20 basins of garri a year. One respondent also mentioned how she now gives her children garri to take to school in Mamfe, so they can sell it to fund their education.

Is there any evidence that the intended project outcomes were achieved?

In Nfakwe and Obonyi 1, a large proportion of the women in each village had been actively participating in the cassava project for several years by the time this research was conducted. The majority felt that they had benefited in some way from the project, although not always in terms of an increase in personal income, as had been envisaged by PSMNR-SWR. Many women felt that they had benefited from being in a group – *'forming these groups be fine, it functions to be inside group, at the end things will be better'*. These two groups have operated like a form of *'njangi'*, whereby the women have worked the farm together, processed the cassava and sold the garri to generate income for the group. This has enabled the groups to loan money to members in times of need, thereby creating a financial safety net. It appears to have been the solidarity aspects that have kept these groups active for many years. However, over time, as people have started to see the benefits of adopting the farming techniques and improved varieties of cassava promoted by IITA, women have started selectively implementing aspects of the training in their own farms as they deem most appropriate. Respondents reported that the project *'has given knowledge'*, *'the activities have become easier'*, *'we get more cassava than before'* and *'we have started to see some small money from garri'*. While the group in Kajifu 1 had not functioned in the same way as the others, possibly because it was a mixed group and the priority of members was indeed their personal farms over group solidarity, participants generally still felt that they had benefited from the project because the *'cassava is bigger now'* and the *'experience is there for head'*. One respondent even mentioned that the cassava project had offset some of the losses incurred by participating in other projects implemented by PSMNR-SWR – *'the cassava training has covered all the losses from the [bee]hives, since cassava pays small money'* (male, 70, Kajifu 1).

The relative success of the cassava project seems to have helped to improve attitudes towards PSMNR-SWR and Takamanda National Park, with some respondents acknowledging that *'they have done plenty things and brought things plenty'* and that *'the wildlife people have given us sense'*, with others saying that they were *'praying that they come more and more'*. The financial support provided to this project over several years by PSMNR-SWR and the adaptive approach taken to project implementation has helped to shape these positive opinions despite some initial setbacks, showing that longer-term engagement is key when it comes to changing people's practices. The cassava project, particularly the processing equipment, was frequently cited by those in Nfakwe as one of the main benefits associated with Takamanda National Park, albeit the only perceived benefit for many – *'they gave cassava, they*

gave the machine, but that's the only benefit', 'the grinding machine is fine, but nothing again'. One respondent said that 'the most important things we want they don't give, we already had all the things they brought' (female, 35, Nfakwe). Several individuals in Nfakwe listed the things that had been prioritised in their village development plan which they were still waiting for, notably a road and water tap. The cassava project participants in Obonyi 1, which had already been connected to the road network, were generally more positive about PSMNR-SWR saying that despite issues 'the project people are doing their best' and that 'everything we ask for they give we'. Again, the cassava processing equipment was mentioned as one of the main benefits they had received in relation to Takamanda National Park, but some were disappointed that they had yet to receive any personal financial gain from participating in the project and it was mentioned that 'wildlife don't hear' their requests to adjust the boundaries of the park to give them more land within the enclave for farming. In Kajifu 1, however, there was some confusion about which entity actually brought the cassava project – 'we got new stems from agric people, it was agric not wildlife, they used to come all the time for meetings about pepper and cassava', 'they said some person had dashed (given) a cassava machine, I don't know the people who brought it, it be some woman that brought cassava, not be wildlife'. It undermines the ability of the project to improve community support for Takamanda National Park if people do not associate it with the park because of the different actors involved in different components of the PSMNR-SWR portfolio.

There is some indication from responses that at least some of the cassava project participants may have reduced their harvesting of NTFPs within Takamanda National Park, with one respondent saying that she had '*reduced the plucking of eru in the forest since joining the group*' because now she can '*make garri to sell instead*' (female, 48, Obonyi 1). Others also said that before they '*depended on going to the bush to get money but now get money from garri*'. Several mentioned the things that they had been told to do differently, such as fishing with four-finger nets instead of the smaller holed two-finger nets, plucking just the leaves of eru rather than pulling down the entire vine, and leaving some bush mango in the forest for the animals to eat. However, there were also respondents who said that the project had not had any effect on their forest activities, with one saying that '*cassava is cassava and what I do in the forest is not the same*' (female, 60, Nfakwe). Others had taken onboard that they should stop harvesting NTFPs but felt this was unfair and unfounded – '*why come take our forest, we can't remove anything like bush mango, njangsang, black leaf and bush onion, people from the other side can but the people in this village cannot*' (female, 60, Obonyi 1). Although there are legal provisions for the harvesting of NTFPs inside Takamanda National Park, project participants appear not to have been fully informed of their rights. Furthermore, the reasons for reducing forest use have either been insufficiently justified or do not align with locally perceived priorities and have thus been rejected by some.

It was unclear based on interview responses whether the cassava project would eventually lead to reduced forest clearance as yields per hectare increased, because there was evidence to suggest that the new varieties of cassava were being considered as different crops for a different purpose. This could potentially lead to an increase in clearance of forest for farmland. There may ultimately have to be trade-offs between reduced use of the forest inside Takamanda National Park and increased clearance of the forest on its periphery – *‘I don’t go to the forest again, I don’t have time to enter again, now I clear forest and plant cassava’* (female, 59, Kajifu 1).

How was the success of this project perceived by PSMNR-SWR?

The cassava project is considered by PSMNR-SWR to have been the most important project supporting the livelihoods of women in the villages around Takamanda National Park. Assuming participants plant cuttings from the multiplication farm in their own farms, and that the improved varieties of cassava yield 25 tonnes of fresh root per hectare, it is estimated in the final report that farmers could earn as much as 551,000 XAF (1,146 USD) per hectare per year if 50% is sold as garri at 80 XAF (0.17 USD) per kilogram and 50% as water fufu at 50 XAF (0.10 USD) per kilogram. However, a 1 ha cassava farm typically contains 10,000 cuttings, and based on the number of cuttings supplied by the project it is estimated that each participant received 308 on average, which would provide a more modest income of 16,962 XAF (35 USD) per year. Yet few participants had planted as many as 308 cuttings of the improved cassava at the time of the research. The additional income that could be earned from adopting new farming practices and processing more of the local variety of cassava into garri was not estimated. It appears to be assumed by PSMNR-SWR that there is sufficient market for the projected levels of garri production. This may indeed be the case at the national level, where increased cassava production is seen as being critical to meet the food security needs of the country as a whole, and production of garri to meet urban demand is actively being encouraged, yet in rural areas the market potential of cassava may not be apparent due to the informal and underdeveloped nature of the value chain (Emmanuel, 2013). With a reported selling price of 80 XAF (0.17 USD) per kilogram, the value to weight ratio of garri is significantly lower than that of cocoa at 1,000 XAF (2 USD) and bush mango at 2,500 XAF (5 USD) per kilogram.

Overall, the cassava project implemented during Phase 1 was viewed by PSMNR-SWR as a success and it was one of the few projects that continued to be supported during Phase 2. In 2017, it was reported in Conservation Echoes that *‘the communities that embraced the new technologies are now experiencing the dividend of their participation’* and that *‘it is hoped that huge quantities of garri shall be produced that will necessitate the creation of associations to facilitate storage and the putting in place of appropriate commercialisation strategies’* (Ndolo, 2017). PSMNR-SWR and IITA have showcased the approach taken with the cassava project at international conferences (see: Kirscht et al., 2015, Hanna et

al., 2017). In these presentations they indicate that after the project came to an end in 2015, 82% of farmers adopted the improved cassava varieties leading to income increases of 40% compared to incomes generated from the local variety of cassava. They also note that 20% of farmers said they had reduced the amount of land cleared for cassava farming. The success of the project is said to be associated with the fact that it aligned with the aspirations and needs of the communities and involved a known product with limited production risks.

5.3.9 Case study 7: Cocoa farming

What was the aim of the project and who was targeted?

Cocoa is an important export crop in the South West Region, and one which has the potential to provide farmers with substantial economic benefits. Cultivating cocoa is a relatively new activity in the villages around Takamanda National Park but has quickly gained in popularity. However, agricultural extension services provided by the government rarely reach such remote areas and knowledge about cocoa farming is considered to be insufficient. Farmers often spend more money than needed on chemical inputs due to misapplication, and poor management practices generally lead to relatively low yields. The aim of the cocoa project was to increase yields by introducing improved cocoa farming techniques, integrated crop and pest management, and fast-growing, high-yield varieties of cocoa. The project targeted men, particularly the '*youth*' (a term used to describe those 35 and under; Malleison, 2000).

How did the implementers of the project envisage it having an impact?

Increasing the productivity of cocoa per hectare means that less forest needs to be cleared to achieve comparable yields. Applying fungicides and insecticides only when needed can reduce the environmental impacts of these chemicals at the same time as reducing the costs incurred by farmers. The distribution of improved varieties of cocoa was expected to increase incomes, and by specifically targeting the youth, it was expected that cocoa farming would reduce their dependence on hunting, fishing and the collection of NTFPs inside Takamanda National Park. Figure 5.8 shows the activities, outputs and outcomes through which these impacts were expected to be achieved. This project promoted an alternative source of income to forest-based activities through training participants in alternative methods of cocoa farming. The adoption of improved farming techniques was expected to have an impact in the short-term (within 1 year), while the planting of improved cocoa varieties was anticipated to have an impact in the longer-term (3-4 years). The project started in 2008 and was implemented in 17 villages during Phase 1 of PSMNR-SWR. Within 14 of these villages, 294 farmers each received 20 seeds on average of an introduced high-yield hybrid variety of cocoa.

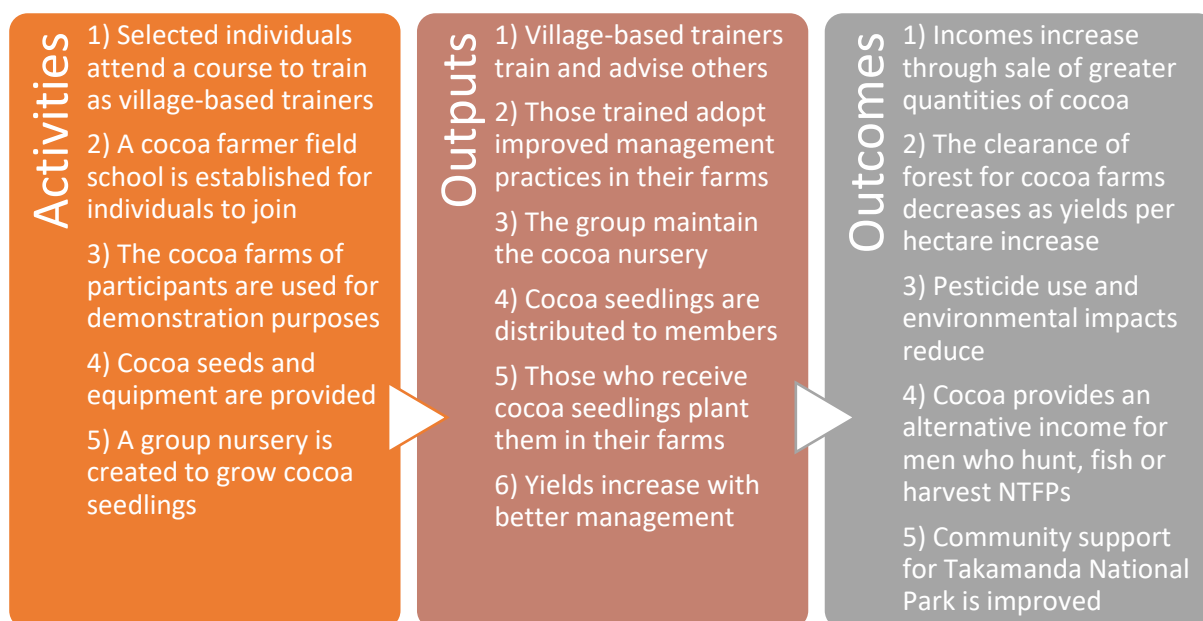


Figure 5.8: Reconstructed theory of change for the cocoa project implemented by PSMNR-SWR

Who participated and why did they participate?

Along with the bush mango and cassava projects, the cocoa project was one of the more popular projects implemented by PSMNR-SWR, with 39 individuals from 46% of sampled households taking part across the three villages. Participants captured in the sample ranged in age from 25 to 70, with an average age of 45. Twelve respondents who participated in the cocoa project were in the ‘youth’ category, the others were over the age of 35. All of the project participants interviewed were male, however one female (48, Kajifu 1) said she had received training from the village-based trainer taught by the cocoa project. Participation in this project was high because of the widespread interest in cocoa, which is increasingly seen as one of the best ways of generating an income in the village – *‘cocoa is the most important thing if you want to be able to support children in school’*, *‘other people have told me that cocoa gives money’*, *‘I have been encouraged by seeing other people selling cocoa and getting much money from it’*, *‘people who work cocoa farms can get more money than government workers’*. Many stated that they had specifically wanted more training in cocoa and that a cocoa project had been requested by members of the village – *‘we had cocoa farms before wildlife came but we needed help with agricultural techniques, so we asked them to send experts’*, *‘I tried cocoa before but failed’*, *‘the way I was working was not the best’*, *‘I was just learning by error before’*, *‘I wanted some direction’*.

How was the project implemented? How were participants selected?

The way the cocoa project was implemented made participation more inclusive than for some of the other projects. Rather than request that interested members of the community form and pay a registration fee to a specific group, the cocoa project used the Farmer Field School model introduced in

Cameroon by IITA (for further details about this approach see: David, 2005). Although there is generally strong allegiance towards groups, which essentially equate to social networks within the villages, the Cocoa Farmer Field School appears to have been open to all, at least in two of the villages – *‘the whole village can attend the school when they like, it is not a group thing’*, *‘anyone with cocoa can benefit from training’*, *‘it is a school not a CIG, it is to make all farmers learn’*, *‘people joined plenty, people are still joining’*. However, the situation in Obonyi 1 differed somewhat from that in Nfakwe and Kajifu 1. Although, the cocoa project was not claimed by one particular group, respondents in Obonyi 1 indicated that only those belonging to certain pre-existing groups were allowed to take part. Some respondents stated that they could not get involved with the Cocoa Farmer Field School because they were in a group that was involved in a different project – *‘some people would like to join but one man cannot be in two groups’*, *‘we did not join cocoa if we were in another group for a different project, if I joined cocoa it would worry me to switch to that side, so I remained with banga’*. This may indicate more inclusivity overall if different projects were allocated to different groups to ensure more people could participate in at least one project, but it also suggests that those with a desire to learn about several different activities may have been restricted from doing so. Yet the claim that certain groups were not able to participate in the cocoa project in Obonyi 1 is countered by some who did take part – *‘it was open to all man, it is just that some people did not join’*, *‘some people do not realise the importance of the programme’*.

Representatives from each village were elected in a village meeting to train as village-based trainers. These representatives attended one or more intensive courses in a neighbouring village. One of those selected explained that *‘people know I am a hardworking somebody, and they trust me to tell them the real thing’* (male, 34, Obonyi 1). With the other projects, those selected as village-based trainers were considered to have benefited more from the project by having received intensive training and additional equipment, and as such it was expected that these individuals would train other members of their communities voluntarily. However, with the cocoa project, village-based trainers were paid 5,000 XAF (10 USD) for every training session they conducted. This appears to have made the diffusion of knowledge more effective – *‘even if you are not in a group, you can get training from the village-based trainer. Anyone who wants training can ask for training, you just need to ask his advice’*. As with cassava, the cocoa project continued to receive support from PSMNR-SWR during Phase 2 and had been ongoing for 6 years by the time this research was conducted. The Cocoa Farmer Field Schools operate through weekly meetings organised by the village-based trainers, with external trainers visiting each village intermittently to provide additional support and advice. During each session, the participants visit a different person’s farm to assess any issues they may have and conduct practicals, which may involve pruning or applying particular chemicals to treat diseased trees – *‘it be just like njangi (village-based savings groups), one day we go to work in one farm, the next we go to another’*. At the time of data

collection, these weekly meetings were still ongoing in Nfakwe and Kajifu 1 but had lapsed in Obonyi 1, where meetings were only arranged when external trainers visited – *‘we need the executive of the group to change, the last time they organised a meeting was one year ago’*. In addition to the practical guidance provided, Obonyi 1 and Kajifu 1 also received an allocation of seeds from a high-yielding variety of cocoa. Village nurseries were established and the cocoa seedlings were later shared around the whole community, not just to those participating in the Cocoa Farmer Field School.

Did participants think that the project was implemented well?

Respondents described receiving training on how to prune, how to plant, how to diagnose problems, when to fell shade trees, and when and how to apply fungicides and insecticides. Participants from all of the villages generally spoke very positively about the training they had received but expressed a desire for more frequent visits from external experts – *‘the training has been 100%’, ‘the training has been correct, may they bring more more’, ‘training can never be enough, we need more experts to help with problems in our cocoa farms’*. Some individuals in Obonyi 1 said that no external trainers had visited for two years and that those who wanted to participate in expert trainings had to travel to Kajifu 1. Several respondents stated that they had never received training from the external experts but that the village-based training had still been *‘correct’*. The main complaints were relating to expectations that the project would provide inputs, particularly chemicals, as well as training – *‘they only brought two sachets of chemicals for the demo farm, we cannot manage with two sachets’, ‘we had expected chemicals, sprayer, wheelbarrow and knives’, ‘we expected the things they promised, like free chemicals and sprayer’, ‘we did not get given materials so were discouraged’*. Others simply expressed a wish that the project would help them to obtain the necessary inputs – *‘even if they bring to sell, we will buy’, ‘we hoped they would give medicine (pesticides) and after buy the cocoa and deduct the price of the medicine’*.

Did participants apply what they learnt? Did they continue with it? Did they expand production?

The majority of respondents stated that they had applied what they had learnt in the Cocoa Farmer Field School to their own farms, particularly with regard to pruning – *‘before it was trial and error, I did not know how to prune, I thought the bigger the better’, ‘I am now doing pruning better, I am putting my head for that school’*. Many said that they were also following the advice given regarding buying and applying the appropriate chemicals – *‘I am not spending as much on chemicals now, I bought chemicals for 3,000 [XAF] (6 USD) instead of 10,000 [XAF] (21 USD), so it is saving me money’, ‘I have reduced the amount of chemical. First time I used plenty chemical and did not get plenty cocoa’, ‘before I did cocoa carelessly, I did not know how to prune and apply chemicals, I did not know which chemicals to use and when to apply them, sometimes I would just buy chemicals and the cocoa would die’*. Some individuals had also created their own personal nurseries and changed the way they plant cocoa – *‘I have learnt how*

to nurse cocoa, I now have a nursery at the side of my house', 'I have changed how I plant, everything in the 1 ha farm is planted in lines, unlike the other farm which I planted blindly'. A cocoa seedling nursery in Kajifu 1 was reported to be producing enough to now sell them in batches of 100. However, not everyone was as enthusiastic about the cocoa project, particularly some of the older participants – 'I go to the meetings when I feel like it, but I just continue to do as I did before, it is all talk for nothing' (male, 70, Nfakwe). Some respondents also felt disappointed by the number of cocoa seedlings they received from the project. In Obonyi 1, seedlings were distributed throughout the village, but this meant that most people only got two or three – 'I was given two stems, so I dashed (gave) them to someone, two stems of cocoa cannot make a farm'. However, the way that the cocoa seedlings were distributed is likely to have been associated with the amount of interest an individual showed in the project and how many training sessions they attended. One individual received 10 seedlings and explained that he planned to 'use the fruit of the new type to plant it again' (male, 38, Obonyi 1).

Is there any evidence that the intended project outcomes were achieved?

Since interest in the training was high and many of those who participated had applied what they had learnt in their own farms, the cocoa project is likely to achieve at least some of its intended outcomes. Although the project is likely to have only had marginal effects on the amount of income that farmers were getting from cocoa at the time of the interviews, many respondents reported that they had seen improvements in their cocoa farms – *'I have removed shade and applied chemicals and the cocoa has improved', 'I now prune and the cocoa bears more than before', 'I am just starting to benefit small, small', 'any benefits will only be seen after this season, I have seen changes in the farm but not yet in the house'. Others were still anticipating that they would start to see improvements in the future – 'I will only see if there is a difference later', 'I only started this year, so no benefits yet', 'I hope to be able to have money from cocoa in the future, enough money to support the house'. The changes that many respondents had seen, either in their own farm or in the farms of other participants, had given them encouragement and as such a willingness to stick with the Cocoa Farmer Field School training programme – 'now that the cocoa has flowers I know I have not wasted my time, I have new things in my life and am happy', 'I am sure that there will be improvements in my farm by next year', 'I have just started to see changes this year, I am still waiting to see but it looks like it has more', 'knowledge will never be lost, it has opened my head', 'I go gather sense at these meetings, so have not wasted time'. Some respondents who did not participate in the cocoa project stated that they were 'still watching to see if it works'.*

Respondents often noted how much better the cocoa project was than some of the other projects implemented – *'cocoa has been a good programme, the people embrace it, all other things have not worked', 'the only positive to come from the national park is the farmer field school, nothing else, the*

other projects have not worked and they promise things and do not do them'. The fact that PSMNR-SWR has continued to support the Cocoa Farmer Field Schools over several years seems to have made a difference in attitudes toward the project. Respondents did not complain of the lack of follow-up, which is a common theme with the other projects. Although cocoa project participants still had complaints about the national park, these were not related to the project itself, and four participants actually had nothing bad to say about the protected area, which was quite unusual. Therefore, since participants remained hopeful that their incomes would increase as a result of the cocoa project, and almost all associated the project with the protected area, it seems that this project has made a positive contribution to increasing community support for Takamanda National Park.

Cocoa was the only activity that some respondents mentioned as a viable alternative to forest-based activities, simply because of the amount of income that can be generated from cocoa. The cocoa project successfully aligned with the aspirations of respondents to develop their cocoa farms, but the project does not appear to have triggered the initial interest in cocoa. This increased interest is likely to be associated with the rise in the price of cocoa and the creation of motorbike roads by PSMNR-SWR which have helped to facilitate the transport of cocoa to market. Improved road access has particularly benefited those in Obonyi 1 – *'cocoa did not have market before, if buyers came from town it would take long and we used to get a bad price, but now people are coming from different sides so there is competition and the price has improved'*. Although responses may have been influenced by the amount of emphasis the project implementation team has placed on reducing hunting, a few respondents did specifically state that they were now too occupied with cocoa to find the time to hunt – *'I put more attention on farming now, even bush mango, I do not have the same interest as before'*. However, attempts to move away from forest-based activities appear to be primarily driven by legislation and enforcement activities associated with the national park – *'I do not use the forest as much as before, but for other reasons'*, *'I do not enter bush as much as before because of the law'*. Yet many respondents stated that their use of the forest had not changed, particularly those who had only established cocoa farms recently – *'it is too soon for any projects to affect my use of the forest'*, *'we still need the things from the forest, if we don't have mature farms we need to add money from something'*.

How was the success of this project perceived by PSMNR-SWR?

The final report for Phase 1 does not provide an assessment of all aspects of the cocoa project implemented around Takamanda National Park due to the lack of information provided by field staff prior to its preparation. Although the improved farming techniques demonstrated during the Cocoa Farmer Field School were expected to lead to an increase in cocoa yields, no data were available at that time to assess whether there had been any change. However, predictions were made to suggest that

once farmers replaced their existing cocoa trees or created new farms with the high-yield cocoa variety their yields would increase to 1,000 kg per hectare. This was expected to result in an annual income of 641,466 XAF (1,334 USD) per hectare if the cocoa sold at 1,000 XAF (2 USD) per kilogram. However, 1 ha cocoa farms typically contain more than 1,000 cocoa trees and project participants received 20 seedlings of the high-yield variety of cocoa on average. If participants only plant the 20 seedlings they were given and do not propagate from these plants as they mature or source more from elsewhere, they are only expected to earn an additional 8,231 XAF (17 USD) per year, and in reality many farmers received less than 20 seedlings. Despite the lack of data on changes in cocoa yields, the cocoa project was considered a success by PSMNR-SWR and was one of the few village development projects that continued to receive support during Phase 2, with Farmer Field School trainings observed during data collection.

The cocoa project showed more signs than any of the other projects that the recommended practices were being implemented in people's farms and were being taught to others. As such, the cocoa project is likely to have the most benefits in terms of raising incomes, improving attitudes towards the national park, and potentially also reducing reliance on and use of forest resources. However, another possible outcome is that despite increased yields per hectare, farmers may be encouraged to expand their farms. Since the clearance of primary, rather than secondary, forest is preferred for the creation of cocoa farms (Asaha and Deakin, 2016), an unintended consequence of this project might be an increase rather than a reduction in deforestation around the periphery of Takamanda National Park, as was previously asserted by van Vliet (2010). The impact of land conversion on wildlife dispersal corridors is likely to depend somewhat on the extent to which forest trees are retained within cocoa farms (Laird et al., 2007). The retention of forest trees will depend on the advice given by cocoa experts during trainings, the success of the bush mango project in encouraging farmers to plant 16 bush mango trees per hectare and the willingness of farmers to retain forest trees when they clear new farmland. Yet there is evidence from the interviews that farmers may have been encouraged by the trainers to fell trees to reduce shade.

By 2015, PSMNR-SWR reported in Conservation Echoes that the Cocoa Farmer Field School approach had received praise from the communities for the effectiveness with which it had enabled farmers to make improvements to their cocoa farms and how this had led to improvements in their lives. Farmers at the Cocoa Farmer Field School graduation ceremonies are reported to have suggested that *'the training had helped them gain more income from the sale of cocoa, and as a result they no longer needed to engage in hunting to support their families'* (Kleine, 2016). PSMNR-SWR later expanded the project by introducing a one-week Cocoa Farmer Business School course ran by trainers from MINADER to help farmers more effectively market their cocoa and manage their incomes. Due to demand from villagers, the cocoa

project was reported to be entering a further follow-up phase in March 2016, making it the longest lasting of the livelihood interventions implemented by PSMNR-SWR around Takamanda National Park.

5.3.10 Framework of guiding principles for livelihood interventions in conservation

Drawing lessons from across the seven case studies, the conceptual framework in Figure 5.9 highlights factors that should be given due consideration by project implementers before embarking on a livelihood intervention, particularly when this intervention is to be implemented as part of a broader conservation initiative such as in the context of a protected area. The factors for consideration either relate to the local context, the choice of participants, the type of livelihood activity to be supported or the approach to project implementation. The issues listed in the four quadrants of the framework warrant deep reflection by implementation teams and evaluators since they appear to be pivotal to project success.

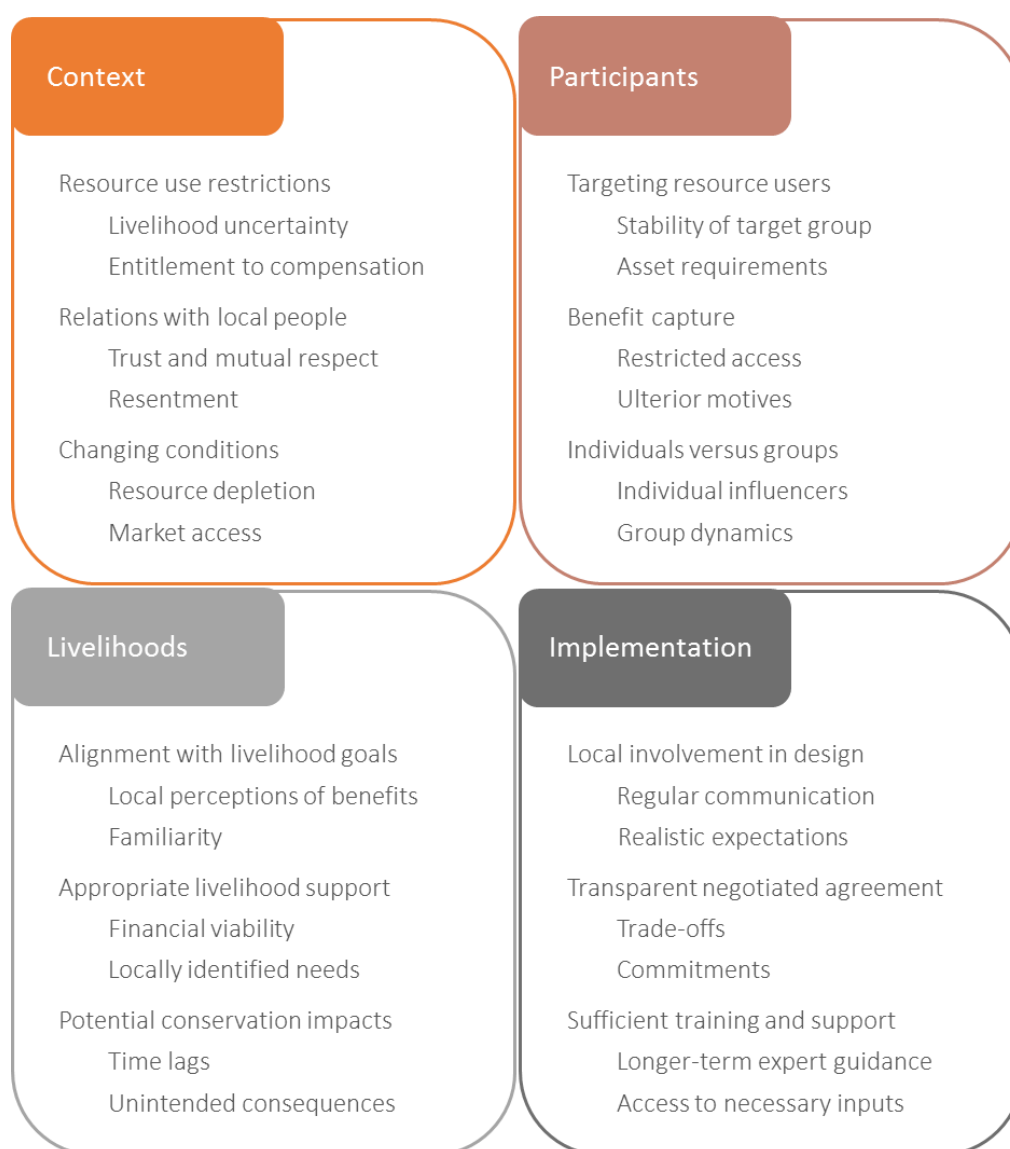


Figure 5.9: Framework of guiding principles for implementing livelihood interventions in conservation

5.4 Discussion

The implementation of alternative livelihood projects is widespread in conservation, particularly around protected areas, yet as highlighted in the systematic review by Roe et al. (2015), publicly available evaluations of such projects are relatively rare. This makes it difficult to learn and share lessons that would enable implementers to refine project design and implementation approaches moving forward. By closely examining seven projects coordinated by one umbrella institution around a protected area in Cameroon, it has been possible to identify factors, also described as effect modifiers, that appear to enhance or limit the social and conservation impacts of livelihood interventions. The framework of guiding principles proposed is an initial attempt to comprehensively identify the factors that project implementers should consider during project design, and which evaluators should investigate when trying to determine the reasons why a project had, or did not have, the impacts intended. Although the factors identified have been drawn from the experiences and perceptions of those involved in a series of farm-based alternative livelihood projects around a terrestrial protected area in Africa, most of them likely apply more broadly within the field of conservation in both the terrestrial and marine realms.

While some of the livelihood projects assessed, namely the bush mango, cassava and cocoa projects, can be considered to have been more successful, at least from a social perspective, than the others, and have the potential to result in positive conservation impacts due to shifts in behaviour or favourable sentiment towards conservation, the aim here was not to identify which types of projects work. Rather the aim was to determine why those projects proved to be more successful, and why other projects resulted in disappointment. Attempts to identify which type of project works best are futile because it is context dependent and ultimately depends on whether a particular activity is financially viable, aligns with the livelihood goals and perceived needs of the population concerned, and has the potential for net positive conservation impacts. There is a wealth of expertise, both local and technical, associated with each project type, and within each sector there are examples of successful and unsuccessful projects whereby the desired social benefits have or have not materialised. Therefore, it is not the type of project that determines success, it is whether that type of project is most appropriate to meet the social and conservation objectives in that particular context, and whether lessons learnt from previous projects implemented in that livelihood sector are drawn on sufficiently to ensure best practice implementation.

The three livelihood projects that were more positively perceived by the communities around Takamanda National Park shared various characteristics that appear to have improved their overall performance. Firstly, they focused on three of the most important products harvested or produced in these villages – bush mango and cocoa being the two main income earners, and cassava being the main food staple. Participants were therefore already familiar with these products and improving production

broadly aligned with their livelihood goals, particularly in relation to bush mango and cocoa due to local knowledge of existing demand, improving market access and profitability. Relatively high participant motivation encouraged PSMNR-SWR to provide support to the cassava and cocoa projects for several years. This appears to have created a positive feedback loop since participants appreciated these projects more due to the longer-term training and support provided, which had allowed them and other community members to observe and trial the practices recommended before adopting these behaviours. Another commonality between the three projects is that access to project benefits appears to have been more inclusive, with members of all households seemingly able to get involved if interested. Although the degree of inclusivity did vary between villages, attitudes towards the projects were improved when access was perceived as fair and there were fewer opportunities for benefit capture and village disputes. However, while these aspects of project design improved the social impacts, and mitigated unintended effects on community cohesion, the conservation impacts of these projects are harder to decipher.

The positive experiences participants had with the bush mango, cassava and cocoa projects may have offset some of the negative experiences associated with the protected area and generally improved relations with conservation actors, but the extent to which the projects resulted in direct shifts from forest- to farm-based activities remains uncertain. Targeting livelihood projects at the community level, or at broad categories of people such as men and women, is common practice in conservation (Roe et al., 2015), yet the implication is that those who participate may not be those having the greatest impact on biodiversity. Although households with a history of hunting were more likely to have been involved in several of the livelihood projects implemented by PSMNR-SWR – indicating that there was either some deliberate targeting by field staff or that these households showed greater propensity to participate – it should be remembered that not all hunters have the same level of bushmeat offtake. Jones et al. (2019) used a cluster analysis approach to segment hunters in Liberia into different categories according to their hunting method, offtake, and other livelihood activities. This identified which types of hunters already practiced perennial cash crop farming and would most likely be interested in further training and support, as well as those more dependent on hunting due to land tenure issues or lack of stability in the village. If the latter group are the ones having the greater impact on biodiversity, projects should instead be built around their livelihood goals and address the barriers they face rather than assume that a livelihood activity of interest to villagers in general will be appropriate for them.

A balance needs to be struck between increasing the potential effectiveness of a livelihood intervention through precise targeting on the one hand and minimising social tensions and jealousy through greater inclusivity on the other. A middle ground would be to ensure that targeting decisions are completely transparent and socially acceptable to community members (Bladon et al., 2018). This approach would

arguably be more effective and equitable than targeting the whole community in a way that allows more powerful individuals to capture the benefits without any ramifications. Having agreed targeting criteria from the outset would enable grievance mechanisms to be put in place whereby community members can report inclusion and exclusion errors and any misappropriation of resources (Devereux et al., 2013, Devereux and Roelen, 2015). This would increase perceptions of fairness even if benefit distribution is more restricted. Once strategic targeting decisions have been made, implementers should think carefully about whether to deliver project activities through clearly defined groups or directly to individuals. For decades, the *modus operandi* for small-scale agricultural development projects in Africa has been to require the formation of membership groups (Lyon, 2003). By encouraging collective action such groups are expected to benefit from economies of scale and increased bargaining power (Gyau et al., 2014). Yet the realisation of benefits is often undermined by the challenges associated with working as a group.

All the livelihood projects implemented by PSMNR-SWR encouraged the creation of CIGs except for the bush mango and cocoa projects. In Cameroon, CIGs are legally registered entities which have an executive committee and usually require members to pay a joining fee. The founding members decide on the rules by which the group will be governed, including additional conditions that must be met by anyone wishing to join the group at a later date. Such conditions can make access to project benefits more exclusive and preclude those who would rather observe others first to see if they make a success of an activity before investing time and money in it themselves. Therefore, delivering project benefits exclusively to membership groups may limit the diffusion of the activities promoted and ultimately the extent of the project's impacts. Furthermore, the functioning of groups is frequently undermined by mistrust and disagreement, particularly when the group has been formed specifically to meet the requirements of an external institution. In the South Region of Cameroon, Solly (1999) found group members to be highly suspicious of each other's ulterior motives, particularly those of the executive, in a context where positions of power are abused at all levels and serving one's personal interests at the expense of others is seen as normal behaviour. Building trust is a long-term process which is likely why PSMNR-SWR encouraged communities to allocate specific projects to different pre-existing groups when possible. Existing groups are more motivated to work together and generally exhibit greater cohesion and reciprocity, often due to kinship ties, but these groups may not be the most appropriate target for an intervention and their capture of project benefits will prevent access by others.

Although operating through membership groups can make the delivery of training programmes easier, encouraging collective action should not be the go-to approach in every instance. The advantages of working as a group depend on the specificities of the product, such as its degree of scarcity and level of demand, as well as the size of the collective benefit relative to multiple individual ones (Ostrom, 2000). If

collective action is deemed appropriate by both implementers and producers, training in project management, accounting and dispute resolution, as well as in negotiation and other marketing skills, should be provided as standard rather than as add-ons to more production-orientated training. The longevity of groups depends on members being intrinsically motivated to collaborate as well as the willingness and ability of leaders to invest time and effort for the group's benefit (Lyon, 2003). In some cases, groups may be motivated more by social rather than financial reasons, which seems to explain the longevity of two of the cassava groups studied despite the limited financial benefits realised by group members at the time of the research. This was similarly the case for members of a women's group in a village around Dja Faunal Reserve where Solly (1999) observed that it was the desire for unity and kinship among wives that sustained the group despite chronic disfunctions in relation to the group's core activities. If a project's aim is to build the technical capacity of individuals, the creation of self-perpetuating membership groups may not be necessary or appropriate. Instead, the format of an annual school could be adopted, as was the case with the cocoa project, whereby any individual can register to take part in that year's training. Such an approach could facilitate more equitable access to project benefits while enabling greater targeting of key resource users and the diffusion of new techniques and approaches across an increasing number of people with time, thus amplifying the overall scale of impact.

Ultimately, having a population-level impact depends on the widespread adoption of practices by members of the target group. Yet individuals targeted because of their similar resource use behaviours may differ substantially in terms of their willingness and ability to experiment with new techniques and approaches. Early adopters are generally more educated, wealthy, ambitious and open-minded (Rogers, 2003). With greater exposure to external stimuli and ability to cope with uncertainty and risk, they are more willing and able to follow advice provided by technical experts. However, the majority of the target group may initially be sceptical of ideas introduced by external agents, particularly if they are uncertain about the potential returns on investment. These individuals may instead place greater credibility on the subjective opinions of their peers and prefer to observe and discuss with the early adopters before investing time and resources in implementing changes themselves. Therefore understanding individual heterogeneities and how people are positioned within and across different social networks can help in identifying those who are willing and able to change and can inspire and influence others (Mbaru and Barnes, 2017). All communities consist of interconnected networks of individuals, each with their own allegiances, rivalries, and circles of influence. It is therefore important that implementers invest sufficient time and energy in understanding these social dynamics. If influential individuals, who may be part of the village elite, are specifically targeted to increase the cumulative effects of a project, it is vital they are trusted and respected by the primary target audience in order to ensure their involvement maximises project impacts while minimising the risk of exacerbating or creating intra-community conflicts.

The three livelihood projects that had the most negligible impacts and for the fewest people – often prompting negative reactions – were the pepper and ginger, snail and beekeeping projects. In contrast to those generally perceived favourably by respondents, these projects focused on less familiar livelihood practices, the promotion of which led to unrealistic expectations that were ultimately not met. Since the farming of ginger, snails and bees were novel ideas introduced to the communities by outsiders, follow-up support would have been needed over the longer-term to give participants the opportunity to learn and improve after inevitable initial teething problems. Participants would also have needed guidance and support to source the necessary inputs and overcome other barriers to benefiting from these livelihood practices. However, it appears the level of support provided was insufficient and participation was also restricted to those who joined the CIG for each project during its launch, excluding others who only heard about or wished to join the project at a later date. Yet the likely hesitancy of participants to invest time and resources in activities with unproven local benefits seems to have been equally demotivating for project implementers, who ultimately discontinued these projects. This highlights the importance of integrally involving communities, and particularly the resource users to be targeted by an intervention, early in the design phase. Many of the key design decisions discussed here, including who should be the target audience, the choice of livelihood support mechanism and whether it would be more appropriate to work with individuals directly or through groups, should be discussed and decided with the local people who will be actively involved in these projects rather than by agencies acting on their behalf.

Of the 106 alternative livelihood projects included in the systematic map of the evidence by Roe et al. (2015), the degree to which local communities were involved in project design was only stated in studies relating to nine of them. These studies suggest that community involvement is still generally limited to information provision, for example via participatory rural appraisal techniques, or through consultations which note community opinions and concerns. However, decisions are still predominantly taken by project implementers rather than jointly with those who will ultimately be affected by these decisions, and this appears to have been the case for the projects implemented by PSMNR-SWR. Yet the need to strive towards co-design, or meaningful interactive participation, in conservation has been stressed by academics for over two decades (e.g. Pimbert and Pretty, 1997, Shackleton et al., 2010, Homewood, 2013), and such an approach is particularly necessary for livelihood projects which aspire to provide relevant support to communities in order to create lasting change. A positive step in the right direction would be to discuss with community members the different issues encompassed within the framework of guiding principles and then move towards co-producing theories of change. Debating the logic and assumptions behind a proposed intervention, as well as its intended impacts, can flag potential issues prior to implementation and ensure that all parties understand and agree on the intended direction of change. This level of transparency can increase community buy-in as well as avoid suspicion about

ulterior motives. The theory of change development process should begin by discussing the complexity of the problem and understanding it from different viewpoints, then progress to identifying the most appropriate target group if a project is to have the desired impacts, and determining the most suitable livelihood support for this group based on their interests, resources and perceived needs. It is imperative that throughout this process expectations are kept realistic, with costs as well as benefits made clear.

Co-producing a theory of change with community members for each livelihood project, and situating it within the broader objectives of a conservation programme, can ensure that implementer intentions are made explicit, underlying logic and assumptions are properly scrutinised, and the expectations of both parties are aligned (Ghate, 2018). The involvement of researchers in this process can help validate the plausibility of implementer and community aspirations by checking these against the existing evidence. It is also important to consider the potential unintended social and environmental consequences of an intervention at this stage, and identify elements of the system that require careful monitoring (Larrosa et al., 2016). Taking such an approach would move livelihood projects in conservation further towards the goal of implementing locally designed, evidence-supported interventions. However, remaining cognisant of heterogeneities, divides and governance structures, project implementers should adopt a proactive approach when engaging communities in dialogue to ensure a wide range of opinions are represented. This might involve initially working separately with relatively homogenous sub-groups before bringing representatives of each group together to discuss their different perspectives (Smyth and Vanclay, 2017). The skill and ability of the facilitators that convene these sessions will determine the degree to which different voices are heard, therefore using highly trained facilitators is key to effective dialogue. Regular communication and conducive interpersonal relationships between field staff and community members are fundamental to ensuring genuine commitment on both sides to deliver and engage with the proposed projects for the achievement of the desired impacts. The personability of field staff and their competence at carefully managing power imbalances has been shown to be pivotal to project success (Devereux and Roelen, 2015). The prudent selection of field staff, coupled with training on how to interact to ensure all persons are treated with dignity and respect, should be standard practice.

However, implementers must initially take time to reflect on how the context at a particular site may affect willingness to engage in co-design, as well as how it might shape project outcomes (Reed and Sidoli del Ceno, 2015). This is especially the case when a livelihood intervention is linked to a protected area or is to be implemented in villages that have engaged with similar projects before. While it is vital to understand current trends within the broader social-ecological system and be mindful of critical tipping points, such as when the level of resource depletion or extent of market access may begin to shift livelihood priorities, it is also important to understand the historical context. Past experiences with

external actors and different projects leave legacies that condition how community members perceive and respond to future initiatives. For instance, if coercion has previously been used by conservation organisations to change the behaviours of local people, the legacy may be a climate of mistrust, as Sharpe (1998) observed in the South West Region of Cameroon in the early 1990s. During the establishment of protected areas, the discourse between field staff and local communities is often focused on community development benefits. While this approach can successfully secure local acceptance and support for the creation of new protected areas, it can also unduly raise expectations and lead to disillusionment when the expected benefits do not materialise (Chaigneau and Brown, 2016). Sometimes this is due to timescale mismatches, whereby the benefits from livelihood and other development projects take years to materialise while the impacts of resource use restrictions are felt almost immediately (Wilson et al., 2016), but often the touted development benefits are simply overstated. This leads to unfulfilled promises, livelihood uncertainty and a feeling of entitlement to compensation. The resentment and mistrust this can trigger may affect a person's willingness to engage with subsequent interventions despite the apparent economic rationale for doing so (Stern, 2017). Rebuilding trust and conducive relations in settings where pre-existing conflict is evident, as is common around protected areas, is difficult but possible with concerted and sustained effort and commitment.

A third-party mediation process might be necessary in situations where there has been a complete breakdown in trust between project implementers and local communities, or where views are so divergent that developing a pathway forward that all parties can agree on appears impossible. Having a professional mediator who is familiar with the socio-cultural context, has the ability to enable equal participation and is perceived to be genuinely independent is key (Reed and Sidoli del Ceno, 2015). During the mediation process, the position of the project implementer shifts from being the responsible party to one of several stakeholders around the negotiating table, and they must commit to act on the decisions made within this forum if consensus is successfully reached (Laws et al., 2014). This does require relinquishing power to a degree and would represent a significant change in organisational culture for many conservation organisations. However, if noncompliance with resource use restrictions is currently the norm because the rules imposed are viewed as illegitimate by the local people affected by them, then it is incumbent upon project implementers to make compromises and agree to specific trade-offs in order to improve the conservation and social situation overall (Brechin et al., 2002). The aim of mediated negotiation is to reach agreement over a detailed plan of action that all parties can accept – not because it is their preferred choice but because it is better than the alternatives (Laws et al., 2014). This is essentially the opposite of the win-win discourse that remains prevalent in conservation. Rather than being overambitious and unachievable, the final plan should be pragmatic and realistic, with clear and unambiguous conservation and social commitments outlined for implementers, communities and

other stakeholders as appropriate. Accountability mechanisms need to be put in place to ensure all parties adhere to these mutually agreed commitments, including a mechanism through which local people can report on the performance of implementing organisations and the behaviour of field staff so that plans can be adapted and corrective action taken as necessary (Bennett and Dearden, 2014).

5.5 Conclusion

The qualitative, inductive research approach taken for this chapter has enabled an in-depth examination of the complex reasons for the relative success or failure of different alternative livelihood projects associated with a protected area in Cameroon. Previous studies comparing alternative livelihood projects with a view to determining critical success factors have ended with calls for more such projects to be rigorously evaluated to bolster the evidence on which to base conclusions (Roe et al., 2015, Wicander and Coad, 2018). While emphasis in the conservation literature has been on the need for more impact evaluations employing quasi-experimental designs that can attribute and determine the magnitude of change, focusing on quantitative outcome assessments alone is insufficient because they do not enable a thorough examination of factors critical to success (Baylis et al., 2016, Moore et al., 2016). Carefully designed qualitative evaluations that draw on the perspectives and experiences of participants as well as implementers provide deeper understanding of implementation and livelihood change processes, thereby generating practical insights as to how and why interventions have an impact or not, which can inform design and implementation approaches moving forward. Alternative livelihood projects are complex interventions that require significant changes in human behaviour if they are to have a measurable conservation impact. With uncertain and often unpredictable pathways to change, a more nuanced understanding of project processes and the multitude of factors that shape project outcomes is essential. This must extend beyond a focus on project inputs and activities to consider complex social dynamics and exogenous factors that create feedback loops and tipping points (Devereux et al., 2013). By determining whether the trajectory of change is positive or negative, timely process evaluations allow for adaptive management that can ultimately increase the likelihood of hoped for impacts being realised.

Thematic analysis of qualitative data relating to the seven alternative livelihood projects studied for this chapter has revealed both proximate and underlying factors that lead to variance in the longevity of projects and their social and conservation impacts. Although success depends on the appropriateness of the type of livelihood promoted, the nature and level of support provided and whether those motivated to participate are able to do so, ultimately local people need to have greater input into these decisions, which requires the building and maintenance of conducive relationships based on mutual respect and trust. Yet having positive social outcomes does not guarantee that the intended conservation outcomes will be achieved. This requires implementers to focus on a clearly defined conservation problem, which

enables the most relevant people to be targeting and supported in a way that is tailored to their circumstances. Such an approach necessitates more careful consideration of a project's theory of change, as discussed in more detail in Chapter 6. The a priori assumption of Roe et al. (2015) that the targeting of groups considered a biodiversity threat and their involvement in project design could lead to improved conservation outcomes is broadly supported by these conclusions. Analysis of the case studies has also confirmed how imperative it is to moderate the expectations of communities and implementers by being realistic as to what can be achieved through a single project. Transparency is essential and any contractual agreements that are signed should only detail achievable and reasonable commitments for each party. However, the evidence presented in this chapter does not provide support for the final aspect of project design that Roe et al. (2015) proposed could be an effect modifier – that the livelihood activity promoted be dependent on conservation outcomes. The only case study project that arguably depended on conservation, i.e. continued existence of the forest and flowering plants, was the beekeeping project, however such projects may falter due to their novelty if they promote an externally introduced livelihood option.

The process of enabling meaningful interactive participation and achieving both development and conservation outcomes inevitably takes time and is unlikely to advance in a linear fashion (Shackleton et al., 2010). Changing long-standing livelihood practices is complicated and fraught, yet alternative livelihood projects are often regarded as relatively simple, small-scale, minimal input interventions. Typically those implemented across West and Central Africa have had low budgets and short funding cycles of around 1-2 years (Wicander and Coad, 2018), which suggests a lack of appreciation on the part of conservation practitioners as to the amount of investment and level of support required to enable someone to make changes to their livelihood. Implementers need to be realistic with regards to their goals, the timeframes set for achieving them and the level of resources required. The time lag between the launch of a project and it having measurable outcomes needs to be considered before quantitative assessments of impact are conducted, since early claims of success or failure may be premature. The value of qualitative evaluations should not be underrated, since it is such explorations of field-based realities that can determine the trajectories of change and guide adaptation as necessary. Livelihood interventions in conservation must be better informed by what has and has not worked well in the past. Documenting projects in a comparative, open-access database would enable implementers to review the processes and outcomes specific to the types of projects that seek to address particular conservation problems, thereby deepening our understanding of what approaches work best in different contexts. However, in terms of lessons that are applicable more broadly, the guiding principles presented in this chapter form the basis of what could be developed into a set of best practice guidelines to inform the design and implementation of livelihood interventions in conservation moving forward.

Chapter 6

Livelihood interventions in theory and practice: a theory-based assessment of alternative livelihood projects with insights from behavioural science

6.1 Introduction

Every alternative livelihood project implemented has an underlying theory of change. This theory may have resulted from intensive discussion within the project design team and may have been co-produced with the intended target audience for an intervention, other stakeholders and relevant experts.

However, often the theory behind a project, i.e. how an intervention is expected to bring about change, is not explicitly discussed nor articulated. Implementers make assumptions about how and why a project should work, and these assumptions tend to reflect deeply-held values, worldviews, beliefs, norms and ideologies (Vogel, 2012). Often assumptions are so ingrained and widespread that they are not questioned by project implementers and instead appear to be common sense. With increased pressure from donors for projects to demonstrate impact, articulating theories of change, often as results chains or logical frameworks, has become more common. However, it has made theories of change somewhat of a tick-box exercise for grant proposals when their real value is as tools for critical thinking. Producing a theory of change enables implementers to identify and question implicit assumptions relating to the causal mechanisms through which an intervention could result in change (Moore et al., 2015). Many conservation interventions fail to have the desired impact simply because the critical assumptions on which they are based do not hold (Biggs et al., 2017). It is therefore vital that key uncertainties are acknowledged and addressed, especially if the rhetoric associated with a particular type of intervention has propagated key assumptions for decades (Wells et al., 2004). To increase the likelihood of conservation interventions being effective, theories of change should draw on the existing evidence base by focusing on causal mechanisms that have empirical support and learning from established theories.

The principal role of livelihood interventions in conservation is to change human behaviour. Such projects aim to reduce the pressures that local resource users place on ecosystems by reducing their reliance on natural resources. This requires a dramatic shift in livelihood practices at the population level, particularly in situations where the livelihood activity considered to be problematic, such as hunting, is a normal day-to-day activity for a significant proportion of the population concerned. Alternative livelihood projects therefore try to influence system-level outcomes through individual-level incentives, and their effectiveness depends on the extent to which they influence the decisions and behaviours of individual

resource users. Human decision-making processes, the mechanisms of behaviour change and the conservation consequences of any such change are still largely assumed in conservation, rather than backed up with empirical evidence (Milner-Gulland, 2012). However, there is much that conservation can learn from the behavioural sciences – psychology and behavioural economics in particular (St John et al., 2010b, Cowling, 2014). In the health sector, it is increasingly recognised that interventions should be based on a theoretical understanding of behaviour change mechanisms (Michie et al., 2008), with evidence to suggest that public health initiatives based on established behavioural science theories are more effective than those that are not (Glanz and Bishop, 2010). Such theories are characterised by sets of interrelated concepts that are purported to explain or predict behaviour across a variety of settings. The numerous behavioural science theories that exist are the result of years of cumulative knowledge about what influences human behaviour and how to change it (Davis et al., 2015). These theories can therefore usefully be applied to better understand behaviour change processes within conservation and help project implementers identify the barriers and potential levers to change in any given situation.

The process of behaviour change is inherently complex across all settings but changing practices that have been passed down from generation to generation is particularly challenging. Even more so when the need for change has been identified by technical experts, with a focus on environmental or societal benefits, rather than by the people themselves. In conservation, the notion that humans are rational actors who adapt their behaviour in response to economic incentives is widely assumed (Barrett and Arcese, 1998, Damania et al., 2005). This is based on traditional economic theory which considers individuals to be perfectly rational resource allocators who, by weighing up the pros and cons, make optimal decisions that maximise their personal benefits (Gowdy et al., 2010). The point at which the benefits of switching to an alternative livelihood activity start to marginally outweigh the costs is when behaviour change is purported to occur. However, psychologists have long since highlighted that behaviour change is a far more complicated process than economic theory suggests. Human behaviours are the product of multiple internal mechanisms that operate simultaneously and interact with each other. In addition to rational thought processes, humans are driven by emotions, habit and instinct, all of which are affected by their social and physical environment (Christmas et al., 2015). Consequently, interventions which seek to change human behaviour, such as alternative livelihood projects, are more complex than is typically assumed. Multiple behaviours may have to change for an intervention to have the desired impact, with causal chains often long and outcomes unpredictable (Michie et al., 2014b). Established theories from the behavioural sciences can guide broader reflection on the functionality of alternative livelihood projects, and used as diagnostic frameworks they can help us better understand the components necessary to make these kinds of projects more effective at changing human behaviour.

For conservationists new to behavioural science, there is a bewildering array of established theories that could be used to provide insights and help explain observations relating to alternative livelihood projects. Davis et al. (2015) identified 82 behavioural science theories from across psychology, sociology, anthropology and economics, and noted the lack of guidance available to implementers on how to select appropriate theories to guide their interventions. Instead, within the public health sector, a limited number of better-known theories tend to be used by implementers, such as the Transtheoretical Model (Prochaska and DiClemente, 1983) and the Theory of Planned Behaviour (Ajzen, 1991), even when these theories may be ill-suited to the behaviour or context in question (Davis et al., 2015). Behavioural science theories can broadly be divided into two types – theories of behaviour and theories of behaviour change (Fishbein et al., 2001, Davis et al., 2015). The former identify factors that influence whether or not a behaviour is performed, whereas the latter focus on the stages that individuals pass through during the behaviour change process. To understand why an intervention has or has not resulted in behaviour change, an important initial step is to identify what has prompted the change and what barriers have prevented it, and theories of behaviour are useful explanatory tools for this purpose (Michie et al., 2005). There are two broad types of mechanism involved in changing behaviour, those external to the individual, which are determined by the context, and those internal to the individual based on their personal disposition and characteristics (Michie et al., 2011). Most of the theories identified by Davis et al. (2015) focus on internal factors, such as an individual's level of motivation and capability, with limited consideration of the social and environmental factors that facilitate or restrict engaging in a behaviour.

Some of the behavioural science theories widely used within the public health sector have now started to gain traction within conservation, particularly the Theory of Planned Behaviour (see: St John et al., 2010b). This theory suggests that an individual's intention to perform a behaviour is determined by their attitudes towards the behaviour, their perception of what other people think about them performing the behaviour (subjective norms), and the extent to which they feel able to perform the behaviour (perceived behavioural control) (Ajzen, 1991). By identifying which of these factors is preventing a person from conducting a behaviour, it is possible to focus intervention efforts more precisely on what needs to change in order to increase the strength of a person's intention, or motivation, to perform the behaviour. The Theory of Planned Behaviour is one of many social cognition theories developed in psychology that focus on beliefs and the reflective thought processes involved in conscious decision-making (Michie and Abraham, 2004). However, motivation is also influenced by automatic, unconscious processes driven by emotions, biases, habits, impulses and gut reactions (Michie et al., 2011). Using a theory that assumes the performance of a behaviour is determined through reflective choice ignores these automatic drivers and limits the comprehensiveness and usefulness of a post-hoc theory-based assessment. There also may be limits to the transferability of behavioural science theories developed in

the West to other cultural contexts (Browne-Núñez and Jonker, 2008). However, these issues can be minimised by selecting an all-encompassing theory that draws key constructs from across a variety of behavioural science theories, thus enhancing its comprehensiveness and transferability across settings.

There have been two main attempts to develop an all-encompassing theory of behaviour. In 1991, the proponents of five of the most prominent behavioural science theories from social psychology and the health sector convened to create a definitive list of variables that should be considered during behavioural analyses. After dissecting the five theories, Fishbein et al. (2001) arrived at a list of eight variables considered to be the primary determinants of any behaviour, with three of them (intention, skills and environmental constraints) deemed pivotal in determining whether or not a behaviour occurs. For a person to perform a behaviour, they must therefore have formed a strong positive intention to do so, have the necessary skills, and there must not be any environmental constraints preventing them from performing the behaviour. The remaining five variables identified by Fishbein et al. (2001) are thought to influence the strength of a person's intention to perform a behaviour. However, this group of behavioural scientists failed to reach consensus in relation to the causal linkages between the eight variables and therefore ultimately did not propose an all-encompassing theory of behaviour. In 2002, a similar, but independent, expert consensus-building exercise was conducted by a group of 18 UK-based psychological theorists. Working in collaboration with implementation researchers and psychologists from across the health sector, Michie et al. (2005) also aimed to produce a definitive list of theoretical constructs that explain behaviour, and they did this by identifying and deconstructing as many psychological theories as possible. They identified 33 psychological theories and broke these down into 128 explanatory constructs, which were then grouped into domains. Michie et al. (2005) concluded that 12 theoretical domains should be considered when seeking explanations for behaviour – eight of these overlapped with the variables suggested by Fishbein et al. (2001) while four were additional variables.

The process conducted by Michie et al. (2005) validated and added to the earlier work of Fishbein et al. (2001), thus ensuring the comprehensiveness of the final list of 12 behavioural determinants. Yet, for a second time, there was no consensus as to the causal processes linking the theoretical constructs together. A comprehensive theory of behaviour was not proposed until the theoretical domains were revisited by Michie et al. (2011), who sought to create the most parsimonious model of interacting elements that could explain changes in behaviour. Believing motivation to be the most critical factor determining behaviour, they considered the minimum number of additional factors needed for a behaviour to occur. Informed by Fishbein et al. (2001) and a key principle in US criminal law, which stipulates that to prove someone's guilt prosecutors must demonstrate that the person had the means, motive and opportunity, Michie et al. (2011) concluded that capability, opportunity and motivation are

all necessary and interact to generate behaviour, and thus proposed the COM-B model (Figure 6.1). According to this theory, there always needs to be sufficiently strong motivation to perform the behaviour in question rather than not perform the behaviour or engage in a competing behaviour, and an individual's capacity to engage in the behaviour (capability) and the external factors which make the behaviour possible (opportunity) influence the degree of motivation. Unlike other behavioural science theories developed in psychology, the COM-B model gives equal weight to internal and external factors. Once a behaviour has been enacted there is positive or negative feedback which, by altering perceptions about individual capability and the opportunities available, directly and indirectly affects the level of motivation to enact the behaviour again. Increased motivation can lead to a person taking steps to increase their capability, and interaction between the three factors continues (West and Michie, 2020).

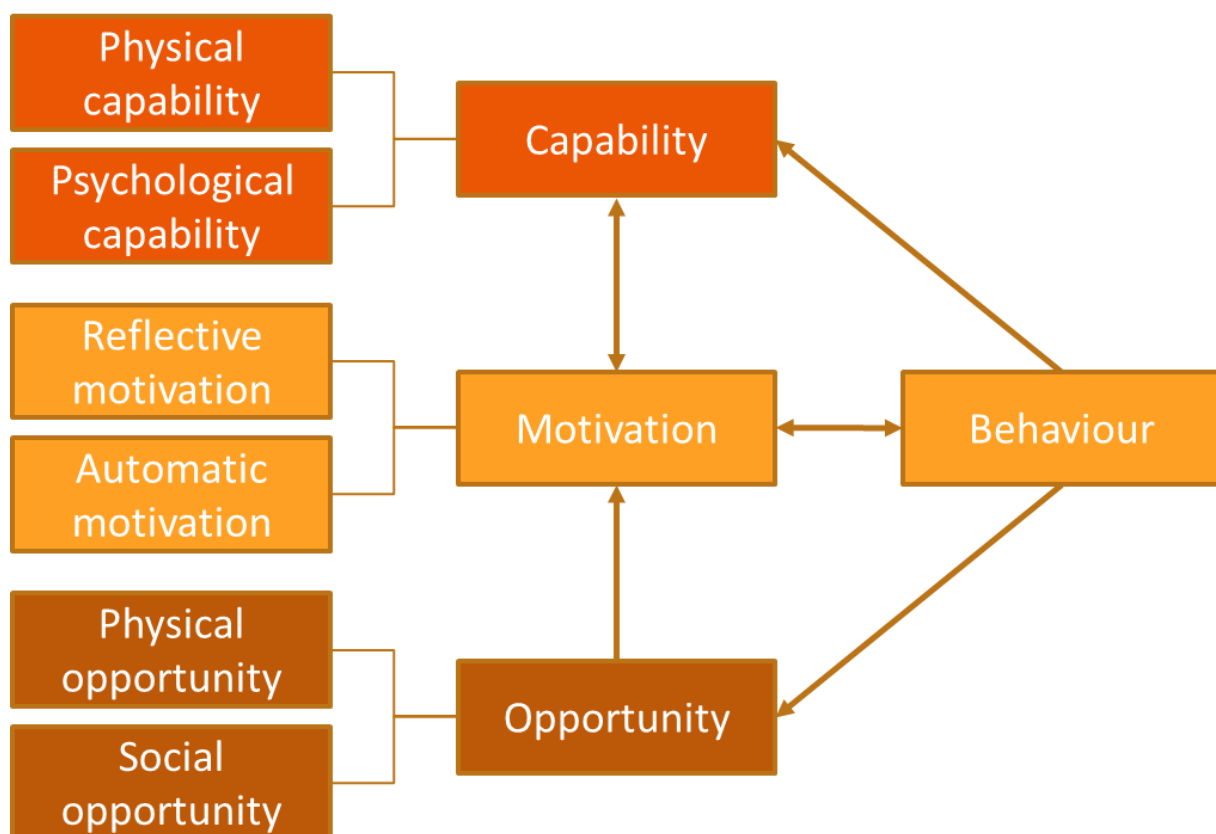


Figure 6.1: A diagrammatic representation of the interacting components of the COM-B model. Adapted from West and Michie (2020) under the terms of the Creative Commons Attribution Licence (CC BY 4.0). The original version can be viewed here: <https://doi.org/10.32388/WW04E6.2>

Encapsulating the main themes covered by the remaining theoretical domains and drawing on key distinctions made in the literature, the three components of the COM-B model were then subdivided by Michie et al. (2011) into six components that represent all aspects that influence behaviour. Capability is divided into physical and psychological capability to distinguish between the skills, strength and stamina associated with a person's physique and those associated with their mental function and fortitude.

Motivation is divided into reflective and automatic motivation to acknowledge the differing roles of reflective cognitive processes (i.e. planning and evaluation) and the subconscious, automatic processes, such as habits and emotional reactions, which are often overlooked during behavioural analyses. Finally, opportunity covers contextual issues and is divided into physical and social opportunity, with the former encompassing aspects of the physical environment, such as resource availability and accessibility, while the latter covers social and cultural aspects, such as social acceptability and interpersonal influences. Michie et al. (2011) argue that all components of this behavioural system, as depicted in Figure 6.1, are necessary for behaviour to occur, with the exception of reflective motivation since automatic processes alone can be sufficient, particularly when a behaviour becomes habitual. The COM-B model can be used to systematically determine which components of the behavioural system need to change for a person to perform a behaviour. It can help in identifying the barriers to change that need to be overcome as well as the enablers that can be enhanced (French et al., 2012). Remaining cognisant of alternative behaviours in competition with the desired behaviour, implementers and evaluators should ultimately aim to establish what practicable and acceptable interventions will create the necessary conditions, both within individuals and in their environment, that can lead to the behavioural target being achieved.

In Chapter 5, I delved into the details of how a series of alternative livelihood projects were implemented in villages around Takamanda National Park in Cameroon, and examined how people responded to them. In this chapter, I critically reflect on the theory behind alternative livelihood projects in conservation and scrutinise long-held assumptions about how such projects should result in change. I draw insights from the behavioural sciences by using a comprehensive theory of behaviour – the COM-B model – as a diagnostic framework. More specifically, I determine what internal and external factors have facilitated or limited behavioural adoption in relation to twenty alternative livelihood projects implemented around two protected areas in Cameroon – Takamanda National Park and Dja Faunal Reserve. By reconstructing a typical theory of change for alternative livelihood projects, I use these empirical case studies to explore where breakages in the causal chain take place and what the key uncertainties are. Finally, acknowledging the complex conservation landscapes in which alternative livelihood projects are implemented, I consider how behavioural science theories can be used to help pinpoint which components of the behavioural system need to be targeted by conservation interventions to create the conditions necessary for desired behaviours to thrive and behaviours of conservation concern to decline.

6.2 Methods

6.2.1 Study sites

The empirical research for this chapter was conducted at three sites around Takamanda National Park and the Dja Faunal Reserve in Cameroon. Takamanda National Park covers an area of 676 km² and is in

the anglophone South West Region (Figure 6.2a; see section 3.3 of Chapter 3). Renowned for its unusually high species richness and levels of endemism, Takamanda was classified as a national park in 2008. It is part of the Cross-Sanaga-Bioko coastal forest which runs along the international border with Nigeria (Sunderland-Groves and Maisels, 2003). There are relatively high human population pressures in the South West, with an average of 60 people per km² (INS, 2015). Conversion of forest to farmland and hunting for bushmeat have resulted in a high proportion of endemic species becoming endangered, including the Cross River gorilla. Covering an area of 5,260 km², Dja Faunal Reserve is eight times the size of Takamanda (see section 3.4 of Chapter 3). Part of the Congo Basin forest, it straddles the francophone South and East regions (Figure 6.2b). The Dja and its surrounding landscape represents one of the few extensive tracts of forest that could sustain populations of large mammals, such as forest elephants, over the long term (MINFOF, 2004). Classified as a *Reserve de Faune* in 1973, the Dja has been recognised internationally as an area of global conservation importance for many years and attained UNESCO World Heritage Site status in 1987 (IUCN, 1987). While the human population densities of the South and East regions are low at 16 and 8 people per km² respectively (INS, 2015), and wildlife population densities are high compared to Takamanda, the Dja is a source area for bushmeat destined for the capital Yaoundé (Edderai and Dame, 2006). As such, the rate of wildlife population declines is of significant concern.

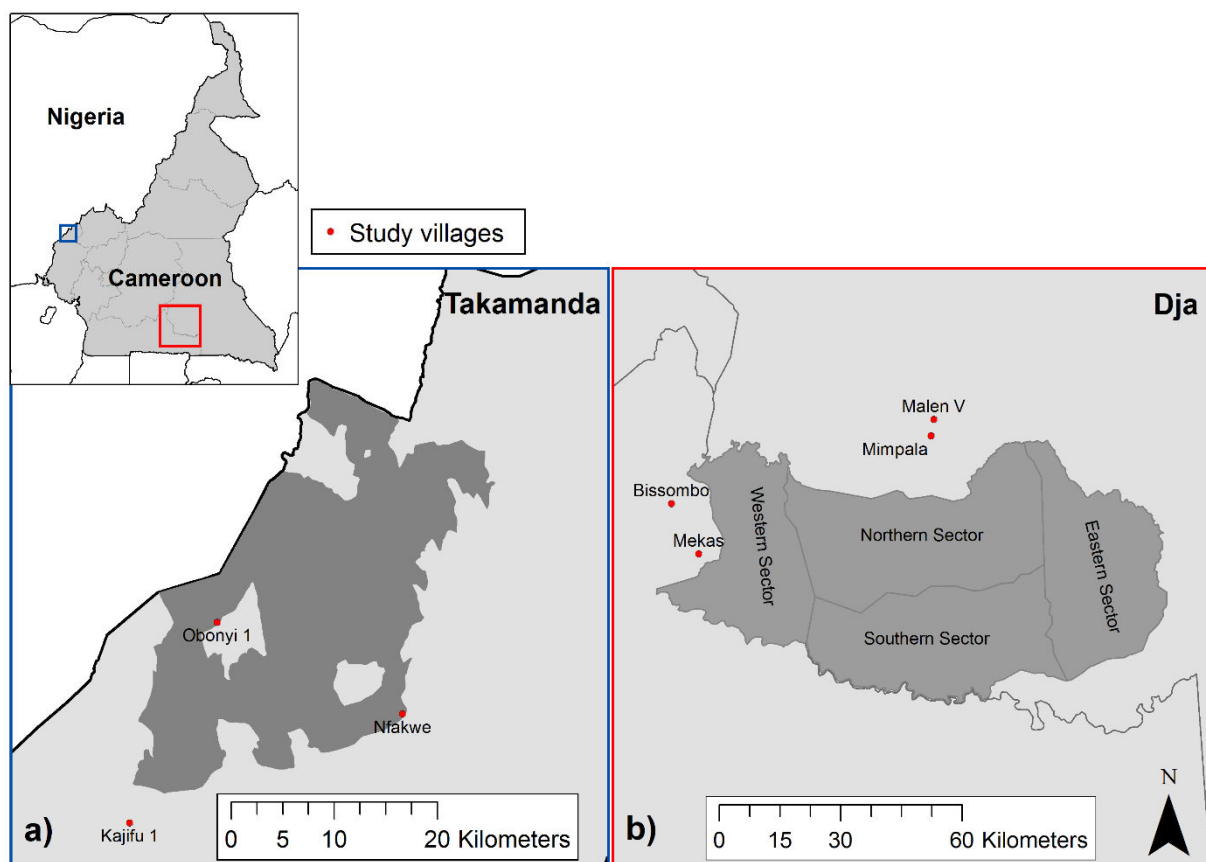


Figure 6.2: Map of study sites showing a) Takamanda National Park and the three study villages, and b) Dja Faunal Reserve and the four study villages adjacent to the western and northern sectors

Takamanda National Park is managed by MINFOF in collaboration with a consortium of partners, which all come under the umbrella of PSMNR-SWR. Co-financed by the Cameroon government and KfW, PSMNR-SWR coordinates all of the protected area management and village development activities undertaken around Takamanda, and has been implementing livelihood projects in villages surrounding the protected area since 2006 (see Chapter 5 for a detailed analysis of these projects). While overall jurisdiction for the management of the Dja Faunal Reserve also comes under MINFOF, there is no umbrella institution financing and coordinating activities around the Dja. Instead, activities have been funded by multiple donors, including significant investment from the European Union's ECOFAC programme, and there are many local and international NGOs operating across the four sectors of the protected area. It is the range of different projects implemented over a long period by different organisations that makes the Dja Faunal Reserve an interesting comparative site to Takamanda. The Cameroonian NGO *Fondation Camerounaise de la Terre Vivante* (FCTV) operates in the 'Boucle de Mekas' in the western sector of the Dja, while a project linked to the Royal Zoological Society of Antwerp called *Projet Grands Singes* (PGS) operates at the periphery of the northern sector alongside the Cameroonian NGO Tropical Forest and Rural Development (TF-RD). All three of these organisations are involved in ongoing livelihood projects in areas with a history of similar initiatives. To learn from a range of different livelihood interventions, past and present, these two sites in the western and northern sectors of the Dja were visited a year after visiting Takamanda so as to glean insights from an increased number of projects.

There are 43 villages around the periphery of Takamanda National Park, which are located on either side of the Nigeria-Cameroon border. Eighteen of the villages on the Cameroon side are considered 'direct impact' villages by PSMNR-SWR because they share a boundary with, or are enclaved within, the national park (MINFOF, 2010). Around the periphery of the Dja Faunal Reserve, 105 villages were considered to be within the intervention zone of ECOFAC, when that programme was still in operation (Seme, 1998). Unlike in Takamanda, there are both sedentary, village-based peoples and semi-nomadic forest peoples living in and around the Dja. Sedentarisation efforts by the Cameroon government have pushed the semi-nomadic Baka to settle in existing Bantu villages, which has resulted in many villages having a 'Pygmy' camp attached to them (Nguiffo, 2001; see section 3.4.3 of Chapter 3). Until recently, most of the villages around Takamanda National Park were only accessible on foot, which limited sales of agricultural produce. Instead, the communities were heavily reliant on trading in NTFPs with a high value to weight ratio, such as bush mango and eru (Sunderland et al., 2003). However, as motorbike access has improved, a growing number of people have established cash crop farms, particularly cocoa farms. In contrast, the Bantu around the Dja Faunal Reserve have been engaged in cocoa farming for decades. Predominately situated along earth roads, Bantu villages around the Dja have previously benefited from state-funded agricultural development assistance but have also been badly affected by falls in

commodity prices. Many people abandoned their cocoa farms in the late 1980s and, taking advantage of the high demand in towns and cities, turned to the bushmeat trade instead (Solly, 2000, Wilmé, 2002).

Once the specific villages involved in the livelihood interventions implemented by PSMNR-SWR, FCTV and PGS had been identified, seven villages were randomly selected across the three study sites out of a total of 32: three in Takamanda (Nfakwe, Obonyi 1 and Kajifu 1), two in the western Dja (Mekas and Bissombo) and two in the northern Dja (Malen V and Mimpala) (Figure 6.2). The selected Takamanda villages are located in the Akwaya subdivision of Manyu division in the South West Region, while the western Dja villages are in Bengbis subdivision of Dja-et-Lobo in the South Region and the northern Dja villages in Messaména subdivision of Haut-Nyong in the East Region. The populations of the villages ranged from 51 to 819 inhabitants when I conducted censuses of the Takamanda and Dja villages in 2014 and 2015 respectively, with the Takamanda villages generally containing more households (Table 6.1). The main means of transport to all the villages is by motorbike or on foot, with travel times to either the divisional capital (in the case of the Takamanda villages) or the subdivisional capitals (for the Dja villages) ranging from 2 to 6 hours. Nearly all of the study villages contained some form of conservation infrastructure. This ranged from the national park headquarters constructed by PSMNR-SWR in Kajifu 1 to Mimpala being the nearest village and access point for *'La Belgique'*, a research station set up by PGS to study great apes in an area of unprotected forest adjacent to the Dja Faunal Reserve. However, at the time of fieldwork, the headquarters and ecoguard post in the Takamanda villages were yet to become fully operational, while the ecoguard posts and research centre constructed by ECOFAC in the Dja villages were either being used intermittently or had largely been repurposed. The PGS research station was the only facility actively in use during my fieldwork, providing significant employment opportunities for the people of Mimpala to work as forest guards, field guides, cooks and porters.

Table 6.1: Characteristics of the seven study villages around Takamanda National Park and Dja Faunal Reserve

	Village	Pop. size	Ethnicity	Road	Time to town[‡]	Park infrastructure
Takamanda	Nfakwe	233	Anyang	No	6 hours	None
	Obonyi 1	356	Anyang	Yes	4 hours	Ecoguard post
	Kajifu 1	819	Boki	Yes	2 hours	Headquarters
Western Dja	Mekas	239	Bulu + Baka	Yes	3 hours	Research centre
	Bissombo	65	Bulu	Yes	2 hours	Ecoguard post
Northern Dja	Malen V	187	Badjoué + Baka	Yes	2 hours	Ecoguard post
	Mimpala	51	Badjoué	No	4 hours	Field site access [*]

[‡] Estimated travel time to the divisional or subdivisional capital using the fastest means of transport available

^{*} Access to research station managed by PGS in unprotected forest adjacent to the Dja Faunal Reserve

6.2.2 Data collection

Data were collected in the three study villages around Takamanda National Park in June and July 2014, and in the four study villages around Dja Faunal Reserve in May and June 2015. The research protocol used in the villages around Takamanda, which is described in detail in section 5.2.2 of Chapter 5, was replicated in the villages around the Dja with some modifications to the interview guide. Ethics approval for this research was obtained from the ZSL Ethics Committee and research permits were granted each year by the Cameroon Ministry of Scientific Research and Innovation (MINRESI) (see section 1.5 of Chapter 1). Before fieldwork commenced, permissions were obtained from the appropriate regional delegations of MINFOF, as well as from the conservators of Takamanda National Park and Dja Faunal Reserve. Being accompanied to the field by an ecoguard was compulsory across all sites. The three ecoguards who accompanied the team to different villages assisted with logistics and food preparation but were not involved in any aspects of the research. At the village level, permission to stay and conduct research was sought on arrival from the chief, and in each case a village meeting was arranged. At these meetings, the purpose of the research, methods to be used, time involved, and anticipated outputs were explained and debated (see village information sheet in Appendix A). A small contribution of 10,000 XAF (approximately 20 USD) was donated to each village's development fund as a token of appreciation.

My research team consisted of three members when visiting Takamanda – myself, my research assistant Catherine, and a local facilitator/cook (as detailed in section 5.2.2 of Chapter 5). For the Dja, I was accompanied only by my research assistant Wirba Terence Ndzebeme and an ecoguard. Terence is an anglophone from the North West Region of Cameroon who can speak fluent French having spent many years working in the capital Yaoundé. Terence was working as an education officer at a primate sanctuary located near Yaoundé called Ape Action Africa and was unfamiliar with the Dja area prior to conducting this research. I deliberately worked with a research assistant who had no prior experience of, or ties to, the study area so as to increase the confidence of research participants in our impartiality and ability to maintain confidentiality. In each of the study villages, the team stayed in either the chief's house or with a family based on the recommendation of the chief, and a good rapport was developed with our hosts and other members of the community. The length of time spent in each study village ranged from seven to eight days in the villages around Takamanda and five to seven days in the villages around the Dja. We travelled to and between villages either by motorbike or on foot, except for when visiting Malen V, for which the Conservator arranged a 4WD to drop us there and PGS offered a lift back.

Interviews were conducted with households selected at random in each study village. Because there were no available lists of households which had participated in each livelihood project, and so many different livelihood interventions had been implemented, it was impossible to make a clear-cut

distinction between, and therefore stratify according to, participant versus non-participant households. As such, I concluded that using a simple random sample was the best approach for getting an unbiased insight into perceptions and experiences of the different livelihood interventions implemented. To facilitate the random selection of households, a village mapping exercise and census were carried out as soon as approval was granted to conduct research in each village. A villager with extensive knowledge of the community was identified to assist with the mapping process and help us create a comprehensive list of households for use as a sampling frame. Extended families were divided into smaller nuclei for the purpose of this research, with a household typically consisting of a married couple or widow and the unmarried children that reside with them most of the time. Young couples living in the same house as their parents were therefore considered a separate household. Polygamous families were divided up, with each wife considered to be semi-autonomous. Absent family members, including children away at school, were excluded from the census. In Mekas and Malen V, the village census incorporated the Baka families resident in camps at the periphery of the village at the time of the research. The mapping and census exercise took a full day in most villages and was a good opportunity to introduce ourselves to members of each household and familiarise ourselves with the village setting. Details about village infrastructure and other characteristics were noted on a village survey form (included in Appendix B). Once a sketch map of the village and the household census were complete, pre-printed random number tables generated in Microsoft Excel were used to randomly select numbered households for interview.

The number of households randomly selected for interview depended on the size of the village and the time available. For the Takamanda villages, I followed a rule of thumb suggested by Shively (2011) and aimed to interview a minimum of 25 households per village. However, the Dja villages were generally smaller than those in Takamanda and there was also less time available. I therefore randomly selected between 10 and 40 households per village, which were then visited in the order they were selected as much as was practically possible. Interviews were conducted with the male and/or female household head depending on availability, with repeat visits made if a more convenient time was specified or if no one was around. Across the seven villages, only one household declined to participate in the research. However, it was not uncommon for household heads to be absent, either because they had temporarily travelled outside the village, were at their farms or in the forest. Additional households were randomly selected in Nfakwe, Kajifu 1 and Malen V to substitute for those unavailable for interview, but in each case only one substitute household was interviewed due to time limitations. In Mekas, three Baka households were initially selected for interview, but language barriers prevented these interviews from taking place. However, we did not encounter the same problem in Malen V because one of the Baka could speak French. The total sample size across the three study sites was 127 households, with a mean

sampling effort of 42% and a non-response rate of 24%. Final sample sizes, the proportion of households captured in the sample, and non-response rates for each village are presented in Table 6.2.

Table 6.2: Sample size, sampling effort and non-response rates in the villages around Takamanda and Dja

	Village	Households		Sample size		Sampling effort	Non-response rate
Takamanda	Nfakwe	37		25		68%	20%
	Obonyi 1	65		29		45%	28%
	Kajifu 1	157		28		18%	29%
Western Dja	Mekas	60		15		25%	21%
	Bissombo	19		9		47%	10%
Northern Dja	Malen V	42		13		31%	40%
	Mimpala	13		8		62%	20%
			Total	127	Mean	42%	24%

Free, prior and informed consent was obtained from each respondent before the interview commenced (see section 5.2.2 of Chapter 5). Permission was then sought to audio record the interviews. Each household interview followed a structured format with a mixture of closed and open-ended questions. A household survey datasheet was initially piloted and implemented in the Takamanda villages (see Appendix B), before being refined and adapted for the Dja villages (see Appendix D). Interviews began with a series of questions on household composition and characteristics, main income-generating activities and use of forest resources, with the topic of hunting broached sensitively through a casual questioning approach (see section 5.2.2 of Chapter 5). Respondents were then asked a series of questions about the livelihood interventions implemented in their village. In Takamanda, these questions focused on the projects implemented by PSMNR-SWR, however a more exploratory approach was taken in the Dja to identify additional projects. All livelihood projects identified prior to each interview were listed to respondents, who were asked to verify whether they had heard about them and whether anyone in their household had participated in them. Respondents were then asked to reflect on their personal experiences of having been involved in one or more of the projects, or to explain why they had not been involved, if applicable. Other members of the household were encouraged to provide input if they had participated in different projects and were available to answer questions. This section of the interview followed a semi-structured format, with supplementary questions and probes used to encourage a fuller response. Additional notes were made in notebooks if the space available on the datasheet proved insufficient. The final part of the interview focused on opinions regarding living adjacent to a protected area and how households had been positively and negatively affected by it.

Interviews were conducted in pidgin English in the villages around Takamanda and in French in the villages around the Dja. Because I have a good understanding of pidgin English, a one-way translation process was used whereby my assistant asked the questions and I only asked for clarification regarding the response when necessary. However, my French language abilities are considerably more limited, and I needed two-way translation to be able to conduct the interviews effectively. While relying on translations is not ideal in terms of ensuring data accuracy, and because it lengthens interview duration, I was at least able to understand enough French to be able to pick up when aspects of the conversation had not been translated in full or required further clarification. In Takamanda, I worked with my research assistant to appropriately phrase the questions in pidgin English, whereas for the Dja the questions were translated into French by a professional Cameroonian translator based in Yaoundé, then backtranslated for verification purposes using Google Translate. Further adjustments were made to the French script by my research assistant to ensure the questions would be fully understood by respondents. Interviews conducted in the Takamanda villages took one hour on average, but the Dja interviews lasted much longer at two and a half hours per interview. While this was partly due to the extra time needed for two-way translation, the people around the Dja were also generally happier to spend longer periods of time going into detail about their experiences and opinions. At the end of each interview, I assigned a general reliability score to indicate whether I perceived the respondent to have answered the questions honestly and accurately. I then gave a handful of Maggie stock cubes to the respondent as a courtesy gift to thank them for participating in the study. Across the three study sites, the information provided during seven interviews was considered to be potentially unreliable and was treated with caution during analysis.

Information about past and present livelihood interventions was also collected at the village level. Details provided during informal conversations with village leaders and project focal points were either added to the village survey form or recorded in a notebook. Any ongoing activities or tangible aspects of the livelihood projects, such as pigsties and beehives, were observed and photographed whenever possible. Although translation issues prevented me from conducting interviews with the Baka households living near the village of Mekas, I was able to hold a discussion with the Baka community one evening with the help of someone from the main village who acted as an interpreter. This at least gave me a better understanding of their situation and level of involvement with the livelihood projects. Finally, information was obtained from project implementers to enable comparisons to be made between their perceptions of the projects and those of participants. Informal key informant interviews were conducted with five project managers and three field staff from PSMNR-SWR, FCTV, PGS and TF-RD. All project documents that were made available, or are publicly available online, were reviewed. Contact was also made with the European Union delegation in Yaoundé to enquire about the projects previously implemented by ECOFAC around the Dja. However, only the reports from more recent phases of ECOFAC

were available, and these did not contain details of any livelihood projects. This is probably because during the latter phases of ECOFAC, livelihood projects have been implemented through NGO partners, such as FCTV. The discussions with implementers and reports obtained helped to clarify the theories of change behind each project, as well as details of when and how each project was implemented.

6.2.3 Data analysis

After leaving each study site, the detailed notes written on datasheets and in accompanying notebooks were typed up in full, with audio recordings checked for clarification if necessary. For the household interviews, both the socio-demographic variables and the open-ended responses to the livelihood intervention questions were entered into spreadsheets in Microsoft Excel. Descriptive statistics were conducted on the socio-demographic variables to characterise the final sample at each study site. The qualitative data on the livelihood projects were analysed using a directed content analysis approach (Hsieh and Shannon, 2005, Atkins et al., 2017). This followed a similar process to the thematic analysis conducted for Chapter 5 (see section 5.2.3), except that the components of the COM-B model were used as the initial coding framework, making this analysis primarily deductive rather than inductive. All data of relevance were therefore coded to six predetermined themes: 1) physical capability, 2) psychological capability, 3) reflective motivation, 4) automatic motivation, 5) physical opportunity, and 6) social opportunity. Having already analysed the Takamanda data and produced a series of detailed and inclusive narrative case studies (see sections 5.3.3 to 5.3.9 of Chapter 5), it was the content in these narratives that was coded during this subsequent analysis. However, for the more recently collected Dja data, I read the interview responses in full and immediately coded all content of relevance to the six COM-B components. I then reviewed the data coded to each component to identify specific barriers and enablers that affected the uptake of promoted livelihood activities. These factors are discussed in the results according to whether they affected individual capability, motivation or opportunity to act. Case study projects from Takamanda and Dja are presented in boxes to illustrate how the identified barriers and enablers actually resulted in the relative success or failure of different alternative livelihood projects.

To critically examine the implicit theories of change underlying the alternative livelihood projects, key informant interview notes and project documents were scrutinised to understand the logic behind as many projects as possible. Explicit assumptions made by project implementers were noted, with additional assumptions inherent to alternative livelihood projects identified from the published conservation literature, particularly Wicander and Coad (2015) and Biggs et al. (2017). This information was used to reconstruct a simple linear theory of change, which broadly reflects the prevailing notion in conservation about how alternative livelihood projects should result in the uptake of desired livelihood practices and thereby reduce those of conservation concern. The data from across the three study sites

were examined to determine how far along this theory of change each of the identified livelihood projects had progressed, thus highlighting where breaks in the causal chain occur and the level of uncertainty regarding some of the critical assumptions that are often made. Insights from the COM-B analysis and this reality check of the accuracy of the reconstructed theory of change were used to create a cyclical schematic to illustrate how contextual factors in a typical conservation landscape interact with individual factors to determine which livelihood practices are adopted and sustained over time.

6.3 Results

6.3.1 Socio-demographic characteristics of the sample

Of the 127 households interviewed across the three study sites, 107 (84%) recognised a male member of the family as being the household head, with 20 (16%) recognising a female head of the household (see Table 6.3). The average age of male household heads was lower than that of females at 50 years compared to 60 years, with most female household heads being widows. There was no significant difference in the sex and age distribution of household heads across the three study sites. However, the education level of household heads did differ between sites, with educational attainment being lowest in the villages around Takamanda, where the majority (56%) had attended primary school for at least a year, but a relatively high proportion (26%) had never gone to school. At the northern Dja site, the majority (65%) of household heads had attended primary school, but only in the western Dja site had the majority (74%) attended secondary school. This is likely a reflection of the comparatively high level of infrastructural development in the western Dja area, due in part to the President's native village being in the vicinity. This also probably explains why the western Dja villages had a higher proportion of household heads (29%) that were in-migrants compared to the other two sites. In the Takamanda villages, the majority of household heads were either Anyang or Boki, depending on the village, whereas at the western Dja site they were mainly Bulu and in the northern Dja mainly Badjoué.

The proportion of households that had at least one person with an official position in the village differed significantly between Takamanda and Dja, reflecting the different cultural and administrative contexts (see sections 3.3.3 and 3.4.3 of Chapter 3). In Takamanda, the majority of households (57%) had someone who was in a leadership position or on a village council committee, whereas around the Dja the proportion of households containing an individual with an official village position was lower at 29%. Ninety-one percent of households owned their own home. In Takamanda, most houses were built from locally made mud bricks, whereas in the Dja they were almost always made from traditional wattle and daub. While 70% and 67% of houses in Takamanda and the western Dja had corrugated iron roofs, the majority (86%) of houses in the northern Dja were still thatched in the traditional way.

Table 6.3: Socio-demographic characteristics of the sample across the three study sites

	Takamanda		Western Dja		Northern Dja		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Sex of household head $\chi^2 = 1.204$, $df=2$, $n=127$, $p=0.548$								
Male	67	82%	21	87%	19	90%	107	84%
Female	15	18%	3	13%	2	10%	20	16%
Age of household head $\chi^2 = 3.729$, $df=4$, $n=127$, $p=0.444$								
16-35	18	22%	4	17%	6	29%	28	22%
36-55	28	34%	8	33%	10	48%	46	36%
56+	36	44%	12	50%	5	24%	53	42%
Education of household head*** $\chi^2 = 26.047$, $df=2$, $n=125$, $p=0.000$								
<Primary	67	82%	6	26%	13	65%	86	69%
>Secondary	15	18%	17	74%	7	35%	39	31%
Origin of household head* $\chi^2 = 6.242$, $df=2$, $n=126$, $p=0.044$								
Village	74	90%	17	71%	18	90%	109	87%
Elsewhere	8	10%	7	29%	2	10%	17	13%
Farm size*** $\chi^2 = 20.544$, $df=4$, $n=123$, $p=0.000$								
<2.5 ha	32	41%	2	8%	10	50%	44	36%
2.5-4 ha	23	29%	3	13%	3	15%	29	24%
>4 ha	24	30%	19	79%	7	35%	50	40%
Forest dependent*** $\chi^2 = 14.523$, $df=2$, $n=127$, $p=0.001$								
Yes	32	39%	4	17%	0	0%	36	28%
No	50	61%	20	83%	21	100%	91	72%
Hunting household** $\chi^2 = 10.237$, $df=2$, $n=127$, $p=0.006$								
Yes	40	49%	16	67%	18	86%	74	58%
No	42	51%	8	33%	3	14%	53	42%
Perceived change in livelihood security over previous 5 years* $\chi^2 = 11.922$, $df=4$, $n=125$, $p=0.018$								
Improved	56	69%	11	46%	8	40%	75	60%
No change	4	5%	3	12%	5	25%	12	10%
Worsened	21	26%	10	42%	7	35%	38	30%
Number of livelihood projects* $\chi^2 = 10.378$, $df=4$, $n=127$, $p=0.035$								
0	13	16%	3	13%	2	9%	18	14%
1-3	37	45%	19	79%	13	62%	69	54%
4-7	32	39%	2	8%	6	29%	40	32%

Asterix indicate the level of significance: * $P<0.05$; ** $P<0.01$; *** $P<0.001$

Cocoa was an important source of income across all three sites, with 50%, 44% and 38% of households deriving their main income from cocoa in the western Dja, Takamanda and northern Dja respectively. In total, 72% of all households received some form of income from cocoa even if it was not their main income source. The amount of farmland households had for all crops ranged from 0.25 to 15.5 ha, with households in the western Dja having the largest farms at 6 ha (± 3) on average. Employment was of equal importance to cocoa in the northern Dja due to the presence of the PGS research station, with 38% of households deriving their main income from paid work. While in Takamanda, bush mango was the second most important income source after cocoa, providing a main income for 37% of households.

Across the three sites, 28% of households were considered forest dependent, with their main income derived from the sale of forest resources. Most of these were households in Takamanda dependent on the sale of NTFPs, however some households in the western Dja were also considered to be forest dependent because their main income came from hunting or the trade in bushmeat. Fifty-eight percent of all households had at least one member who knew how to hunt and had hunted in the past, with the proportion of households that hunt being higher in the Dja villages than in the Takamanda villages. However, differing degrees of social desirability bias across sites in relation to hunting may have played a role in this finding. The majority (69%) of respondents in Takamanda thought that the livelihood security of their household had improved over the last 5 years, whereas most respondents (57%) around the Dja felt that their livelihood security had remained the same or even got worse.

The number of livelihood projects each household had participated in depended on the number of projects implemented at each site. However, 86% of households across all three sites had participated in at least one livelihood project. Households in Takamanda and northern Dja had participated in three projects on average, while those in western Dja had participated in one. Answers to the questions asked about livelihood projects were mainly provided by the 82 men and 45 women who acted as the primary interview respondents in their respective households, although contributions were made by other household members in some cases. The average age of primary respondents was 49 (± 16) years.

6.3.2 Alternative livelihood projects identified at the three study sites

Twenty projects were identified across the three study sites that can be described as alternative livelihood projects in that their purpose was to reduce the prevalence of livelihood activities deemed to be environmentally damaging by promoting lower impact activities as a substitute. Although most of these projects were identified by liaising with implementers prior to visiting the study sites, several additional livelihood projects were identified through oral histories at the village level. Due to limited or inaccessible documentation, many alternative livelihood projects that have been implemented over the years are almost impossible to identify without talking to people on the ground. As such, the prevalence of these types of projects in conservation is likely to be greatly underestimated. All of the projects identified in the Takamanda, western Dja and northern Dja villages are listed in Table 6.4, along with the name of the implementing institution and an indication of how much time had elapsed between project launch and data collection. One project (No. 8) was implemented in both the western Dja and northern Dja sites, so is listed twice with the same ID number. Several other community projects were identified at the study sites, such as the establishment of an agricultural training centre at the northern Dja site and a government cocoa project at the western Dja site, but these projects fundamentally differed from typical alternative livelihood projects in terms of their aims, approach and theories of change, with some having

purely a development rather than a conservation focus. These projects are therefore excluded from the list but are later referred to for comparison purposes when relevant.

Table 6.4: Alternative livelihood projects implemented in the Takamanda, western Dja and northern Dja villages

Site	Implementer	#	Project type	No. of years ago
Takamanda	PSMNR-SWR	1	Oil palm farming	5 - 10
		2	Pepper and ginger farming	5 - 10
		3	Snail farming	5 - 10
		4	Beekeeping	< 5
		5	Bush mango cultivation and marketing	< 5
		6	Cassava farming and processing	< 5
		7	Cocoa farming	< 5
Western Dja	ECOFAC - PMdA	8	Oil palm farming*	> 10
	Living Earth	9	Cane rat farming*	> 10
	FCTV	10	Beekeeping	< 5
		11	Cocoa farming and marketing	< 5
Northern Dja	ECOFAC - PMdA	8	Oil palm farming* (same as western Dja)	> 10
		12	Cocoa farming*	> 10
	DACAFI	13	Fruit tree farming*	> 10
	PGS	14	Cocoa farming	5 - 10
		15	Beekeeping	< 5
		16	Fruit tree farming	< 5
		17	Pig farming	< 5
	TF-RD	18	Cocoa farming and marketing	< 5
		19	NTPP cultivation and marketing	< 5
		20	Oil palm farming	< 5

* Alternative livelihood projects identified through oral histories with no official documentation obtained

6.3.3 Alternative livelihood projects - a reconstructed theory of change

Examining project documents and talking to project implementers informed the development of a typical theory of change for conservation-focused alternative livelihood projects (Figure 6.3). This theory of change aligns with the prevailing notion in conservation that humans are rational actors seeking to maximise their economic benefits. The aim of alternative livelihood projects is almost always to increase the level of income, either cash or non-cash, from a particular livelihood activity, which is intended to become an economic substitute for an activity deemed to have negative conservation consequences. The theory of change, which is depicted in the upper section of the diagram, can therefore be described as an income pathway to change, as opposed to a goodwill or other alternative pathway that could also theoretically result in change. The critical assumptions underlying the theory of change are shown in the

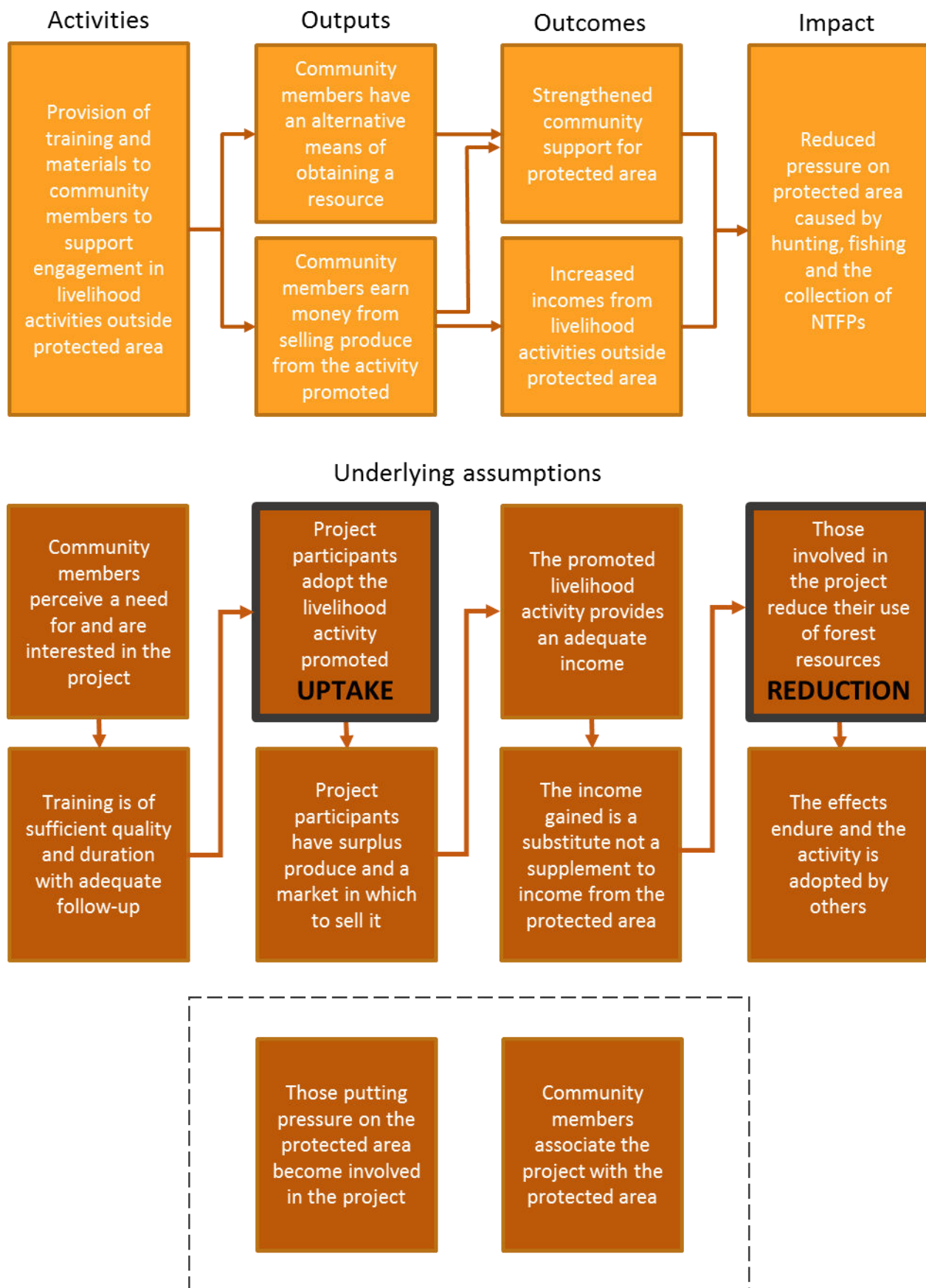


Figure 6.3: A simple linear theory of change for an alternative livelihood project (upper section) and the underlying assumptions associated with each stage of the theory (lower section), with important higher-level assumptions noted in the hashed box.

lower part of the diagram. These assumptions will be scrutinised in section 6.3.5 to determine whether they hold in practice. Contained within the hashed box are two assumptions that are discussed in Chapter 5 but will not be specifically examined in this chapter. These assumptions relate to 1) targeting, i.e. those who participate in a project are those whose behaviour most needs to change, and 2) association, i.e. community members are aware that a project is being implemented for conservation purposes and may be willing to discontinue certain behaviours if they can relate to the project's overarching objective and buy-in to what it aims to achieve, possibly following on from a negotiation process. Although these two assumptions are likely to be fundamental in terms of whether an alternative livelihood project has a conservation rather than purely a development impact, they represent higher level issues associated with project design and implementation. Here the focus is purely on the steps in the causal chain from project launch to conservation impact via an income pathway to change.

As is often the case with behaviour change interventions, more than one behaviour needs to change for an alternative livelihood project to have a conservation impact. The key question is whether increasing a person's capacity to engage in one livelihood activity leads to them ultimately abandoning another livelihood activity once comparable or greater economic returns are realised. The hypothetical link between these two behaviours is the greatest uncertainty associated with alternative livelihood projects. In Figure 6.3, the two behaviours that need to change for an alternative livelihood project to have a conservation impact are denoted as the uptake and reduction behaviours, with the uptake behaviour intermediary to the reduction behaviour. The uptake behaviour is simply that participants adopt the livelihood practices promoted by a project, while the reduction behaviour involves these participants progressively decreasing the amount of effort spent engaging in behaviours of conservation concern, such as the extraction of forest resources. When evaluating alternative livelihood projects, it is therefore important to differentiate between interventions that fail to change the intermediary 'uptake' behaviour and those in which the intermediary 'uptake' behaviour is changed as planned yet this has no effect upon the ultimate behaviour change target of reducing the behaviour of conservation concern. While the first scenario may result from poor implementation, the second scenario represents a fundamental breakdown in the causal chain of the theory of change, and these two scenarios will be examined on a project-by-project basis for the twenty projects identified in villages around Takamanda and Dja.

6.3.4 Factors that influence the uptake of livelihood activities – applying the COM-B model

Capability

A recurrent theme associated with projects at each site was that of inadequate training, which resulted in limited capability to enact the behaviours promoted. All of the projects were production focused, either aiming to increase the yield of a particular agricultural product or encourage the cultivation of

forest products, such as bush mango. Yet the amount of training provided was often limited to a few days, with two to four follow-up visits to monitor progress during the first few months. The difference that having more intensive training made was evident with the beekeeping project in Takamanda (Project No. 4; see section 5.3.6 of Chapter 5). Those who were selected to be trained as trainers and then travelled to attend an intensive beekeeping course in Bamenda, where they witnessed the honey trade first-hand, were not only more capable of keeping bees and better equipped to do so, they were also more motivated to persevere with an activity which takes time and persistence to see results. In contrast, those who only received the village-based training did not succeed in keeping bees, likely due to both limited capability and motivation. Some of the earlier projects, such as the oil palm and cocoa farming projects implemented by ECOFAC in the Dja villages (Projects No. 8 and 12), were particularly criticised for having distributed seedlings and then never having followed up to see how recipients were getting on. Respondents were cynical that the ECOFAC projects had only been implemented so that the coordinators of these projects could tick a box and tell their funders how they had spent the money.

The level of resources, effort and support required to start a new livelihood activity is often grossly underestimated by project implementers. The case study described in Box 6.1 of the pig farming project implemented in northern Dja (Project No. 17) highlights the level of household assets and technical capability needed to be able to engage in an activity as resource intensive as livestock rearing, and also be able to bear the risks associated with such an investment. Access to the project was restricted from the outset to those with the financial and farming capacity deemed necessary to keep the pigs fed, and this is likely to have excluded some members of key target groups, such as hunters without sufficient farmland. The pig farming project was also implemented before the necessary enabling environment was in place. For introduced forms of livestock rearing, access to veterinary services over the long term is a necessity, and this was particularly the case for the pig farming project because it introduced large white pigs to villages which had not previously reared these animals. The participants succeeded in rearing the pigs during the period when they were receiving inputs and advice from the project, but once this support ended they did not have the resources and capability to continue. Many cut their losses and cashed in by selling the pigs while they were still able to do so.

Motivation

Another common theme with the projects is that they were mainly, or exclusively, designed by project staff and expert consultants. Efforts were usually made to find out the kinds of projects that people would be interested in, for instance each of the Takamanda villages were assisted by PSMNR-SWR in preparing a village development plan. Yet the focus of each project, and the form that project would take, were ultimately decided by project implementers rather than community members, with PSMNR-

Box 6.1: The pig farming project in northern Dja (Project No.17)

In 2012, PGS initiated a pig farming project in the villages in the northern sector of the Dja where they had been working since 2001. The project aimed to provide an alternative source of protein to replace bushmeat. Initial training was conducted for three days by a technician from the Ministry of Agriculture and Rural Development (MINADER). Seventy-nine individuals participated in this training. They were provided with timber and instructed on how to build an enclosure for large white pigs, which 29 individuals did. A pig farmer from the surrounding area then conducted a further three days of training to teach the participants about all of the local foods that could be fed to the pigs, either cultivated food crops or products available from the forest. By encouraging the use of inputs that could be freely sourced locally, the implementers sought to ensure the long-term sustainability of the project. Those who had constructed an enclosure, had a large enough farm to feed the pigs and were able to make a contribution of 10,000 XAF (US \$17) were provided with two infant pigs and one month's supply of ready-made pig food. A vet came to check on the pigs on three occasions over the first six weeks, but after that the support and training ceased.

Once the ready-made pig food was finished and the pigs were fed local foods, the pigs started to lose weight and die. Participants complained that the pigs *'ate more than people'*, that they had needed to create a new farm just for the pigs, and that *'taking care of pigs is harder than taking care of children'*. Those who had the money to do so started buying the ready-made food to feed their pigs, but many pigs fell sick, either due to disease or malnutrition, and participants did not have the medicine or know-how to successfully treat them. Although the pigs were provided as an alternative source of protein, the monetary value of the pigs was more important to project participants. People with healthy pigs became afraid that their pigs would get sick too, so they sold them. Nobody succeeded in keeping pigs. When asked whether they had benefitted from the project, only one-off benefits were mentioned - *'after they died, we ate them, that was the only benefit'*, *'I became afraid that the pigs would die if they fell sick, so I sold the two pigs and bought a motorbike'*. Due to the resources required to care for the pigs, only the wealthier members of the community were able to participate in the project, yet the ongoing costs and lack of follow-up support meant that they too failed to breed the pigs as envisioned. The project had no impact on hunting since the youths, who mostly hunt, were not interested in engaging in pig farming. The only remnants of the project were the abandoned pig enclosures (Figure 6.4).



Figure 6.4: An abandoned pig enclosure

SWR designing a package of ‘green micro-projects’ for replication across three protected areas. Respondents frequently complained that project implementers *‘listen but don’t hear’*. It is often assumed that the methods taught by technicians are better than those already used by local people, but this ignores local knowledge and the reasons why people do things in a certain way. Project participants are often sceptical of the supposed benefits of a new technique, and wary of making dramatic changes to their current production systems, which are tried and trusted. This was evident with the cassava farming and processing project in Takamanda (Project No. 6; see section 5.3.8 of Chapter 5), which is described in Box 6.2. Several of the women who participated in this project did so because they felt obliged to, rather than because they were intrinsically motivated to get involved. This resulted in high levels of participation but lower levels of behaviour uptake. Although the project was still ongoing in two villages several years after its launch, its underlying theory of change was still to be realised because few women had managed to increase their individual incomes from cassava. Many did not perceive there to be a need to change their current practices, since the system of cassava production and processing promoted required there to be economically-viable access to a market. Although PSMNR-SWR had invested heavily in improving market access by creating motorbike roads, the cost of transport was still prohibitively expensive for low value to weight products such as *garri* (processed cassava; see Figure 6.5). However, the cassava project did have unanticipated benefits in that the money raised through the bulk selling of *garri* as a group had been used as seed capital to establish an informal rotational loans system in one village and to help fund the building of a community hall in another.

Projects that were perceived to have been inappropriate or badly implemented, and which ultimately failed, such as the snail project in Takamanda (Project No. 3; see section 5.3.5 of Chapter 5), often had a direct impact on people’s motivation to become involved in subsequent projects. Such projects led to disappointment and negative feelings towards implementers and the associated protected area – *‘we prepared a village development plan, then all they brought were these snails’*. Motivation is also strongly affected by other aspects of the context, particularly in a protected area setting where restrictions are in place and specific memorable events may have occurred. For instance, a lack of compensation for land claimed by the state can lead to bitterness and a sense of injustice. This occurred when farms were cleared during the construction of the Takamanda National Park headquarters. The resentment was palpable in the affected community since some households had clearly suffered as a result. Individuals with farms inside the national park were given an eight-year notice period to allow time to create new farms outside the protected area, but this was not the case for the farms destroyed to make way for the headquarters. One or two farms may not have seemed significant to protected area managers, but the knock-on effects of the emotional reactions to such events should not be underestimated.

Box 6.2: The cassava farming and processing project in Takamanda (Project No.6)

Cassava is one of the most important food crops grown in the villages around Takamanda National Park. In 2010, PSMNR-SWR initiated a cassava farming and processing project. By increasing cassava yields and adding value by processing it into '*garri*' (Figure 6.5), the aim of the project was to raise the incomes of women and reduce their reliance on NTFPs from the national park. Women were under pressure to join the project, with some threatened with penalties by others in the village if they did not participate – *'all women were told to join the group, those not in the group were told to buy food for the men digging the road'*. The level of participation with the cassava project was therefore high. Some women valued the identity and solidarity aspect of being a member of a women's group, others conformed to avoid being scorned – *'any woman not in own group should paddle canoe like man'*. The project helped the newly formed women's group in each village to establish a 1 ha multiplication farm in which to plant a new higher yielding variety of cassava. The women were encouraged to maintain this farm as a group and share the cuttings in order to expand their own farms. The women's incomes were expected to increase as they increased the size of their farms, switched to the new variety of cassava and processed more *garri*.

However, many women considered the cassava project to be purely a group exercise. The leaders of the groups called meetings whenever there was work to be done in the multiplication farms. Depending on the rules of the group, members who refused to work in the farm were often made to pay a fine. When the cassava was ready for harvest, the groups met to harvest and process it into *garri*. Groups often had to share the proceeds with the village council. The money retained was sometimes used to provide loans to group members. While some of the women replicated the techniques learnt in their own farms, many were not convinced, particularly the older women, who considered planting in lines to be a silly, outsider concept – *'I'll continue planting my own way, even if they train me 20 times, I don't have interest in straight lines, it's just wasting time'*. Younger women were more receptive to new ideas but still wanted to see proof that these techniques would make a difference before copying them. There was limited initial interest in the new variety of cassava – *'they grow their own, and we grow our own, the one they introduced can be used to make garri and water fufu but can't be used to eat like our own type'*. There were complaints that local demand for *garri* was limited and that it was too low value to transport to distant markets – *'we grow cassava for chop [to eat], not sale, if we make garri we go sell for which side?'*. Responses were mixed as to whether the women felt they had benefited from the project. Most felt that their income had not changed but that there were benefits from being a member of a group. The cassava women's groups were still active in two of the three Takamanda villages visited.



Figure 6.5: A basin of *garri* made from cassava

Motivation to adopt a livelihood activity builds incrementally over time as people see others realise the benefits and take time to reflect. This was evident with the succession of cocoa projects implemented by multiple organisations in the northern Dja (Projects No. 12, 14 and 18). The cocoa farming project brought by ECOFAC's PMdA programme resulted in limited uptake, as did the cocoa project implemented less than 5 years later by PGS. Both projects also resulted in social conflicts over the unfair distribution of seedlings from group nurseries. Yet as some of those who received seedlings started to benefit, interest in cocoa grew and villagers asked PGS if they could follow-up with a second phase of the cocoa project. PGS learnt lessons from their first attempt and provided training to all on how to nurse cocoa so that they could each receive equal numbers of cocoa pods and create personal nurseries. TF-RD followed on from where PGS left off by continuing to support the cocoa farmers, helping them to create a cooperative and initiating the process of obtaining Rainforest Alliance certification. A key element that has increased the level of uptake with each successive project has been the continuity provided by the long-term involvement of PGS. The director of TF-RD was a previous PGS employee, so the key figures in both organisations had invested considerable time in building long-standing trust-based relationships with the communities in which they worked, and this was evident during fieldwork.

Opportunity

The ability of an individual to take advantage of the training opportunities offered by a livelihood project is determined by their social capital and the degree of influence and power they have within their community. The monopolisation of project benefits by particular social groups or individuals, with the exclusion of others, was a recurring theme. The beekeeping project implemented in the western Dja (Project No. 10) was described as '*political*' with only the chief and the people around him receiving any benefits from it. One respondent who would have liked to have participated said '*I don't know why the animator gave hives to people who aren't interested in them, they still have them in their houses*'. The strategy that PSMNR-SWR used with most of their projects in Takamanda was to insist that those interested in a particular livelihood activity form a group (Projects No. 1, 2, 3, 4 and 6). These projects were usually designed to be open to all, yet village-level politics often meant that this was not the case. Although communities may be perceived as homogenous entities united under a village chief, in reality, as in any social setting, complex social networks exist. In the villages around Takamanda, individuals are members of different meetings and savings (i.e. *njangi*) groups. Although disputes can happen in all groups, members of *njangi* groups have an established bond and are used to working together. Some of the projects implemented by PSMNR-SWR, such as the pepper and ginger farming project (Project No. 2; see section 5.3.4 of Chapter 5) and the beekeeping project (Project No. 4; see section 5.3.6 of Chapter 5), were claimed by pre-existing groups. Indeed, some village authorities deliberately restricted access to project benefits so that each existing group had ownership of one project – '*we did not join if we were in*

another group for a different project', 'one man cannot be in two groups'. People who were not members of existing groups claimed that they had not been able to take part in the group-based projects. The reason people prefer to stick to existing social groups is because of the trust that has already been built between members – 'we know if a person is correct, we know people's fashion'.

While access to project benefits may be restricted by social factors, exogenous factors ultimately determine the financial viability of promoted livelihood activities. The perceived lack of demand, or the infeasible cost of transporting produce to market, severely limited livelihood uptake for several of the projects. Activities with low income potential were not considered to be worth the time and effort required. This was largely the case with the beekeeping projects across all sites (Projects No. 4, 10 and 15). Although honey is valued for home consumption, it is difficult to attract wild bees to colonise hives, and they may abscond, or the hive decimated by ants, at any time. The income obtainable from beekeeping, particularly for those just starting to keep bees, is therefore likely to be small and unreliable. Furthermore, the commercialisation of honey was an introduced concept in these villages. Only those involved in the beekeeping project in Takamanda, who had had the opportunity to visit an area of high honey production, could appreciate the potential of beekeeping as an income-generating activity. Yet their own context was different, both in terms of the enabling environment and the natural environment, with beekeeping in the forest generally being less productive than in the grasslands.

Both PSMNR-SWR's programme in Takamanda and ECOFAC's PMdA programme in Dja had infrastructure development components. The construction or improvement of roads has affected the economic viability of certain livelihood activities. It has opened up markets for high-value products, such as cocoa, yet has had limited impact on low-value products, such as cassava. The roads connecting the villages around Takamanda were designed for use by motorbikes only, which are expensive to hire, making value relative to weight an important consideration. However, the new opportunity provided by these roads, and the doubling of the price of cocoa over the previous decade, has created the perfect motivational storm for cocoa production, which created the ideal setting for the cocoa farming project in Takamanda described in Box 6.3 (Project No. 7; see section 5.3.9 of Chapter 5). Requested by the people themselves, the cocoa project aligned with existing aspirations, and the level of motivation resulted in high uptake. As the financial benefits of cocoa became visible, and project participants noticed signs of improvement in their own farms, the level of enthusiasm for the project increased, which encouraged others to join. This was possible because the project's training programme was ongoing and open to all, making it much more inclusive than those working only with specific groups. While most projects focused on increasing production, the more recent projects (Projects No. 5, 7, 11, 18 and 19) also addressed market-related issues by helping producers establish cooperatives to increase the selling price of their produce.

Box 6.3: The cocoa farming project in Takamanda (Project No.7)

In 2008, PSMNR-SWR initiated a cocoa farming project in the villages around Takamanda National Park. Cultivating cocoa was a relatively new activity in these villages but it had already started to gain popularity prior to the project. People in the villages requested help to improve their cocoa production – *‘we had cocoa farms before wildlife came but we needed help with agricultural techniques, so we asked them to send experts’*. Participation in the project was high because of the widespread interest in cocoa. This interest was mainly due to the rise in the price of cocoa, coupled with improved access to market via the motorbike roads created by PSMNR-SWR – *‘cocoa did not have market before, if buyers came from town it would take long and we used to get a bad price, but now people are coming from different sides, so there is competition, and the price has improved’*. When the early adopters of cocoa started to reap the benefits, the earnings potential was realised by others – *‘I have been encouraged by seeing other people selling cocoa and getting much money from it’*. There was also increased status associated with owning a cocoa farm, so by aligning with people’s aspirations, the cocoa project was positively received.

Rather than request that people interested in cocoa form a village-based group, a process which often results in benefit capture by certain individuals, the cocoa project used the more inclusive Farmer Field School model (David, 2005; Figure 6.6) – *‘the whole village can attend the school when they like, it is not a group thing’*. Most people had applied what they had learnt in their own farms – *‘before I did cocoa carelessly’, ‘I am now doing pruning better’, ‘I am not spending as much on chemicals’*, and many had started to see improvements in their farms, even if they had yet to benefit financially – *‘any benefits will only be seen after this season, I have seen changes in the farm but not yet in the house’*. This gave them a willingness to stick with the training programme, which was still ongoing – *‘now that the cocoa has flowers, I know I have not wasted my time, I have new things in my life and am happy’, ‘knowledge will never be lost, it has opened my head’*. Cocoa was one of the few activities which participants believed could be a viable alternative to some forest-based activities, simply because of the amount of income that can be generated. Some claimed that they were now too occupied with cocoa to find the time to engage in forest-based activities – *‘I put more attention on farming now, even bush mango, I do not have the same interest as before’*.



Figure 6.6: Demonstration farm used by the Cocoa Farmer Field School in Nfakwe

6.3.5 Is the typical theory of change underlying alternative livelihood projects being realised?

If the aim of an alternative livelihood project was purely to increase the incomes of participants and thereby reduce poverty, overcoming barriers to uptake would often be sufficient to ensure success. However, as discussed in section 6.3.3, if such projects are to have a conservation impact, this income increase must lead to a reduction in the practice of activities deemed to be of conservation concern. In Table 6.5, I indicate for each project whether or not the assumptions noted in the reconstructed theory of change (Figure 6.3) held in practice, and where breaks in the causal chain are likely to have occurred.

Table 6.5: An indication of which of the key assumptions set out in Figure 6.3 were met for each alternative livelihood project, and ultimately where they reached along the reconstructed theory of change

Project	Interest	Training	Uptake	Produce	Income	Substitute	Reduction	Scale
1 - Oil palm		?						
2 - Pepper		?						
3 - Snails	?							
4 - Beekeeping			?					
5 - Bush mango*				?				
6 - Cassava*			?					
7 - Cocoa*						?	?	
8 - Oil palm		?						
9 - Cane rats	?							
10 - Beekeeping †	?							
11 - Cocoa †						?	?	
12 - Cocoa		?						
13 - Fruit trees					?			
14 - Cocoa						?	?	
15 - Beekeeping*			?					
16 - Fruit trees					?			
17 - Pigs		?						
18 - Cocoa*						?	?	
19 - NTFPs*				?				
20 - Oil palm*				?				

* Projects that were receiving ongoing training and support; † projects that had only just finished

The livelihood activities promoted by three projects (No. 3, 9 and 17) were no longer practiced by any participants due to either a lack of interest or insufficient training. These projects all introduced forms of livestock rearing that were novel to the communities, i.e. the rearing of snails, cane rats (*Thryonomys swinderianus*) and large white pigs. Apart from one-off benefits such as being able to eat the pigs, these projects had no lasting impact on incomes nor on people's use of forest resources. Instead, there is evidence that some of these projects had a negative impact on attitudes towards project implementers, with blame apportioned for inadequate training and follow-up support.

The majority of the other projects resulted in some degree of uptake; however, the level of uptake was often limited, which means that the impact on incomes, and therefore on the use of forest resources at

the community level, was likely negligible. Ten projects fall into this limited uptake and negligible impacts category (Projects No. 1, 2, 4, 6, 8, 10, 12, 13, 15 and 16). Beekeeping was the only novel activity introduced that was still practiced by a small number of participants at each site, typically one or two people per village (Projects No. 4, 10 and 15). Although those who had continued with beekeeping had managed to have some reasonable harvests, the amount of honey obtained varied considerably and only provided an occasional source of supplementary income. The other projects in this negligible impacts category focused on existing livelihood activities that people continued to practice at the time of the research, i.e. the farming of cassava, oil palm, pepper, fruit trees and cocoa. However, for a variety of reasons, the projects in question had limited impact on the way people practiced these activities. ECOFAC's PMdA projects around the Dja (Projects No. 8 and 12) had restricted reach due to elite capture of the benefits. The oil palm project in Takamanda (Project No. 1) provided insufficient inputs to make a noticeable difference to yields. The cassava project in Takamanda (Project No. 6) had limited impact on the practices and incomes of participants due to the challenges associated with getting the product to market, and the knock-on effect this had on motivation to change existing practices. The fruit tree projects in northern Dja (Projects No. 13 and 16) provided a supplementary resource for home consumption but not a cash income nor a substitute for forest resources. One respondent commented that *'fruit is not a replacement for meat'*. Yet each of these projects provided some benefits to some people, which may have incrementally improved perceptions of the associated protected area.

The only projects to progress along the theory of change to the point where they met, or had the potential to meet, the assumption that the promoted livelihood activity would provide an adequate income were the cocoa farming projects implemented at each site by PSMNR-SWR, FCTV, PGS and TF-RD (Projects No. 7, 11, 14 and 18), and the NTFP cultivation and commercialisation projects implemented in Takamanda and northern Dja by PSMNR-SWR and TF-RD respectively (Projects No. 5 and 19). These projects focused on high-value products with high demand and increasingly accessible markets, and as such motivation to engage with these projects was stronger. Many individuals had experienced an increase in their incomes due to cocoa. Although this cannot be wholly attributed to the projects, there was strong sentiment that the cocoa projects had helped. Yet whether incomes from cocoa substitute for incomes from forest-based activities requires further investigation. In western Dja, where respondents appeared to be particularly comfortable talking about the often-sensitive topic of hunting, it was suggested that cocoa had either reduced hunting to a degree or made no difference to hunting practices. One respondent explained that *'most men have engaged in cocoa, but cocoa has not reduced hunting because it needs to be taken care of for years before it produces, and even then, it only produces once or twice a year. Since people do not save, when they need money they go to the forest'*.

Respondents in the northern Dja similarly indicated that the cocoa projects had only resulted in marginal changes in hunting effort, but they explained that this was because *'few youths are interested in cocoa'*.

The situation in Takamanda appeared to be different in that there was a drive within the communities to switch to cocoa production amid crackdowns on hunting as the national park infrastructure gradually became operational and the presence of ecoguards increased. The status of biodiversity within the two protected areas is markedly different as well, with hunting more lucrative in the Dja compared to Takamanda, where wildlife populations have already been decimated. In the Dja, one respondent commented on the increasing price of bushmeat – *'bushmeat is expensive, it wasn't expensive at first, but it is now, and it is encouraging people to hunt'*. Any impacts of the NTFP cultivation and commercialisation projects on hunting pressure in Takamanda and northern Dja had yet to be seen. Although motivation and uptake were high, the bush mango and moabi trees planted can take more than 10 years to bear fruit, and the cooperatives were not fully functional at the time of the research. The more recent oil palm project implemented in northern Dja by TF-RD was also yet to have an impact (Project No. 20). Although some respondents commented that *'no one sells palm oil, it is only for consumption'*, the price of palm oil is increasing and interest in oil palm is rising elsewhere in Cameroon. So, it may be the next form of project to be positively affected by a perfect motivational storm.

6.3.6 Livelihood interventions in conservation – an alternative framing

The primary focus of alternative livelihood projects is usually on training provision, with the aim of building technical capacity and equipping people with the skills needed to engage in a particular livelihood activity in a particular way. Such projects therefore typically provide a combination of expert-led teaching to increase knowledge, hands-on training to improve practical skills, and a degree of persuasion to encourage participants to adopt the practices promoted. The persuasion tactics usually focus on creating expectations of financial reward. Framing this behaviour change strategy according to the six components of the COM-B model, alternative livelihood projects essentially attempt to change behaviour by increasing psychological capability, physical capability and reflective motivation. Although there is strong consensus among psychologists that motivation is the pivotal factor that determines whether a behaviour is enacted (Fishbein et al., 2001, Michie et al., 2011), motivation is largely assumed and therefore overlooked by project implementers, with the prospect of maximising financial returns considered to be motivation enough to initiate change. However, as the case studies highlight, multiple factors affect the strength of a person's motivation to not only participate in a livelihood project but also adopt the behaviours promoted and reduce engagement in competing behaviours. It is therefore vital to understand why people engage in their livelihood activities in the ways that they do and how they perceive the alternatives. Increasing a person's capacity and confidence to engage in a particular

livelihood practice can increase their motivation to pursue that activity further, but focusing solely on increasing capability might not be enough to lead to behaviour change. Instead, consideration needs to be given to how both individual and contextual factors interact to influence levels of motivation.

Linear theories of change that focus on improving individual capabilities, and assume that increasing incomes is the sole motivator, artificially narrow the range of influencing factors to those associated with a particular pathway to change. Having this degree of clarity is important in that it makes implementer decisions and assumptions more transparent. However, when conceptualising a project, implementers should first zoom out and view all interacting elements at the systems level. This enables a greater appreciation of the complexities of behaviour change and the array of factors that have the potential to influence outcomes. Using a comprehensive behavioural science theory, like the COM-B model, to inform this process can help to ensure that critical elements of the system are not overlooked. In Figure 6.7, I present a schematic that visualises the key interacting elements that influence livelihood adoption and ultimately whether this leads to a conservation impact within the context of a protected area.

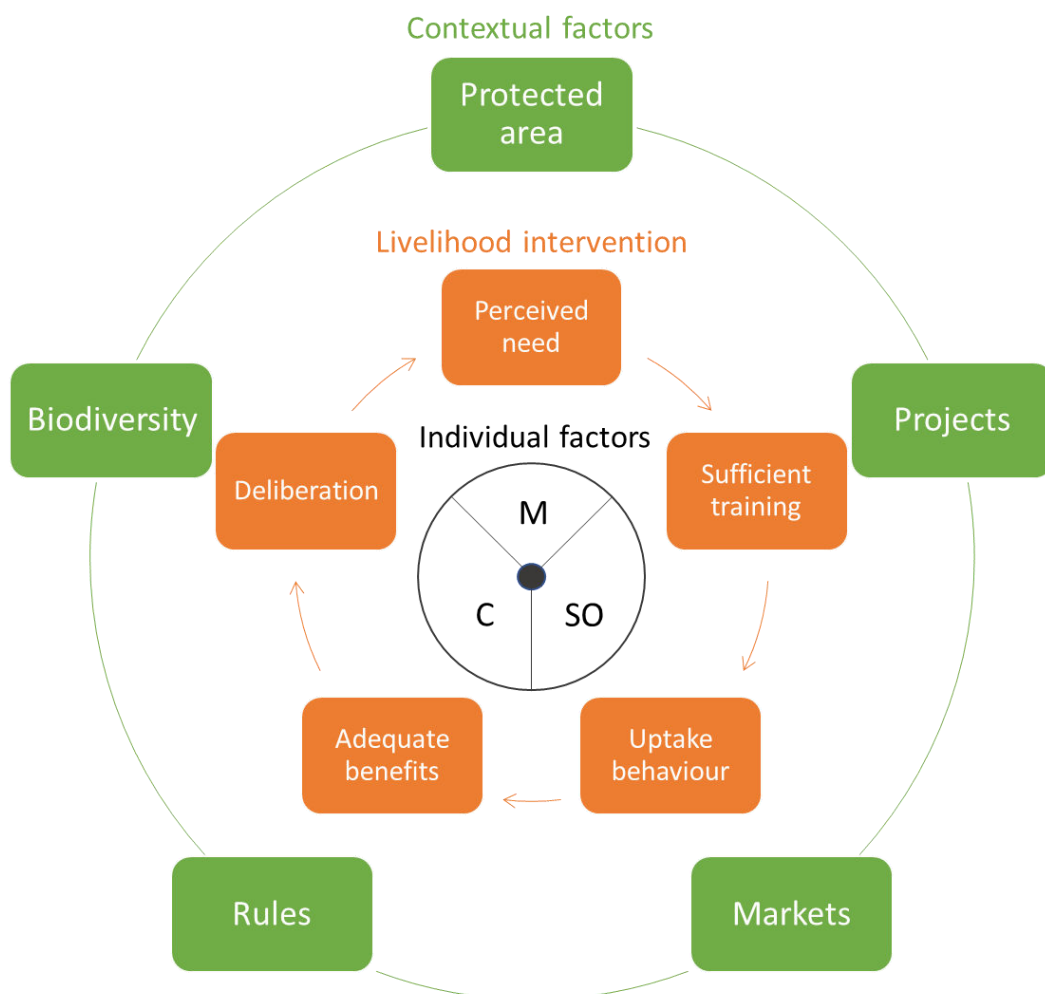


Figure 6.7: A schematic depicting key individual and contextual factors that influence a cyclical process of livelihood decision making within a protected area context: M = motivation, C = capability, SO = social opportunity

Individual factors are at the core of the schematic, with the opportunities and constraints imposed by the social dynamics in a community considered to be at least in part linked to individual characteristics and factors within a person's sphere of control. Motivation is at the very centre, with all other factors influencing behaviour through their effects on motivation levels, including perceived capability to perform a behaviour. These individual factors are then embedded within the broader context, with the factors in green representing the opportunities and constraints often associated with protected areas. The behaviour being encouraged should be considered alongside other behaviours that compete for a person's time and attention, with the aim being to understand the interplay of factors that determine behavioural performance in each case. The individual and contextual factors influence both reflective and automatic motivation beyond purely financial considerations. While some of the contextual factors (aka physical opportunities), such as the abundance of natural resources or the accessibility of markets, may still primarily motivate or discourage people from engaging in certain livelihood practices via reflective consideration of the potential returns on investment, other factors, such as rules and legal restrictions, have more complex effects on reflective and automatic processes. Resource use restrictions can influence conscious decisions to abstain or indeed adapt to circumvent the rules, yet they can also instil a sense of unfairness that can lead to emotive responses and negative sentiment, which can then undermine motivation to participate in associated projects. This underscores the need to think about influences on motivation at the systems level and to understand how previous experiences with projects and their personnel can continue to shape reflective and automatic thought processes moving forward.

All the individual and contextual factors indicated in the schematic represent either barriers or potential levers to change. A thorough analysis of the situation can help to identify opportunities as well as determine what the potential challenges might be. Behaviour change rarely occurs overnight, instead theories of behaviour change suggest that it is more of a cyclical process (Davis et al., 2015). The process of livelihood adoption is therefore depicted in orange in the schematic and imbedded between the individual and contextual factors. Those who take onboard the advice provided and begin to make changes to their livelihood practices will likely make incremental gains or losses that will be followed by periods of reflection. Others may prefer to wait to see if those who dabble with new approaches experience any benefits before trying themselves. Generally, seeing is believing, and most people are hesitant and sceptical until they have seen proof of a livelihood practice's potential or had verification from sources they trust, such as their peers or respected members of the community. Implementers should be mindful of these reflective decision-making processes when designing projects, and when laying out their own expectations of what constitutes success. Furthermore, change processes are dynamic, with motivations constantly affected by how individual and contextual factors evolve. It may therefore take more than one iteration of a particular project for a promoted practice to gain traction,

and implementers should be aware of this from the outset. Ultimately, implementers should strive to see things from the point of view of those whose behaviour they believe needs to change. Humans in all contexts are complex, emotional beings rather than purely rational economic actors. Learning from the COM-B model, due consideration should always be given to automatic as well as reflective motivation moving forward, and rather than being an afterthought, project implementers should ensure that the social and physical opportunities available are conducive to the desired behaviour change, since in the absence of an appropriate enabling environment, focusing efforts on building the psychological and physical capabilities of individuals is unlikely to be enough.

6.4 Discussion and conclusion

An almost countless number of alternative livelihood projects has been implemented for conservation purposes over the last few decades, particularly around protected areas. However, publicly accessible documentation about most of these projects is lacking. Even when it is possible to access project reports, the reasoning behind project implementation is often not made explicit. Since alternative livelihood projects have been implemented in so many different contexts for so many years, they have become the go-to approach for solving the challenge of unsustainable resource use by local communities, despite the lack of evidence that they achieve this conservation objective. As such, there is a pressing need to take a step back and critically examine the alternative livelihood project approach and associated implementer assumptions through various different lenses, each of which can provide new insights into how and why such projects have the impacts desired or not. For this chapter, I increased the number of case study projects from seven to twenty by collecting data in villages around Dja Faunal Reserve to complement the data already collected from Takamanda National Park for Chapter 5, and used a qualitative deductive approach to examine all projects through a behaviour change lens and determine whether the typical assumptions underlying alternative livelihood projects hold in practice. Given the many uncertainties associated with these projects, the development of more nuanced and realistic theories of change that clearly articulate how interventions are expected to have a conservation impact is critical moving forward. This will ultimately enable greater scrutiny of assumptions and help further develop an evidence base for what works and what to avoid in future.

The anti-failure culture in conservation often results in unsuccessful projects getting brushed under the carpet (Catalano et al., 2019), which is one of the reasons why it can be hard to find documented evidence about previous alternative livelihood projects. Many are only identifiable through oral histories, which necessitates site visits and reaching out to implementers past and present. Redford and Taber (2000) called for a safe-fail culture in conservation two decades ago, but as long as failure continues to go unmentioned, the same mistakes will continue to be repeated (Catalano et al., 2019). However, as

well as a lack of willingness to report on unsuccessful projects (Catalano et al., 2018), there is also a lack of mechanisms for doing so beyond publishing in peer-reviewed journals. The creation of an open-access database of projects, as discussed in Chapter 5, is therefore essential to enable cumulative learning about the effectiveness of livelihood interventions, and indeed other strategies, in conservation. Yet there is also a fundamental need to be more realistic about what a project can actually achieve. Having overly ambitious expectations based on limited evidence of how the projected change can be realised is a common flaw with alternative livelihood projects. Implementers must moderate their expectations as well as those of project participants by carefully examining how similar projects have panned out in the past and drawing insights from established theories that help to explain the mechanisms of change. It must be remembered that not all failure is bad. Ultimately the only way to know whether a proposed intervention can be effective in any given context is to implement and evaluate it. Even when having followed the most meticulous design and implementation processes, many projects will not have the impacts intended within the specified timeframe. Yet failure is a fundamental principle in the realm of product design and innovation (IDEO.org, 2015, Edmondson, 2011), and it should be more widely acknowledged that it takes learning from failure to finally succeed.

It is vital that conservation practitioners move away from unquestioningly taking projects off the shelf and replicating what has been done elsewhere, with only superficial analysis of the situation at their site and limited knowledge of the outcomes of the original project. Too often intervention strategies are decided upon before a thorough assessment has been conducted to better understand the nature of the problem, the behaviours that need to change, the people who should be targeted and the factors that would facilitate or prevent them from changing their behaviour. Such a behavioural assessment would benefit from being guided by an established theory of behaviour, particularly an all-encompassing theory such as the COM-B model, as well as by more context-specific aide-mémoire, such as the schematic depicted in Figure 6.7. Following a collaborative and participatory assessment process, it may ultimately be determined that implementing a livelihood intervention is not the most appropriate strategy. Therefore, rather than begin with an intervention in mind, conservation practitioners should be open to other options based on the circumstances at their particular site. Practitioner resources developed in the behavioural sciences, such as the Behaviour Change Wheel by Michie et al. (2014a), which is based on the COM-B model, are useful tools for identifying appropriate intervention types once specific barriers and opportunities to behaviour change have been identified. Conservation practitioners should then give careful thought to what practicable and acceptable interventions could create the necessary conditions, both within individuals and their environment, to lead to the behaviour change target being achieved. Interventions based on inaccurate assumptions and limited understanding of the behaviours that need to change are unlikely to have the effects desired and could instead lead to unintended consequences.

If a livelihood intervention is deemed to be the most appropriate strategy for enabling behaviour change, livelihood analyses informed by the sustainable livelihoods approaches (SLAs) described in Chapter 4 can help to ensure that the intervention is tailored effectively to the target group based on their asset profile. The combination of livelihood activities an individual is able to engage in will be shaped by the quantity and quality of human, financial, physical, social and natural assets at their disposal (Chambers and Conway, 1992, Carney, 1998, Scoones, 2015). The lack of particular assets, including social ones, can be critical barriers to behaviour change and may even restrict access to project benefits in the first place. Furthermore, when considering livelihood intervention strategies, it should not be automatically assumed that improving production techniques is the answer, especially if this assumption partially stems from dismissive attitudes towards local production methods. Beekeeping projects typically promote 'modern' hive types; however, these are more expensive to buy or construct than most local types of hive. Promoting modern hives can conversely have the effect of limiting overall honey production by limiting the number of hives each beekeeper can afford (Lowore and Bradbear, 2009). Again, rather than simply replicating what has been done before, project implementers should base their interventions on detailed livelihood needs assessments. Changing the production context by developing marketing strategies and building business management capacity can have longer lasting effects on livelihoods than focusing on changing production techniques. This was the case with the 'Ibis' rice project in Cambodia which ultimately resulted in the development of a self-sustaining business (Clements et al., 2010). Examining the commodity chains for relevant products can help in identifying factors that are limiting production and sale. The insights gleaned can help in determining appropriate intervention points and strategies along supply chains that have the potential to maximise the benefits for producers.

For livelihood interventions to result in sustained behaviour change, the practices promoted must align with the aspirations of the target group and their desired livelihood trajectories, which is a topic covered in more depth in Chapter 7. Alignment with aspirations can create real impetus for change, as was apparent for the more recent cocoa projects implemented around Takamanda and Dja. Yet there has generally been limited attempts in conservation to really understand what motivates people to do what they do, and importantly, what would motivate them to change. Recent research has demonstrated the centrality of intrinsic motivation, i.e. the internal motivation of individuals, in determining the relative success of conservation projects implemented around protected areas (Cetas and Yasué, 2017), and more attention now needs to be paid to the cumulative evidence from psychology which indicates that motivation is key. Having the capacity to take advantage of the opportunities available and the ability to change one's behaviour does not necessarily mean that people will do so. It is only when participants have sufficiently strong motivation to change that a livelihood intervention will succeed. As discussed in section 6.3.6, many factors influence motivation levels and the different types of motivation. Both

individual and contextual factors play a key role. However, a third dimension is the specifics of the behaviour itself. According to the diffusion of innovation theory, five attributes of a behaviour influence whether it is adopted: 1) its perceived relative advantage, 2) its compatibility with people's values and their other behaviours, 3) its trialability and whether it can be practiced to a limited extent initially, 4) its observability and whether the benefits are already visible, and 5) its complexity and whether people perceive themselves to have the capability required (Rogers, 2003). Motivation takes time to build but can also wane, which is why behaviour change is a process. People on the threshold of change will ponder, wait, investigate, tread warily and continually make up their minds whether to continue or not (Pawson, 2013). Maintaining motivation can be as challenging as building it in the first place, and sometimes getting someone to enact a behaviour can involve decreasing their intrinsic motivation to enact a competing behaviour as much as increasing their motivation to enact the behaviour itself.

The context in which livelihood interventions are implemented plays a significant, but often overlooked, role in whether behaviours are adopted, due to the effect of contextual factors on motivation levels. While market-related factors can build an economic rationale for behaviour change, an uncondusive institutional environment at a project site can undermine these reflective reasoning processes. This was evident when comparing the implementation contexts in Takamanda and Dja. In Takamanda, the national park had only recently been established and local people were worried about how their livelihoods would be affected. Livelihood interventions were implemented by the government and their international partners – institutions directly associated with resource access restrictions. Although the earlier projects around the Dja were implemented in a similar institutional setting, the context had since evolved. All recent livelihood projects identified around Dja had been implemented by Cameroonian-led NGOs. The directors of each organisation had built strong relations with the communities in which they worked, and the people in these communities generally appreciated the efforts that had been made. Even when projects had not worked as planned, respondents did not appear bitter, as was observed in Takamanda, where people felt entitled to adequate compensation for the restrictions imposed. Creating more conducive and collaborative settings for the implementation of livelihood interventions should be the goal moving forward. Cultivating a truly participative atmosphere founded on empathy and respect takes time and requires long-term commitment as well as a degree of humility. It should be remembered that while anxiety and feelings of hopelessness can significantly dampen motivation levels, optimism and hope can be the greatest catalysts for change (Snyder, 2002).

Whether the target group for an intervention is already motivated to adopt a particular behaviour or not should determine the approach that implementers take, because not being motivated is very different from being motivated but not having the ability to act. This distinction is important when assessing

whether a livelihood intervention focused on building technical capacity is the best strategy to pursue. If someone is highly motivated to change their practices but is not acting on it, an intervention that builds their capacity or helps them overcome specific environmental constraints can enable change, but for others the initial focus may need to be on strengthening their intention to act (Fishbein et al., 2001). Developing different strategies for those who won't and those who can't may be necessary (Michie et al., 2014a), and indeed these strategies are likely to be complimentary. If multiple barriers are identified that need to be removed for behaviour change to occur, a package of appropriate measures can be designed accordingly. Effective livelihood interventions ultimately require deep thought, collaboration, a thorough analysis of the situation, and an understanding of behaviour change processes and livelihoods. All interventions should have a carefully considered, evidence-informed theory of change, with different potential pathways to change given due consideration as well as how the intervention can contribute to population-level change, which is the ultimate goal if meaningful conservation impact is to be achieved. Given the urgency of human behaviour change in conservation, it is somewhat surprising that applying lessons from the behavioural sciences has only recently started to gain traction (Travers et al., 2021). However, the fact that conservation practice can draw new insights from the theories and approaches developed in psychology and other disciplines offers hope. By applying new insights and learning from past projects, we can continually improve conservation practice and thereby increase our impact moving forward.

Chapter 7

Out-migration, rural-urban linkages and the implications for tropical forest conservation in Cameroon

7.1 Introduction

Rural communities are often the focus of conservation interventions in tropical forest regions, particularly when located close to, or within the boundaries of, protected areas. The livelihood activities of people living in forest-adjacent villages are often viewed as a threat to biodiversity, with hunting for bushmeat and the conversion of forest land to agriculture perceived to be the local threats with the greatest ecological impacts in tropical Africa (Tranquilli et al., 2014). Conservation programmes often aim to alter the livelihood practices of local people by encouraging the adoption of substitute activities deemed to be less environmentally damaging. Yet empirical evidence that this so-called 'alternative livelihood' approach is effective in conserving biodiversity is limited (Roe et al., 2015). As discussed in Chapters 4 and 6, often such interventions are implemented on the basis of flawed assumptions, including the notion that the people to be targeted form a homogenous, place-based community. Although this has been refuted in the academic literature (see: Agrawal and Gibson, 1999), the homogeneity of communities remains a key assumption in conservation practice.

The notion of 'community' as a spatially-bounded entity with shared norms and a homogeneous social structure has been criticised for ignoring the multiple axes of differentiation, and the multiple interests, that exist within communities (Agrawal and Gibson, 1999). A study examining social structuring in communities in Nepal demonstrates how a more nuanced understanding of 'community', which in this case was achieved by differentiating between those with higher and lower levels of social status, can aid understanding of natural resource use by different groups as a prerequisite for more targeted conservation interventions (Waylen et al., 2013). However, communities are not only complex internally, due to their heterogeneity, they are also complex to define in terms of their boundaries (Kumar, 2005). Who is actually considered to be a member of a community and how do different community members use and rely on natural resources in different ways? These questions are particularly pertinent when making targeting decisions about livelihood interventions given the increasing mobility of the human population. Across Sub-Saharan Africa, people are becoming increasingly mobile as infrastructure development and communication technologies improve the connectivity of even the most remote rural

villages (Kramer et al., 2009, Potts, 2010). Community composition is not static. Instead, communities are part of multi-scale, multi-site social systems, or networks, that are constantly changing through time (Berkes, 2004). For conservation practitioners to engage effectively with communities for the purpose of natural resource management, the dynamic nature of communities needs to be better understood. As such, the connectivity of rural communities to urban centres warrants further consideration given the significant role such linkages play in shaping community dynamics.

The movement of people from rural to urban areas is a significant global trend, with an estimated 3 million people around the world moving to urban areas every week (IOM, 2015). In Sub-Saharan Africa, rural migrants are thought to account for approximately a third of urban population growth (Tacoli et al., 2015). This is in part a reflection of the number of young men looking for economic opportunities in towns and cities (Garcia et al., 2015). The out-migration of young men is often initially for education, since secondary schools in Sub-Saharan Africa are mainly located in urban settlements, and there is still a gender bias with more boys from rural areas being sent to urban schools than girls (Porter et al., 2011). However, although there is a notable trend towards increased mobility, rural-to-urban migration is not a linear process (Potts, 2010). The rate of net in-migration to urban areas in Sub-Saharan Africa is in constant flux, is generally thought to be slowing, and has on occasion been observed to go into reverse (Beauchemin and Bocquier, 2004, Potts, 2009). The complex patterns of movement between rural and urban areas in Africa are characterised by the maintenance of strong rural-urban linkages and are heavily influenced by the prevailing macro-economic conditions (Bakewell and Jonsson, 2011, Mberu and Pongou, 2016).

Rural-to-urban migration patterns can have direct implications for tropical forests. For instance, it has been suggested that out-migration from rural communities can disproportionately remove the age group with the greatest ability to engage in the physically demanding male-dominated activities often perceived to be a conservation threat, such as the clearance of forest for agriculture and hunting (Jorgenson and Burns, 2007). Amid the dramatic rise in oil prices from 2003 to 2012, two separate longitudinal studies were conducted in the oil-rich Central African countries of Gabon and Equatorial Guinea during a period of rapid economic development. In two villages in central Gabon, Coad et al. (2013) found there to be a lower proportion of hunters aged ≤ 30 in 2010 compared to 2004, with 25% of the hunters who had been active in 2004 having left their villages for education and employment opportunities in urban areas. Similarly, in the village of Sendje in Equatorial Guinea, Gill et al. (2012) reported a reduction in the intensity and extent of hunting in 2010 due to the out-migration of 54% of the hunters who had been active in 2003. Most of these hunters had left to gain employment in the burgeoning construction industry associated with the building of new roads and hotels across the

country (UN-HABITAT, 2014). Rural-to-urban migration has also been linked with tropical forest regrowth in some countries where agricultural land has been abandoned by out-migrants. However, this has mainly been observed in countries in Latin America and the Caribbean, which have experienced high rates of economic development, and is not evident in Sub-Saharan Africa (Rudel, 2012).

Conversely, periods of economic decline have been observed to have dramatic negative effects on tropical forests in terms of the impacts of local livelihood practices. For instance, forest clearance for small-scale agriculture rapidly increased in the decade after the 1986 onset of an economic crisis in Cameroon, which was triggered by a decline in the world prices of oil, cocoa and coffee (Sunderlin et al., 2000). This increase in deforestation is attributed to the significant rise in rural population densities as out-migrants returned to their villages of origin and urban residents in-migrated to rural areas. The purpose of this movement appears to have been to fall back on the subsistence farming of food crops as urban earnings reduced and the cost of food increased. Hunting has also been reported to serve as a fallback, either on an intermittent basis when people are out of work (Kümpel et al., 2010), or during economic downturns such as in Cameroon in 2008 (Endamana et al., 2010). Migration, often temporary, is a long-established adaptive response to the economic uncertainty and livelihood insecurity prevalent in African cities (Parnell and Walawege, 2011). In Sub-Saharan Africa, 65-80% of the urban workforce is engaged in the informal sector rather than in formal paid employment (Beauchemin and Bocquier, 2004, Cobbinah et al., 2015). Not only is income usually more variable and irregular in the informal sector, but workers engaged in this sector also lack any form of social security benefits. The lack of an urban safety net heightens the importance of the rural area of origin to out-migrants, who may need to fall back on rural-based livelihood activities if they experience financial difficulties in town.

However, the use of forest land and resources by out-migrants does not necessarily depend on a temporary or long-term change in residence from urban back to rural areas. The intensified linkages between rural and urban areas, facilitated by the spread of mobile phones and improved transport networks, enable individuals to engage in income-generating activities in both domains as part of a diversified livelihood portfolio (Ellis, 1998). This has been described as having 'multi-spatial livelihoods' (Foeken and Owuor, 2001). For instance, in a number of studies in East and Southern Africa, a large proportion of out-migrants residing in urban areas retained ownership of farms in their villages of origin (53% in Harare, Zimbabwe: Potts and Mutambirwa, 1990, 44% in Nakuru, Kenya: Foeken and Owuor, 2001, 79% in Chinsapo, Malawi: Englund, 2002, 62% in Nairobi, Kenya: Mberu et al., 2013). These studies emphasise the importance of rural farms as an economic safety net for migrants, reducing vulnerability in the event of unemployment, enterprise failure or inability to work. However, the role of rural farms as a supplementary income source and as a means of accumulating asset wealth is also noted. In

Cameroon, out-migrants who are well educated with high earnings (often referred to as ‘urban elites’) have considerable political influence in their villages and are increasingly establishing large commercial farms in their home areas where they can access land through customary entitlements (Malleson, 2000, Asaha and Deakin, 2016).

Conservation activities need to be designed and targeted in a way that aligns with people’s needs and aspirations, without exacerbating existing vulnerabilities or leading to unintended consequences (Larrosa et al., 2016). In order to do this the different characteristics of resource users and the circumstances that trigger and enable different forms of resource use need to be better understood. Despite their absence, rural out-migrants resident in urban areas in Cameroon, and even their descendants, retain membership of their home communities. Their identities remain deeply rooted in their regions of origin, they continue to be involved in the decision-making process at the village level and retain customary rights to access rural land and resources (Fisiy and Goheen, 1998, Nkemnyi et al., 2016). However, community members based in urban areas are rarely taken into consideration during conservation planning, and their rural resource use is a neglected area of research (Sharpe, 2005). Newing (2009) highlights the need for in-depth studies focusing on individual mobility and rural-urban networks to further unpick the concept of ‘community’, better understand the broader context of natural resource use, and create more nuanced frames of reference for conservation interventions. This chapter contributes to this area of research through an exploratory qualitative case study which provides insights into the livelihoods, aspirations and rural resource use patterns of urban-based out-migrants from villages around Takamanda National Park in South West Region, Cameroon, which may also be indicative of what many rural residents aspire to.

By examining the livelihood trajectories of male out-migrants and their anticipated responses to future economic scenarios, I aim to understand the characteristics and circumstances that influence their use of forest land and resources in the village of origin. I draw on theories from the livelihoods literature on livelihood diversification (e.g. Ellis, 2000, Barrett et al., 2001, Niehof, 2004, Martin and Lorenzen, 2016) and resilience (e.g. Marschke and Berkes, 2006, Sallu et al., 2010, Ifejika Speranza et al., 2014, Tincani and Poole, 2015) to explore the situations in which rural activities are a coping mechanism, a means of reducing risk or an opportunity for accumulating wealth. I specifically focus on the different roles and functions of hunting and farming. Then I identify the different livelihood pathways that may predict the continued or discontinued use of rural land and resources by out-migrants, and relate these to the concepts of ‘hanging in’ and ‘stepping up’ versus ‘stepping out’ (Dorward et al., 2009). By considering individual aspirations, I aim to provide an insight into some of the different long-term livelihood goals of rural people in a Sub-Saharan Africa context. My findings highlight the importance of forest land and

resources to urban as well as rural residents, and contribute to understanding of the multi-spatial nature of both livelihoods and communities.

7.2 Methods

7.2.1 Study area

Takamanda National Park covers 676 km² and is located in Manyu Division of South West Region, Cameroon (Figure 7.1; MINFOF, 2010). The tropical forest zone along the southern portion of the Nigeria-Cameroon border is renowned for its species richness and endemism (Oates et al., 2004), with the critically endangered Cross River gorilla (*Gorilla gorilla diehli*) being a focal species for conservation in the area. Conservation efforts aim to reduce hunting and habitat loss both within the national park and across the gorilla's range (Dunn et al., 2014). However, with 18 villages sharing a boundary with, or enclaved within, Takamanda National Park, and several others located around its periphery, human activity in and adjacent to the forest is high (MINFOF, 2010).

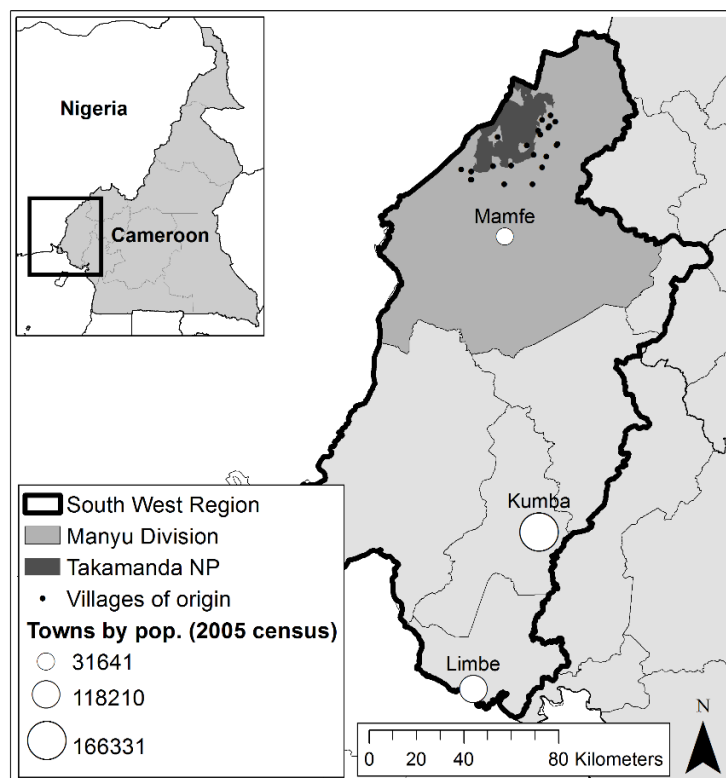


Figure 7.1: Map of study area showing Takamanda National Park, respondent villages of origin and the location and relative size of study towns within Manyu Division and South West Region

As described in detail in section 3.3.3 of Chapter 3, the villages around Takamanda National Park are mainly small and remote, with seasonally variable access due to the height of the rivers during the rainy

season. The people living in these villages have traditionally been reliant on NTFPs, such as bush mango, bush onion and bushmeat, and continue to trade these products informally across the porous border with Nigeria (Comiskey et al., 2003, Ingram et al., 2011). The majority of Takamanda National Park is forested, but the vegetation transitions into grassland in the north. The main ethnic groups around the southern forested section are Anyang, Basho, Boki and Ovande. In general, the people are highly mobile, often trekking on foot to the nearest towns of Ikom and Amana in Nigeria or Mamfe and Akwaya in Cameroon to buy and sell goods or seek medical and other services (Schmidt-Soltau et al., 2002). However, the area has undergone significant change with the creation of Takamanda National Park in 2008, and the construction of farm-to-market motorbike roads has gradually improved access to Mamfe, the administrative centre of Manyu Division. This appears to have affected how, and what, people trade. More people in the villages have established cash crop farms, particularly cocoa farms (van Vliet, 2010). The price of cocoa has increased significantly over the last decade, from an average of US \$1,500 per tonne in 2005 to US \$3,100 per tonne in 2015 (ICCO, 2017). As such, interest in smallholder cocoa farming has increased across the South West Region and elsewhere in Cameroon (Asaha and Deakin, 2016). Similarly, smallholder oil palm production, which has a long history across the region, is undergoing a rejuvenation of interest as palm oil prices continue to rise (Nkongho et al., 2014). See section 3.1.3 of Chapter 3 for an overview of other relevant socio-economic trends in Cameroon.

Despite the growing interest in cocoa farming, out-migration from the villages around Takamanda National Park is prevalent, particularly among young men, while in-migration to the area is uncommon. During a household survey conducted in three villages in June and July 2014 (described in detail in Chapter 5), respondents from 82 households were asked about their migration histories and those of family members (including siblings). Sixty one percent of households either had a family member who had migrated and was living elsewhere, or had a household member who had migrated in the past and since returned. The majority had migrated either to urban centres or to peri-urban agricultural areas to work on plantations. Most had remained in Cameroon, with 68% staying in the South West Region. The main destinations for migrants were Limbe, Mamfe and Kumba. Data for this chapter was therefore collected in these three towns. Mamfe is located 27 km from the headquarters of Takamanda National Park, with the more distant towns of Kumba and Limbe located 184 km and 276 km away respectively. At the sub-division level, Mamfe has a population of 31,641, Kumba a population of 166,331 and Limbe a population of 118,210 according to the last census conducted in 2005 (INS, 2010). Limbe, and its surrounding area, has the most prominent industries with large plantations of palm oil, rubber, tea and banana having dominated the landscape since the late 1890s (Mbaku, 2005). These plantations, along with the oil platform off the coast of Limbe, are of significant importance to the economy of Cameroon.

7.2.2 Data collection

Interviews were conducted with male out-migrants, aged 16 and above, who originated from villages around Takamanda National Park but resided in urban areas. For the purpose of this study, an urban resident is defined as someone who has been primarily based in town for a period of at least one year, and has their spouse living with them where applicable. This definition excludes men staying in town for shorter periods, whose primary residence and nuclear family are in the village. Fifty-three interviews were conducted with members of this target group from March to June 2015 in the towns of Mamfe (n=40), Kumba (n=6) and Limbe (n=7). Before research commenced, a research permit was obtained from the Cameroon Ministry of Scientific Research and Innovation as described in section 1.5 of Chapter 1, and permission was also sought from the relevant government officials in each town.

Snowball sampling, also known as chain referral, was used to identify members of the target group. This sampling approach involves identifying a few members of the target group initially who can help to identify other potential research participants, who in turn identify others (Bernard, 2006, Newing, 2011). It is a useful approach for hard-to-find populations and was the only viable option for locating individuals from specific villages within populous urban areas. Three individuals known to the research team provided the first lists of contacts, and one of them, who was from the Anyang tribe, was recruited to help facilitate the interviews since it helps in building trust when someone can speak in '*country talk*'. A list of 38 villages located within 10 km of the southern forested portion of Takamanda National Park used as a sampling frame to guide the selection of participants (see Appendix E). Individuals who fitted the definition of urban resident and considered themselves to be from one of the listed villages were interviewed. While interviewees were in the best position to identify other potential respondents, additional lines of enquiry were also pursued in order to branch across social networks. Respondents engaged in a variety of different livelihood activities and those from a range of different villages were purposefully selected. While the majority of the sample were first generation out-migrants, twelve interviewees had either been born in town or had moved to town with their parents. Initial interviews with second generation out-migrants revealed that they retained customary rights to access land and resources in their villages, and several had spent time living in the village at some stage in their lives, therefore this group was included in the sample. The final sample includes respondents from 22 villages and captures a diverse range of characteristics and circumstances.

In Mamfe, I was assisted in conducting the interviews by Catherine Chopjou, a recent graduate from the University of Buea and a native to the South West Region. Catherine translated the interview questions into Pidgin English before we pre-tested them on four respondents and made refinements. Verbal consent was obtained from all research participants following an explanation of the aims and purpose of

the study. Respondents were advised that all information provided was confidential and that they were free to ask questions, refuse to provide an answer or terminate the interview at any time. During the interviews, Catherine asked the questions in Pidgin English while I made detailed notes. Pidgin English is a language I understand well but cannot fully converse in and people often struggle to understand my accent. We therefore used a one-way translation process and I asked for clarification if there was anything I did not understand. For some interviewees, particularly those formally employed in office jobs, it was more appropriate for me to conduct the interviews in English. Interviews typically lasted for 1 hour. Initially, an audio recorder was used with the respondent's permission but because most interviews were conducted at people's job sites, there was often too much background noise for the recording to be audible during playback. Furthermore, use of recording devices and cameras can be met with hostility in busy urban environments. As a result, neither were routinely carried around after the first four interviews to avoid being intrusive and to ensure the safety of the research team. Due to time demands associated with data collection for Chapter 6, the interviews in Kumba and Limbe were conducted solely by Catherine, who was accompanied by the local facilitator, Levis. However, having visited Kumba on a few occasions and spent extended periods in Limbe, I am familiar with the context in both locations.

Interviews were structured and incorporated a scenario-based interviewing technique. A series of standard questions were asked of each respondent as detailed in the datasheet in Appendix E, with supplementary questions and probes used to encourage a fuller response. The first part of the interview covered socio-demographic details, such as age, education level, family size, estimated monthly income and urban assets. Questions were then asked about rural assets and engagement in rural activities, with specific questions on farming and hunting. Hunting did not appear to be a sensitive topic for those resident in urban areas, likely due to the interviews being conducted in a very different context. As such, people were prepared to talk freely about their hunting experience and whether or not they still hunted when they visited the village. The second part of the interview collected detailed life history information starting from the first time the individual moved outside of the village to the date of the interview. Each migration destination and main urban livelihood activity were recorded along with the year and duration. Interviewees were then asked to list all activities they had engaged in, either in the village or in town, over the preceding 12 months and to indicate which provided their main sources of income. Respondents explained their motives for leaving the village, what had enabled them to migrate, why they had decided to base themselves in their current town, and whether they ever planned to return to live in the village and what would prompt them to do so.

The final part of the interview used a scenario approach to explore individual responses to different future situations. The use of scenarios as a means of predicting human behaviour has been limited in conservation to date. However, scenario-based interviews have been used to explore how fishers would respond to declines in catch (Cinner et al., 2009, Cinner et al., 2011), and how individuals would change their land use practices under different conservation policies (Travers et al., 2016). In this study, three different scenarios were presented to respondents in a qualitative narrative format to understand how livelihoods and rural resource use might change under different economic conditions, and see whether an economic crisis would prompt return migration. The first scenario simply asked respondents where they planned to be in 5 years' time and what they hoped to be doing, assuming the socio-economic context remained more or less the same as it is now. This first scenario was then used as a baseline for the other two scenarios. The second was an economic stress scenario whereby the respondent had to imagine that in 5 years the income from their anticipated main urban livelihood activity reduced by half. It was explained that everything else would remain the same, and respondents were asked what they would do and where they would be based. The third scenario represented an economic shock, with respondents asked to imagine that they lost their main urban source of income, and would be unable to restart that particular activity for at least 2 months. Again, respondents were asked what they would do and where they would be based. In addition, respondents were asked whether they would farm or hunt under each scenario and whether they would make any changes, such as increase or decrease the size of their farm. Responses to scenarios can reveal heterogeneity as well as commonality in reactions.

7.2.3 Data analysis

The socio-demographic information collected about individual respondents and their responses to both closed- and open-ended interview questions were typed up in full in a single spreadsheet in Microsoft Excel. The whole dataset then went through a long, exploratory, qualitative analysis process. I initially took a similar thematic analysis approach as used in Chapter 5 but wanted to take this analysis a step further to fully understand the trajectories of individual respondents as well as the range and diversity of responses to specific sets of questions. I therefore ultimately followed a systematic approach to qualitative analysis known as 'Framework', which was developed in the 1980s by the National Centre for Social Research (NatCen) in the UK to help guide applied policy research (see: Ritchie and Spencer, 1994, Ritchie et al., 2014). Although the series of clearly defined data management and analysis steps outlined in the Framework method have been used extensively to qualitatively evaluate social policies implemented by government and public bodies, this approach only started to receive attention in the academic literature relatively recently – mainly in the fields of medicine (e.g. Gale et al., 2013) and psychology (e.g. Parkinson et al., 2016). The initial data management steps associated with Framework, outlined in Figure 7.2, mirror the thematic analysis steps advocated by Braun and Clarke (2006), with the

main point of divergence being the creation of framework matrices. A framework matrix consists of a row per respondent and a column per theme. All content coded to a particular theme is summarised for each respondent in the matrix. This significantly reduces the volume of qualitative data while retaining the essence of what each person said about each topic. Using this type of matrix-based approach enables both cross-case and within-case analyses, thus facilitating the search for patterns and linkages.

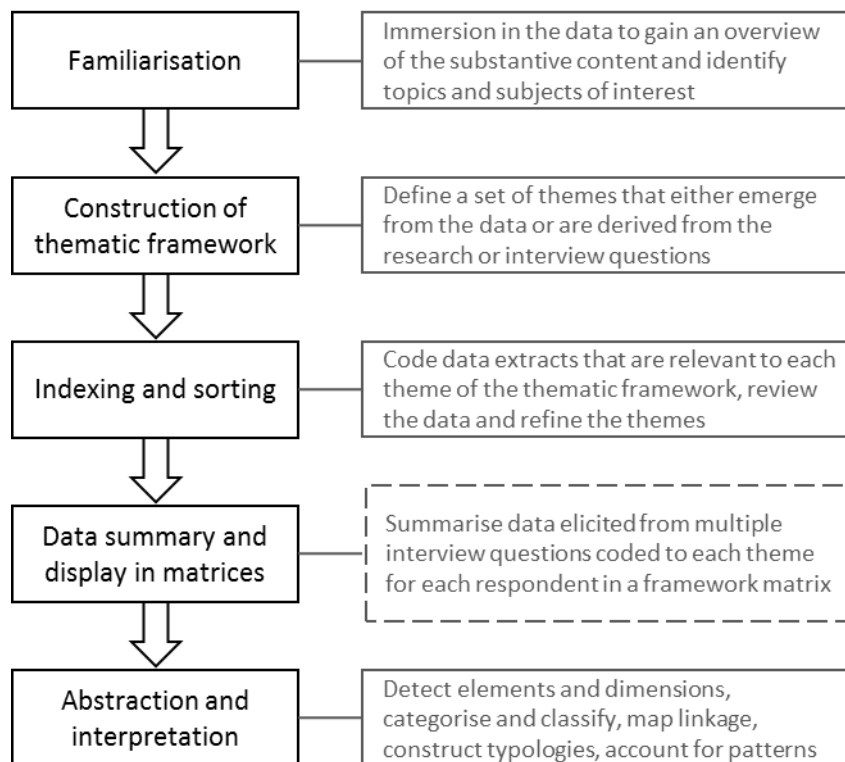


Figure 7.2: The data management and analysis steps outlined in the Framework method, as detailed in Ritchie and Spencer (1994) and Ritchie et al. (2014). The hashed box indicates the step which differentiates the Framework approach from typical thematic analyses.

I began the analysis process by printing out all of the data in the Excel spreadsheet to enable full immersion and familiarisation. While reading through the printouts, I developed initial codes, categories and groupings to identify the range of activities, reasons, issues, enabling factors, plans and reactions. I added all thoughts and reflections to a data analysis journal. To examine how livelihood trajectories and use of natural resources could vary depending on a person's present situation, I developed a thematic framework based around six themes: 1) current livelihood activities, 2) livelihood aspirations, 3) coping strategies under economic stress, 4) coping strategies under economic shock, 5) farming behaviour, and 6) hunting behaviour. The data relating to the first four themes came from specific questions asked of each individual during the interviews, however details about a person's intention to farm or hunt were brought up throughout interview discussions. I therefore imported the Excel data into NVivo 10 and coded all mentions of farming and hunting across the dataset. Using the function that supports

Framework analysis in NVivo, I was able to review the responses to specific questions and the content coded to specific themes for each respondent in turn and compile comprehensive summaries in a framework matrix to enable further scrutiny (see Box 7.1 for an extract from the framework matrix).

Box 7.1: Extract from the framework matrix showing colour-coded data summaries for one respondent

	A : Livelihood activities	B : Livelihood aspirations	C : Coping strategies (economic stress)	D : Coping strategies (economic shock)	E : Hunting	F : Farming
<p>1 : SC01</p> <p>Monthly income = 26,000-50,000 Asset wealth = Lower 25% Village visits = Visits once per year for less than 1 month</p>	<p>Traditional medicine, casual manual labour on building blocks, digging wells), labouring on farms (clearing, brushing), porting (timber, petrol).</p> <p>Fishing and tapping palm wine.</p> <p>Recently started an apprenticeship in carpentry.</p> <p>Young (17), unskilled, uneducated, unestablished, urban income only, unhappy due to lack of financial support to continue education.</p>	<p>To work for the government as a teacher in a primary or secondary school in Manyu Division. Also to become a builder.</p> <p>In the village, plans to expand his cocoa farm and open an off-licence. Will continue to harvest NTFPs and fish.</p> <p>Aspires to be educated with formal employment and a skilled trade, and establish rural income sources. Remain in Manyu.</p>	<p>Will have three different types of livelihood activities to alternate between: teaching, building and farming.</p> <p>Focus more on farm work but not change location. Will continue to harvest NTFPs and fish.</p> <p>Ex-ante diversification, live outside the village but fallback on income from farming.</p>	<p>If no income from teaching and building, will go back to the village to farm. He would go back if struggling to feed himself and no money for house rent. Although he would initially ask his mother to send food from the village.</p> <p>Will continue to harvest NTFPs and fish.</p> <p>Fallback on farming and living in the village.</p>	<p>I don't do hunting or trapping.</p> <p>I don't know how to hunt and am afraid trapping would displace my eye.</p> <p>People trespass in our forest now because they can't hunt in the NP.</p>	<p>My main income source when I lived in the village came from cocoa, then palm oil.</p> <p>I have a 1.5ha cocoa farm in the village but it is bad due to lack of money for fertiliser. However, this didn't make me leave the village, I left to be able to watch CRTV and to hear about jobs.</p> <p>There is ongoing conflict in the village over inherited land - the family keep disturbing because they want to take our land.</p> <p>In 5 years, I will open up a farm where I'm teaching and plant cocoa. The children at the school can work in the cocoa farm.</p> <p>If money from teaching reduces, I will do more farmwork. If I have lots of work associated with teaching and building, I can abandon the farm. But if there is no money from these activities, I will go back to the village to farm.</p>

I colour-coded and interrogated the framework matrix to identify and explore patterns and associations, including contradictory ones. I intermittently returned to the original data to explore why certain patterns or exceptions might exist. I also imported all socio-demographic variables and inputted categories derived from the qualitative analyses into SPSS version 23. This enabled me to run cross-tabulations and other descriptive statistics to further explore patterns and linkages, and identify outliers, which I then investigated further by returning to the data summaries or the original data. During this process, I classified respondents according to their current livelihood type and developed a typology based on their present degree of establishment in town. I conducted further analyses on the farming and hunting summaries by thematically coding them to map the range of reasons for engaging in each activity, or not, and to identify all enabling and limiting factors. The resulting codes were refined and merged until I had a comprehensive list of key reasons and issues. These were then charted according to each individual's main livelihood type and degree of establishment in town to develop a thorough understanding of dominant rural resource use patterns, as well as notable exceptions. Finally, I further explored livelihood trajectories and rural resource use under different scenarios by creating schematic diagrams in Microsoft PowerPoint, using weighted lines when appropriate to illustrate the number of respondents following particular paths.

7.3 Results

7.3.1 Socio-demographic characteristics of the sample

Respondents ranged in age from 16 to 68 years, with 21 individuals aged 16 to 25, 21 aged 26-40, and 11 aged 41 and above. The size of the respondent's nuclear family was associated with age, with nearly half of the sample being single (n=25) and the rest either having small families (1-2 family members; n=12) or larger families (more than 3 family members; n=16). Most were from villages of the Anyang tribe (n=32), followed by Basho (n=14), Boki (n=6) and Ovande (n=1). The number of years that respondents had spent in education ranged from 0 to 18, with the highest qualification for half of the sample being their First School Leaving Certificate (n=26). The other half had gone on to secondary education and had completed either their O-Levels (n=17), A-Levels (n=5), an undergraduate degree (n=3) or a master's degree (n=1). Only one individual had not attended school and he was the oldest participant aged 68. Most respondents resided in their home division of Manyu, with only 15 living further afield. However, there was no significant difference in the frequency with which those living in Manyu and those living elsewhere visited their villages. 17% of the sample visited their village less than once a year, 36% visited annually and the remaining 47% visited the village more often. For comparison purposes, individuals are grouped according to their main urban livelihood activity, categorised as either: 1) education (n=10), 2) casual work (n=6), 3) skilled trade (n=15), 4) business (n=11), or 5) formal employment (n=11). Individuals were further grouped by the degree to which they had established their livelihoods in town, with 19 considered 'precarious', 13 'becoming established' and 21 'established'. Most (60%) estimated their monthly income at less than 50,000 XAF, with 19% in the 51,000-100,000 XAF category and 20% with incomes above 100,000 XAF. For a breakdown of all individual characteristics see Appendix E.

7.3.2 Rural-urban migration

Of the sample of 53 urban-based out-migrants from rural villages around Takamanda National Park, 41 migrated to urban centres themselves (first generation) and 12 were either born in town or moved to town with their parents (second generation). The number of years migrants had resided in town varied substantially from 1 to 54, largely corresponding with age. The average age at which first generation migrants left the village was 17, with urban attractants outweighing rural repellents as determinants of migration. One of the most prominent reasons to migrate was to seek education or apprenticeships in town (n=27). The lack of secondary schools and the poor quality of teaching in the rural area were cited as reasons why obtaining an education in town was desirable. In all cases, this was enabled by financial and/or in-kind support from relatives, either parents based in the village or uncles, aunts and siblings able to provide accommodation and support in town. Obtaining an urban income, either over the short- or long-term, was the ultimate goal of almost all respondents, the potential to obtain a higher income in

town than in the village being a key motivator, the exception being one individual (#57) who had been forced to leave the village and was depending on his sister in town until he was granted permission to return. Five respondents mentioned social conflicts, and witchcraft, as reasons that had prompted their migration - *'they put traditional medicine on my head, they tried to trap me, so I left the village and have never been back'* (#40).

Preference for the urban lifestyle over rural life was frequently mentioned as a reason for migrating and for staying in town. The comfort of life in town, facilities available, social interaction, and ease of transportation and communication were all cited as reasons for preferring urban life. These were contrasted with descriptions of the monotony, hard labour and isolation associated with rural life. Two respondents stated how they could miss out on highly desirable public sector job opportunities if they remained in the village due to the lack of television and other forms of communication. A few individuals mentioned specific challenges associated with life in the village which had influenced, but had not been the main reason behind, their decision to leave. These included the difficulty of selling farm produce (#48) and obtaining provisions (#4,22,36) due to bad roads, struggles maintaining the farm due to lack of money to buy inputs (#1) or pay labourers (#39), the lack of an income source while waiting for a cash crop farm to mature (#45), and restricted access to resources (specifically timber; #37) associated with the creation of the national park.

The majority (68%) of respondents planned to remain in their current town over the next 5 years. For those residing in Mamfe, proximity to the village was important as it reduces the cost of travelling home – *'in Limbe, if you have no money to travel you can't travel, but in Mamfe if you have no money to travel you can trek'* (#31). It also means that Mamfe has a higher proportion of people from the villages around Takamanda National Park than the other more distant towns. This increases the likelihood of being able to stay with a family member, and networks of people from the same village or ethnic group provide valuable links to income earning opportunities – *'it would take years to make contacts if I moved to Kumba, here people know me'* (#19). The cost of living in Mamfe is also less than in larger towns, which was another reason many were content with remaining. For all those resident in distant towns, support from family members already living there had been critical. Of the 32% who planned to relocate elsewhere in the next 5 years, four planned to return to the village to farm, five planned to migrate to more distant towns in Cameroon and eight aspired to migrate abroad. The thirteen respondents with an interest in further migration were all aged 31 or younger, and their goal was to obtain formal employment or pursue university education in Cameroon or Nigeria (n=7), or further afield in Europe and elsewhere (n=6). However, some were more certain than others about having the means to follow through with these migration ambitions.

Over the longer-term, 29 respondents (55%) stated that they planned or thought it likely that they would return to live in the village at some stage in their lives. For some, return migration would only be temporary for specific periods, such as between secondary school and university (#27), for others it would be to get married and start a family (#1,29), or to fulfil village or family responsibilities (#29,50,53,54). Many respondents (n=16) said they would return to the village after retirement, either because they would no longer be able to afford the cost of living in town – *‘when age comes you go back to the village, you can’t afford to stay’* (#19), or for sentimental reasons – *‘I plan to go back one day to be with my people, they have to bury me for there’* (#22); *‘I am a stranger here [in town], I don’t want to die outside’* (#40). Second generation migrants varied in terms of the amount of time they had spent in the village, and therefore their familiarity with village life. Many could not envisage any reason why they would decide to move to the village, but four of the 12 second generation migrants did express their intention to live in the village one day. Two intended to move to the village after retirement (#3,46), and two intended to move earlier because they had inherited a house and farm (#7) or had been appointed chief (#53). However, many were opposed to the idea of returning to the village – *‘no problem in town would make me go back’* (#20), *‘I am happy in town, I am looking to go ahead not run back to the village’* (#18). Although several (n=10) stated that their plan might change if the road to their village and other infrastructure improved.

7.3.3 Urban livelihood activities

The sample included 10 individuals in formal sector employment, and one person with a government pension (#24). Those in high paid positions, with a total monthly income between 100,000 and 800,000 XAF (185 - 1,480 USD²), were engaged in teaching, retail, the legal profession, the NGO sector and company management. Most had been educated to secondary school or degree level. Only three individuals in the sample earned more than 200,000 XAF (370 USD) per month and they were all employed by foreign institutions. Those in lower paid jobs, with monthly incomes less than 50,000 XAF (92 USD), were security guards and plantation workers. Regardless of monthly income, all respondents with permanent jobs had specialised livelihood portfolios, with most having only one income source. However, two of the individuals with a high monthly income had two income sources; one stated that he received comparable incomes from his managerial job and his cash crop farm near Kumba (#41), the other obtained his main income from the government for being a chief (#53). The pensioner, a former teacher, had a monthly income less than 50,000 XAF (92 USD) and complained that *‘the government does not pay the correct amount for pensions, it is not enough to support a family’*. He supplemented his income by running a motorbike taxi and renting out the cocoa farm in the village which he inherited.

² 1 USD to 542 XAF on 1 January 2015

Ten respondents, all aged between 16 and 23, were still in full-time secondary or technical education studying for O-Level or A-Level exams. They each received financial support from their families but supplemented this income through part-time casual work in town or by engaging in rural activities during the school holidays. As such, they engaged in a diverse range of urban and rural livelihood activities, with an average of five different activities each. Their urban activities included manual jobs such as dredging sand, carrying loads and labouring on farms and building sites. Those learning a trade at technical school start to earn some money from practicing that trade long before completing their course. Nevertheless, most students got by on an income less than 25,000 XAF (46 USD) per month. Only one of the students interviewed had all his expenses covered by his family and did not need to earn an income himself (#14). Six other respondents had similarly diverse and precarious urban incomes as the students, and engaged in many of the same kinds of casual, informal sector activities. Two of these had been unable to continue their studies due to lack of financial support from family, and hoped to save enough money through casual work to be able to return to school to continue their O-Levels. Two others had completed their education to secondary or degree level and were engaged in casual work while looking for formal sector jobs. The remaining two were only working in town on an interim basis as they intended to eventually return to the village to farm. All of those engaged full-time in casual work were first generation migrants, and most earned less than 50,000 XAF (92 USD) per month.

Many had decided to opt for vocational training, rather than secondary education, and had made an arrangement with a patron to do an apprenticeship. This usually entailed paying a fee for a period of 3 years. Eleven respondents had done apprenticeships to train to become tailors, mechanics, carpenters, cobblers, and electricians. Some were financially supported by family while others financed themselves. Depending on the arrangement made with the patron, apprenticeships can become a form of bonded labour. One respondent had worked for his 'master' for seven years unpaid after he completed his 3-year apprenticeship, with only the cost of his rent covered (#19). Others struggled to find enough capital after they finished their apprenticeship to set up a business of their own, having to resort to casual work or farming in the village to raise the money necessary to buy equipment or open a store. In total, 15 respondents were engaged in skilled trades as their main livelihood activity. Six of these had trained at technical school instead of doing apprenticeships, which appears to be the preferred route to learn building and construction. Two individuals who took apprenticeships to become tailors had since switched to other business ventures, but the majority interviewed considered a skilled trade to be a profession for life. Earning potential differed by trade with established builders and mechanics earning up to 200,000 XAF (370 USD) per month, while tailors usually earn up to 50,000 XAF (92 USD). The most lucrative trades seemed to be those associated with construction and repairs. As with formal

employment, those with skilled trades tended to have specialised livelihoods, with their trade representing their only urban income source.

The remaining 11 respondents were all engaged in business ventures in the informal sector. These ranged from service businesses, such as computer repair stalls, barber's shops and bars, to wholesale trading, provisions and clothing stores. Many of those engaged in business did not receive financial support from family initially but instead used their personal savings and started small – *'I used to sell biscuits in Mamfe, I started with 10 cartons and got 5,000 every week from biscuits'* (#39). Three respondents first started businesses in the village before using the capital to open stores in town – *'I used to sell biscuits in a small boutique in the village, then I started buying wine and soap in Mamfe and selling it in Nigeria. I met people in Nigeria and started a timber business, I would pay workers to cut a stick whenever I received a call. The balance from my timber business enabled me to open my provisions store in Mamfe'* (#37). Several respondents mentioned getting ideas and learning business skills from traders who visited their village – *'I followed people to Nigeria when I helped carry things, I later followed them there to learn marketing. I started selling clothes in the village and later took my clothes business from the village to Mamfe. There was no population in the village then, so I left to find a market outside'* (#22). These individuals were older when they first moved to town compared to those who initially left for education and training opportunities. As with those engaged in skilled trades, most involved in business did not have a secondary education. Monthly incomes tended to range from 50,000 to 100,000 XAF (92 – 184 USD) with most having relatively specialised livelihood portfolios, focused on their business and related activities.

7.3.4 Livelihood aspirations

The majority of respondents who had established businesses or trained in a skilled trade planned to continue with their current activity over the next 5 years (91% and 80% respectively) – *'if I can get 200,000 a month sitting here fixing shoes, I have no plans to change'* (#8). Those still starting out in their skilled trade careers aspired to acquire premises and equipment to become patrons of their own workshops, while some of those already established with a business or skilled trade hoped to move to bigger premises, open additional stores or upgrade their equipment. Similarly, the majority of individuals in formal employment (64%), and all of those working in the public sector, intended to remain in the same job over the next 5 years, or planned to retire and start receiving a pension (#34). Some of those in full-time education (40%) planned to complete secondary school and go to university, while others intended to move on to other things. All those engaged in casual work hoped to switch to a different form of livelihood activity over the next 5 years. Figure 7.3 illustrates the range of livelihood trajectories

based on the stated intentions of individual respondents. As some individuals planned to return to the village and establish their main livelihood there, rural-based activities are differentiated from urban ones.

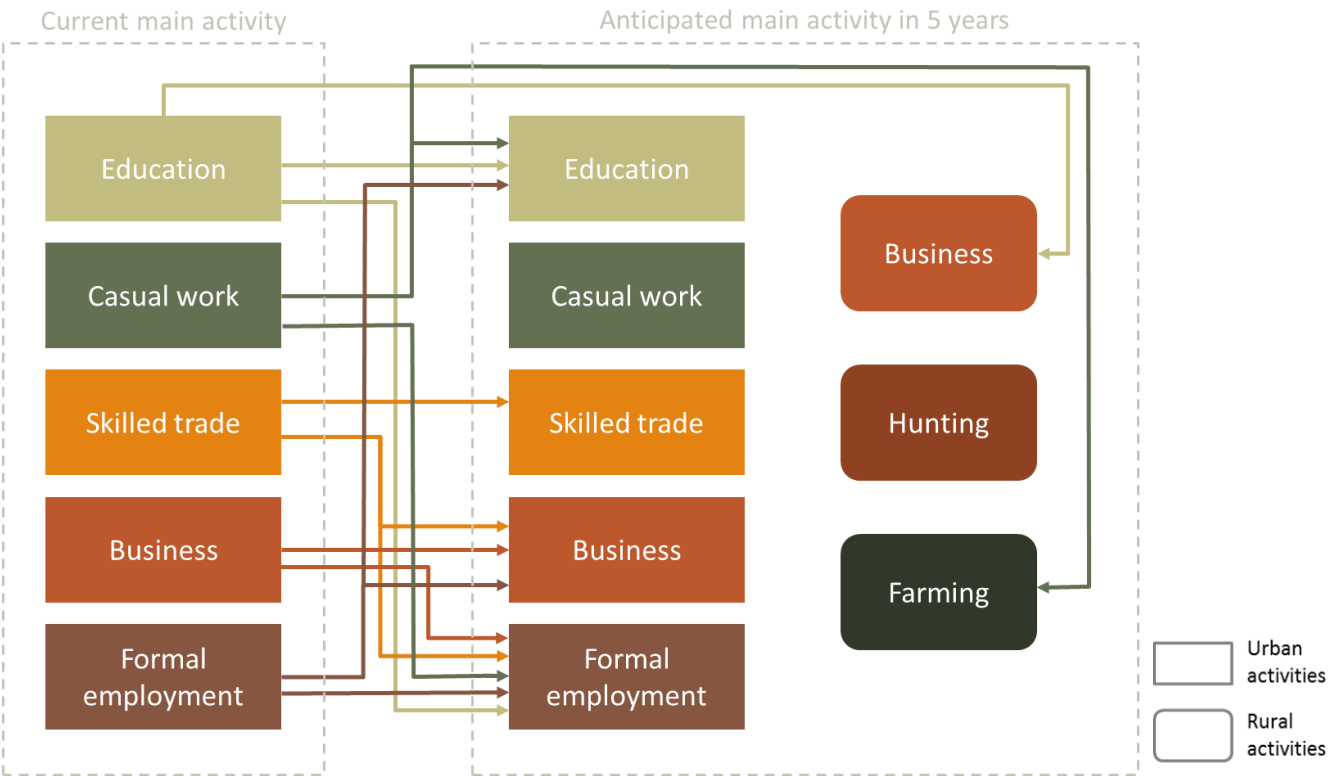


Figure 7.3: Livelihood trajectories based on current and anticipated main livelihood activity in 5 years, differentiated by whether the activity is urban- or rural-based

There were individuals in all livelihood categories who aspired to obtain formal employment, particularly those currently in full-time education or engaged in casual work. Public sector jobs were most preferred, with six individuals hoping to find administrative jobs, become teachers or work for the police. Whereas three hoped to find formal employment in the private sector, either in retail or construction. Four individuals who already had either a skilled trade or formal employment wanted to start their own businesses. Two with skilled trades planned to establish provisions stores in town, whereas two in formal employment in the private sector both planned on establishing their own businesses in the same fields in which they currently work. Three respondents stated their desire to continue their education, with one in casual work hoping to return to secondary school and two in formal employment hoping to go to university and study at either undergraduate or PhD level.

Four individuals in either full-time education or casual work envisaged moving back to the village over the next 5 years. Those in casual work wanted to go back to concentrate on farming, whereas those in education hoped to establish provisions and trading businesses in the village. No one expressed their

intention to switch to a skilled trade from their current activity, nor did anyone want to be primarily engaged in casual work or rural activities such as hunting in 5 years' time.

7.3.5 Rural farming

Three quarters of the sample had multi-spatial livelihoods in the sense that they continued to engage in farming and/or hunting in the village despite being resident in town. However, the frequency of engagement with these activities and the extent to which they contributed to the individual's overall income varied substantially. Rural farming was a much more prevalent activity among out-migrants than hunting, with 35 individuals owning cash crop farms in their village. Most had cocoa farms (n=31), many of which had been recently planted (n=16) and had not yet produced a crop. Some individuals with mature farms had the local variety of oil palm rather than cocoa because they had established the farm many years earlier or had inherited it from their parents. Ownership of a rural farm was highly desirable among urban-based out-migrants, with most of those without a farm planning to establish one within the next 5 years. If these aspirations were met, this would increase the proportion of rural farm owners in the sample from 66% to 89%. Those keen to establish farms were mainly interested in cocoa, but there appears to be renewed interest in oil palm due to an increased focus by agribusiness on oil palm in the South West Region. Some individuals also mentioned an interest in cultivating the NTFP bush mango (*Irvingia gabonensis*) – *'cocoa has been key but some people now want to divert to bush mango, they want to invest in a farm that is less work and less money to maintain'* (#24).

The size of rural farms owned by the out-migrants ranged from 0.25 ha to 8 ha, with an average farm size of 2 ha. Those with businesses had the largest farms, with an average of 3.5 ha, followed by those in formal employment with 3 ha (see Figure 7.4a). Nine respondents considered the income they received from their farms to be central to their livelihoods, often providing greater or comparable income to their urban-based activities – *'my main income is from cocoa but I need money from other activities to be able to pay workers'* (#39, engaged in business, 7.5 ha cocoa farm). Most of those who relied on rural farms for a large proportion of their income worked in the informal sector, either having businesses or practicing a skilled trade. Over the next 5 years, most respondents, including those currently with or without farms, envisaged having a farm in the village sized between 2 ha and 6 ha, with an average increase in farm size of 2.5 ha envisaged by respondents. However, three individuals expressed a desire to establish much larger farms of up to 30 ha. Those with ambitions to create cocoa or oil palm plantations in the village as a business venture either already had urban businesses (#38,39) or were in high paid formal employment (#53) (see Figure 7.4b).

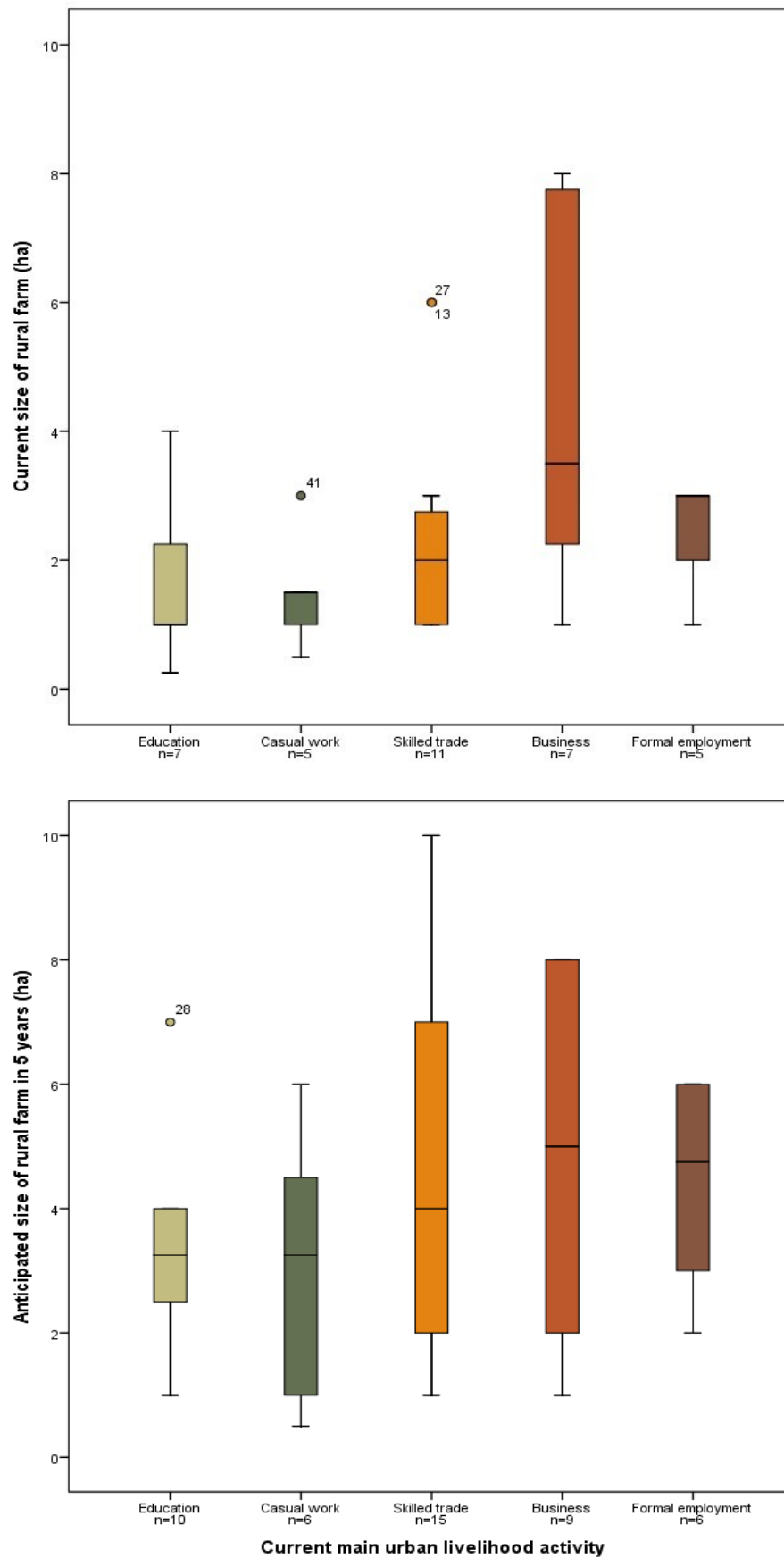


Figure 7.4: Current (a) and anticipated (b) farm size grouped by current main livelihood activity (with three outliers removed for anticipated farm sizes over 10 ha)

The reasons for and against rural farming, as well as enabling and limiting factors, are listed in Appendix E according to the respondent's livelihood type and degree of establishment in town. The role of the rural farm in providing a fallback income was stated by individuals across all livelihood and establishment categories – *'I want to maintain things in the farm so that if anything bad happens I can go back to the village'* (#29). Cocoa farms are considered to be a reliable source of income – *'once my farm is mature, I know my children will not suffer'* (#33), and are also seen as a tangible asset that can be passed on through inheritance or sold – *'I plan to increase the size of my cocoa farm to 10 ha so that eventually it can be shared among my children'* (#15), *'I am considering selling some of my farm and building a house in Mamfe'* (#31). For those hoping to continue their education, particularly to degree level, the rural farm is regarded as a sponsor – *'after A-Levels, I will go back to the village to develop my farm, I want to have a farm that can sponsor my education'* (#29). However, due to the lag time between the planting and harvesting of tree crops, prospective students may postpone their studies initially – *'after secondary school, no one will support me. I will spend 2 years in the village working my farm. When it starts producing, my brother can maintain it and send the money to pay my school fees'* (#35). Similarly, the proceeds from rural farms are used to fund investments to meet other livelihood goals – *'after I have my electrician certificate, I will go back to the village to work my farm until I have enough money to open a store'* (#21). For those working in the informal sector, establishing a farm was also considered a way of preparing for retirement – *'I plan to go back to the village when I am old. I already have my farm and now just need to build a house for my family'* (#37). Irrespective of age most respondents were making short-term and long-term plans for the future, and farms seem to play a key enabling or insurance role.

Out-migrants have customary entitlement to land within the boundaries of their village's territory, and many perceive that they have limitless access to land – *'we have a very big forest, even if I decide to clear 100 ha we will still have a lot of forest'* (#38). The main perceived limiting factor with regard to farm establishment and expansion is cost – *'I have access to land, I just don't have the money to clear it'* (#16). Most respondents sent money to the village to pay people to clear and maintain their farms but this often proved to be a financial burden, especially given that crops such as cocoa require maintenance and treatment with pesticides for several years before they start to produce – *'I am not yet getting an income from cocoa because the farm is still young, so I am sending 100,000 every year to my brothers to clear and work the farm with no return'* (#8). This is a cost that those more established in town with businesses and skilled trades find easier to bear than those with more precarious urban livelihoods – *'my farm in the village is bad, I don't have enough money to buy chemicals'* (#1). The limited accessibility of the village is also a deterrent to starting or expanding a farm for many – *'I am thinking of opening a palm and cocoa plantation in the village eventually, but how to sell the produce is always my first consideration and access to the village is an issue'* (#41). Three respondents with the means to buy land closer to their urban

residence had done so and abandoned their village farms – *‘I still have 5 ha of cocoa and 3 ha of palms in the village but I no longer have anything to do with them, my relatives work them now. I have a 3 ha palm farm in Limbe and am very happy to have my own farm in town’* (#48). Others abandon their rural farms once they are sufficiently established in town and feel that their urban livelihoods are secure – *‘I have been the patron of a clothes business in town for 47 years. I still have an 8 ha cocoa farm in the village but I’ve abandoned it’* (#22).

7.3.6 Rural hunting

Compared to farming, fewer urban-based migrants hunted (including trapping and hunting with dogs). Of the 24 respondents who had hunted in the past, either using guns, dogs or wire snares, 15 had hunted in the village area during the preceding 12 months. 80% of those who hunted did not have farms, or their farms were yet to produce a crop, so they did not have a supplementary or fallback income from a rural farm. They tended to be those with more precarious urban livelihoods; five were in education, two were engaged in casual work, five were learning or just becoming established in a skilled trade or business and one had low paid formal employment. They were also mainly below the age of 30 with total incomes less than 50,000 XAF (92 USD) per month. Most of those who hunted spent extended periods, between one and three months, in the village each year, typically during the school holidays or during the off-season for their main urban activity. Skilled trades such as building have off-season periods due to the weather, while tailoring has peaks and troughs in demand associated with school terms and public holidays. As such, two individuals well established in town with skilled trades still returned to the village to engage in rural income generating activities during specific periods – *‘I do not have a farm, so I trap in the village during the off-season for tailoring in May’* (#19). Unlike farms, which can be maintained by paid workers during the migrant’s absence, hunting generally requires the migrant’s presence in the rural area. Some individuals who cannot afford to pay workers to maintain their farm, return to the village and hunt while maintaining the farms themselves. Twelve individuals set traps and seven hunted with guns or dogs.

Most of those in education considered some kind of natural resource harvesting to be their main sources of income during the school holidays. This included hunting and the collection of NTFPs such as bush mango and bush onion (*Afrostryax lepidophyllus*). Only two respondents stated that hunting was one of their main sources of income, and both were students. Three individuals said that they would still continue to hunt in the holidays even once they started university. One student considered hunting to be more profitable than some of the casual jobs available in town – *‘for bambi [carrying load] you get 1,000 a day, with trapping you can get 6,000 a day’* (#28). Similar to farming, hunting was considered to be a fallback – *‘if I have problems in town, I set traps and hunt until things come back to normal’* (#28).

However, not everyone had purely economic incentives for hunting. The individual in low paid formal employment (#55) stated that he hunted when he visited the village because he wanted to be able to eat bushmeat, which is likely to be relatively expensive to buy in Limbe. Another respondent explained that *'when you are in the village, you do these kinds of things, it's not a profession'* (#11). Some people just enjoyed hunting, such as the second-generation respondent who hunted when tending to his farm during the off-season for building – *'I like hunting, I studied it, I do it better than other village men'* (#31).

However, several current and former hunters, as well as those who had never hunted, stated a general dislike for hunting as an activity. Some associated hunting with a lack of progress, others considered it to be a stressful and unpleasant activity, while some mentioned their fear of the *'bush'*. Respondents also had safety concerns and mentioned the depletion of wildlife – *'there is a risk of accidents when hunting'* (#4, hunter), *'I have seen plenty of things that have happened to people who trap, like the loss of eyes'* (#36, non-hunter), *'trapping is a waste of time, meat not there again'* (#31, hunter), *'I wouldn't do hunting or fishing because those things are no more there, all the animals and fishes have finished'* (#17, non-hunter). Others expressed a dislike for the wastage associated with trapping – *'animals die and rot in traps, I will never trap, I am against trapping'* (#33, hunter). The ecoguards in Takamanda National Park have deterred some individuals from hunting – *'I would do trapping when I visit the village if it wasn't for wildlife [ecoguards]'* (#20, former hunter), *'if there were no ecoguards, I could remain in town and employ people to set traps on my behalf'* (#24, former hunter). Some respondents stated the influence of others or considered themselves to be above activities such as hunting – *'my father never wanted me to hunt'* (#37, non-hunter), *'I am a chief and cannot be doing such things'* (#53, non-hunter). All reasons for and against hunting, now and in the future, are listed in Appendix E according to the respondent's livelihood type and degree of establishment in town.

Of the 15 individuals who hunted in the 12 months prior to the interview, only seven expected to still be hunting in 5 years' time. Two of these respondents envisioned being back in the village by then and planned to hunt or trap alongside their farming or rural business activities. Of those who intended to remain in urban areas, only the three who planned to go to university indicated that hunting would continue to provide an important source of income. One individual, who was particularly enthusiastic about hunting having recently received military training to counter the threat posed by the terrorist group Boko Haram, hoped to find somewhere closer to the university where he could continue to hunt during term time (#29). The remaining two, who planned to continue in business or in low paid formal employment and were among the oldest of the present hunters, planned to continue hunting as they do now. Those who intended to stop hunting cited the limited earning potential – *'you cannot realise anything from hunting'* (#19), *'trapping money is to buy soap, hunting and trapping don't pay'* (#31). They

also expressed hope that they would be fully occupied in more lucrative activities – *‘once I am a teacher, I won’t go back to hunting, teaching gives more money’* (#27), *‘in 5 years, when I also have a motorbike taxi and a cocoa farm, I won’t have time for it’* (#19). All the hunters who did not have farms planned to establish farms over the next 5 years.

7.3.7 Urban-only livelihoods

In addition to the four respondents who had abandoned their rural farms, ten other individuals did not partake in farming or hunting in the village. Instead, these 14 respondents, representing 26% of the sample, had purely urban sources of income. Eleven rarely visited the village, only going a maximum of once per year to attend festivities or death ceremonies. Most were based in the more distant towns of Kumba and Limbe, and seven were second generation. Twelve were established, or becoming established, in town with either formal employment (n=6), businesses (n=5) or skilled trades (n=1). Of the two individuals with more precarious urban livelihoods, one had been expelled from the village, which prevented him from engaging in any rural activities (#57), and the other was working under a patron having recently finished his apprenticeship in Kumba and did not have the time or the means to travel (#51). Both hoped to have rural farms and be in a position to engage in other rural activities in 5 years’ time. In total, eight of those currently not involved in any rural activities hoped to establish farms in the village in the future, suggesting that the pull of the village was still strong for them.

7.3.8 Responses to economic stresses and shocks

The individuals in the sample described a variety of ways in which they would cope or adapt their livelihoods when faced with economic crises. The two economic scenarios considered here are 1) economic stress – a reduction in the amount of income obtained from an individual’s main urban activity, and 2) economic shock – the complete loss of earnings from an individual’s main urban activity. The responses to each scenario are considered relative to the intended livelihood trajectory of each respondent over the next 5 years, with the four individuals who already intended to be back in the village being hypothetically unaffected for the purpose of this analysis.

Under both the stress and shock scenarios, the majority of the remaining urban-based respondents (78% and 65% respectively) said that they would remain in town and persevere with their chosen career paths. Most felt reluctant to switch to anything else once trained and established in a particular livelihood activity, even if their income from that activity reduced. The majority of respondents had provisioned for this eventuality and had either a second urban-based livelihood activity or a rural farm from which they believed they could receive enough money to be able to remain in town – *‘I would manage with the money from teaching and the farm combined’* (#30). Some would try to find casual work they could do

alongside their main urban livelihood activity to make up the shortfall, while others would reduce their expenditure and aim to manage their money better. For six individuals, particularly those in business, reducing expenditure would entail abandoning their rural farms, and four others would reduce the size of their farms – *‘I would abandon the farm because there would be no money for chemicals or to pay workers’* (#17). However, eight respondents said they would instead increase the size of their rural farms as they became more reliant on them. Figure 7.5 illustrates how engagement in rural activities by those remaining in town would change under each economic crisis scenario, with current and projected resource use in 5 years under business as usual shown for comparison.

For those who felt they would have to make more dramatic changes to their livelihoods if they were put under economic stress by a reduction in income, eight would resort to returning to the village to farm, at least temporarily, and four would hunt whilst there – *‘I would go back to the village for a few months to do farming before coming back to town’* (#5), *‘if my income reduced, I would return to the village and put more interest in hunting and trapping’* (#29). All of those who said they would return to the village still had precarious urban livelihoods at the time of the interview, or were only just becoming established, and most did not yet have mature farms. Therefore, they were less certain of their ability to survive in town with a reduced income, even though all except two students hoped to be established with skilled trades, businesses, or formal employment in 5 years. Rather than return to the village, three individuals, who hoped to be in education or business in 5 years, would instead fall back on their current activity by resuming casual work or formal employment in sectors with which they were already familiar. No one would start a rural farm who did not already have one under the economic stress scenario, likely due to the cost of doing so. However, two individuals who planned to remain based in town said they would start hunting for the first time, both of whom were students. The ways in which different individuals would change their engagement with rural activities under the different economic scenarios are summarised in Appendix E according to current livelihood type and degree of establishment in town.

In a situation of economic stress, most considered themselves able to persevere and manage with a reduced income. However, in the economic shock scenario, in which people lose their main source of income, it becomes more imperative that they have something to fall back on. Those who owned houses in town were in the best position to cope with an economic shock because they did not need to pay rent. Some of those well established in town also had small urban subsistence farms, so were essentially self-sufficient – *‘I would manage my money well and depend on my food crops here in Mamfe’* (#31). Two individuals stated that they would be able to remain in town without a main urban livelihood activity for a period of time because they would be able to rely on the support of family – *‘I would rely on my wife’s income, it can’t go down on both sides’* (#42). Two others had urban cash crop farms to fall back on – *‘I*

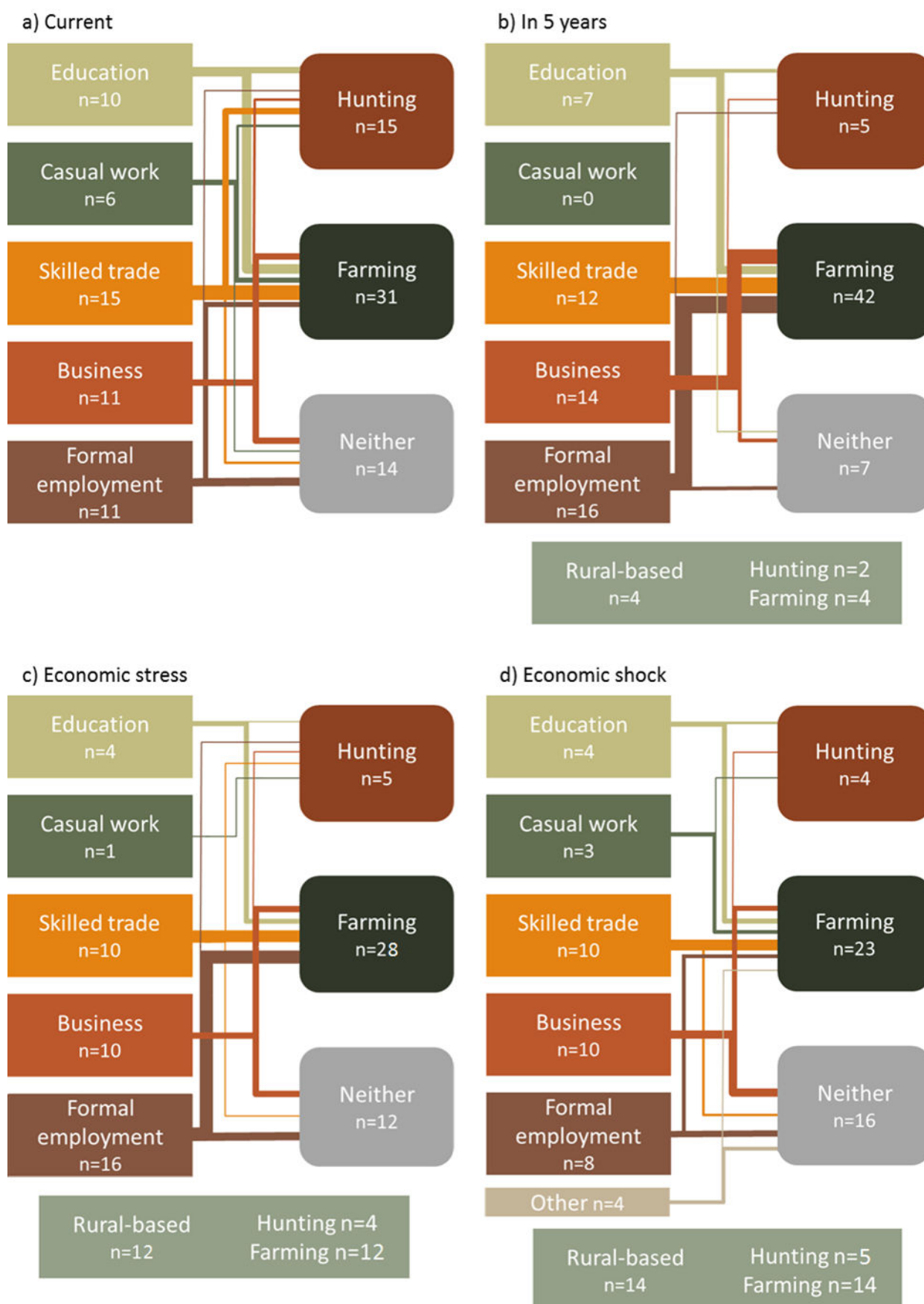


Figure 7.5: Rural resource use under different scenarios: a) current, b) in 5 years, c) economic stress, d) economic shock

might lose my job but my farm never fails me' (#40). Most would remain in town and try to find work as quickly as possible, with some engaging in casual work in the meantime – *'when things are tight, it is quicker to get money here in town than in the village'* (#39). No one would switch to a different type of urban livelihood activity under the economic shock scenario, but some would consider moving to a different town in search of work.

Twenty-three individuals remaining in town would continue to maintain their rural farms if they lost their main source of urban income, but an increased number would abandon them. Those who would consider abandoning their farms were often second generation who regarded them more as a supplementary income than a fallback, and also perceived them to be somewhat of a financial burden – *'I would have to minimise expenses as much as possible and would leave the farm to a relative to decide what to do with it'* (#46), *'I would leave Mamfe and move to Buea or Limbe. People back in the village would have to control my farm'* (#12). However, many others would fall back on their rural farms. Among those not well established in town, there were individuals from all urban livelihood categories that would consider returning to the village to farm if they were without work. Often this was driven as much by the inability to afford the cost of living in town as by the need for an alternative source of income – *'I would go back to the village if I was struggling to feed myself and had no money for house rent'* (#1), *'it is cheaper to live in the village than in town because you grow food rather than buy it'* (#38). A few actually considered having a gap between jobs to be a good opportunity to develop their rural farms – *'if I had nothing doing in town, I would spend up to 4 months in the village to increase the size of my farm'* (#4).

7.4 Discussion

As reported in the four studies examining multi-spatial livelihoods in East and Southern Africa (Potts and Mutambirwa, 1990, Foeken and Owuor, 2001, Englund, 2002, Mberu et al., 2013), a high proportion of urban-based out-migrants from rural villages around Takamanda National Park owned rural farms. Some also engaged in other rural activities, such as hunting and the collection of NTFPs. Both rural farms and forest resources can be considered fallback strategies that reduce an out-migrant's vulnerability to the economic stresses and shocks they might experience in town. As such, farming and hunting can be referred to as ex-ante and ex-post resilience strategies respectively (Tincani and Poole, 2015), in that returning to the village and engaging in extractive activities in the forest does not require prior financial investment, unlike establishing a rural cash crop farm. Indeed, hunting is mainly carried out by those without mature rural farms to fall back on. Hunters tend to be young men with precarious urban livelihoods, and in most cases, hunting is a necessary coping strategy rather than a preferred option. As observed in Ghana, hunting appears to be a low-status activity compared to farming, with cocoa farms in particular considered a highly valued asset (Schulte-Herbrüggen et al., 2013b). People expressed a dislike

for hunting and did not consider it to represent a viable livelihood option, yet those without other options continued to hunt when in the village despite safety concerns, the risk of being caught by ecoguards and the depletion of wildlife. However, most hoped to be too busy with their urban livelihood activities and have mature rural farms in 5 years' time. This indicates that in terms of rural resource use, out-migrants gradually transition from extractive resource use to rural farming as they become more established in town and have the ability to invest and plan for the future.

In the context of economic uncertainty and livelihood insecurity, which is inherent in most cities in Sub-Saharan Africa, a resilient livelihood is one that consists of a diversified income portfolio with low covariate risk between components (Ellis, 2000). Having both urban and rural sources of income represents one of the best ways of spreading risk, and while the economic conditions in Cameroon are conducive to farming, with rising cocoa and oil palm prices (Nkongho et al., 2014, Asaha and Deakin, 2016), urban-based out-migrants will likely continue to establish rural farms. As well as serving as a fallback, rural farms can provide a regular income source, even to those who rarely visit the village. Those in Kenya with rural farms as well as urban income sources were found to be better off on average than those who received all of their income from only one spatial base (Foeken and Owuor, 2001). The income from rural farms, which is likely to be received in relatively large amounts at specific times of the year, can provide vital capital to help in the realisation of urban livelihood goals, such as starting a business or paying tuition fees. Yet this is a two-way process since income from urban activities is often required to establish a rural farm in the first place, and other sources of either rural or urban income must suffice during the several years it takes for tree crops to mature. Thus, migrating to town appears to play a key role in farm development, even for those who do not envisage staying in town long-term.

While many out-migrants establish rural farms as a means of building the resilience of their urban-based livelihoods, there are others who instead consider having free access to land in the village as an opportunity to establish a farm as a business venture. Usually this is on a relatively small scale, not dissimilar to farms owned by rural dwellers, but some with the financial means, i.e. the urban elites, may establish much larger farms. At least one 110 ha area of forest around Takamanda National Park had been earmarked by an urban elite for conversion into a cocoa plantation prior to this study (Etiendem et al., 2013b), and other plantations smaller in size had already been established. This trend is likely to increase as access to the area improves, as has occurred elsewhere in the South West Region (Malleeson, 2000). Such income diversification can be considered more as an accumulation strategy than a risk avoidance one (Pédelahore, 2014). Although such investment in the rural area can have trickle-down benefits for the rural economy through employment, in situations where men have either migrated or are occupied with their own farms, migrants from elsewhere may move into an area to take these jobs

and fill the void. Land acquisition on this scale can have a negative impact on those who depend on harvesting NTFPs and other resources within community forests (Malleon, 2000), and may force them to access these resources inside the national park instead. Although trees that produce valuable NTFPs are often retained in plantations, they become the private property of the farm owner rather than a common good. Furthermore, although many perceive land to be abundant, land scarcity is becoming an issue in some villages around Takamanda National Park, particularly in enclaved villages (van Vliet, 2010).

Using the typology established by Dorward et al. (2009), there are also some individuals who have 'stepped out' of the rural agrarian economy entirely, instead having only urban sources of income. Only those long-established in town with urban houses, often urban farms, and either high paid formal employment or at least two urban income sources are in a position to feel secure about their urban situation. Strong social networks in town also help. The phrase 'stepping in' could be applied to those who do not depend on having a rural income source but have simply taken advantage of the macro-economic conditions and their rural entitlements. The extent to which urban-based out-migrants are reliant on the rural area as a fallback, are spreading risk by diversifying their activities across both domains or are using their financial resources and influence to profit from the rural area is important to decipher if conservation interventions are to specifically target any of these behaviours. While urban-based and rural-based resource users differ, it is important to remember that dichotomous labels such as urban and rural are blurred in reality. Instead, individuals switch between urban and rural areas, and combine the two, at different stages in their lives and as their circumstances change.

7.5 Conclusion

The villages around Takamanda National Park have a well-established 'culture of migration' (Cummings et al., 2015), with urban-based migrants playing a key role in facilitating the migration of others. This creates a positive feedback loop that encourages other people to seek livelihood opportunities outside the village. Yet both practical and sentimental attachment to the village remains strong, with a return to the village in later life often considered inevitable (Foeken and Owuor, 2001). While rural-urban linkages clearly play a fundamental role in the livelihood trajectories of rural people, they also ultimately affect how village life evolves. Visiting and returning migrants bring with them changed aspirations, norms and worldviews, which in turn influence the aspirations of those in the village (Adger et al., 2002, Rigg, 2007). The extent to which seemingly remote rural communities are connected to the wider region and affected by national and global trends is often overlooked, which is why a thorough situation analysis should always be conducted prior to the design of any conservation interventions. Understanding socio-demographic trends, such as rural-urban migration, is an important part of understanding the overall context. It is vital that project implementers move away from broadly targeting 'community members' as

the go-to approach for village-based interventions. By focusing specifically on one group of normally quite hidden community members – urban-based out-migrants, this chapter has highlighted how diverse communities actually are, with different groups in a community using natural resources in different ways, at different times and for different reasons. Disaggregating communities and understanding differing motivations can enable the design of more effectively targeted interventions moving forward.

Whenever intervening to support livelihoods or encourage a shift in livelihood practices, it is essential that project implementers have a deep appreciation of people's livelihood aspirations and goals, since aligning with existing motivations is one of the most effective ways of creating real impetus for change. It is also important to explore how individuals respond to the opportunities and risks that they face, and to understand the role of natural resources in ensuring livelihood resilience (Barratt and Allison, 2014). The qualitative research methods and predictive approaches used in this chapter are well suited for understanding dynamic livelihood strategies, explaining why people use natural resources, and for putting this resource use in the context of longer-term ambitions. Scenario approaches in particular help to determine how people might respond to changing circumstances, either those brought about by contextual changes or specific interventions, and can provide illuminating insights and unravel key uncertainties. Although predictive methods have been underutilised in conservation to date, they offer great potential for understanding human behavioural responses to external stimuli (Travers et al., 2019). This chapter has highlighted the importance of differentiating between different types of resource users and understanding their short-term needs versus long-term goals. It has also brought to the fore the need to better understand the multi-spatial nature of both livelihoods and communities. If livelihood interventions are to address the specific drivers of resource use by specific groups, implementer decisions should be based on the findings of detailed livelihood assessments, and a broad array of livelihood support options should be considered – both rural and urban – to address the specific needs identified. Only by really understanding the nuances of resource use by community members can interventions support livelihoods and reduce unsustainable practices more effectively moving forward.

Chapter 8

Discussion

8.1 The context of livelihoods interventions - a crisis mindset

Across the tropics, hunting is having a profound effect on biodiversity. A recent meta-analysis, which synthesised 176 studies from South America, Africa and Asia, suggested that mammal abundances have declined by 83% in areas up to 40 km from hunter access points, such as settlements and roads (Benítez-López et al., 2017). Although mammal population densities were found to be higher in protected areas, overhunting was still rife. As access to forest areas improve, the need to find ways of reducing hunting pressure remains. The level of demand for bushmeat in urban areas in Central Africa is considered to be one of the main drivers of overhunting in the Congo Basin rainforest (Brashares et al., 2011, van Vliet and Mbazza, 2011). The high price and low weight of bushmeat relative to agricultural commodities makes hunting an attractive economic activity in areas far from markets (Wilkie et al., 2016). Ultimately, to address the drivers of hunting, there needs to be more conservation attention paid to reducing urban demand than is currently the case. However, in an urgent bid to stop the bushmeat trade at its source, the current dominant policy response is to establish more protected areas and increase the effectiveness of law enforcement in existing ones (Venter et al., 2014, Plumptre et al., 2014). This approach almost inevitably leads to conflicts between conservationists and local communities who see their resource access rights curtailed or severely limited (Duffy et al., 2016, Travers et al., 2017).

If people's day-to-day activities are criminalised when they have limited capability or desire to adapt, rule breaking may be out of necessity or based on a conscious assessment of the relative advantages (Keane et al., 2012). Either way, resource use is likely to continue unless there is reciprocal agreement between conservationists and local people. Livelihood interventions are often used as a bargaining chip during the establishment of new protected areas, along with the rhetoric that alternative livelihood options will reduce hunting and other resource use pressures. Despite concerns raised in the literature of the inadequacy of this approach (McShane and Newby, 2004), on the ground in Central Africa and elsewhere many of the assumptions behind alternative livelihood projects remain much the same as when the World Conservation Strategy was published in 1980 (IUCN, 1980). This is not a surprise given the palatability of the notion of 'win-win' approaches, and the noble goal of trying to benefit local people at the same time as conserving biodiversity. Yet, while the aims of protected areas such as Takamanda National Park might be 'to conserve biodiversity...while contributing towards the sustainable

development of local communities' (MINFOF, 2010), the top-down approaches typically used to manage protected areas limit the extent to which this dual goal can become a reality. Limited consideration is given to how all the different components of managing a protected area system (e.g. livelihood interventions, education and law enforcement) interact. Understanding of both the positive and negative feedback loops between these elements is still lacking.

8.2 The key findings of the thesis

In this thesis, I have focused on the livelihood intervention component of protected area systems and the use of alternative livelihood projects within social-ecological systems more broadly. I have sought to critically reflect on the role of livelihood interventions in conservation by examining key assumptions regarding the nature of the resource use behaviours they are designed to address, their mechanisms of impact and the systems in which they are implemented. I have contributed to knowledge on the role and function of alternative livelihood projects by drawing on and combining frameworks from the livelihoods and behaviour change literatures to examine these projects from different perspectives, and in so doing, I have attempted to challenge the dominant narrative still prevalent in conservation practice today. I have also endeavoured to look beyond the protected area system, delving into the realms of sociology and geography, to gain an understanding of how rural livelihoods and people's aspirations are intimately connected with urban landscapes, and have questioned the conceptualisation of place-based livelihoods.

My research has shown that the key assumptions underlying alternative livelihood projects, relating to the notions of substitution and the homogenous spatially-bound community, are flawed. The diversified nature of livelihoods, and evidence of the limited uptake of most of the alternative livelihood projects examined, would suggest that the introduced livelihood activities did not replace behaviours such as hunting as hoped. It is envisaged that promoted livelihood practices will diffuse through communities and be replicated after the implementation period has ended, thus leading to a long-term systems-level impact. However, in reality, such expectations are not realistic given the short implementation timeframes and limited inputs associated with most alternative livelihood projects. Livelihood interventions have become an off-the-shelf strategy in conservation, following rather specific pre-defined, production-orientated formats. Although attempts by conservation actors to introduce completely new livelihood practices to rural communities, such as cane rat and snail farming, have generally been replaced by efforts to improve existing livelihoods, many projects are still not based on a thorough and participatory analyses of the situation at the project site. Participants are therefore often doubtful of the advantages of the introduced ideas over their tried and trusted methods.

All of the alternative livelihood projects evaluated promoted farm-based activities. Such activities require significant investment of time and effort and can take months or even years to generate revenue. The nature of these activities is very different from that of hunting, which is flexible, requiring no prior investment except for the need to acquire skill and the necessary equipment, which is readily available. Money from hunting is quick and is available as and when needed. This is comparable with income from fishing, which has been described as a 'bank in the water' or a 'cash machine in the sea' (Béné et al., 2009, Hill, 2011). Furthermore, my research suggests that many young men who are actively involved in hunting are likely to be fairly mobile, alternating between rural and urban areas depending on the opportunities available. This will limit their willingness to engage in farm-based activities, which typically require their constant attention and presence in the village.

The exception to this generalisation, at least at the Takamanda site, was that male migrants were widely interested in cocoa farming opportunities. At present, cocoa farming represents the only viable alternative livelihood option in the communities that were the focus of this study. That is not to say that people will stop hunting and switch, but their time may be more engaged in farming, at least during certain periods of the year. However, as respondents mentioned, hunting and trapping also have specific seasons, which may complement rather than overlap with farming seasons (McNamara et al., 2016). Having identified cocoa as the main livelihood option which is diffusing and gaining traction around Takamanda and Dja, it would be interesting to follow up in a few years to see what impact cocoa farming has had on incomes, resource use and deforestation levels once a greater proportion of people in the communities have mature cocoa farms. Now would be an appropriate time to establish a baseline to assess this impact quantitatively. The likely impact of cocoa farming on biodiversity depends to a large degree on the cocoa farming methods adopted, with evidence showing that cocoa production is often more favourable to biodiversity than many of the other land use alternatives (Franzen and Borgerhoff Mulder, 2007). However, as other studies in Takamanda have indicated, it is not just land use change that has an impact on focal species such as gorillas, but human presence in the forest (Etiendem et al., 2013b). Further encroachment into the forest is therefore likely to have a detrimental impact on large-bodied mammals particularly vulnerable to hunting pressure.

8.3 Considerations for a more positive relationship with local people

- Recognising complexity

There is a definite need in conservation to start recognising and acknowledging complexity. There is insufficient consideration of the complexities of livelihoods and the unpredictability of human behaviours by conservation practitioners which often leads to unrealistic expectations about how much change can actually be achieved. Failure to recognise complexity and attempts at implementing blueprint

approaches have often resulted in disappointment and negligible outcomes. Yet this is by no means unique to conservation. Behaviour change interventions in general have highly heterogeneous impacts. In public health, the majority of behaviour change interventions have minimal effects, failing to bring about population-level change (Michie et al., 2016). With complex behaviour change interventions, formulae have limited application, experience of designing and implementing one intervention provides no assurance of success with the next, and every community and individual is unique (Glouberman and Zimmerman, 2002). Instead, what is needed is a design framework guided by key principles, and an evaluation framework that focuses on context (Craig et al., 2008). The framework of guiding principles in Chapter 5 and the schematic in Chapter 6, which highlights important contextual factors to consider, go some way towards providing the kinds of reference frameworks needed by conservation practitioners. However, uncertainty of outcome remains even in the best-designed projects (Rogers, 2008).

- **Focusing on the individual**

In conservation, the wants and needs of local people are often equated with monetary benefits and economic substitutes. Yet there are multiple factors that influence people's livelihood strategies, and conservationists need to focus more on the individual and understanding their reasons for doing what they do. While livelihoods thinking focuses on individual capacity and access to opportunities, there is a need to give greater consideration to motivation and the factors that drive us all as human beings (St John et al., 2010b). When a lack of attention is paid to understanding livelihoods and people's reasoning and motives, alternative livelihood projects are designed in such a way that makes them poorly adapted to people's capabilities and fail to reflect their livelihood aspirations. By taking a qualitative approach to understanding the lives, livelihood choices and experiences of individuals, I have sought to provide a more human perspective on livelihood interventions in conservation. This is something that cannot be done using quantitative methods alone, which ignore individual experiences and perceptions (Devereux et al., 2013). Although I started off envisaging a much more quantitative approach to my research, I fundamentally changed my research strategy during my pilot when I realised that treating people as passive respondents to pre-coded questionnaires missed a valuable opportunity for learning. Instead, I wanted to give a voice to those involved in alternative livelihood projects.

- **Recognising the influence of the wider system**

There is a need to give due consideration to endogenous and exogenous trends, as well as power relations, politics and institutions both within conservation programmes and the broader landscape (e.g. Kepe et al., 2001). One of the assumptions behind alternative livelihood projects is that they will essentially take on a life of their own, but there was little evidence of this happening at scale at the sites visited. Instead, alternative livelihood projects are often unsustainable without continued donor support.

Macro-level processes ultimately determine how livelihood pathways evolve, with external trends often offsetting conservation gains (e.g. Hill et al., 2012). The wider processes of social and ecological change must be considered for livelihood interventions to remain relevant. There are many blurred lines within social-ecological systems, one of which is the distinction between rural and urban. The extent to which seemingly remote rural communities are connected to the wider region is often overlooked, particularly in conservation. Even in the development literature, the concept of multi-spatial livelihoods has had limited research (but see: Foeken and Owuor, 2001). Conservationists need to start acknowledging and working with, rather than against, people's multi-spatial ambitions.

8.4 Policy recommendations: general

It is vital to open up dialogue between individuals and groups at multiple levels within social-ecological systems to understand different perspectives. Interpersonal relationships are important both in conservation practice and research. Hierarchies can be counterproductive, so facilitators need to level the playing field in order to make progress in developing interventions that will succeed both for local people and conservation. The approach and attitude of different facilitators can make the difference between project success and failure. Devereux and Roelen (2015) describe a project targeted at women in which two different facilitators worked in different communities. The male facilitator arrived in one of the villages each week on a motorbike. He remained seated on the motorbike while talking to the female participants for 15 minutes before moving to the next community. In the other village, a female facilitator arrived on her bicycle and would sit on the ground with the women and hear their news. As a result, the project failed in the first village but succeeded in the second. So, a lot comes down to the individual, as was particularly evident in the northern Dja site where individual NGO workers had built good relations with community members over many years.

There is a need to start moderating expectations in terms of the benefits that can be realised through livelihood interventions, both in terms of what implementers expect can be achieved and what participants are hoping for (Torell et al., 2010). Propagating the 'win-win' discourse, particularly when gaining community support for the creation of a protected area, is a risky and potentially deceptive strategy, which can result in dashed expectations, negative attitudes towards conservation and even hostility towards conservation actors (Chaigneau and Brown, 2016). However, when done well, studies have shown that livelihood interventions can help to reduce conservation conflicts (Herrold-Menzies, 2006, Baker et al., 2012). As well as some of the shortcomings evident in the design of alternative livelihood projects, there are also many examples of implementation failure, often due to short implementation timeframes and the lack of investment. Livelihood interventions are often wrongly perceived as simple and quick projects, but this demonstrates a lack of appreciation of the risks entailed

in adopting a new livelihood practice. In the context of uncertainty, failure is sometimes inevitable. What is important is that we learn from it and adapt.

Given the limited evidence that substitution occurs as a result of alternative livelihood projects, should such projects even attempt to function as direct behaviour change tools aimed at reducing pressure on natural resources? While livelihood interventions definitely have a role in conservation, the notion of substitution is outdated. Instead, livelihood interventions may be better targeted at the most vulnerable members of a community in order to support them with their existing livelihoods and reduce the extent to which they are negatively affected by resource access restrictions associated with projected areas. The goodwill engendered by such an approach can go a long way towards building community support for conservation. The best way to strengthen livelihoods may not be through changing people's existing production techniques, but rather through facilitating changes to other components of the system. Examining the enabling environment and existing barriers to increasing incomes from goods already produced or harvested may be a more valuable approach to adopt, as has been done for the trade in NTFPs from villages around Takamanda (Ingram et al., 2011, Ingram, 2014). Making livelihood strategies more effective, efficient and lower risk helps in making them more resilient.

To be effective, livelihood interventions must focus on more clearly defined conservation problems, target the most relevant groups of people accordingly, and carefully outline in a detailed and realistic theory of change how a proposed livelihood support mechanism can result in conservation impact. Disaggregating communities in order to understand how natural resource use and dependence differs between groups, as well as understanding differing needs and motivations, is essential. Engaging young men, who are often among the most active hunters, has been a challenge for many farm- and village-based livelihood projects to date. Young people may not be that interested in farm-based activities, preferring instead to move and look for jobs in town. In the context of increasingly urbanised employment opportunities, livelihood interventions aimed at engaging young people may be more effective if they provide the skills training needed within relevant job markets, possibly through apprenticeship schemes or scholarships, rather than continuing to promote the types of rural livelihoods activities that are of more interest to people who are older and more exclusively village based. Ultimately, livelihood interventions must be tailored to the aspirations, circumstances and asset profiles of the target group, with barriers and levers to changing their behaviour identified and acted upon.

8.5 Policy recommendations: site-specific

The protected area authorities for Takamanda National Park were striving for co-management arrangements with local communities, yet participation had been largely restricted to what Pimbert and

Pretty (1997) describe as '*participation by consultation*' for village development plans, '*participation for material incentives*' for boundary demarcation and joint patrols, and '*functional participation*' through the village forest management committees created. Substantial '*interactive participation*' based on transparent negotiation was still lacking. Given that this is typically the *modus operandi* in Cameroon, it is unrealistic to expect rapid change. Hierarchies of power are deeply ingrained within the operational culture of government departments like MINFOF. Yet despite significant investments having been made in both Takamanda and Dja, the ecological status of these two protected areas has continued to decline. In the unprotected forests north of Dja Faunal Reserve where PGS has focused its work, Tagg et al. (2015) have shown that great ape abundance is actually higher than in the protected area. The authors attribute this to PGS's long-term presence and the relationships that have been established with local communities over many years. This adds weight to the argument that using a more personal approach in conservation is more effective and confirms that long-term concerted efforts can make a difference. However, such intensity of effort is unlikely to be feasible over much larger areas. Yet the principles of transparent negotiation can still be applied at scale, with assistance from an independent mediator if necessary, so that agreement can be reached over a pragmatic plan of action that contains clear and unambiguous conservation and social commitments that all parties can accept.

8.6 Further research

Although I have drawn on research conducted in different countries and ecoregions during my study of alternative livelihood projects, my data and personal experiences relate to projects implemented in Central Africa. Research in other contexts and on a broader range of project types would result in a more nuanced understanding of the multitude of factors that shape project outcomes. Collating this evidence within a comparative, open-access database would enable project implementers to review the processes and outcomes specific to the types of projects that seek to address particular conservation problems, thereby deepening our understanding of what approaches work best in different contexts.

The qualitative research methods and predictive approaches used for this research have proved well suited for understanding dynamic livelihood strategies, comparing experiences of having participated in or implemented livelihood projects, and for identifying key factors that must be considered when designing livelihood projects in future. There have been calls for many years urging conservation practitioners to evaluate the impacts of their interventions. I would advocate that similar calls be made to encourage practitioners to conduct qualitative process evaluations while projects are ongoing. Not only is this useful for determining the trajectory of change, thus feeding into adaptive management, it is also a good way of collecting the type of information that should be shared via an open-access database.

While rural-urban linkages and multi-spatial livelihoods have received attention within the fields of geography and sociology, these dynamics and associated trends have rarely been considered by conservationists. Being cognisant of how broader contextual changes, such as the onset of an economic crisis, could impact on conservation landscapes is important. The influence and impact of urban elites also warrants further attention. Land-grabbing by wealthier urban dwellers, or indeed by diaspora overseas, could have significant deforestation consequences and lead to land shortages for local people. For example, in Cambodia, major expansions of Economic Land Concessions have been at the expense of both villagers and conservation areas (Neef et al., 2013). It is important that conservationists consider potential future scenarios when deciding on current priority actions.

Finally, since conservation is fundamentally about behaviour change in most instances, there is much scope for conducting behavioural assessments and using established theories, such as the COM-B model, in other contexts. The application of behavioural science in conservation is still in its infancy. Attempts to really understand what motivates people to behave in the ways that they do, to see things from their perspective and ultimately to find common ground have been lacking, yet this is likely one of the main ways in which we can start to make headway in terms of solving some of the world's most intractable problems, such as those at the biodiversity and poverty interface. Exploring, applying and evaluating tools from psychology and behavioural economics would therefore be a worthwhile endeavour.

8.7 Conclusion

In most instances, livelihood interventions alone and in their current form are unlikely to be sufficient when it comes to achieving the behavioural changes required to have desired conservation outcomes. The evidence from this study, and the literature, points to alternative livelihood projects having limited effects on behaviours of conservation concern for a range of reasons. However, there are suggestions throughout this thesis as to how the design and implementation of livelihood interventions could be improved. This starts with a move away from broad-brush projects that aim to change multiple behaviours associated with different groups of people simultaneously. Instead, livelihood interventions should be used to address specific and clearly defined conservation problems, and only when there is evidence to suggest that the theory of change underlying the proposed project could feasibly result in the desired impact. The role of such projects might not always be to directly change behaviour, but instead to improve resilience or create an enabling environment for other forms of interventions.

Conflict can take many forms in conservation, from conflicting values to hostile relations. To succeed with our aspiration to conserve biodiversity, we must pay more attention to changing the context within which conservation operates. While it is not possible to erase history, it is possible to reflect and make

amends. The value placed by conservationists on stemming biodiversity loss may not be a sentiment shared by local people who have other priorities, yet without local buy-in, attempts to conserve wildlife are futile. Empathy, respect and trust are central to establishing functional relationships with local communities based on mutual agreement and compromise, with livelihood interventions likely to continue to play an important role at the negotiating table. However, it is vitally important that livelihood projects are never mis-sold. Expectations should be moderated, promises upheld, and local actors involved in every stage of project design and implementation to ensure greater relevance and improved conservation and social outcomes. Ultimately, livelihood interventions require deep thought, collaboration, a thorough analysis of the situation, more precise targeting and a greater understanding of livelihoods and behaviour change processes to be more effective moving forward.

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Appendix A: Research ethics and permits

Ethics approval

PRIVATE AND CONFIDENTIAL

ZOOLOGICAL SOCIETY OF LONDON - ETHICS COMMITTEE

RESEARCH PROJECT ETHICAL REVIEW FORM (Human Impacts)



The Ethics Committee considers proposals for research involving the use of animals by ZSL and external staff, and advises the ZSL Directors on ethical and welfare aspects of the work. The Committee has a balance of ZSL staff and external members. It holds 2 main meetings a year and other interim meetings as required. Proposals are dealt with promptly both during and between meetings.

This form should be completed and emailed to the Secretary to the Ethics Committee, well in advance of the proposed start date for the work. If appropriate, supporting documents may be appended to the application.

Please contact the Secretary if you require assistance or wish to discuss any points before submitting the form.

SECTION A – Project Details

01. Project Title

Evaluating the alternative livelihood approach to improving the sustainability of bushmeat hunting in West and Central Africa

02. Project Registration Code

BPE/0650

03. ZSL Project Leader

Marcus Rowcliffe

04. Co-Investigators and Technicians (and affiliations)

Juliet Wright, PhD student, IOZ and Imperial College London
E.J. Milner-Gulland, supervisor, Imperial College London
Noelle Kumpel, co-supervisor, ZSL Conservation Programmes

05. Where is the work to be carried out? (Please list all sites)

Field research will be conducted at Takamanda National Park (TNP) and the Dja Faunal Reserve (DFR) in Cameroon. TNP was created in 2008, covers 69,599 ha and is located in the Southwest Region. The DFR was declared a UNESCO World Heritage Site in 1987, covers 526,000 ha and is located in the East Region. Data collected by CP across mainland Equatorial Guinea during 2011-2012 will also be analysed.

06. What type of proposal is this?

- ☐ A new application
☒ An amendment to an existing approved project
☐ Referred to the Ethics Committee by the Department Director

07. Are any licenses or permits required? Give details

To conduct research in Cameroon, a research permit has been obtained from the Cameroon government's Ministry of Scientific Research and Innovation (MINRESI). This permit is valid until 10 June 2015 but an extension will be requested if necessary.

08. Describe the context and aims of the project (continue on an additional sheet if necessary)

The number of vertebrates threatened with extinction is disproportionately high in tropical regions, and there is a distinct overlap between key areas of biodiversity and areas afflicted with high levels of poverty. One of the main drivers of biodiversity loss is overexploitation, which occurs at many levels, but at the local level it can be caused by the poorest who rely on biodiversity to meet their day-to-day survival needs. This can result in a vicious cycle of dependency and degradation. Since many conservation interventions operate in these environments, there has been much debate among academics, practitioners and policy-makers with regard to the degree to which the conservation community should address social issues. Since the 1970s, many conservation approaches have sought to achieve 'win-wins' between biodiversity conservation and poverty reduction, and much of the conservation-poverty debate has centred on the successes and failures of these approaches. However, this debate has been fuelled by anecdotes and subjective judgment rather than scientific evidence, since rigorous monitoring and evaluation of these approaches has been limited.

Livelihood-focused interventions are popular in situations where biodiversity is an overexploited common pool resource harvested by local people for food and income. Such interventions aim to change livelihood

Page 1 of 8

strategies to reduce behaviours that are considered environmentally damaging and unsustainable. This involves promoting alternative activities to reduce reliance on the natural resources of conservation concern. Despite uncertainty regarding the effectiveness of livelihood-focused interventions, they remain a key strategy in both the terrestrial and marine conservation realms. It is therefore important to understand how promoted livelihood activities align with the needs, aspirations and changing realities of target groups, whilst also taking into consideration the evolving nature of biodiversity threats. The hunting of terrestrial wild animals for meat, known as 'bushmeat', is widespread across the equatorial forest belt of West and Central Africa. This is a classic example of a complex social-ecological system at the interface of biodiversity conservation and poverty reduction agendas. Livelihood interventions aimed at reducing hunting effort in this region have focused on alternative activities such as pig-rearing, beekeeping and snail-farming. Attempts have been made to collate secondary evidence on the effectiveness of livelihood interventions aimed at reducing bushmeat hunting, but findings are inconclusive due to the dearth of monitoring and in-situ evaluations. A more nuanced understanding of the role and function of livelihood interventions in conservation could steer the development of future policies aimed at changing the livelihood strategies of local people for social and ecological benefit.

The overall aim of this research is to gain an understanding of the factors which influence local people when making decisions regarding their livelihood strategies. Focusing on livelihood interventions within biodiversity conservation programmes as one of the potential drivers of change, I will explore the factors that affect the level of uptake and biodiversity impact of such interventions and consider their relevance in the context of rapid socio-economic development at the local and national level. The specific objectives of this research are to: 1) Deconstruct the concept of 'alternative livelihoods' in conservation; 2) Determine what influences the degree of engagement with livelihood interventions; 3) Assess the factors determining hunters' decisions to hunt for bushmeat; and 4) Disentangle the relative effect of livelihood interventions on hunting prevalence. This research will contribute to the evidence base for the role of livelihood interventions in conservation and key findings will be translated into practical policy advice.

09. What are the likely benefits of the project to science?

The academic literature highlights widespread uncertainty about the effectiveness of conservation interventions. There is an emerging evidence-based conservation movement which aims to determine what works and when through the systematic evaluation of conservation policies. Although several authors have responded to the call to systematically appraise and conduct meta-analyses to assess patterns in relation to the effectiveness of people-centred conservation approaches, they have all commented on the lack of evidence on which to base their conclusions. Impact evaluation is therefore a burgeoning area for science, with many important questions still to be resolved. This project aims to make a significant contribution to this field and will increase recognition of ZSL and Imperial College London as institutions at the forefront of research into the effectiveness of conservation interventions. The research findings are likely to be of interest to high impact conservation and development journals, such as *Conservation Biology*, *Ecology & Society* and *World Development*. Preference will be given to Open Access publication options to ensure policy relevant chapters are accessible to conservation practitioners. In addition to publications, findings will be presented at the International Congress for Conservation Biology and the International Primatological Society Congress. All outputs from the research will be made available in the countries where the research took place. At the government level, MINRESI will receive copies of outputs from the research conducted in Cameroon and the Instituto Nacional de Desarrollo Forestal y Manejo del Sistema de Areas Protegidas (INDEFOR-AP) will receive copies of outputs from the research conducted in Equatorial Guinea.

10. What are the likely benefits of the project to conservation, education or other areas?

Bushmeat overexploitation is a major threat to a wide range of animal species in the tropics. Many livelihood interventions have been implemented to reduce dependence on bushmeat but implementers and participants are often left disappointed when expected benefits fail to accrue. Interventions that do not adequately consider the complexity of livelihoods and the broader socio-economic context are unlikely to achieve their conservation aims. It is therefore necessary to understand the nature of local responses to livelihood interventions and the circumstances that cause these responses. The range of livelihood options available, associated barriers and benefits, and how these are changing over time all influence individual choice, and must be explored if interventions are to remain relevant. While looking for success-failure generalisations is too simplistic, gaining a better understanding of the characteristics of interventions that either are or are not effective in reducing unsustainable bushmeat hunting will help to design better conservation interventions in the future. The local communities that participate with this research could also benefit in the long-term if future conservation policies take greater consideration of their needs and aspirations as a result. The outputs of this research will be disseminated to collaborating NGOs in Cameroon (WCS, GIZ, ZSL and FCTV) and Equatorial Guinea (ZSL and ANDEGE) to ensure that this research translates into meaningful policy recommendations on the ground. We will also endeavour to report back to local communities to thank them for their participation, patience and hospitality, and to provide them with information that would be of use to them.

11. Explain why human data is necessary. Are there any other possible approaches?

The research questions are fundamentally about human behaviour and although it is possible to get an idea of hunting prevalence by conducting forest surveys, it is only possible to understand the factors that influence people's behaviours by asking them.

12. Participant Information

(a) Give details of the participants involved (e.g. age, sex):

The study will collect data from five different participant groups: 1) male or female household heads within 10km of either TNP or DFR, 2) men aged 18-30, 31-50 and ≥51 who live within 10km of either TNP or DFR, 3) men aged ≥18 who originate from within 10km of either TNP or DFR but have left to find work elsewhere in the region, 4) NGO and government staff involved with the implementation of livelihood-focused interventions, and 5) key informants, such as village heads, who can provide other contextual information.

(b) Why is the participant group to be used the most appropriate?:

Understanding the behaviours of groups 1-3 is pertinent to the research objectives. Households are the preferred focus for livelihoods research as they are considered to coordinate labour allocation and share resources to a degree. This research seeks to ascertain how household livelihood strategies have changed as a result of livelihood interventions and other socio-economic changes in the landscape, therefore household heads (either male or female depending on availability) are those most likely to be able to provide all of the information needed. Men of different ages are targeted because hunting is the primary activity of interest and hunting is only done by men in this geographical area. This research will explore the range of livelihood options available to men of different ages and capabilities. Groups 4-5 can provide contextual information for this study. NGO and government staff are those in a position to provide key information on the livelihood interventions of interest, while other key informants can provide further information about specific villages, employment opportunities etc.

(c) How are you going to recruit participants?:

Lines of enquiry with groups 1-2 will be conducted systematically whilst in TNP and DFR, whereas groups 3-5 will be targeted more opportunistically. Detailed maps will be used to develop sampling frames of all villages within 10 km of TNP and DFR. The villages will then be stratified according to whether or not they are, or have been, involved with livelihood interventions. Up to 20 villages that have been involved in livelihood interventions will be selected in total (10 around each protected area). Four villages that have not been involved with livelihood interventions will be visited for comparison purposes (two around each protected area), and two additional villages will be selected for the purpose of piloting the methods and training the research team in each region.

Attempts will be made to inform the head of each community prior to the arrival of the research team. Permission will then be sought from the village council at a meeting organised in each village on arrival. All members of the community will be invited to this meeting. A detailed explanation of the research and its objectives will be presented in the local language. An information sheet along with a copy of the research permit will be shown to the village head or a literate individual which he nominates. In negotiating access to the village, community members will have the opportunity to ask questions and discuss any concerns amongst themselves and with the research team. To ensure transparency, there will be full disclosure of the methods, how the data will be used and expected outcomes.

If permission is granted by the village council, data collection will commence with a village mapping exercise to identify all households. 30 households from each of 10 villages will be selected for a household survey and 50 households from each of 20 villages for an unmatched count technique (UCT) questionnaire. This will result in sample sizes of <300 households for the household survey and <1000 households for the UCT questionnaire. A census will be conducted as part of the household survey to help identify men who either reside in the village or work elsewhere within the region. Resident men will be stratified into three groups according to age: 18-30, 31-50 and ≥51. Twelve individuals from each age group will be selected from each village to participate in focus group discussions. A list of key employment hubs, which might include logging camps and plantations, will be prepared based on the information provided on men working elsewhere in the region. A snowball sampling technique will be used to locate <100 of these men for scenario interviews. Permission will be sought from relevant gatekeepers at employment sites and key informant interviews will be conducted opportunistically with those who are around and willing to partake.

Prior informed consent will be obtained from each participant before commencement of any research activities (see Q12e). Incentives for participation will be limited to the provision of small gifts and refreshments. Guidance will be sought from research collaborators as to what gifts would be most appropriate in each area.

(d) What is your inclusion/exclusion criteria?:

All participants must fit one of the descriptions listed in Q12a and be over the age of 18. Group 1 participants will be selected randomly using a sampling frame listing all households in each village. The villages will be selected based on whether or not they have been involved in livelihood interventions. Those in groups 2-5 will be selected more opportunistically based on possessing specific knowledge or experience, and on availability.

(e) How are you going to safeguard the participant (e.g. informed consent and any other ethical considerations including explanation of confidentiality and data protection etc. described in Question 20):

The actual and potential risks (e.g. political, social and cultural) that participants may face as a result of this research will be discussed in advance with research collaborators. The main short-term risk relates to those involved in illegal activities such as hunting, but the implications of the research on future policies could have an impact on the communities adjacent to the protected areas in the long-term. The intentions of the research will be presented honestly and informed consent will be sought from each potential participant once access to them has been permitted by relevant gatekeepers.

Information likely to affect a person's willingness to participate will be communicated to each individual selected from the sampling frame. The purpose of the research, the methods, funding sources, anticipated uses of the data, expected outcomes and potential impacts will be explained verbally. It will be made clear that selected individuals are under no obligation to participate, have the right not to disclose information, and may withdraw consent to continue with the research at any time. It will be explained that all information given will remain confidential, be used solely for the purpose described and will be anonymised to prevent sensitive information from being used against individuals. It will also be clarified that the data will be stored securely and not shared with any third party that could compromise confidentiality. Participants will be given the opportunity to discuss the potential consequences of their willingness to disclose information with friends and family if desired.

Due to the low level of literacy in the study areas it is not deemed appropriate to provide each participant with an information sheet or ask them to sign a consent form as requests for signatures may arouse suspicion. Verbal agreement to participate will be taken as informed consent. Participants will be made aware that they are free to ask questions at any point during the research process. Informed verbal consent must be freely-given based on truthful and respectful dialogue with participants. It will not be considered as consent if a participant has been compelled to participate by an authoritative figure. Once informed consent has been obtained, permission will be sought to use a digital voice recorder. Participants will be made aware of the technical capacity of this device and are free to reject its use.

(f) Provide justification for the numbers of participants to be used, including details of the research/experimental design, numbers of participants required to achieve significant results and factors that may affect this:

A large sample size of >500 is needed to be able to analyse the UCT questionnaire, which is a technique designed to ask sensitive questions in a way that enables complete anonymity. Respondents are randomly allocated into control and treatment groups, the control group receives a list of non-sensitive items while the treatment group are shown the same list with an additional sensitive item added. All respondents indicate how many, not which, items apply to them and the difference in means between control and treatment groups is used to estimate prevalence.

A relatively large sample size is also required for the household survey to enable multiple regression analyses that can be used to explore the factors that influence participation with livelihood interventions and to make comparisons between intervention and non-intervention villages around two different protected area. A sample size of 300 households is therefore desirable to achieve significant results. At least two focus group discussions will be organised with each age group of men in each village to improve the representativeness of this sample but individuals from groups 3-5 will be targeted more opportunistically, with the sample size limited by the availability of willing participants within the research timeframe.

Disturbance to participants and community life will be kept to a minimum. Interviews will be conducted at times and in locations most convenient for participants and the duration of interviews will be kept to under one hour as much as possible. Since focus group discussions are likely to last for longer than one hour, refreshments will be provided. The research team will also aim not to be disruptive to the work of NGO and

government collaborators.

13. Will it be necessary for participants to take part in the study without their knowledge and consent at the time (e.g. covert observation)?: ☐ Yes ☒ No

If YES:

(a) Why can informed consent not be gained in advance?:

(b) When and how will the participants' involvement in the study be revealed to them?:

(c) How will the participants' consent be gained?:

(d) If you are not informing participants of their involvement, how will you ensure that they cannot be personally identified or be potentially compromised by the research?:

14. Will the project involve deliberately misleading participants in any way?: ☐ Yes ☒ No

If YES:

(a) Fully explain why this process is necessary:

(b) Could this specific aspect potentially cause any psychological or physical harm to the participant?

☐ Yes ☐ No

Describe the potential risks and how these will be monitored and addressed:

(d) Will participants be fully debriefed, including the reason for this research design aspect?:

☐ Yes ☐ No

How and when will this process be explained to the participant?:

15. Does the overall study place the participant in any risk greater than that encountered in normal life (risk may be psychological or physical)?: ☐ Yes ☒ No

If YES:

(a) What potential risks are there to the participant?:

(b) How could these potential risks be avoided or minimised?:

(c) How and when will the participant risks be explained and justified to the participant?:

(d) How will you support the participant should they experience any problems?:	
16. Will the study involve the discussion of sensitive topics (e.g. illegal activities, sexual behaviour, culturally-sensitive matters)?: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
If YES:	
(a) How will such topics be addressed?:	
<p>Some of the topics discussed will be of a sensitive nature to certain participants. In particular, some people may feel uncomfortable and unwilling to speak about hunting. Hunting is either strictly prohibited or restricted within protected areas in Cameroon, therefore participants may be concerned about the legal ramifications of divulging information about their illegal activities. Direct questions about hunting will form one section of the household survey. These questions will be asked towards the end of each interview once a rapport has been developed and the participant has been put at ease. Participants will be assured that all data collected will be used for research purposes only and that any information which could be used to identify individuals will be anonymised, stored securely and later aggregated. However, it is expected that this series of questions will still be unsettling for certain individuals. As such we do not expect to receive truthful responses from everyone. The UCT questionnaire will therefore be used as a complementary stand-alone method of estimating hunting prevalence in a manner that makes it impossible to linking hunting to particular individuals.</p>	
(b) How will the welfare of the participant be monitored with regard to this specific discussion?:	
<p>Understanding changes in hunting behaviour is central to the aims of this research project, however we wish to avoid undue intrusion during direct questioning. If participants are unwilling to talk about current hunting practices during the household survey, they will be asked to reflect on past hunting practices so that it is at least possible to determine which households have a history of hunting. However the research team will also make it clear that participants have the right to refuse to answer questions and may withdraw from the interview or discussion at any point. Despite the intrusive nature of direct questioning, being able to discuss hunting practices in detail will provide valuable information for this study. However, being mindful of the issues associated with such questions, the UCT questionnaire is specifically being deployed as a more sensitive means of addressing the issue of hunting albeit in a quantitative rather than a more in-depth qualitative format.</p>	
(c) How will you assist the participant if this specific research/experiment causes any psychological or physical distress?:	
<p>The psychological wellbeing of research participants will be monitored during the interviews, if they appear uncomfortable at any time they will be reminded that they should not feel obliged to answer the question. During training of the research assistants they will be briefed on the importance of remaining open-minded and non-judgmental throughout the research process. The world-views and values are different between international researchers, educated urban Cameroonians and rural dwellers, but these views and values must not interfere with the research process or undermine the rural views and values of interest to this study. If participants wish to withdraw from the interview entirely, data will be used up to the point of withdrawal. Participants will be reassured that the data will be kept confidential but if they have second thoughts about supplying any specific information they may also request that it be taken off the record.</p>	
17. Will the study involve experimental, invasive or potentially harmful procedures of any kind?: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If YES:	
(a) Describe the procedure fully:	
(b) Will biological samples (e.g. tissues) be obtained from the participants?: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Describe fully:	

(c) Who will carry out the procedure/observation/sampling of the participant?:

(d) Describe fully the relevant experience the above named person(s) have with regards to these procedures:

(e) How will the procedure/sampling having any possible implications be explained to the participant?:

(f) How will informed consent be gained from the participant?:

(g) How will biological materials (e.g. blood samples, swabs etc) be handled, stored, used and disposed of etc.?:

18. Will the study involve prolonged or repetitive testing?: ☐ Yes ☒ No

If YES:

(a) Will the participant be informed that he/she can withdraw from the research/experiment at anytime without penalty?:

(b) How long will the research/experiment continue for?:

(c) What are the possible complications to the participant and how will these be monitored and addressed?:

(d) How will support be provided to participants throughout that time?:

(e) How will participants be provided with support after the research/experiment?:

19. Will financial inducements be offered to participants?: ☐ Yes ☒ No

If YES:

(a) What are these?:



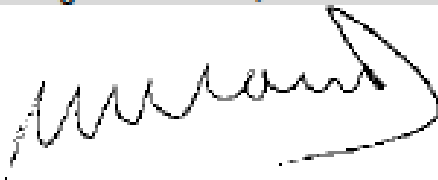

(b) Why are they necessary?:

20. Please give step-by-step details describing how confidentiality and data protection will be

maintained (include storage, restricted access and means of ultimate disposal etc.)	
<p>Data collected about illegal activities could be used to the detriment of the individual through law enforcement. Every effort will be made to ensure that interviews are carried out in a private space. Although the names of the male and female heads of each household are needed to locate specific households selected in the random sample, and to locate men from within 10km of TNP or DFR who are working elsewhere, this information will be recorded and stored separately from the datasheets. Names will only be used for the purpose of locating participants and to ensure the accurate triangulation of data collection using different methods. Household and individual codes will be recorded on datasheets, instead of names, and will be used thereafter during data entry and analysis. All datasheets and field notes will be protected from unauthorised access to maintain confidentiality and the anonymity of subjects. J.W. will be responsible for the secure storage of data throughout the research process and all research assistants granted access to the data will be made aware of their ethical obligations. Conflicts of interest will be minimised by the recruitment of university students and graduates as research assistants rather than using NGO or government staff. Confidentiality statements will be signed by all personnel involved with the collection and analysis of data.</p> <p>Data will be inputted on a laptop and a tablet which will both be locked with passwords. The data will then be backed up on an encrypted USB memory stick and via a private Dropbox account when an internet connection is available. The use of digital media for data storage is of concern due to the ease of duplication, so access to spreadsheets containing the data will be restricted to J.W., with all files being password protected. Research assistants will enter data one form at a time using ODK Collect installed on the tablet. Data will be anonymised during write-up by amalgamating information from numerous participants, this will maintain confidentiality and ensure that publications do not permit the identification of individuals. If any direct quotes are used, the participant who provided the quote will be given a pseudonym. The raw data will not be made available to any persons or organisations responsible for law enforcement. The identity of organisations is harder to anonymise without compromising scholarly accuracy, therefore permission will be sought prior to disclosure of these entities in publications and other outputs. The data will be preserved in the long-term by J.W. and only shared with future researchers after thorough consideration of the ethical implications on a case-by-case basis.</p>	
21. Details of the researchers' previous experience of working with people in this context	
<p>M.R. has supervised students collecting similar kinds of data since 2000. J.W. has been working in Cameroon since 2008 and worked in Equatorial Guinea during 2011-2012, so is familiar with the social, political, cultural and environmental context. J.W. understands the main language used in the Southwest Region, which is Pidgin English, and has a basic working knowledge of French, the dominant language in the East Region of Cameroon. However, research assistants will always be on hand to translate as and when necessary. Discussions with NGO and government collaborators prior to the commencement of fieldwork will help to make the research team aware of the present and past situation in the study locations and any potential areas of conflict. The team will be alert and sensitive to any issues that may arise during fieldwork. Measures will be taken to minimise the risk of causing offense by seeking local advice in order to act appropriately in the verity of situations that will be encountered.</p>	
22. Details of all facilities to be used for the research/experiment	
<p>No specific facilities are required other than office space whilst in Cameroon and camping equipment for use in the field. A laptop, tablet and solar charger have been funded by J.W.'s BBSRC studentship.</p>	
23. Preferred start date of work	24. Estimated completion date
October 2012	September 2015
25. Describe any other ethical considerations that you feel should be discussed	
<p>The research team will be sensitive to power differentials between interviewer and interviewees and will moderate expectations in order to not inadvertently disturb the relationship between participants and collaborating organisations. The research team will also remain mindful of the implications of their actions on the expectations placed on future researchers. J.W. will provide regular updates, either verbal or in the form of interim reports, to NGO and government collaborators without compromising on participant confidentiality. The outputs from this research will be impartial and provide a fair representation of the situations observed. Care will be taken not to risk the reputations of collaborating organisations. The procedures and mitigation measures stipulated in this document will be followed to ensure that the research is carried out in an appropriate and ethical fashion so as not to damage the reputation of ZSL or Imperial College London. All help received will be acknowledged with proper credit given in publications and other outputs. In particular, research assistants will be given appropriate credit for co-authorship. A copy of the final PhD thesis and copies of all publications will be sent to research collaborators.</p>	

Please attach any documents that participants will see or hear (e.g. briefs, debrief scripts, informed consent forms, information sheets etc.) to this form.

SECTION B – Project Approval

01. Signature of Project Leader	Date
	11/3/15
02. Signature of Line Manager	Date
	11/3/2015
03. Signature of Chair, Ethics Committee	Date
	10/03/15
04. Signature of Department Director	Date
	12/3/15

Ref: I-FM12
Revised: 12/06/2014

File Location: W:\Institute of Zoology (IoZ)\04 Research & PhD Projects\Ethical Review\ZSL Research Project Ethical Review Form (Human Impacts)

Ethics code of conduct for research assistants

ETHICAL CODE OF CONDUCT

Research project title: Understanding household responses to livelihood interventions and socio-economic change in communities adjacent to protected areas in Cameroon.

Principle researcher: Juliet Wright, Imperial College London and ZSL Institute of Zoology

- The intentions of the research must be presented honestly and informed consent must be sought from each potential participant once access to them has been permitted by relevant gatekeepers.
- The purpose of the research, the methods, funding sources, anticipated uses of the data, expected outcomes and potential impacts must be explained to each potential participant verbally. It must be made clear that selected individuals are under no obligation to participate, have the right not to disclose information, and may withdraw consent to continue with the research at any time.
- It must be explained to potential participants that all information given will remain confidential, be used solely for the purpose described and will be anonymised to prevent sensitive information from being used against individuals. It must also be clarified that the data will be stored securely and not shared with any third party that could compromise confidentiality. Potential participants will be given the opportunity to discuss the possible consequences of their willingness to disclose information with friends and family if desired.
- Due to the low level of literacy in the study areas it is not deemed appropriate to provide each participant with an information sheet or ask them to sign a consent form as requests for signatures may arouse suspicion. Verbal agreement to participate will be taken as informed consent. Participants will be made aware that they are free to ask questions at any point during the research process. Informed verbal consent must be freely-given based on truthful and respectful dialogue with participants. It will not be considered as consent if a participant has been compelled to participate by an authoritative figure.
- Once informed consent has been obtained, permission must be sought to use a digital voice recorder. Participants must be made aware of the technical capacity of this device and are free to reject its use.
- Understanding changes in hunting behaviour is central to the aims of this research project, however we wish to avoid undue intrusion during direct questioning. If participants are unwilling to talk about current hunting practices, they will be asked to reflect on past hunting practices so that it is at least possible to determine which households have a history of hunting. However the research team must make it clear that participants have the right to refuse to answer questions and may withdraw from the interview or discussion at any point.
- The psychological wellbeing of research participants must be monitored during interviews, if they appear uncomfortable at any time they must be reminded that they should not feel obliged to answer the question. Research assistants must remain open-minded and non-judgmental throughout the research process. Although world-views and values may be different between the researchers and research participants, these views and values must not interfere with the research process or undermine the rural views and values of interest to this study. If participants wish to withdraw from the interview entirely, data will be used up to the point of withdrawal. Participants must be reassured that the data will be kept confidential but if they have second thoughts about supplying any specific information they may also request that it be taken off the record.

- Every effort must be made to ensure that interviews are carried out in a private space. Although the names of the male and female heads of each household are needed to enable identification of the specific households selected in the random sample, and the names of men from within 10km of TNP or DFR are needed to be able to locate them in the employment hubs, this information will be recorded and stored separately from the datasheets which will just include unique household and individual codes.
- All datasheets and field notes must be protected from unauthorised access to maintain confidentiality and the anonymity of subjects. The principle researcher will be responsible for the secure storage of data throughout the research process and all research assistants granted access to the data must be aware of their ethical obligations.
- Access to spreadsheets containing the data will be restricted to the principle investigator with all files being password protected. Data will be entered anonymously and amalgamated during write-up, thus maintaining confidentiality and ensure that publications do not permit the identification of individuals. If any direct quotes are used, the participant who provided the quote will be given a pseudonym. The raw data will not be made available to any persons or organisations responsible for law enforcement.
- The data will be preserved in the long-term by the principle researcher and only shared with future researchers after thorough consideration of the ethical implications on a case-by-case basis.
- The team must be alert and sensitive to any issues that may arise during fieldwork. Measures must be taken to minimise the risk of causing offense by seeking local advice in order to act appropriately in the variety of situations that will be encountered. The research team must be sensitive to power differentials between interviewer and interviewees and must moderate expectations in order to not inadvertently disturb the relationship between participants and collaborating organisations. The research team must also remain mindful of the implications of their actions on the expectations placed on future researchers.
- The principle researcher will provide regular updates, either verbal or in the form of interim reports, to NGO and government collaborators without compromising on participant confidentiality. The outputs from this research will be impartial and provide a fair representation of the situations observed. Care will be taken not to risk the reputations of collaborating organisations. The procedures and mitigation measures stipulated in this document will be followed to ensure that the research is carried out in an appropriate and ethical fashion so as not to damage the reputation of Imperial College London or the ZSL Institute of Zoology.
- All help received will be acknowledged with proper credit given in publications and other outputs. In particular, research assistants will be given appropriate credit for co-authorship. A copy of the final PhD thesis and copies of all publications will be sent to research collaborators.

Research assistant declaration:

I will abide by the ethical code of conduct detailed above to the best of my ability. I will report any ethical issues to the principle researcher and seek their advice when necessary.

Full name: _____

Signature: _____

Date: _____

Name, position and contact address of principle researcher: Juliet Wright, PhD student, Department of Life Sciences, Imperial Collage London, Silwood Park Campus, Ascot, SL5 7PY, United Kingdom.

PROJECT INFORMATION

Your village has been selected to take part in a student research study. Before you decide whether to grant permission or not, it is important for you to understand why the research is being done and what it will involve. Please read the following information carefully.

Title: Understanding household responses to livelihood interventions and socio-economic change in communities adjacent to protected areas in Cameroon.

Purpose: To reduce unsustainable practices, alternative income-generating activities are often promoted in rural communities adjacent to protected areas. This research aims to understand how promoted income-generating activities have affected the livelihood strategies of households in communities around [PROTECTED AREA]. The specific objectives are to determine what factors influence household decisions to participate with alternative income-generating projects, to understand the role that different income-generating activities play in livelihood strategies, how the promoted activities align with the needs and aspirations of the populations targeted and whether involvement in these activities effects the prevalence of unsustainable practices. The study will also investigate the effects of socio-economic change by looking at how livelihood strategies have changed over time due to changing local and national conditions. An insight will be gained into the impact of alternative income-generating projects on the attitudes, behaviours and incomes of target populations. The results will help guide the future development of community engagement strategies around protected areas in Cameroon and further afield.

Methods: Data is being collected from villages around [PROTECTED AREA] that have been involved in alternative-income generating activities. The research team will be staying in this village for approximately seven days and would like the community's involvement with interviews and focus group discussions. The research will target households and individual men. Households will be selected at random to participate with the research and men of different ages will be called to participate in several discussions. The participation of members of this village would be greatly appreciated and valued.

It is up to you to decide whether or not to grant permission for this research to take place in your village. If you agree to allow research to take place, informed consent will also be obtained from each individual and they are free to withdraw from the study at any time without giving a reason.

Time Involved: The research will involve participants spending approximately 1 hour being interviewed. Group discussions may take longer if you agree to partake in these.

Confidentiality: All data collected will be kept confidential and used for research purposes only. The names of participants will only be collected to assist in completing the survey but will not be reported in any documentation nor disclosed to any other persons. Records will be stored securely and will remain in the possession of the principle researcher at all times. The records will remain in a secure location for at least 5 years after the completion of the research project.

The final report of this research will be submitted and assessed as a PhD thesis at Imperial College London in the United Kingdom. A summary of the research findings will be sent to the council of each village as well as to the Ministry of Scientific Research and Innovation, the Ministry of Forestry and Wildlife and relevant non-governmental organisations.

Name, position and contact address of principle researcher: Juliet Wright, PhD student, Department of Life Sciences, Imperial College London, Silwood Park Campus, Ascot, SL5 7PY, United Kingdom.

PARTICIPANT INFORMATION

You are being invited to take part in a student research study. Before you decide whether to take part or not, it is important for you to understand why the research is being done and what it will involve. Please listen to the following information carefully.

Title: Understanding household responses to livelihood interventions and socio-economic change in communities adjacent to protected areas in Cameroon.

Purpose: To reduce unsustainable practices, alternative income-generating activities are often promoted in rural communities adjacent to protected areas. This research aims to understand how promoted income-generating activities have affected the livelihood strategies of households in communities around [PROTECTED AREA]. The specific objectives are to determine what factors influence household decisions to participate with alternative income-generating projects, to understand the role that different income-generating activities play in livelihood strategies and how the promoted activities align with the needs and aspirations of populations targeted by conservation policies. The study will also investigate the effects of socio-economic change by looking at how livelihood strategies have changed over time due to changing local and national conditions. An insight will be gained into the impact of alternative income-generating projects on the attitudes, behaviours and incomes of target populations. The results will help guide the future development of community engagement strategies around protected areas in Cameroon and further afield.

Methods: Data is being collected from villages around [PROTECTED AREA] that have been involved in alternative-income generating activities and in urban areas where villagers have migrated to. The research team will be staying in this village/town for approximately seven days and would like your involvement with interviews and/or focus group discussions. The research will target households and individual men. Households will be selected at random to participate with the research whereas men will be asked to participate based on their age or village of origin. Your participation and contribution is greatly appreciated and valued.

It is up to you to decide whether or not to take part in this study. If you do agree to take part you are still free to withdraw from the study at any time and without giving a reason.

Time Involved: The research will involve spending approximately 1 hour being interviewed. Group discussions may take longer if you agree to partake in these.

Confidentiality: All data collected will be kept confidential and used for research purposes only. Your name will only be collected to assist in completing the survey but will not be reported in any documentation nor disclosed to any other persons. Records will be stored securely and will remain in the possession of the principle researcher at all times. The records will remain in a secure location for at least 5 years after the completion of the research project.

The final report of this research will be submitted and assessed as a PhD thesis at Imperial College London in the United Kingdom. A summary of the research findings will be sent to the council of each village as well as to the Ministry of Scientific Research and Innovation, the Ministry of Forestry and Wildlife and relevant non-governmental organisations.

Name, position and contact address of principle researcher: Juliet Wright, PhD student, Department of Life Sciences, Imperial College London, Silwood Park Campus, Ascot, SL5 7PY, United Kingdom.

Research permits

REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie

MINISTRE DE LA RECHERCHE SCIENTIFIQUE ET DE L'INNOVATION

SECRETARIAT GENERAL

DIVISION DES POLITIQUES SCIENTIFIQUES ET DE LA PLANIFICATION

CELLULE DE LA PROGRAMMATION ET DE LA PLANIFICATION

B.P : 1457 Yaoundé – Cameroun
Tél : (237) 22 22 13 34 ou 22 22 52 02



REPUBLIC OF CAMEROON
Peace-Work-Fatherland

SCIENTIFIC RESEARCH AND INNOVATION

GENERAL SECRETARIAT

SCIENTIFIC POLICY AND PLANNING

PROGRAMMING AND PLANNING UNIT

PO Box 1457 Yaoundé Cameroon
Tél : (237) 22 22 13 34 or 22 22 52 02

1.0000064 /MINRESI/B00/C00/C10/mfe

Yaoundé, le 16 JUN 2014

AUTORISATION DE RECHERCHE

RESEARCH PERMIT

Vu la Constitution ;
Mindful constitution ;
Vu le décret n°2011/408 du 09 décembre 2011 portant organisation du Gouvernement ;
Mindful of decree n°2011/408 of 09 December 2011 organizing the Government ;
Vu le décret n°2011/410 du 09 décembre 2011 portant formation du Gouvernement ;
Mindful of decree n°2011/410 of 09 December 2011 appointing the members of the Government ;
Vu le décret n°2005/091 du 29 mars 2005 portant organisation du Ministère de la Recherche et de l'Innovation ;
Mindful of decree n°2005/091 of 29 March 2005 organizing the Ministry of Scientific Research And Innovation ;

Vu la demande de l'intéressé .
Considering the Applicant's request.

Noms et prénoms/Names : **WRIGHT Juliet Helen**

Addresses Permanentes/ Permanent address: **Imperial College London, Silwood Park Campus, Buckhurst Road, Ascot, Berkshire, SL5 7PY, United Kingdom. Tel: +44 (0) 7941 903756. Email: j.wright12@imperial.ac.uk**

Adresse au Cameroun/Address in Cameroon: **s/c Center for Tropical Research Cameroon (CTR-CAM). P.O. Box: 3055 Messa, Yaoundé/Cameroon; Tel: (237) 75 39 10 99; Email: kynjabo@ucla.edu**

Nationalité /Nationality : **anglaise**

Est autorisé (e) à effectuer des travaux de recherche en République du Cameroun dans la ou les Région(s) de: **Is hereby authorized to carry out scientific or technical research in the Republic of Cameroon in the Region of: Centre, East and Southwest.**

Pour une période de / For a period of: **01 year** du/ from: **10/06/2014** au/ to **10/06/2015**

En collaboration avec / In collaboration with: **Monsieur ROMANUS Ikfuingei, Primatologist in Wildlife Conservation Society (WCS), P.O.Box: 1308, Limbe/Cameroon; Tel: (237) 75 52 98 352; Email: rikfuingei@wcs.org**

Objet de la Recherche/Research Title: **Understanding human behavioral responses to livelihood interventions and socio-economic change in communities adjacent to protected areas in Cameroon.**

Cette autorisation de recherche n'est valable que pendant la période de recherche indiquée ci-dessus, et peut être renouvelable
This research permit is valid only for the research period indicated above and it can be renewed.

AMPLIATIONS

- CAB-MINRESI
- SGPRC
- SGPM
- MINDEF
- DGSN
- DGRE
- CRRI - Centre, East and Southwest.
- SG-MINRESI
- IG-MINRESI
- CDSPSP
- Chrono/Archives



Ministre de la Recherche Scientifique et de l'Innovation

Ministre Délégué

Mme FRELLE ETAMÉ

Rebecca Madeleine

REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie
MINISTRE DE LA RECHERCHE SCIENTIFIQUE ET
L'INNOVATION
SECRETARIAT GENERAL
DIVISION DES POLITIQUES SCIENTIFIQUES ET DE
PLANIFICATION
CELLULE DE LA PROGRAMMATION ET DE LA
PLANIFICATION



REPUBLIC OF CAMEROON
Peace-Work-Fatherland
SCIENTIFIC RESEARCH AND INNOVATION
GENERAL SECRETARIAT
SCIENTIFIC POLICY AND PLANNING
PROGRAMMING AND PLANNING UNIT

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N° /MINRESI/B00/C00/C10/C14

Yaoundé, le 24 JUIN 2015

AUTORISATION DE RECHERCHE RESEARCH PERMIT

Vu la Constitution ;

Mindful constitution ;

Vu le décret n°2011/408 du 09 décembre 2011 portant organisation du Gouvernement ;

Mindful of decree n°2011/408 of 09 December 2011 organizing the Government;

Vu le décret n°2011/410 du 09 décembre 2011 portant formation du Gouvernement ;

Mindful of decree n°2011/410 of 09 December 2011 appointing the members of the Government;

Vu le décret n°2005/091 du 29 mars 2005 portant organisation du Ministère de la Recherche et de l'Innovation ;

Mindful of decree n°2005/091 of 29 March 2005 organizing the Ministry of Scientific Research and Innovation;

Vu la demande de l'intéressé.

Considering the Applicant's request.

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Nationalité /Nationality : Anglaise.

Est autorisé (e) à effectuer des travaux de recherche en République du Cameroun dans la ou les Région(s) de: Is hereby authorized to carry out scientific or technical research in the Republic of Cameroon in the Region of: Sud-ouest, Nord, Nord-ouest, Centre, Sud, Littoral, Extrême-nord, Adamaoua et Est.

Pour une période de / For a period of: 12 mois du/ from: 20/07/2015 au/ to 20/07/2016

En collaboration avec / In collaboration with: Dr. JIOFACK TAFOKOU René Bernadin, Enseignant à l'Institut Supérieur des Sciences Environnementales; BP : 16317 Yaoundé/Cameroun; Tel: (+237) 6 99 32 41 85/6 78 08 18 10; Email: renbernadinl@yahoo.fr

Objet de la Recherche/Research Title: Understanding household responses to livelihood interventions and socio-economic change in communities adjacent to protected areas in Cameroon.

Cette autorisation de recherche n'est valable que pendant la période de recherche indiquée ci-dessus, et peut être renouvelable

This research permit is valid only for the research period indicated above and it can be renewed.

AMPLIATION:

- CAB/MINRESI
- SGPRC
- SGPM
- MINDEF
- DGSN
- DGRE
- CRRI - Sud-ouest, Nord, Nord-ouest, Centre, Sud, Littoral, Extrême-nord, Nord et Est.
- SG/MINRESI
- IG/MINRESI
- CD/PS
- Chrono/Archives

Le Ministre de la Recherche
Scientifique et de l'Innovation

Dr Madeleine Tchuinte



Appendix B: Supplementary material for Chapter 5

Village survey

Village:	Start date:	End date:	GPS (<i>village centre</i>):
Key informants:			

Section 1 – Demographics

Year village was established:		No. of households:	
Total population:	No. of men:	No. of women:	No. of children:
How many different ethnic groups live in the village?			
Have any groups of people moved to the village in the past 10 years?			
Have any groups of people left the village in the past 10 years?			

Section 2: Infrastructure

No. of households with access to electricity:	No. of households with access to piped water:
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Distance from the village to the nearest...	km	min	mode	cost (CFA)	Has this changed over the last 5 years?
1. all season road usable by cars					
2. divisional capital					
3. market where agric. and forest products are sold					
4. market where bushmeat is sold					
5. market where consumer goods are purchased					

Does the village have any of the following...and if so, how many and when were they established (<5yrs, 6-15yrs, >16yrs)?			
1. education services	primary school	secondary school	technical school
2. health services	mobile clinic	health centre	hospital
3. financial services	savings groups	credit union	bank

Section 3: Institutions

Who is the highest traditional authority in the village?
Are there customary rules concerning hunting?
Are these rules enforced and respected? Has this changed?

Who is the highest government authority in the village?
Are there government rules concerning hunting?
Are these rules enforced and respected? Has this changed?

Frequency of the village market:	daily	weekly	fortnightly	monthly	other
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Common Initiative Groups (CIGs)	Function
1.	
2.	
3.	
4.	
5.	

Section 4: Livelihood activities

Which are the five most important activities that meet the annual income and subsistence needs of villagers?				
Activity 1	Activity 2	Activity 3	Activity 4	Activity 5
Which were the most important activities that met the income and subsistence needs of villagers five years ago?				
Activity 1	Activity 2	Activity 3	Activity 4	Activity 5
Which were the most important activities that met the income and subsistence needs of villagers ten years ago?				
Activity 1	Activity 2	Activity 3	Activity 4	Activity 5

Section 5: Livelihood interventions

Number and type of livelihood projects still receiving external support:
Number and type of livelihood projects that previously received external support:

How often is the village visited by NGO staff?	daily	weekly	monthly	yearly	rarely
How often is the village visited by MINFOF staff?	daily	weekly	monthly	yearly	rarely

Detailed information about ongoing livelihood projects...	Project 1	Project 2	Project 3	Project 4	Project 5
1. Which organisation coordinates the project?					
2. Who designed the project, i.e. community involvement? ¹					
3. Does the project promote a new or existing activity?					
4. When did the project start?					
5. How many people attended the initial meetings?					
6. Have participants formed new CIGs?					
7. How many people have joined the CIG(s)?					
8. How often does the CIG meet?					
9. Have participants received any free inputs?					
10. Was any technical training provided?					
11. Did participants agree to any conditions or rules?					
12. Has anyone violated these conditions or rules?					
13. Have any penalties been imposed for violating the rules?					

1) Project design: 1 = local idea, 2 = idea from NGO, 3 = idea from government, 4 = joint idea, 5 = other (specify)

Further details about ongoing livelihood projects:

Detailed information about previous livelihood projects...	Project 1	Project 2	Project 3	Project 4	Project 5
1. Which organisation coordinated the project?					
2. Who designed the project? ¹					
3. When did the project start?					
4. When did the project end?					
5. How many people participated with the project?					
6. Did the participants receive any free inputs?					
7. How many people are still involved in the activity promoted?					

Any further information:

How willing to cooperate with the research were the people of this village?	unwilling	cooperated	very willing
How are relations between the village and the NGOs?	poor	ok	good
Is there likely to be a directional bias?	overly negative	overly positive	no systematic bias

Household survey – Takamanda National Park

Date:	Village:	Household:	Start time:	End time:
Name of HH head (M):		Name of HH head (F):		

Indicate with * who is present during the interview

Section 1 – Household characteristics

Does anyone in your household hold an official position in the village?
Is anyone in your household a member of a Common Initiative Group?

Do you own your house?	yes	no, it is rented	other:		
Do you share your house with other households?	no	yes (specify)			
What are the walls constructed of?	mud and sticks	mud blocks	concrete	other:	
What is the type of material for the roof?	thatch	zinc	other:		
How many rooms?	1-2	3-4	5-6	7-8	8+
Is this your only house?	yes	no (specify)			

Section 2 – Household composition

For each member of the household currently living in the village aged ≥16									For any person who has lived and worked elsewhere			
ID	Relation to HH head	Age	Sex	Place of birth	Ethnicity	No. of years in village	Education ¹ (* ongoing)	Main occupation	What jobs have you had outside village?	Where?	When?	How long or how often?
1												
2												
3												
4												
5												
6												

1) Education: N/A = no formal education, P1-P6 = primary, S1-S7 = secondary, T1-T6 = technical, U1-3 = university

How many children aged ≤15 are the responsibility of the household?		no. of boys:	no. of girls:
Number of boys in school...	...in the village	...elsewhere (<i>specify</i>)	
Number of girls in school...	...in the village	...elsewhere (<i>specify</i>)	
What is the relationship of these children to HH head?			

Are any members of your household or extended family currently living and working outside the village?					
Relation to HH head	Age	Sex	Activity outside village	Location	Duration

Section 3: Livelihood activities

List all livelihood activities conducted by male and female members of this household aged ≥16 (<i>prompt for farm-based activities, forest-related activities, business-related activities and waged-labour</i>) and rank the top five activities according to overall contribution to household income.										
Men										
Women										

Which three activities are most important to meet the income needs of the household during the rainy and dry seasons?			
Rainy	1.	2.	3.
Dry	1.	2.	3.

Do you ever invest the money earned from one livelihood activity in developing another livelihood activity?
Are the livelihood activities that your household engages in now the same or different to what you used to do before?
If the main income-generating activity for your household failed to give you money, what would you do?
Has the creation of Takamanda National Park positively or negatively affected any of your livelihood activities?

How much money did your household get last year from selling cocoa, oil palm, bush mango and cassava (<i>if relevant</i>)?			
Product	Quantity sold and selling price	Where sold and amount spent on transport	Amount spent on inputs during production
cocoa			
oil palm			
bush mango			
cassava			

Does your household get money from any other sources, if so when did you last receive this money and how much was it?		
Remittances:	Rent:	Other (<i>specify</i>):

Section 4: Household assets and wealth perceptions

Can you get help from other people in the village if you are in need?	no	sometimes but not always	yes
What do you do if you need money in an emergency?	1.	2.	3.
Has anyone in your household ever used a bank or credit union?			

Does your household have any of the following...and if so, how many?			
1. means of communication	mobile phones:	televisions:	radios:
2. productive assets	farmland: <i>hectares</i>	motorbikes:	guns:
3. basic utilities (<i>specify</i>)	generators:	source of drinking water:	type of toilet:

How comfortable do you consider your household to be?	struggling	copied	comfortable
Has the amount of food been sufficient for your household over the past 12 months?	no	about sufficient	yes
Has the amount of meat been sufficient for your household over the past 12 months?	no	about sufficient	yes
What kind of meat does your household eat and from where do you get it?			
Compared with other households in the village, how well-off is your household?	worse-off	about average	better-off
Why is your household better or worse off?			
How well-off is your household today compared to 5 years ago?	worse-off now	about the same	better-off now
What has caused this change?			

Section 5: Forest resources

How long does it take you to trek to the area of forest that your household uses for...	NTFP collection:	hunting:
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Has anyone in your household ever hunted?							
ID #	Method of hunting	Reason for hunting	When did they start?	How often do they hunt now?	How often did they hunt before?	When did they stop?	Why has the frequency changed or why did they stop hunting?

Has the number of animals hunted by your household changed over the last 5 years?	declined	about the same	increased
If increased or decreased, why?			

Has anyone from your household ever been affected by wildlife law enforcement?	yes	no
If yes, describe the nature and frequency of encounters with 'ecoguards'		

Section 6: Livelihood interventions

Have you heard about any of the following livelihood projects coordinated by PSMNR-SWR? <i>(note initial responses and reactions)</i>						
1. CASSAVA	2. COCOA	3. OIL PALMS	4. BUSH MANGO	5. SNAILS	6. BEEKEEPING	7. PEPPER AND GINGER

Has anyone in your household participated in any of these livelihood projects? <i>(circle)</i>						
1. CASSAVA	2. COCOA	3. OIL PALMS	4. BUSH MANGO	5. SNAILS	6. BEEKEEPING	7. PEPPER AND GINGER

For the _____ project <i>(repeat for additional projects if time allows – note responses in accompanying notebook if necessary)</i>
1. Who in your household participated?
2. Why did you/they participate?
3. Did anyone encourage you/them to participate?
4. Are you/they still involved with the project now?
5. How often have you/they attended project-related meetings or trainings?

6. What do you/they do during these meetings or trainings?
7. Do these meetings or trainings continue? When was the last one?
8. Has your/their involvement with the project changed the way you/they do things compared to before?
9. Have you/they noticed any positive or negative effects from following the guidance provided by the project?
10. What do you think were the aims of this livelihood project?
11. What do you think about the level of training and support provided by the project?
12. Did the project supply you/them with any materials?
13. Have you/they since obtained the same materials from elsewhere, independently of the project?

14. Before participating in the project, were there any conditions you/they needed to agree to?
15. Could anyone participate in this project or were there some people who would have liked to participate but were not able to do so?
16. Do you think you/they will continue to do what you/they were taught or encouraged to do by the project?
17. Have you/they benefited from participating in this livelihood project?
18. Have you/they incurred any costs due to participating in this livelihood project?
19. Has this livelihood project had an effect on your/their income?
20. Has participating in this project changed your/their use of forest resources?
21. Has this livelihood project fulfilled your/their expectations?

Why did you or other members of your household <u>not</u> participate in the other (or any) livelihood projects?
Do you think that PSMNR-SWR listens to villager opinions and feedback regarding the livelihood projects?
Are villagers involved in the coordination of the livelihood projects? Do you think the villagers involved manage the projects well?

Section 7: Perceptions about the protected area

Overall, how do you feel your household has been affected by the creation of Takamanda National Park?			
Positives	1.	2.	3.
Negatives	1.	2.	3.

Section 8: Pilot test of unmatched-count technique

Card:	C	T	How many of these activities have members of your household done to get money in the past year?
Card:	C	T	How many of these activities did members of your household do to get money before the protected area was created?

Notes:

How reliable is the information provided by this household in general?	poor	reasonably reliable	reliable
How reliable is the information provided by this household on hunting effort?	poor	reasonably reliable	reliable

Appendix C: Details of unmatched-count technique survey

Unmatched-count technique survey

Understanding the prevalence and drivers of illegal bushmeat hunting in Cameroon

Introduction

This study considers the perceived impact of livelihood interventions, relative to other conservation interventions, on changes in hunting effort in Takamanda National Park (TNP). Given that hunting is illegal, and is sensitive in Takamanda, I used an indirect questioning method as a means of gathering information on sensitive behaviour. This allowed me to explore differences in hunting prevalence between villages with different levels and types of livelihood intervention, in the context of individual attitudes toward different conservation interventions. Unfortunately, due to lack of time, I was unable to carry out the analyses for this extra chapter, although the data collection was successfully completed.

The challenges of studying sensitive behaviours

Quantifying change in sensitive behaviours such as hunting has proven to be particularly challenging in conservation. One of the most effective methods is direct observation whereby observers accompany hunters on hunting trips (Rist et al., 2008), but this approach will yield biased results in situations where people are aware that it is illegal to hunt and fear prosecution because the presence of observers is likely to change behaviour (Gavin et al., 2010). Alternatively, change can be measured through indirect observation of the signs of illegal hunting activity in the forest, such as the presence of snares, shotgun cartridges and hunting camps (Linder and Oates, 2011), or through urban bushmeat market surveys (Allebone-Webb et al., 2011). These methods can collect data on the spatial characteristics and prevalence of hunting, and on the magnitude of hunting and species composition respectively, however indirect measures cannot be used to determine the characteristics of hunters or whether the behaviour of individuals has changed as a result of involvement with livelihood interventions.

Indirect questioning techniques developed within the disciplines of psychology, criminology and health have started to be applied in conservation to enable the collection of data from individuals about sensitive behaviours whilst avoiding some of the biases associated with direct questioning (St. John et al., 2010). The method that has received the most attention is the randomised response technique (RRT) which was applied in a comparative study alongside direct questioning in Madagascar to estimate the proportion of the study population who had consumed bushmeat in the previous year (Razafimanahaka et al., 2012). Based on probability theory, whereby respondents either answer a question truthfully or say yes/no depending on the roll of a dice, the RRT produced similar estimates to direct questions at most sites but significantly higher

estimates in communities adjacent to protected areas where bushmeat consumption is perceived to be a sensitive behaviour due to its illegality. The advantage of RRT is that it guarantees respondent anonymity, since the researcher has no way of knowing whether the respondent is telling the truth or has been forced by the dice roll to lie.

Nuno et al. (2013) applied a similar indirect questioning method called the unmatched-count technique (UCT) to provide estimates of bushmeat hunting in Tanzania. UCT randomly allocates respondents to control and treatment groups then provides them with a list of items. They must indicate how many items apply to them but not indicate which. An estimate of prevalence can then be calculated using the difference in means between control and treatment groups. This technique produces similar estimates of illegal behaviour to RRT but is thought to be less confusing, especially for illiterate respondents who may not understand the concept of probability and suspect trickery (Coutts and Jann, 2011). The only drawback with both RRT and UCT is the requirement for large sample sizes, especially if the data is to be disaggregated according to the characteristics of respondents, which could reveal the most useful insights in terms of behaviour change associated with participation in livelihood interventions, and at the time when this research was conducted these methods had not been applied to bushmeat hunting in West and Central Africa.

Research methods

The UCT method was piloted during the household survey conducted for Chapter 5 by asking two questions regarding how many livelihood activities the household engaged in 1) over the past year and 2) before involvement with the livelihood interventions. These questions were administered in Pidgin English to a sample of 82 intervention village households using the UCT cards attached (accompanied with instructions). A sample of 82 is too small for robust analysis using the UCT method but this exercise resulted in some lessons learnt. For instance, asking UCT questions after direct questioning about hunting and other livelihoods may have undermined the anonymity of this approach since a household's involvement with the non-sensitive activities on the card may have already been discussed. Piloting the UCT approach also highlighted the importance of using an unrelated practice question first to enable the technique to be explained fully to participants before commencing the actual exercise and as a means of validating responses, as done by Nuno et al. (2013).

During April and May 2015, interviews were conducted with 488 households in 12 villages around Takamanda National Park, which were a combination of intervention and non-intervention villages. I recruited a team of three research assistants – Sunday Kingsley Tardzenyuy, Perrick Jingwa Ajeng and Atemafeh Nkeze Claude, plus Levis as the local facilitator, and made the deliberate decision not to be involved in the administration of the interviews myself as I wanted to take the '*whiteman*' out of the equation. The research assistants were all recent graduates and had not been to Takamanda National Park previously, so were not associated with any of the ongoing protected area management related activities. The UCT interviews lasting approximately 20

minutes per respondent with some basic socio-economic questions asked at the beginning as well as some questions related to attitudes at the end.

For the UCT to work, one of the non-sensitive items should be very commonly practiced, and one very rarely practiced, so that there is a very small chance that people either say zero or all of the activities (as that then reveals their hunting behaviour if they are in the treatment group). The items also need to be similar in type to bushmeat hunting, so that it looks 'in place' being in the list.

Explanation of the non-sensitive livelihood activities chosen, and their estimated prevalence (in brackets):

1. Palm oil is one of the main cash crops in the South West Region (70%);
2. Households are still allowed to pick bush mango from within TNP to sell to Nigerian traders (99%);
3. People do petit trading, either buying palm oil and other products within the village to sell in town or buying consumables to sell in the village (30%);
4. Hunting or trapping in the forest to generate income is the sensitive behaviour of interest;
5. There will be only one or two teachers per village, so this is an unlikely option for most people (1%).

The data were to be analysed in R statistical software using the 'list' package which has been specifically designed to create a probability-based estimate. This can then be used as a dependent variable to see what factors determine whether households hunt for commercial purposes or not. This would enable comparisons between individuals involved in livelihood interventions and those not involved in livelihood interventions, as well as seeing how the size of cocoa farms has an impact on hunting behaviour.

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Unmatched-count technique questionnaire in Pidgin English

Village:	Interviewer:	Date:
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THROW COIN <u>BEFORE</u> APPROACHING EACH HOUSEHOLD			
FCFA SIDE = C		PICTURE SIDE = T	
INTO WHICH GROUP IS THIS HOUSEHOLD ALLOCATED?	C	T	[CIRCLE ONE]

[READ OUT] My name na ____, I be na graduate from University for Buea. I dey do research for some PhD student weh yi name na Juliet Wright. Yi commot from Imperial College for London. We dey research for see how weh the work weh people dem for Manyu Division dey do for support house don be affected by change. We go like for invite you for take part for this interview weh we get some questions them for ask you. The interview fit take like 30 minutes. We no dey force you for answer questions, if you no want answer the question dem, problem no dey. You fit leave the interview anytime weh you like. We want for assure you say, all thing weh you go talk go remain confidential. The information weh we di get from you na only for school thing, so we no di givam for any person. We no go write your name so dat man no fit know person weh yi answer question. The information them weh we di get-am for this research go be for write PhD book.

You get any question for ask? If you be happy we fit start?

IF THE RESPONDENT <u>DOES NOT</u> WANT TO PARTICIPATE, THANK THEM AND FINISH HERE						
GENDER:	MALE	FEMALE	[CIRCLE ONE]			
AGE:	16 – 30	31 – 50	51+	[ESTIMATE AND CIRCLE ONE]		
HOUSE:	ZINC	THATCH	MUD	MUD BLOCKS	CEMENT	[CIRCLE ALL THAT APPLY]

Start time:	[READ OUT] Feel free for ask we question anytime.
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Section 1 – Respondent characteristics

Gender: male / female	[circle one]	You be na how many years?	[specify]
You be which tribe? Anyang / Basho / Boki / Ovande / Becheve / other _____ [circle or specify]			
The born you for here? yes / no	[circle one]	You di steady for village? yes / no	[circle one]
You go school reach which level? <div style="float: right;">no formal education</div> <div>primary class _____</div> <div>secondary form _____</div> <div>technical year _____</div> <div>university _____</div> <div>+ professional _____</div> <div style="text-align: right;">[circle and specify]</div>			

Na you be head for this house? yes / no [circle one]

[IF NO] The head for this house na who for you? _____ [specify]

Section 2 – Household characteristics

HOUSE:	ZINC	THATCH	MUD	MUD BLOCKS	CEMENT	[CIRCLE ALL THAT APPLY]
--------	------	--------	-----	------------	--------	-------------------------

[IF NOT THE HOUSEHOLD HEAD] The head for this house be how many years? _____ [specify]

Yi be na man or na woman? male / female _____ [circle one]

Yi go school reach which level?

no formal education

primary class _____

secondary form _____

technical year _____

university _____

+ professional _____ [circle and specify]

This house na wuna own? yes / no _____ [circle one]			
Na how many rooms dey for this wuna house, with kitchen and parlour? _____ [specify]			
Wuna get house for some other side? yes / no _____ [circle one]		[IF SO] For which side? _____ [specify]	
Any other people don married for this house? yes / no _____ [circle one]		[IF SO] How many? _____ [specify]	
Wuna get na how many farms dem? _____ [specify for cash crops]			
The farm na which size? Wuna plant weti for dey? You measure'am na how? _____ [complete table]			
#	main cash crop	size	measurement method
1			
2			
3			
4			

How many people dey for your house?

man pikin dem weh dey pass 16 years _____

woman dem weh dey pass 16 years _____

small pikin dem weh dey no reach 16 years _____ [specify]

Any man dey for your house weh yi get position for village council? yes / no _____ [circle one]

[IF SO] Yi get na which position? _____ [specify]

You fit say di people dey for your house be na: comfortable / just dey manage / suffer _____ [circle one]

How di people dey for your house be now so, as compared to 5 years ago?

e better-pass / na the same / e bad-pass _____ [circle one]

[IF BETTER OR WORSE OFF] Why? Weti di happen? _____ [specify]

Section 3 – Unmatched-count technique

CHECK PAGE 1 - TO WHICH GROUP HAS THIS HOUSEHOLD BEEN RANDOMLY ALLOCATED?

C T

[CIRCLE ONE]

HAVE THE APPROPRIATE CARDS READY BUT DO NOT SHOW ANY CARDS TO THE RESPONDENT YET

[READ OUT] The question weh I go dey ask you now na one dem weh no man fit know person weh yi answer'am. I go show you some card dem with some activities dem. I go read the activities dem for way weh you fit understan'am fine, then you go tell me how many of this activities dem weh people for your house don di do for get money for the past 12 months. Abeg, I no want know weti people for your house don di do, I just want know HOW MANY. So, you just go give me number dem for dey activities.

1. SHOW THE RESPONDENT THE APPROPRIATE CARD FOR QUESTION 1
2. READ THROUGH THE LIST OF ACTIVITIES AS THEY ARE WRITTEN ON THE CARD
3. MAKE SURE THE RESPONDENT UNDERSTANDS WHAT ACTIVITY EACH PICTURE IS REFERRING TO
4. IF THEY TRY TO TELL YOU WHAT THEY DO, REMIND THEM THAT YOU DO NOT WANT TO KNOW!

Question 1. Na how many of this activities dem weh people for your house don di do for get money for the past 12 months?

1 2 3 4 5

[circle one]

ONCE THE RESPONDENT HAS UNDERSTOOD THAT YOU DO NOT WANT TO KNOW WHAT ACTIVITIES THEIR HOUSEHOLD DOES, YOU JUST WANT TO KNOW HOW MANY - MOVE ON TO QUESTION 2

[READ OUT] Now, I go show you some different card them and I go ask make you answer the same question. I no want make you tell me the activities weh people for your house dey do for get money, I just want make you tell me na the number - HOW MANY.

1. SHOW THE RESPONDENT THE APPROPRIATE CARD FOR QUESTION 2
2. READ THROUGH THE LIST OF ACTIVITIES AS THEY ARE WRITTEN ON THE CARD
3. MAKE SURE THE RESPONDENT UNDERSTANDS WHAT ACTIVITY EACH PICTURE IS REFERRING TO
4. IF THEY TRY TO TELL YOU WHAT THEY DO, REMIND THEM THAT YOU DO NOT WHAT TO KNOW!

Question 2. Na how many of this activities dem weh people for your house don dey do for get money for the past 12 months?

1 2 3 4 5

[circle one]

HOW WELL DID THE RESPONDENT UNDERSTAND THE QUESTION?

VERY WELL

REASONABLY WELL

NOT AT ALL

[CIRCLE ONE]

HOW HONEST DO YOU THINK THE RESPONDENT WAS WHEN REPLYING?

VERY HONEST

REASONABLY HONEST

NOT HONEST

[CIRCLE ONE]

Section 4a – Household participation

THIS SECTION IS APPLICABLE TO COMMUNITY PROJECT VILLAGES ONLY. IF YOU ARE NOT IN A PROJECT VILLAGE - GO TO SECTION 4b

You done ever hear whether dem don do any of this project dem for this wuna village?

1. Support cassava farming through woman group dem?
2. Give machine for grind or press cassava for people for make garri?
3. Cocoa Farmer Field School
4. Give improved seed varieties for banga
5. Give dry season bush mangos for plant inside farm
6. Teach people for keep nyamangoro
7. Teach people for keep honey
8. Teach people for plant pepper and ginger

[circle the numbers for all that apply]

[QUESTION 1] Any person for your house don ever participate for any of this projects?

[QUESTION 2] Up to today, any person for your house still dey participate for this project dem or use thing weh dem learn'am from the project? [circle all that apply]

#	project	ever participate	still participate
1	member of cassava womans group	yes / no	yes / no
2	use machine weh project give'am for grind garri	yes / no	yes / no
3	member of Cocoa Farmer Field School	yes / no	yes / no
4	give you improved variety banga for plant	yes / no	yes / no
5	give you bush mango for plant	yes / no	yes / no
6	learn for keep nyamangoro	yes / no	yes / no
7	learn for keep honey in top bar hives	yes / no	yes / no
8	learn for plant pepper and ginger for group	yes / no	yes / no

[COMMENTS]

Section 4b – Household participation

Any person for your house be member for village forest management committee? yes / no [circle one]

Dem don ever pay any person for your house for take part for cut boundary for park or work with dem wildlife people inside park? yes / no [circle one]

You or any member for your house be don go learn about conservation, like for watch film concerning bush animal dem?

respondent ☐ other household members ☐

no one ☐

[tick all that apply]

Section 5 – Individual attitudes

[READ OUT] Now I go like for ask weti you think about the activities dem weh the park don bring'am for wuna. How you feel say they don touch the people for wuna house. I wana know if you fit say the activity dem get positive or negative impact for wuna house. No right or wrong answer no dey.

So you feel say the _____ get positive or negative effect for wuna house?

[PROMPT] It be very positive/negative, it be positive/negative small, or be no change? [tick one box per activity]

	very positive	positive small	no change	negative small	very negative	no idea
farm to market okada roads						
community projects						
education about wildlife						
village forest management comm.						
ecoguard patrols						

For the community projects dem, which one you be like'am pass?

[specify]

[COMMENTS]

[READ OUT] Now I go like make you tell me if you feel say any of these activities don reduce the number of man pikin for village weh dem di hunt or trap for inside forest to get money.

So, you fit say the _____ don reduce the number of man pikin for village weh dey hunt or trap for inside forest to get money, or it instead increase em? [tick one box per activity]

	reduce-em plenty	reduce-em small	no change	increase-em small	increase-em plenty	no idea
farm to market okada roads						
community projects						
education about wildlife						
village forest management comm.						
ecoguard patrols						

[COMMENTS]

[READ OUT] We go like for know weti you think about these activities weh people for park want deny people say make dem no do.

You think say for deny make people for village no _____ for inside park be na fine or bad thing?

[tick one box per activity]

	fine plenty	fine small	no get idea	bad small	bad plenty
poison rivers					
burn bush					
hunt or trap					
make farm					

[COMMENTS]

Finally, if people still dey your village weh dem dey hunt or trap, you think say the main reason na weti?

[circle one for each; rank **the three main reasons** in order of importance]

reason	applicable	rank
other place no dey weh dem fit get meat	yes / no	
other work no dey give money fine	yes / no	
the people dem need money quick quick	yes / no	
dem just like for hunt	yes / no	
dem just like for chop bushmeat	yes / no	
na tradition	yes / no	
e dey give plenty money pass	yes / no	
other: [specify]		

[READ OUT] Thank you plenty for your time, we don finish. You get some other thing for talk or question for ask?

[COMMENTS]

End time:

Checked by: _____ on: _____

Entered by: _____ on: _____

Unmatched-count technique cards for the hunting question

Question 2 - Card T



Make oil from banga



Pick bush mango for inside farm or forest



Do business



Hunt or trap for inside forest



Teach for school inside village

Question 2 - Card C



Make oil from banga



Pick bush mango for inside farm or forest



Do business



Teach for school inside village

Appendix D: Supplementary material for Chapter 6

Household survey – Dja Faunal Reserve

Date:	Village:	Household:	Start time:	End time:
House: zinc thatch mud mud blocks cement				

Section 1 – Respondent characteristics

Sex: male / female	Age:	Ethnicity:	Education:
Were you born in this village? yes / no	[IF NO] Where:	Do you spend most of your time living in this village? yes / no	
Are you the head of this household? yes / no	[IF NO] What relation is the head of the household to you?		

Section 2 – Household characteristics

Does anyone in your household hold an official position in the village?					
Is anyone in your household a member of a Common Initiative Group?					
Do you own this house? yes / no					
How many rooms?	1-2	3-4	5-6	7-8	8+
Do you have another house anywhere else? yes / no		[IF YES] Where?			

Section 3 – Household composition

How many men ≥16?		How many women ≥16?		How many children ≤15?	
How many boys?		How many girls?		How many children aged 5-15 are in school?	
What is the relationship of these children to the HH head?				Who sponsors the children in school?	

For each member of the household currently living in the village aged ≥16								For any person who has lived and worked elsewhere					
#	Relation to HH head	Age	Sex	Ethnicity	Place of birth	Education (* ongoing)	Main occupation	Type of work outside village	Where?	When?	How long?	Why returned?	Plan to go again?
1													
2													

#	Relation to HH head	Age	Sex	Ethnicity	Place of birth	Education (* ongoing)	Main occupation	Type of work outside village	Where?	When?	How long?	Why returned?	Plan to go again?
3													
4													
5													
6													

Do you have any close family members who are currently living and working outside the village?							
Relation to HH head	Type of work outside village	Where?	How long?	Age	Education (* ongoing)	How often visit village?	How long do they remain in village?

Section 4: Livelihood activities

List all livelihood activities done by men and women in this household aged ≥16 over the last 12 months (<i>prompt for farm-based activities, forest-related activities, business-related activities and waged-labour</i>); rank the top five activities according to overall contribution to household income over last 12 months.										
Men										
Women										

Do you use any of the money generated from one activity to subsidise other activities?
--

Have any of your main income-generating activities ever failed to generate money as you had hoped?
[IF YES] When this activity failed to generate the money hoped for, how did you manage?
Has there been any change in the types of activities conducted by members of your household?
Does the protected area affect how you conduct any of your activities?

Section 5: Household assets and wealth perceptions

Can you indicate how much money your household earns in one month?							
0 – 5,000	6,000 – 10,000	11,000 – 25,000	26,000 – 50,000	51,000 – 100,000	101,000 – 200,000	201,000 – 400,000	400,000 +
Does anyone regularly send your household money?							
If a main income earner in your household fell sick, how many people from other households in the village would help provide food, money or other assistance?							
What do you normally do if you need money in an emergency?	1.	2.	3.				
If you wanted to invest money in an income-generating activity, would your household be able to...							
...use savings?	...borrow money?	...ask someone to give you money?					

How many farms do members of your household have?			
#	What is the main crop grown in the farm?	What is the size of the farm?	How did you measure the area of the farm?
1			
2			
3			
4			
5			
6			

How comfortable do you consider your household to be?	comfortable	managing	struggling
Why?			
How does your household situation now compare to 5 years ago?	better-off now	about the same	worse-off now
Why?			

Section 6: Forest resources

Has anyone in your household ever set traps in the forest? yes / no	[IF YES] Just one person or more than one?		
What is their reason for trapping?			
Have they set any traps in the last 12 months? yes / no	[IF YES] How many traps have they set in the last 12 months?		
Did they set more, less or the same number of traps 5 years ago?	more	the same	less
[IF MORE/LESS] Why do they set more/less traps today than before?			
Did/do they consider themselves to be a successful trapper compared to others in the village?			

Has anyone in your household ever hunted with a gun or dog in the forest? yes / no	[IF YES] Just one person or more than one?		
What is their reason for hunting?			
Have they hunted in the last 12 months? yes / no	[IF YES] How often have they gone to hunt in the last month?		
Did they hunt more, less or the same amount 5 years ago?	more	the same	less
[IF MORE/LESS] Why do they hunt more/less today than before?			
Did/do they consider themselves to be a successful hunter compared to others in the village?			

Has anyone in your household ever been disturbed by the conservation service while hunting or trapping? yes / no
[IF YES] What happened? Does it happen often?

Section 7: Livelihood interventions

<p>Have you heard whether any of the following projects have been implemented in your village? <i>(note initial responses and reactions)</i></p> <p>1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____</p>
<p>Have you heard of any similar projects that have been implemented in your village?</p>
<p>Has any member of your household ever participated in any of these projects?</p>

For the _____ project <i>(repeat for additional projects if time allows – note responses in accompanying notebook if necessary)</i>
1. Why did you/they participate?
2. Was anyone free to participate or was it only if you were invited?
3. What did participation in the project involve?

4. Were you/they asked to change any of your/their existing livelihood activities by those bringing the project?
5. How often did you/they attend project meetings?
6. Did you/they receive any training?
7. Were you/they given anything by the project?
8. How many times have people come from outside to coordinate the activities of this project?
9. When was the last time that people came for this project?
10. Are you/they still involved in the project up until today?
11. Are you/they still engaged in the activity promoted by the project?

12. Do you/they continue to be a member of a group that focuses on this livelihood activity? How often do you/they attend meetings?

13. Have you/they learnt anything from the project that has changed the way you/they carry out your/their individual activities?

For each project your household has been involved in, what impact do you think it has had on your household? Has it been positive, negative, or no change?

Project	Impact ¹	How did the project affect your household positively or negatively?

1) *Impact on household*: very positive, a bit positive, no change, a bit negative, very negative, no idea

As a result of participating in these projects, has your household income increased, decreased or remained the same?

Are there any livelihood activities that members of your household now spend more or less time doing as a result of participating in these projects?

Were these projects initially requested by the people of this village? If not, who decided which livelihood activities the projects would focus on?

Have these livelihood projects fulfilled your expectations?
Out of all these livelihood projects, which one do you think was the best and which was the worst?

Do you think these projects have reduced, increased or had no impact on the number of men in this village who hunt or trap in the forest to make money?		
Project	Impact ¹	How has the project had an impact on the number of men who hunt or trap to make money?

1) *Impact on hunting and trapping*: reduced a lot, reduced a bit, no change, increased a bit, increased a lot, no idea

Section 8: Perceptions about hunting and the protected area

What do you think are the main reasons people hunt or trap?	otherwise difficult to get meat	no other options for making money	need money quickly
enjoy hunting or trapping	like to eat bushmeat	a tradition or part of culture	generates more money than other activities
other:			

Overall, how do you feel your household is affected by the protected area?			
Positives	1.	2.	3.
Negatives	1.	2.	3.

How reliable is the information provided by this household in general?	poor	reasonably reliable	reliable
How reliable is the information provided by this household on hunting effort?	poor	reasonably reliable	reliable

Appendix E: Supplementary material for Chapter 7

Villages within 10km of Takamanda National Park

Research to focus on the southern forested zone, not the villages in the northern grassland zone.

Akwa
Assam
Atolo
Aworri
Bache
Badshama 1
Badshama 2
Badshama 3
Bandolo
Bantako
Basho 1 (aka Ketoya)
Basho 2 (aka Mago)
Ebinsi
Eshobi
Kajifu 1
Kajifu 2
Kekpani
Kekukesim 1
Kekukesim 2
Makwe
Matene
Mbilishe
Mbu
Mekwempoh
Nchumba
Nfakwe
Nyang
Obonyi 1
Obonyi 2
Obonyi 3
Okpambe
Ote 1
Ote 2
Takamanda
Takpe
Tassomo
Tava
Tito

Scenario interview datasheet

Location:	Interviewer:	Date:
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CONFIRM THAT THE INDIVIDUAL IS FROM ONE OF THE TARGET VILLAGES

VILLAGE: _____ [SPECIFY]

[READ OUT] My name is Catherine and this is Juliet Wright a PhD student at Imperial College London. We are conducting research with men from the villages around Takamanda National Park to understand more about the livelihood options available to them. We are interested to learn about the things that made them leave the village and under what circumstances they would go back. We would like to invite you to partake in an interview during which we will present you with a range of scenarios. The interview could take up to one hour. You are not obliged to participate and have the right to refuse to answer questions. You may also withdraw from the interview at any time. All information given will remain confidential and will be used for research purposes only. We will not record your name on the datasheet so that your answers remain anonymous. The outputs from this research will be a PhD thesis and a publication about the livelihood strategies of rural men in South West Region, Cameroon. Do you have any questions? Are you happy to continue?

IF THE RESPONDENT DOES NOT WANT TO PARTICIPATE, THANK THEM AND FINISH HERE

AGE: 16 – 30 31 – 50 51+ [ESTIMATE AND CIRCLE ONE]

Start time: [READ OUT] Feel free to ask questions at any time.

Section 1 – Respondent characteristics

What is your age?		[specify age or year of birth]		
Which ethnic group are you from? Anyang / Basho / Boki / Ovande / Becheve / _____ [circle or specify]				
What is your highest level of education? no formal education				
primary	class _____			
secondary	form _____			
technical	year _____			
university	_____	[circle and specify what year]		
Have you done any professional training?		[specify]		
Have you learnt any vocational skills?		[specify skill or trade]		
How long have you lived outside the village since you left the first time?		[specify months or years]		
Do you have a traditional role in the village or are you likely to have one in the future?				
[specify role]				
Do you have wife and children to support?	Y / N [circle]	How many? women: _____ children: _____ Where? [specify where]		
Do you have property in the village?	house / farm / neither [circle]	Or elsewhere? house: _____ farm: _____ [specify where]		
The farm in the village / _____ is what size? What is planted in it? How did you measure it? [complete table]				
#	location	size	main crop	measurement method
1				
2				

How happy are you with your current situation?	very happy	reasonably happy	unhappy
Why?			

Do you prefer living in your current location or in the village?	current	both the same	village
How successful are you at your activities in your current location?	successful	average	unsuccessful

Section 3 – Leaving the village

Why did you leave the village? [PROMPT] What are your three main reasons?
[list three main reasons]

[IF USED TO HUNT OR TRAP] When you used to hunt, were you better at hunting than other people, could you hunt plenty of animals, or were you average or not so good at hunting and struggled to catch anything?	successful	average	unsuccessful
---	------------	---------	--------------

Why did you decide to move to your current location? [PROMPT] What are your three main reasons?
[list three main reasons]

What factors enabled you to leave the village and find work at your current location?
1) Did you have a particular skill that was needed here? Y / N
2) Did you have qualifications that helped you to get work? Y / N
3) Did you have savings that enabled you to travel and do what you do? Y / N
4) Did your family provide financial support to enable you to travel and do what you do? Y / N
5) Did you take out a bank loan or borrow money to enable you to travel and do what you do? Y / N
6) Did you already have friends here who could show you the place and help you find work? Y / N
7) Did you already have family members here who could show you the place and help you find work? Y / N
8) Did you have someone you could stay with for free? Y / N
9) Any other enabling factors?
[specify]

Section 4 – Scenarios

[READ OUT] Now we would like you to think about the future and what you would do if different things changed. We will present different possible futures to you and we would like you to imagine how you would respond to the change described in each scenario. Each scenario will cover a period of five years and only one thing will change - everything else will remain the same as it is now. So, for each scenario we would like you to imagine what you will be doing in 5 years' time and where you will live.
--

For example, I might ask you to imagine that the price of food doubles but everything else remains the same as it is now. How would this affect you? If the price of food remained double for 5 years, would you be able to afford to stay where you live now? Would you move back to the village or elsewhere? Would you continue doing the activities that you do now or would you switch to other activities or add other activities to what you do now? Or maybe you would not do anything different to what you do currently. If that is the case, would there be anything stopping you from making changes? So, I am just asking how you would react to specified changes in the future but I would like you to be realistic.

Scenario 1 – Business as usual

I would like you to imagine that things in Cameroon, and in the South West Region, remain as they are now. The situation in the village remains the same. Where do you see yourself in 5 years? What are you likely to be doing? What is your plan?

- In 5 years, do you think you will be: doing farm work / picking bush mango and other forest products / hunting / fishing

Scenario 2 – Improved access to the village

I would now like you to imagine that road access to your village is improved so that it is now accessible in all seasons by both motorbikes and other vehicles. Everything else in Cameroon, the South West Region, and the village remain the same as now. In this scenario, where do you see yourself in 5 years? What are you likely to be doing?

- In 5 years, if the road to your village is improved, do you think you will be: doing farm work / picking bush mango and other forest products / hunting / fishing

Scenario 3 – Improved agricultural extension services in the village

Now imagine that farmers in the village are provided with training, equipment and other inputs to increase the productivity of their farms. Cooperatives are established to sell the products. Income per hectare doubles. Everything else in Cameroon, the South West Region, and the village remain the same as now. The road to the village is just as it is now. Where do you see yourself in 5 years? What are you likely to be doing?

- In 5 years, if there is more support provided to farmers in the village, do you think you will be: doing farm work / picking bush mango and other forest products / hunting / fishing

Scenario 4 – Decrease in income from current livelihood activities

Now imagine that due to an economic recession in Cameroon the amount of income that you can get from your current activities reduces by half. Everything else in Cameroon, the South West Region, and the village remain the same as now. The road to the village and farming in the village are just as they are now with no extra support. In this scenario, how would you cope? Where do you see yourself in 5 years? What are you likely to be doing?

- Would you: suffer losses / work longer hours / change location / switch to other activities / return to the village

- In 5 years, if the money you get from your current activities is reduced by half, do you think you will be: doing farm work / picking bush mango and other forest products / hunting / fishing

Scenario 5 – Irregularity of income from current livelihood activities

Now imagine that your income becomes less reliable. Your employment contracts become shorter and paid work becomes harder to find. You may go for 1-2 months without receiving your main source of income. Everything else in Cameroon, the South West Region, and the village remain the same as now. The road to the village, farming in the village and the money obtainable from different activities remain the same as now. In this scenario, how would you cope? Where do you see yourself in 5 years? What are you likely to be doing?

- Would you: suffer losses / work longer hours / change location / switch to other activities / return to the village

- In 5 years, if you experience gaps in your income from your current activities, do you think you will be: doing farm work / picking bush mango and other forest products / hunting / fishing

Scenario 6 – Decreased frequency of ranger patrols within Takamanda National Park

Now imagine that the frequency of ranger patrols around Takamanda National Park reduce due to insufficient funds. Those who enter the park to hunt or do other activities are very unlikely to be disturbed by rangers. Everything else in Cameroon, the South West Region, and the village remain the same as now. The road to the village, farming in the village, the money obtainable from different activities and the regularity of income remain the same as now. In this scenario, where do you see yourself in 5 years? What are you likely to be doing?

- In 5 years, if the frequency of ranger patrols around Takamanda National Park decrease, do you think you will be: doing farm work / picking bush mango and other forest products / hunting / fishing

Section 5 – Returning to the village

What would prompt you to return to the village? [PROMPT] What are the three main reasons?

[list three main reasons]

Do you plan to return to the village one day? Y / N / M

When? Why?

Y / N / M = yes / no / maybe

How many men do you know from your village who work or live for here?

What do the men you know well who work outside the village do?

	Main occupation	Approx. age	Location	Contact
1				
2				
3				
4				
5				

ASK FOR THE CONTACT DETAILS OF OTHER MEN FROM THE LISTED VILLAGES WHO ARE LIVING AND WORKING IN URBAN AREAS IN SOUTH WEST REGION

Additional discussion and further contacts:

[READ OUT] Thank you for your willingness to answer the interview questions. The answers you provided will help us understand more about the livelihood opportunities available to men in South West Cameroon, what their preferences are and how the rural-urban migration trend might evolve.

Are there further questions you would like to ask us about the research? Do you have any comments?

End time:

Socio-demographic characteristics of individual respondents

ID #	Age	Village	Tribe	Gen.	Town	Education	Years urban	Family size	Main urban livelihood activity	Establishment	Village visits	Rural farm (ha)	Crop type	Hunter	Hunting type
1	17	Makwe	Basho	1st	Mamfe	First School	<5	0	Casual work	Precarious	Infrequent	1.5	Cocoa	No	
2	17	Kekpani	Anyang	1st	Mamfe	O-Level	<5	0	Education	Precarious	Frequent	0.0		Yes	Traps
3	29	Akwa	Anyang	2nd	Mamfe	O-Level	11-25	>3	Formal employment	Established	Frequent	1.0	Cocoa	No	
SC04	25	Makwe	Basho	1st	Mamfe	O-Level Technical	6-10	0	Skilled trade	Becoming established	Frequent	2.0	Cocoa	Yes	Hunts
SC05	16	Tava	Anyang	1st	Mamfe	First School	<5	0	Education	Precarious	Frequent	1.0	Cocoa	No	
SC07	30	Akwa	Anyang	2nd	Mamfe	First School	>26	0	Skilled trade	Established	Infrequent	1.5	Palms	No	
SC08	52	Akwa	Anyang	2nd	Mamfe	First School	>26	>3	Skilled trade	Established	Frequent	3.0	Cocoa	No	
SC09	21	Basho 1	Basho	1st	Mamfe	First School	6-10	0	Skilled trade	Becoming established	Infrequent	1.0	Cocoa	No	
SC10	18	Basho 2	Basho	1st	Mamfe	First School	<5	0	Skilled trade	Precarious	Frequent	1.0	Cocoa	Yes	Traps
SC11	18	Basho 2	Basho	1st	Mamfe	O-Level	6-10	0	Casual work	Precarious	Infrequent	1.5	Cocoa	Yes	Hunts
SC12	23	Akwa	Anyang	2nd	Mamfe	First School	11-25	0	Skilled trade	Becoming established	Infrequent	0.0		No	
SC14	18	Basho 2	Basho	1st	Mamfe	O-Level	6-10	0	Education	Precarious	Frequent	0.3	Cocoa	No	
SC15	40	Basho 1	Basho	1st	Mamfe	A-Level Technical	11-25	>3	Skilled trade	Established	Frequent	6.0	Cocoa	No	
SC16	24	Eshobi	Anyang	2nd	Mamfe	O-Level	11-25	1-2	Business	Becoming established	Infrequent	0.0		No	
SC17	53	Eshobi	Anyang	1st	Mamfe	First School	>26	>3	Skilled trade	Established	Infrequent	1.0	Cocoa	No	
SC18	29	Akwa	Anyang	1st	Mamfe	First School	11-25	0	Formal employment	Established	Infrequent	0.0		No	
SC19	27	Makwe	Basho	1st	Mamfe	First School	11-25	1-2	Skilled trade	Established	Frequent	0.0		Yes	Traps
SC20	32	Eshobi	Anyang	1st	Mamfe	O-Level	6-10	0	Skilled trade	Becoming established	Infrequent	1.0	Cocoa	No	
SC21	22	Tava	Anyang	1st	Mamfe	First School	<5	0	Skilled trade	Precarious	Infrequent	2.5	Cocoa	No	
SC22	68	Kajifu 1	Boki	1st	Mamfe	None	>26	>3	Business	Established	Frequent	8.0	Cocoa	No	
SC23	31	Kajifu 2	Boki	1st	Mamfe	Bachelor	11-25	1-2	Casual work	Precarious	Infrequent	0.0		Yes	Traps

SC24	61	Kekukesim 1	Boki	1st	Mamfe	First School	>26	>3	Formal employment	Established	Frequent	2.0	Cocoa	No	
SC27	18	Obonyi 2	Anyang	1st	Mamfe	O-Level	11-25	0	Education	Precarious	Infrequent	0.0		Yes	Traps
SC28	19	Obonyi 2	Anyang	1st	Mamfe	O-Level	<5	0	Education	Precarious	Frequent	0.0		Yes	Traps
SC29	18	Nfakwe	Anyang	1st	Mamfe	O-Level	<5	0	Education	Precarious	Frequent	2.5	Cocoa	Yes	Both
SC30	20	Makwe	Basho	1st	Mamfe	First School	6-10	0	Education	Precarious	Infrequent	1.0	Cocoa	No	
SC31	68	Nchumba	Basho	2nd	Mamfe	First School	>26	>3	Skilled trade	Established	Infrequent	6.0	Cocoa	Yes	Both
SC32	23	Kekukesim 2	Boki	1st	Mamfe	O-Level	<5	0	Education	Precarious	Frequent	1.0	Cocoa	No	
SC33	29	Obonyi 3	Anyang	1st	Mamfe	First School	6-10	>3	Business	Becoming established	Infrequent	3.5	Cocoa	Yes	Hunts
SC34	59	Obonyi 3	Anyang	1st	Mamfe	Bachelor	>26	>3	Formal employment	Established	Infrequent	0.0		No	
SC35	22	Obonyi 3	Anyang	2nd	Mamfe	O-Level	11-25	1-2	Education	Precarious	Frequent	2.0	Cocoa	No	
SC36	21	Kekpani	Anyang	1st	Mamfe	O-Level	11-25	0	Casual work	Precarious	Frequent	1.0	Cocoa	No	
SC37	27	Takamanda	Anyang	1st	Mamfe	First School	<5	0	Business	Becoming established	Frequent	2.0	Cocoa	No	
SC38	26	Takamanda	Anyang	1st	Mamfe	A-Level	11-25	0	Business	Becoming established	Frequent	2.5	Cocoa	No	
SC39	33	Takamanda	Anyang	1st	Mamfe	O-Level	11-25	1-2	Business	Established	Frequent	7.5	Cocoa	No	
SC40	52	Atolo	Other	1st	Mamfe	First School	>26	>3	Formal employment	Established	Infrequent	3.0	Palms	No	
SC41	40	Obonyi 3	Anyang	2nd	Mamfe	Master	>26	>3	Formal employment	Established	Infrequent	0.0		No	
SC42	33	Kekukesim 2	Boki	1st	Mamfe	O-Level Technical	11-25	>3	Skilled trade	Established	Frequent	2.0	Cocoa	No	
SC43	34	Obonyi 3	Anyang	1st	Mamfe	A-Level	<5	1-2	Formal employment	Becoming established	Frequent	3.0	Cocoa	No	
SC44	33	Nfakwe	Anyang	1st	Limbe	First School	6-10	1-2	Business	Becoming established	Frequent	0.0		Yes	Both
SC45	23	Akwa	Anyang	1st	Limbe	First School	11-25	1-2	Casual work	Precarious	Infrequent	3.0	Cocoa	No	
SC46	47	Basho 1	Basho	2nd	Limbe	First School	>26	>3	Business	Established	Infrequent	0.0		No	
SC47	54	Mbilishe	Basho	2nd	Limbe	First School	>26	>3	Business	Established	Infrequent	0.0		No	
SC48	43	Basho 2	Basho	1st	Limbe	A-Level	11-25	>3	Business	Established	Frequent	8.0	Cocoa	No	
SC49	30	Bache	Anyang	2nd	Limbe	A-Level	>26	0	Formal employment	Established	Infrequent	0.0		No	

SC50	22	Obonyi 2	Anyang	1st	Limbe	First School	6-10	1-2	Skilled trade	Becoming established	Infrequent	0.0		Yes	Traps
SC51	26	Badshama 1	Anyang	1st	Kumba	First School	<5	0	Skilled trade	Precarious	Infrequent	0.0		No	
SC52	42	Mbilishe	Basho	1st	Kumba	First School	<5	1-2	Business	Becoming established	Infrequent	1.0	Palms	No	
SC53	31	Takpe	Anyang	2nd	Kumba	Bachelor	>26	1-2	Formal employment	Established	Frequent	0.0		No	
SC54	32	Kajifu 1	Boki	1st	Kumba	O-Level	6-10	1-2	Formal employment	Established	Infrequent	3.0	Palms	No	
SC55	38	Mbu	Anyang	1st	Kumba	First School	6-10	>3	Formal employment	Becoming established	Infrequent	0.0		Yes	Both
SC56	22	Nfakwe	Anyang	1st	Kumba	O-Level	6-10	0	Education	Precarious	Frequent	4.0	Cocoa	Yes	Traps
SC57	40	Nyang	Anyang	1st	Mamfe	First School	6-10	0	Casual work	Precarious	Infrequent	0.5	Cocoa	No	

Reasons for and against rural farming with enabling and limiting factors by type and establishment of urban livelihood

Current livelihood		Small farm	Medium farm	Large farm	Abandoned farm	No farm
Education	Precarious	SC05, SC14, SC30, SC32, SC35 – Livelihood reasons: activity during school holidays (1: SC14); funds other investments – asset purchases (1: SC30); funds education (2: SC30, SC35); fallback income (5: all); preparation for return to village after retirement (1: SC30); <i>aims to establish urban farm (1: SC14)</i> Enabling factors: <i>expand farm if road improved (1: SC14)</i>	SC29, SC56 – Livelihood reasons: increased income with cocoa price rise (1: SC29); funds education (1: SC29); fallback income (1: SC29); <i>preparation for return to village if appointed chief (1: SC29)</i>			SC27, SC02, SC28 – Livelihood reasons: <i>will fund education (2: SC02, SC27); fallback income (1: SC28)</i> Enabling factors: <i>expand farm if road improved (1: SC27)</i> Limiting factors: <i>infrastructure – difficulties selling produce (1: SC27)</i>
	Becoming established					
	Established					
Casual work	Precarious	SC01, SC11, SC36 – Livelihood reasons: one of main incomes (1: SC11); preparation for return to village (1: SC11); fallback income (1: SC01) Limiting factors: <i>cost of establishing and maintaining a farm (1: SC01); farm size limited by own labour capacity (1: SC11); conflict over inherited land (1: SC01)</i> Reasons to abandon in future: <i>sufficient income and fully occupied (1: SC01)</i>			SC57 Reasons for abandoning: <i>social conflict – expelled from village (1: SC57)</i>	SC23

	Becoming established		SC45 – Livelihood reasons: will fund education (1: SC45); fallback income (1: SC45) Issues: lag time between investment and income (1: SC45)			
	Established					
Skilled trade	Precarious	SC10	<u>SC21</u> – Livelihood reasons: one of main incomes (1: SC21); funds other investments – business (1: SC21); fallback income (1: SC21) Limiting factors: infrastructure - difficulties paying labourers in the rainy season (1: SC21)			SC51
	Becoming established	<u>SC04</u> , SC09, <u>SC20</u> – Livelihood reasons: one of main incomes (1: SC04); fallback income (3: all); social reasons: provide job opportunities (1: SC20)				SC12 , SC50 Enabling factors: expand farm if road improved (1: SC50)
	Established	<u>SC07</u> , SC17, <u>SC42</u> – Livelihood reasons: one of main incomes (2: SC07, SC42); fallback income (1: SC42); preparation for return to village (2: SC07, SC42 – after retirement); social reasons: produce given to relatives as in-kind remittances (1: SC17) Enabling factors: Improved road access (1: SC42); free	SC08 Enabling factors: inherited farm (1: SC08) Limiting factors: infrastructure - difficulties transporting produce (1: SC08) Issues: lag time between investment and income (1: SC08)	<u>SC15</u> , <u>SC31</u> – Livelihood reasons: one of main incomes (1: SC15); farm can be sold to raise funds (1: SC31); social reasons: provide inheritance to children (1: SC15) Enabling factors: would farm during off-season for urban activity if road improved (1: SC31)		SC19 – Livelihood reasons: wants to farm during off-season for urban activity (1: SC19); social reasons: encouraged by relative (1) Limiting factors: limited availability of land (1: SC19)

		access to land (1: SC42); inherited farm (1: SC07); legal to farm (1: SC42) Limiting factors: shortage of labour (1: SC42)		Limiting factors: infrastructure - difficult to get to the farm to work it regularly (1: SC31); unreliable workers (1: SC31); limited skills and knowledge about farming (1: SC31); doesn't enjoy farm work (1: SC31) Reasons for previously abandoning: inability to pay workers (1: SC15)		
Business	Precarious					
	Becoming established	<u>SC37, SC52 – Livelihood reasons:</u> one of main incomes (1: SC37); preparation for return to village after retirement (1: SC37) Limiting factors: cost of establishing and maintaining a farm (1: SC37)	SC33, SC38 – Livelihood reasons: reliable incomes (1: SC33); business venture (1: SC38); fallback income (2: all) Enabling factors: free access to land (1: SC38); legal to farm (1: SC38) Limiting factors: limited availability of land (1: SC33) Reasons for abandoning: portion of farm taken by national park (1: SC33)			SC16, SC44 – Livelihood reasons: fallback income (1: SC16) Enabling factors: free access to land (1: SC16) Limiting factors: cost of establishing and maintaining a farm (1: SC16); infrastructure – difficulties selling produce (1: SC16); doesn't enjoy farm work (1: SC16)
	Established			<u>SC39 – Livelihood reasons:</u> one of main incomes (1: SC39); business venture (1: SC39); fallback income (1: SC39) Enabling factors: Improved road access (1: SC39); free access to land (1: SC39);	SC22, SC48 - Social reasons: provide inheritance to children (1: SC22) Reasons for abandoning: lack of strength (1: SC48); infrastructure –	SC46, SC47 Limiting factors: cost of establishing and maintaining a farm – cost of workers (1: SC47); lack of strength (1: SC47); lack of skills

				money from urban activities needed to pay labourers (1: SC39)	difficulties selling produce (1: SC48); portion of farm taken by national park (1: SC48); owns an urban cash crop farm (1: SC48); owns urban subsistence farm (1: SC22); established and self-sufficient in town (1: SC22)	and knowledge about farming (1: SC46)
Formal employment	Precarious					
	Becoming established		SC43 – <i>Livelihood reasons</i> : fallback income (1: SC43); <i>activity for school holidays when teaching</i> (1: SC43)			SC55 Limiting factors : cost of establishing and maintaining a farm (1: SC55)
	Established	SC03, SC24 – <i>Livelihood reasons</i> : one of main incomes (1: SC24); fallback income (1: SC24); <i>aims to establish urban farm</i> (1: SC24) Enabling factors : free access to land (1: SC24); inherited farm (1: SC24) Limiting factors : lack of interest (1: SC03)	SC54 Enabling factors : <i>expand farm if road improved</i> (1: SC54)		SC40 - [owns urban cash crop farm (1: SC40)] Enabling factors : free access to land (1: SC40) Reasons for abandoning : infrastructure – difficulties selling produce (1: SC40)	SC18, SC34, SC41, SC49, SC53 – <i>Livelihood reasons</i> : <i>business venture</i> (2: SC41, SC53); [owns urban cash crop farm (1: SC41)] Limiting factors : infrastructure – difficulties selling produce (1: SC41); limited availability of land (1: SC41); lack of strength (1: SC18); lack of interest (1: SC49)

Red ID = second generation

Underlined IDs = mature/productive farm

Reasons for hunting by type and establishment of urban livelihood

Current livelihood		Infrequent hunter	Frequent hunter	Non-hunter
Education	Precarious	SC27 - Livelihood motives: supplementary income, activity during school holidays	SC02, SC28, SC29, SC56 – Livelihood motives: supplementary income, activity during school holidays, fallback income; personal motives: avoid being idol, practice using gun after military training	SC05, SC14, <u>SC30</u> , SC32, SC35 – Livelihood motives: fallback income
	Becoming established			
	Established			
Casual work	Precarious	<u>SC11</u> , SC23 – Livelihood motives: supplementary income, fallback income; situational motives: join in with village activities; social motives: get meat to help the family		SC01, SC36, SC57
	Becoming established			SC45
	Established			
Skilled trade	Precarious		SC10 - Livelihood motives: supplementary income, reduce expenditure	<u>SC21</u> , SC51
	Becoming established	SC50 – Social motives: help protect family crops	SC04 - Livelihood motives: supplementary income,	SC09, SC12 , <u>SC20</u>
	Established	SC31 – Livelihood motives: fallback income, reduce expenditure; situational motives: get pocket money when in village to 'buy soap'; personal motives: good at hunting, enjoys hunting; social motives: encouraged to hunt by relative	SC19 - Livelihood motives: supplementary income, activity during off-season for urban income	SC07 , SC08 , <u>SC15</u> , <u>SC17</u> , <u>SC42</u>
Business	Precarious			
	Becoming established	SC33 – Cultural motives: desire to eat bushmeat	SC44 – Livelihood motives: fallback income	SC16 , <u>SC37</u> , SC38, <u>SC52</u>
	Established			SC22, <u>SC39</u> , SC46 , SC47 , SC48
Formal employment	Precarious			
	Becoming established	SC55 – Livelihood motives: reduce expenditure; social motives: help protect family crops; cultural motive: desire to eat bushmeat		<u>SC43</u>
	Established			SC03 , SC18, <u>SC24</u> , SC34, SC40, SC41 , SC49 , SC53 , <u>SC54</u>

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Reasons for not hunting by type and establishment of urban livelihood

Current livelihood		Infrequent hunter	Frequent hunter	Non-hunter
Education	Precarious	SC27	SC02, SC28, SC29, SC56 – <i>Personal reasons</i> : safety concerns regarding hunting (1)	SC05, SC14, <u>SC30</u> , SC32, SC35 - <i>Personal reasons</i> : dislike for hunting (1); physically demanding (1); no experience (1)
	Becoming established			
	Established			
Casual work	Precarious	<u>SC11</u> , SC23		SC01, SC36, SC57 - <i>Personal reasons</i> : safety concerns (2); no experience (2)
	Becoming established			SC45
	Established			
Skilled trade	Precarious		SC10	<u>SC21</u> , SC51 - <i>Livelihood reasons</i> : Too busy with other activities (1); <i>personal reasons</i> : dislike for hunting (1); no experience (1)
	Becoming established	SC50	<u>SC04</u>	SC09, SC12 , <u>SC20</u> - <i>Personal reasons</i> : no experience (1); <i>legal reasons</i> : deterred by ecoguards (1)
	Established	SC31	SC19	SC07 , SC08 , <u>SC15</u> , <u>SC17</u> , <u>SC42</u> – <i>Livelihood reasons</i> : Too busy with other activities (1); depletion of wildlife (1); <i>personal reasons</i> : not good at hunting (1); no experience (1)
Business	Precarious			
	Becoming established	SC33 - <i>Personal reasons</i> : dislike for trapping due to wastage (1)	SC44	SC16 , <u>SC37</u> , SC38, <u>SC52</u> - <i>Livelihood reasons</i> : Too busy with other activities (1); <i>personal reasons</i> : not interested (1); no experience (1); <i>social reasons</i> : parental guidance (1)
	Established			SC22, <u>SC39</u> , SC46 , SC47 , SC48 - <i>Personal reasons</i> : not interested (1); never lived in the village (2)
Formal employment	Precarious			
	Becoming established	SC55		<u>SC43</u>
	Established			SC03 , SC18, <u>SC24</u> , SC34, SC40, SC41 , SC49 , SC53 , <u>SC54</u> - <i>Personal reasons</i> : safety concerns (1); dislike for hunting (1); not good at hunting (1); not interested (3); no experience (1); <i>social reasons</i> : set a good example (1); <i>legal reasons</i> : deterred by ecoguards (2)

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Reasons for not hunting in the future by type and establishment of urban livelihood

Current livelihood		Infrequent hunter	Frequent hunter	Non-hunter
Education	Precarious	SC27 - <i>Livelihood reasons</i> : engaged in more profitable activity (formal employment) (1)	SC02, SC28, SC29, SC56	SC05, SC14, <u>SC30</u> , SC32, SC35
	Becoming established			
	Established			
Casual work	Precarious	<u>SC11</u> , SC23 - <i>legal reasons</i> : deterred by ecoguards (1)		SC01, SC36, SC57
	Becoming established			SC45
	Established			
Skilled trade	Precarious		SC10 - <i>Livelihood reasons</i> : too busy with other activities (1); <i>personal reasons</i> : dislike for hunting (1)	<u>SC21</u> , SC51
	Becoming established	SC50	<u>SC04</u> – <i>Personal reasons</i> : safety concerns (1)	SC09, SC12 , <u>SC20</u>
	Established	SC31 - <i>Livelihood reasons</i> : limited earnings potential (1); depletion of wildlife (1); <i>personal reasons</i> : old age (1); <i>legal reasons</i> : deterred by ecoguards (1)	SC19 - <i>Livelihood reasons</i> : limited earnings potential (1); hunting as indicator of lack of progress (1); too busy with other activities (1)	SC07 , SC08 , <u>SC15</u> , <u>SC17</u> , <u>SC42</u>
Business	Precarious			
	Becoming established	SC33	SC44	SC16 , <u>SC37</u> , SC38, <u>SC52</u>
	Established			SC22, <u>SC39</u> , SC46 , SC47 , SC48
Formal employment	Precarious			
	Becoming established	SC55		<u>SC43</u>
	Established			SC03 , SC18, <u>SC24</u> , SC34, SC40, SC41 , SC49 , SC53 , <u>SC54</u>

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Farming during economic stress by type and establishment of urban livelihood

Current livelihood		Small farm	Medium farm	Large farm	Abandoned farm	No farm
Education	Precarious	SC05, SC14, <u>SC30</u> , SC32, SC35 – maintain farm (4: SC05, SC30, SC32, SC35); expand farm (1: SC14); return to the village to farm (1: SC05)	SC29, SC56 – maintain farm (2: SC29, SC56); increase output with chemicals (1: SC29); return to the village to farm (1: SC29)			SC27, SC02, SC28 - maintain farm (3: SC02, SC27, SC28) ; return to the village to farm (2: SC02, SC28); reduce number of workers (1: SC27)
	Becoming established					
	Established					
Casual work	Precarious	SC01, <u>SC11</u> , SC36 – maintain farm (1: SC36); expand farm (2: SC01, SC11); put more effort (2: SC01, SC11); return to the village to farm (1: SC11)			SC57 - maintain farm (1: SC57) ; return to the village to farm (1: SC57)	SC23
	Becoming established		SC45 – maintain current farm – abandon plans to expand (1: SC45); no money to expand (1: SC45)			
	Established					
Skilled trade	Precarious	SC10 – expand farm (1: SC10)	<u>SC21</u> – expand farm (1: SC21); work farm rather than pay labourers (1: SC21), return to the village to farm (1: SC21)			SC51 – reduce farm (1: SC51)
	Becoming established	<u>SC04</u> , SC09, <u>SC20</u> – maintain farm (1: SC09); expand farm (2: SC04, SC20); return to the village to farm (1: SC20)				SC12 , SC50 - maintain farm (2: SC12, SC50)
	Established	SC07 , SC17, SC42 – maintain farm (2: SC07 , SC42); work	SC08 – maintain farm (1: SC08)	SC15, SC31 – reduce farm (1: SC15) ; not		SC19 – maintain farm (1: SC19)

		farm rather than pay labourers (1: SC42); abandon farm (1: SC17) ; no money for inputs or labour (1: SC17)		enough money to maintain all (1: SC15); abandon farm (1: SC31) ; would sell farm (1: SC31)		
Business	Precarious					
	Becoming established	<u>SC37</u> , <u>SC52</u> - maintain farm (1: SC37); abandon farm (1: SC52) ; no money for inputs or labour (1: SC52)	SC33, SC38 – expand farm (2: SC33, SC38) ; work farm rather than pay labourers (1: SC33); return to the village to farm (2: SC33, SC38); produce more food crops (2: SC33, SC38)			SC16 , SC44 – <i>maintain farm (1: SC44)</i>
	Established			<u>SC39</u> - maintain farm (1: SC39)	SC22, SC48 – rely on urban cash crop farm (1: SC48); rely on urban food crop farm (1: SC22)	SC46 , SC47 - <i>maintain farm (1: SC46)</i> ; abandon farm (1: SC47) ; <i>reduce spending on farm to cover other household costs (1: SC47)</i>
Formal employment	Precarious					
	Becoming established		<u>SC43</u> – maintain current farm – abandon plans to expand (1: SC43); produce more food crops (1: SC43); return to the village to farm (1: SC43); no money to expand (1: SC43)			SC55 – <i>maintain farm (1: SC55)</i>
	Established	SC03 , <u>SC24</u> - maintain farm (2: SC03 , SC24)	<u>SC54</u> - maintain farm (1: SC54); work farm rather than pay labourers (1: SC54)		SC40 – rely on urban cash crop farm (1: SC40)	SC18, SC34, SC41 , SC49 , SC53 – <i>maintain farm (1: SC53)</i> ; <i>make labourers work harder for less money (1: SC53)</i> ; rely on urban cash crop farm (1: SC41)

Red ID = second generation Underlined IDs = mature/productive farm

Farming during economic shock by type and establishment of urban livelihood

Current livelihood		Small farm	Medium farm	Large farm	Abandoned farm	No farm
Education	Precarious	SC05, SC14, <u>SC30</u> , SC32, SC35 – maintain farm (4: SC05, SC30, SC32, SC35) ; work farm rather than pay labourers (1: SC32); return to the village to farm (2: SC32, SC35); abandon farm (1: SC14) ; hand over farm to relatives (1: SC14)	SC29, SC56 – maintain farm (2: SC29, SC56) ; increase output with chemicals (1: SC29); return to the village to farm (1: SC29)			SC27, SC02, SC28 – maintain farm (2: SC02, SC28) ; return to the village to farm (1: SC28); reduce farm (1: SC27) ; reduce number of workers (1: SC27)
	Becoming established					
	Established					
Casual work	Precarious	SC01, <u>SC11</u> , SC36 – maintain farm (2: SC11, SC36) ; expand farm (1: SC01) ; return to the village to farm (2: SC01, SC11, SC36)			SC57 – maintain farm (1: SC57)	SC23 – abandon or not start farm (1: SC23)
	Becoming established		SC45 – maintain current farm – abandon plans to expand (1: SC45)			
	Established					
Skilled trade	Precarious	SC10 – expand farm (1: SC10) ; return to the village to farm (1: SC10)	<u>SC21</u> – maintain farm (1: SC21)			SC51 – maintain farm (1: SC51)
	Becoming established	<u>SC04</u> , SC09, <u>SC20</u> – maintain farm (1: SC20) ; expand farm (2: SC04, SC09) ; return to the village to farm (2: SC04, SC09)				SC12 , SC50 – maintain farm (1: SC50) ; abandon farm (1: SC12) ; hand over farm to relatives (1: SC12)
	Established	<u>SC07</u> , SC17, <u>SC42</u> – maintain farm (2: SC07, SC42) ; abandon farm (1: SC08)	SC08 – maintain farm (1: SC08)	<u>SC15</u> , <u>SC31</u> – maintain farm (1: SC31) ; reduce farm (1: SC15) ; rely on		SC19 – maintain farm (1: SC19)

		SC17); no money for labour or inputs (1: SC17)		urban food crop farm (1: SC31)		
Business	Precarious					
	Becoming established	<u>SC37</u> , <u>SC52</u> – maintain farm (1: SC37); no money to expand (1: SC37); abandon farm (1: SC52); no money for labour or inputs (1: SC52)	SC33, SC38 – expand farm (2: SC33, SC38) ; work farm rather than pay labourers (1: SC33); put more effort (1: SC33) return to the village to farm (2: SC33, SC38); produce more food crops (1: SC38)			SC16, SC44 – start farm (1: SC16); reduce farm (1: SC44); not enough money to maintain all (1: SC44)
	Established			<u>SC39</u> – maintain farm (1: SC39)	SC22, SC48 – rely on urban cash crop farm (1: SC48); rely on urban food crop farm (1: SC22)	SC46, SC47 - maintain farm (1: SC47); no money to expand (1: SC47); abandon farm (1: SC46); hand over farm to relatives (1: SC46)
Formal employment	Precarious					
	Becoming established		<u>SC43</u> – maintain current farm – abandon plans to expand (1: SC43) ; return to the village to farm (1: SC43)			SC55 – maintain farm (1: SC55)
	Established	SC03, SC24 - maintain farm (1: SC24); abandon farm (1: SC03)	SC54 – abandon farm (1: SC54); no money for labour or inputs (1: SC54)		SC40 – rely on urban cash crop farm (1: SC40)	SC18, SC34, SC41, SC49, SC53 – maintain farm (1: SC53) ; make labourers work harder for less money (1: SC53); rely on urban cash crop farm (1: SC41)

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