EVALUATING HOLISTIC MANAGEMENT IN HWANGE COMMUNAL LANDS, ZIMBABWE: AN ACTOR-ORIENTED LIVELIHOOD APPROACH, INCORPORATING EVERYDAY POLITICS AND RESISTANCE

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DECLARATION

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ABSTRACT

Rangelands in the semi-arid and arid regions of the world support livelihoods through their provision of multiple goods and services. Livestock production, for example, occurs in rangelands both as extensive ranching under freehold tenure and as collective ranching under communal tenure systems. However, the sustainability of rangelands is threatened and has been a major concern this century, leading to a variety of interventions. Holistic management (HM) is one such example, designed by its proponents as a panacea to halt degradation and, recently, climate change effects in the rangelands of Africa and beyond. HM has been implemented in the Hwange Communal Lands (HCLs) of Zimbabwe since 2010. In principle, the programme is aimed at restoring degraded watersheds and croplands through utilising properly managed livestock. To achieve this, two principles are promoted under HM, namely (i) holistic planned grazing (HPG) and (ii) animal impaction of crop fields. However, the effects of HM on the livelihoods of its beneficiaries currently are poorly understood.

In order to address this lacuna, this study aimed to determine both the intended and unintended effects of a community-based land restoration programme called Holistic Land and Livestock Management (HLLM) in the HCLs of Zimbabwe on the livelihoods of its beneficiaries through a conceptual framework that combined an actor-oriented livelihoods approach with concepts of everyday politics and resistance. This was done by exploring the impact of HLLM on the six types of farmers' assets, adoption patterns, farmers' reactions to the introduction of HLLM, and challenges preventing farmers from adopting HLLM. Case studies employing a qualitative and exploratory research design were undertaken in three communities that were selected purposively from a total of 18 communities in which the HLLM programme had been promoted by the Africa Centre for Holistic Management (ACHM) in order to discover different perspectives on the effects of the programme on the livelihoods of its beneficiaries. The study employed qualitative Participatory Rural Appraisal tools, focus group discussions, participant observation, document analysis, and key informant and semi-structured interviews. These lines of enquiry enabled triangulation and cross-checking of information to enhance the reliability and validity of the research findings.

The study showed that adoption levels were disappointingly low across all the study sites. Several challenges, including livestock diseases, predation, cultural stigma, labour constraints and witchcraft fears, were among the barriers explaining the low rate of adoption in the HCLs. The findings reveal that the farmers were concerned more with immediate problems, especially lack of water, than with land degradation, which is the primary focus of HLLM. Thus the

farmers responded by complying, accommodating and covertly resisting the ACHM's efforts to implement HLLM in order to suit their needs, using creative everyday politics and resistance. The study concludes that, although HLLM is required in such semi-arid environments, it is not sufficient to sustain rural livelihoods in its current state. While the main focus of HLLM is to improve the natural capital (i.e. restoring degraded watersheds), it should be complemented by and aligned with the farmers' other development priorities, especially those relating to water.

KEY WORDS

Actor-oriented livelihoods perspective, ACHM, everyday politics and resistance, holistic management, HLLM, Zimbabwe

OPSOMMING

Weiveld in die halfdor- en dor gebiede van die wêreld ondersteun menslike lewensbestaan deur die verskaffing van ’n verskeidenheid goedere en dienste. Veeproduksie, byvoorbeeld, kom in weivelde voor as beide ekstensiewe veldbeesboerdery onder grondbesit en kollektiewe veldbeesboerdery onder gemeenskaplike eiendomsreg. Die volhoubaarheid van weiveld word egter bedreig en het in hierdie eeu ’n groot bron van kommer geword, wat gelei het tot ’n verskeidenheid ingrypings. Holistiese bestuur (*Holistic management (HM)*) is een van hierdie en is deur sy voorstanders ontwerp as ’n wondermiddel om degradasie, en meer onlangs die effekte van klimaatsverandering op die weivelde van Afrika en verder, stop te sit. HM is reeds sedert 2010 in die Hwange gemeenskaplike gronde (HGG’e) in Zimbabwe geïmplementeer. In beginsel is die doel van die program om gedegradeerde waterskeidings en landerye te herstel deur gebruik te maak van behoorlik bestuurde vee. Om dit te bereik word twee beginsels onder HM bevorder, naamlik (i) holisties beplande weiding (*holistic planned grazing (HPG)*) en (ii) dier-impaksie van landerye (*animal impaction of crop fields*). Die effekte van HM op die lewensbestaan van sy begunstigdes word tans egter swak begryp.

Om hierdie leemte aan te spreek, was die doel van hierdie studie om die bedoelde en onbedoelde gevolge van ’n gemeenskapsgebaseerde grondherstelprogram (*Holistic Land and Livestock Management (HLLM)*) in die HGG’e van Zimbabwe op die lewensbestaan van die begunstigdes te bepaal deur middel van ’n konseptuele raamwerk wat ’n akteur-georiënteerde lewensbestaansbenadering met konsepte van alledaagse politiek en weerstand gekombineer het. Dít is gedoen deur die impak van HLLM op ses soorte van bates wat boere het, hulle aannemingspatrone, boere se reaksies op die invoering van HLLM, en uitdagings wat verhoed het dat boere HLLM aanneem, te ondersoek. Gevallestudies met gebruik van ’n kwalitatiewe en verkennende navorsingsontwerp is in drie gemeenskappe onderneem wat doelbewus uit ’n totaal van 18 gemeenskappe waarin die HLLM-program deur die *Africa Centre for Holistic Management* (ACHM) bevorder word, geselekteer is om verskillende perspektiewe van die effekte van die program op die lewensbestaan van die begunstigdes te ontdek. Die studie het kwalitatiewe Deelnemende Landelike Takseringsgereedskap (*Participatory Rural Appraisal*), fokusgroepbesprekings, deelnemerwaarneming, dokument analise en sleutel-informant en semi-gestruktureerde onderhoude gebruik. Hierdie ondersoeklyne het triangulasie en kruiskontrole van die inligting moontlik gemaak, wat die betroubaarheid en geldigheid van die navorsingsbevindings verhoog het.

Die studie toon dat aannemingsvlakke teleurstellend laag was in al die studieliggings. Verskeie uitdagings, insluitend veesiektes, predasie, kulturele stigma, arbeidsbeperkings en vrese vir heksery was onder die hindernisse wat die lae aannemingstempo in die HGG'e verklaar. Die bevindinge wys dat die boere meer besorgd was oor onmiddellike probleme, veral die tekort aan water, as oor grondagteruitgang, wat die vernaamste fokus van HLLM is. Die boere het dus gereageer deur instemming, aanpassing en onderlangse weerstandbieding tot die ACHM se pogings om HLLM te implementeer om sodoende hulle eie behoeftes te pas deur kreatiewe alledaagse politiek en weerstand te gebruik. Die studie kom tot die gevolgtrekking dat hoewel HLLM in sulke halfdor omgewings nodig is, dit nie in sy huidige staat voldoende is om landelike lewensbestaan te onderhou nie. Hoewel die vernaamste fokus van HLLM is om die natuurlike kapitaal te verbeter (m.a.w. deur gedegradeerde waterskeidings te herstel), moet hierdie rol gekomplementeer word deur en belyn word met die boere se ander ontwikkelingsprioriteite, veral dié wat verband hou met water.

TREFWOORDE

Akteurgeoriënteerde lewensbestaanperspektiewe, ACHM, alledaagse politiek en weerstand, holistiese bestuur, HLLM, Zimbabwe

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CONTENTS

TABLES

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ACRONYMS AND ABBREVIATIONS

A1, A2	Small and large farm models in fast track land reform
ACHM	Africa Centre for Holistic Management
AEZ	Agro Ecological Zone
AREX	Agricultural Research and Extension
ARC	Agricultural Research Council
AOA	Actor-oriented Approach
ARC	Agricultural Research Council
CAC	Community Action Cycle
CAMPFIRE	Communal Areas Management Programme for Indegenous Resources
CLs	Communal Lands
CPR	Common Property Resources
DAC	Development Aid Counties
DFID	Department for International Development
FAO	Food and Agricultural Organization
FGD	Focus Group Discussions
FPL	Food Poverty Line
FTLRP	Fast Track Land Reform Programme
GNU	Government of National Unity
HCLs	Hwange Communal Lands
HLLM	Holistic Land and Livestock Management
HM	Holistic Management
HPG	Holistic Planned Grazing
PRAs	Participatory Rural Appraisals
LADA	Land Degradation Assessment in Drylands project
LFA	Landscape Functional Analysis
NGO	Non-Governmental Organisation
NRB	Natural Resources Board
NLHA	Native Land and Husbandry Act
MDC	Movement for Democratic Change
ODA	Official Development Assistance
OFDA	Office of U.S Foreign Disaster Assistance
ORAP	Organization of Rural Associations for Progress

SLF	Sustainable Livelihoods Framework
TTLs	Tribal Trust Lands (later communal lands)
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
US	United States
USAID	United States Agency for international Development
VBFs	Village-Based Facilitators
ZANU-PF	Zimbabwe African National Union – Patriotic Front
ZIMVAC	Zimbabwe Vulnerability Assessment Committee
ZIMSTAT	Zimbabwe National Statistics Agency
$	United States dollar

CHAPTER 1: SETTING THE SCENE: COMMUNAL RANGELAND DEGRADATION AND HOLISTIC MANAGEMENT

Drylands[1] occupy about 41% of the Earth's surface and more than 2 billion people depend on them for their livelihoods in more than 100 countries (Middleton et al. 2011). Infact, local livelihoods in the drylands are more dependent on ecosystem goods and services (that is, provision, regulating, supporting and cultural) which they deliver than in any other ecosystem (Millenium Ecosystem Assessment 2005). However, drylands face severe land degradation (Millenium Ecosystem Assessesment 2005), adversely affecting about 250 million people in developing countries (Reynolds et al. 2007). Land degradation is more pronounced in the drylands because such ecosystems are vulnerable to over-exploitation, inappropriate landuse and climate change (Schwilch, Hessel & Verzandvoort 2012). Land degradation is a complex global environmental problem that can negatively affect future global food and energy security, water availability, capacities to adapt to and mitigate climate change and biodiversity conservation (Millenium Ecosystem Assessement 2005; Neely, Bunnings & Wilkes 2009). Rangelands, which occupy a large proportion of the surface area in the drylands (Wilcox 2007) and support livestock production, are increasingly becoming degraded. It is estimated that 73% of the world's rangelands have lost their productivity due to land degradation (Gabathuler et al. 2009; UNEP 2006). Holistic management (HM), a decision making framework developed by Allan Savory, is one of the solutions that has been developed with the aim of restoring degraded rangelands, enhancing their productivity and mitigating the effects of climate change. However, there is paucity of studies to date that investigate the impacts of HM, particularly in communal rangeland areas.

This chapter provides the background of the thesis. The rationale for studying the impacts of HM as a rangeland rehabilitation approach on the livelihoods of smallholder farmers beneficiaries and the research aims and objectives are set out. The chapter concludes with an articulation of the organisation of the thesis.

[1] According to MEA (2005), the term dry lands describes hyper-arid, arid, semi-arid and dry subhumid areas characterized by evaporation rates at least 1.5 times greater than mean annual precipitation.

1.1 CONTEXTUALISING HOLISTIC MANAGEMENT

Natural rangelands in the dry lands of the globe support livelihoods through the provision of a range of goods and services (Reid, Galvin & Kruska 2008). Livestock production is one such example, occurring as either extensive ranching under freehold tenure or collective ranching under communal tenure (Niamir-Fuller & Turner 1999; Reid, Galvin & Kruska 2008). About one billion poor people across the globe, particularly in dry lands where other agricultural activities are less favourable, rely on livestock as a major source of food and livelihood (AU-IBAR 2012). An estimated 23% of the world's poor (about 300 million people) live in sub-Saharan Africa, and about 60% of these poor people rely on livestock for some part of their livelihoods (Thornton et al. 2002). It is estimated that 25 million pastoralists and 240 million agro-pastoralists depend on livestock as a major source of income in sub-Saharan Africa (AU-IBAR 2012; IFPRI and ILRI 2000). However, these dry lands used for livestock production are under threat of land degradation (FAO 2010b; Neely, Bunnings & Wilkes 2009), with an estimated global cost of US$40 billion annually (FAO 2010b). It is calculated that 10 to 20% of the dry lands are already degraded (Millennium Ecosystem Assessment 2005).

Land degradation in the dry lands is "one of the most serious threats facing humanity" (Kofi Annan 2006, cited in Conliffe 2011:44), with more than one billion people being at risk of its effects (Low 2013; Millennium Ecosystem Assessment 2005; World Meterological Organization 2005). Several definitions of land degradation exist in literature, with early definitions revolving around biophysical aspects (that is, vegetation change and soil erosion). However, the concept of land degradation has evolved over time (Nachtergaele et al. 2010). More recent definitions of land degradation have moved away from the purely biophysical aspects to an emphasis on the "reduction in the capacity of land to perform ecosystem functions and services that support society and development" (FAO 2010b:1). According to the LADA definition, land degradation is the "reduction in the capacity of the land to provide ecosystem goods and services to assure its functions over a period of time to its beneficiaries" (Nachtergaele et al. 2010:73)

Although land degradation is a major concern in both freehold and communal tenure, it is thought to be more prevalent in communal tenure systems due to the so-called Hardin (1968) "tragedy of the commons" (Bennett, Palmer & Blackett 2012). According to Hardin (1968), individuals have no incentive to reduce livestock numbers, but instead tend to increase them at

the expense of the communally owned resource, leading to land degradation and desertification, and perpetuating the belief that people irrationally keep more livestock than they require – a scenario that Herskovits (1926) referred to as "cattle complex". The term 'communal tenure' is problematic to define in the African context (Cousins 2009). Generally, the term has been used to refer to the joint or collective use of land and other natural resources, yet African systems also include the allocation of individual or family rights to other land uses and types, such as cropping land and common property resources (Cousins 2009:2). In this study, communal tenure systems, as informed by Cousins (2009), are used to differentiate the system from freehold, private tenure. In the context of Zimbabwe, communal tenure is characterised by two key components (Guveya & Muir-Leresche n.d.). The first comprises arable and residential land held under traditional freehold tenure, with subdivision rights granted to families that may be bequeathed or inherited (Guveya & Muir-Leresche n.d.:3). The second comprises a common property regime that grants access to grazing areas, woodlands, water and other natural resources (Cousins 1987; Guveya & Muir-Leresche n.d.). According to Bird and Shepherd (2003), land in the communal areas of Zimbabwe is held by the state and allocated to the individuals by traditional leaders based on the customary law.

Thus, communal rangelands are held and administered either as common property resources or as common pool resources (Toulmin, Hesse & Cotula 2004). These are characterised by two distinct features, namely the exclusion of users is difficult, while each user is capable of subtracting from the welfare of others (Berkes et al. 1989; Ostrom et al. 1999). However, some communal rangelands are open-access resources (Ainslie 1998), where the exclusion of non-user groups from the resources is difficult (Cousins 1992).

For decades, the state of communally grazed rangelands has been a major concern, both in Africa and globally (Vetter 2003; 2005a). Communal rangelands are commonly perceived as overstocked, overgrazed, degraded and unproductive (Lamprey 1983; Sinclair & Fryxell 1985), leading to various interventions to reduce livestock numbers in an effort to halt the problem of land degradation (Vetter 2005a). However, more recently, research conducted in southern and eastern Africa has questioned this simplistic view of communal grazing systems, especially the economic and ecological assumptions and the common perception that communal rangelands are overgrazed and unsustainably managed (for example Abel & Blaikie 1989; Ellis & Swift 1988; Mtetwa 1982; Scoones 1995). In addition, Allan Savory, the proponent of holistic management,

has also challenged the mainstream view of overstocking (Cousins 1987). Savory and Butterfield (1999) believe that overgrazing is a function of the length of time a plant is exposed to grazing before it recovers, rather than animal numbers.

In Zimbabwe, these debates have been dominant in the communal lands (CLs). Previously known as native reserves (NR), and then as Tribal Trust Lands (TTLs) after the Act of 1967, CLs account for 42% of the total land surface of the country, of which 74.2% of the CLs are located in the natural regions IV and V (Cousins 1992; Scoones 1990). Native reserves were created after 1898 when the British government evoked the Southern Rhodesia Order-in-Council which required the British South African (BSA) Company to establish native reserves for the African population (Dore 2009; Hanlon, Manjengwa & Smart 2013; Rukuni 2006). Natural regions VI and V were recommended for extensive and semi-extensive livestock production (Scoones and Cousins 1989). Currently, CLs in Zimbabwe support about 67% of the total population (Zimbabwe National Statistics Agency [ZIMSTAT] 2012). An estimated two thirds of the population live in the agro-ecological regions IV and IV, which are both characterised by low and erratic rainfall (Scoones & Cousins 1989). Livestock production is a major livelihood activity in the CLs, where about 67% of the country's cattle population and 85% of the goats are owned by smallholder agro-pastoralists (Brown & Carr 2014). The livestock sector in Zimbabwe contributes about 34% of the total agricultural GDP (FAO 2005). Cattle, like anywhere else in the region, have multiple purposes in the CLs, such as the provision of manure, transport, milk, savings, paying bride price and meat (Mavedzenge et al. 2006), thus cattle in communal lands have a higher economic return than single-use beef animals in commercial farming systems (Barrett 1992; Scoones 1992).

The CLs in Zimbabwe have long been viewed as overstocked and overgrazed, consequently resulting in low levels of productivity (Guveya 2008; Scoones & Cousins 1989). Thus, policies and programmes aimed at improving livestock production and rangeland management have been a key feature of agricultural development initiatives in these areas (Cousins 1992; 1999) to halt the problem of rangeland degradation in Zimbabwe since the 1920s (see, for example, Cousins 1987; 1988; 1992).

One such example is holistic management (HM), which emerged in Zimbabwe in the 1960s as a solution to the problem of rangeland degradation and has since been applied in the CLs. Despite

its vigorous promotion in Zimbabwe, research investigating the efficacy of this intervention is still limited. This study hopes to address this lacuna, evaluating the holistic land and livestock management (HLLM) currently being promoted in the CLs by a local NGO called the Africa Centre for Holistic Management (ACHM).

Conventional econometric models and economic surplus models generally have been considered a 'best practice' in impact-evaluation studies (Alston, Norton & Pardey 1999). However, these conventional models have generally failed to explain complex issues arising as a result of outside interventions. Thus, there has been a growing interest in using the sustainable livelihoods framework (SLF) as an analytical framework in impact-evaluation studies (Bourdillon et al. 2003; Cramb & Culasero 2003; Hallman, Lewis & Begum 2003; Hossain et al. 2003; Mahalaya 2010; Nkala 2012; Place et al. 2003; Reddy et al. 2004). Although the SLF is useful, it is found to be inadequate in its treatment of power and political issues (Arce 2003; Baumann & Sinha 2001; Carr 2008; 2013; De Haan & Zoomers 2005; Jakimow 2012; 2013; Scoones 2009, O'Laughlin 2004), as well as culture (Adato & Meinzen-Dick 2002; Bebbington 1999). In order to address these inadequacies, this study integrated the SLF into other social constructs, namely an actor-oriented perspective (Long 1989; 2001; 2004), everyday politics (Kerkvliet 1995; 2009) and everyday forms of resistance (Scott 1985). Thus, this study employed a modified SLF framework called an "an actor-oriented livelihoods approach, coupled with everyday politics and resistance" (Bonnin & Turner 2012; Turner 2012), as an analytical framework to assess the impact of HLLM on the livelihoods of agro-pastoralists in the Hwange Communal Lands (HCLs).

This modified framework incorporated theories from the core discipline of geography and environmental studies but also drew from others developed in anthropology, development sociology and political science, notably those concerning issues of power, politics and the cultural dimension of 'development'. The intention of this approach is to add some theoretical depth to the standard version of the livelihoods approach, incorporating other disciplinary insights and framings.

1.2 HOLISTIC LAND AND LIVESTOCK MANAGEMENT IN HCLs

Since 2005, the ACHM, supported by USAID/OFDA, has developed and implemented a project entitled "Land and livelihoods restoration through holistic management" for agro-pastoralists in the CLs of Zimbabwe and in other parts of the southern African region. By 2010, USAID/OFDA had provided about US$5.9 million to support this project (USAID 2012). The project became known as holistic land and livestock management and is based on the concept of holistic management (HM) developed by the founder of the ACHM, Allan Savory (ACHM 2013a). The central goal of HLLM is to restore degraded watersheds and croplands using livestock as a main tool. HLLM has been promoted by the ACHM in 18 communities. The ACHM began promoting HLLM in HCLs in 2010.

HM is a management framework aimed at restoring degraded water catchments and enhancing productivity (Peel 2014). Two key principles of HM have been adapted for use in the agro-pastoral communities of HCLs, namely holistic planned grazing (HPG) and animal impaction of crop fields. HPG is the new terminology used by HM advocates to refer to HM recommended grazing principles (De Villiers 2013). HPG has also been referred to as the "Savory Grazing Method" or "Holistic Resources Management" over the years (De Villiers 2012; Savory 1983). HPG involves the use of planned grazing, which ensures rotation of livestock, accompanied by the utilisation of the "herding effect" or "herd effect" (Savory & Butterfield 1999). This is likened to the behaviour of the vast herds of herbivores that existed alongside pack-hunting predators in African rangelands in the past (Savory & Butterfield 1999; Savory & Lambrechts 2012). In such cases, a predator-prey relationship existed, which ensured that the large herds of herbivores were kept bunched together for protection and constantly moving, leading to the breaking of soil capping, trampling down of plant material, dunging and urinating, and planting of seeds through hoof action, resulting in the natural maintenance of grassland health (Savory & Lambrechts 2012:36; Savory & Parsons 1980). The proponents of HPG mimicked the rotational grazing of wild herbivores by concentrating livestock in high densities in order to produce a heavy impact ("herding effect") over limited spatial and temporal scales to achieve the desired outcomes (Savory & Butterfield 1999). These include improved forage, increased ground water resources and improved stream flow and water quality (Peel 2014).

Contrary to accepted wisdom, Allan Savory argued that physical hoof impact is beneficial to the drier rangelands because it stimulates better plant succession (Savory & Parsons 1980). As such, concentrated livestock grazing will have an impact on soil characteristics through hoof action and encourage the uniform use of plant species by grazers, leading to restoration, in contrast to a lack of disturbance, which may result in over-resting, leading to poor soil conditions and "undesirable competition among plant species" (Briske et al. 2011:328).

Animal impaction or treatment of crop fields has been also promoted by the ACHM in HCL. This is part of an effort aimed at improving productivity through enhancing soil fertility in abandoned and poor fertile crop lands (ACHM 2013a). Savory introduced this concept with the aim to increase crop yields without expanding/opening up new crop fields (ACHM official 2013, Pers comm). After harvesting (in the non-growing season), livestock are kraaled in movable kraals in the crop fields at night to consume or break the stover (crop residues), break up the soil with their hooves, and deposit dung and urine (ACHM 2013a). In most cases, the livestock are kraaled for a period of nine days before the kraal is moved to another spot within the crop fields.

1.3 FORMULATION OF THE RESEARCH PROBLEM

Several reports have identified the need to test and investigate the feasibility of holistic management (formerly HRM) advocated by Savory in the communal lands of Zimbabwe (Cousins 1987:1988; Whiteside 1998:30) However, little research has been done to date to address this call. Past studies have focused mainly on comparing holistic planned grazing with other grazing systems (for example Peel 2014). A more recent evaluation study by Brown and Carr (2014) took an integrated approach to assess the impact of HLLM in Zimbabwe and Zambia. However, because of the many sites selected, this study did not allow for an in-depth understanding of the impacts of HLLM at individual sites. In order to address this lacuna, this study attempts to evaluate the impacts of HLLM on local livelihoods based on the perspectives of beneficiary smallholder farmers, through a conceptual framework that incorporates notions of everyday politics and resistance in an actor-oriented livelihood perspective.

This study comes at a time when the claims that HM, through HPG, can reverse two of the world's most challenging and interlinked global change processes, namely desertification and climate change, are heatedly debated, particularly since the founder of HM's 2013 TED

(Technology, Entertainment and Design) talk entitled "How to green the world's deserts and reverse climate change" went viral (http://www.ted.com/talks/allan_savory_how_to_green_the world's deserts and reverse climate change.html).

Limited peer-reviewed studies have been conducted to investigate the efficacy of HM in the African rangelands and further afield (De Villiers 2013), mainly focusing on controversial grazing principle promoted by HM (Briske et al. 2011; Teague et al. 2008). Most studies have tended to focus on commercial farming, while few studies have investigated the context of communal land tenure systems.

The motivation for conducting this study stems from my ambition to work as a development practitioner in the field of agriculture and rural development. This study is important for establishing the successes and failures of HLLM in HCLs. The study will also provide feedback to the ACHM and other stakeholders. It is hoped that lessons will be drawn from this study that will help to improve the HLLM programme.

1.4 RESEARCH AIM AND OBJECTIVES

The aim of this research project was to assess the impacts of holistic land and livestock management on the livelihoods of smallholder farmers in the Hwange Communal Lands, based on the perspectives of the farmers themselves.

To achieve the research aims, the objectives were to:

1. Identify challenges faced by farmers in crop and livestock production in the study sites;
2. Document adoption patterns of HLLM;
3. Understand the differentiated responses of smallholder farmers to HLLM;
4. Assess the impact of HLLM on the livelihood assets of the smallholder farmers;
5. Identify key challenges facing programme beneficiaries, HLLM and other stakeholders.

1.5 DEFINITION OF KEY TERMS

The following concepts and terms are used throughout this thesis and will therefore be briefly defined in this section.

Adopters refer to the households that used the HLLM principles during the time of the study (cf. Place et al. 2005). Adopters in this study include partial adopters (those using at least one HLLM principle, for example animal impaction of crop fields) and full adopters (using all HLLM principles).

Animal impaction of crop fields refer to the overnight kraaling of animals in the crop fields using movable kraals (boma) after the harvesting period in order to break the soils and fertilize (dung and urine) (ACHM 2013a).

Core group members refer to a group of people that works closely with ACHM that are affected and willing to do something about land degradation or interested in land restoration (ACHM 2013a).

Communal lands (CL) (formerly known as Tribal Trust Lands (TTLs) areas that were set aside for the indigenous people during the colonial era (Rukuni 2006).

Dis-adopters refer to the households that used HLLM principles originally but discontinued their involvement (cf. Place et al. 2005).

Holistic planned grazing (HPG) involves the concentration of livestock at high densities to induce heavy livestock impact over limited spatial and temporal scales with the aim of restorind degraded rangelands and or to enhance their productivity (ACHM 2013a; Peel 2014).

Landscape Functional Analysis (LFA) is a monitoring procedure that applies easily determined field indicators to assess the functional status of rangelands (Tongway & Hindley 2004:109).

Non-adopters refer to the households that never used HLLM (cf. Place et al. 2005).

1.6 REPORT STRUCTURE

Chapter 1 introduces the thesis. It begins by providing some general background to study, giving an overview of communal rangeland degradation and HM in HCLs. It then describes the research problem, stating the research aim and objectives and details the structure of the thesis.

Chapter 2 lays the foundation for the conceptualisation of the study in an extensive literature review. Key areas of literature include shifts in rural development thinking, the role of

agriculture in rural development, smallholder agriculture and its role in rural livelihoods, overview of land degradation and holistic management.

Chapter 3 provides the research context within Zimbabwe, including the role of agriculture in the Zimbabwean economy, the thorny land question and reform, a focus on livestock production and the historical background of communal rangeland regimes, both during colonial and post-colonial period. The chapter also provides a description of the study area, in terms of its location, climate and socio-economic profile.

Chapter 4 presents the theoretical frameworks of the study, namely the sustainable livelihoods approach (SLA), the actor-oriented approach (AOA), everyday politics and resistance.

Chapter 5 presents the research design and the methodology that was employed to execute the research study.

Chapter 6 presents the research findings drawn from the participatory rural appraisals (PRAs), semi-structured interviews, document review, focus group discussions, key informant interviews, observation and informal discussions.

Chapter 7 provides an analysis of the different responses of farmers to HLLM and the impacts of HLLM on the livelihoods of farmers.

Lastly, **Chapter 8** concludes the study by revisiting the objectives and summarising the research findings. The limitations of the study are identified, recommendations are made and areas of further research are suggested.

1.7 SUMMARY

This chapter has introduced the study. It has provided an overview of the problem of rangeland degradation particularly in communal areas. It has also traced ACHM's efforts to implement HM in HCLs. The chapter also outlined the aims and objectives of the study and outlined the overall organisation of the thesis.

CHAPTER 2: LITERATURE REVIEW

This chapter provides a summary of the key bodies of literature pertaining to the study topic. It provides a critical discussion of rural development perspectives, such as modernisation theory, small farm models and the sustainable livelihoods approach, to locate the four concepts that have been adopted in this study, namely the livelihoods approach, the actor-oriented approach, and everyday politics and resistance in rural development thinking. The role of agriculture in rural development thinking and livelihoods is also discussed in detail. The final section of this chapter examines land degradation and holistic management, its perceived benefits and criticisms, and how it has been practised in Zimbabwe.

2.1 SHIFTING RURAL DEVELOPMENT PERSPECTIVES

There is no single accepted definition of rural development (Clark et al. 1997), prompting Maxwell, Urey & Ashley (2001:2) to note that "there is no shortage of narrative about – or prescriptions on rural development". Rural development is an "ever-elusive" concept, particularly in sub-Saharan Africa (Muntali, Mkandawire & Tembo 2012:29), and also "multidimensional", as there is no single benchmark to understand rural situations and trends (Adisa 2012:7). The concept of rural development has gained momentum over the past 50 years and has been characterised by the continuous and dynamic evolution of development theories, themes and policies (Ellis & Biggs 2001; Muntali, Mkandawire & Tembo 2012). Some of the past narratives of rural development include 'community development', the 'Green Revolution', 'integrated rural development', 'doubly green revolution', 'sustainable agriculture', 'rural livelihoods', 'market liberalisation', 'food security' and, more recently, the Millennium Development Goals (Ellis & Biggs 2001; Muntali, Mkandawire & Tembo 2012).

Attempts to understand the paradigms of rural development often group the different theories, themes and policies by decades or era (Ellis & Biggs 2001; Phuhlisani Solutions [PS] 2009). As such, the 1960s is often characterised by modernisation theories, the 1970s by state intervention and the 1980s by market liberalisation, while the 1990s are characterised by participation and empowerment (PS 2009).

However, these paradigm shifts did not follow these "superficially neat" changes (Ellis & Biggs 2001:437). Instead, they occurred in a non-linear and non-schematic manner associated with "leads and lags in the transmission of new ideas across space and time" (Ellis & Biggs 2001:437) that overlapped, so that ideas initiated in one decade often gained currency a decade or so later (Ellis & Biggs 2001). As illustration, the sustainable livelihoods approach (Carney 1998), which has become the focus of rural development in recent years, dates back to the work of Chambers (1983) and Chambers and Conway (1992) in the 1980s to the early 1990s, and the famine analysis of the 1980s by Sen (1981) and Swift (1989), among others (Ellis & Biggs 2001). Table 2.1 provides a simple summarised list of the dominant themes in rural development discourse since the 1950s.

Table 2-1 A summary of the timeline of rural development ideals

Era	**Rural development paradigm**
1950s to 1960s	Modernisations, dual economy model, "lazy" peasants, backward agriculture, community development
1960s to 1970s	Transformation approach, technology transfer, mechanisation, agricultural extension, growth role of agriculture, start of the green revolution, rational peasants
1970s to 1980s	Redistribution with growth, basic needs, integrated rural development, state-led credit, state agricultural policies, urban bias, induced innovation, green revolution continued, rural growth linkages
1980s to 1990s	Structural adjustment, free markets, 'getting prices right', retreat of the state, rise of NGOs, rapid rural appraisals (RRA), farming systems research (FSR), food security and famine, rural development as a process, not a product, women in development (WID), poverty alleviation
1990s to 2000s	Micro-credit, participatory rural appraisals (PRA), actor-oriented rural development, stakeholder analysis, rural analysis, rural safety nets, gender and development (GAD), environment and sustainability, poverty reduction
2000s	Sustainable livelihoods approach, good governance, decentralisation, critique of participation, sector-wide approaches, social protection, poverty reduction, Millennium Development Goals (MDGs), fair trade, climate change, and "climate smart" agriculture around 2010

Source: Adapted from Ellis & Biggs (2001:439), PS (2009)

1950s to 1970s: Modernisation

From the 1950s to the 1970s, some of the dominant models in rural development included 'the dual sector' model, 'modernisation', 'backward agriculture' and 'community development' (Ellis & Biggs 2001). The dual sector model formulated by Lewis in 1954 largely influenced rural

development thinking in the 1950s. This model favoured the industrialised urban sectors over the traditional, subsistence agricultural sectors. However, by the 1960s it was noted that little progress had been made in improving the living conditions of the poor in the developing countries, and that these theories did not result in the "trickle down" of development (Moreda 2012).

1960s to 1970s: Small farm model

The paradigm shift in rural development thinking began in the early to mid-1960s, with the realisation that small farm agriculture could be an engine of economic growth and development (Ellis & Biggs 2001). The acceptance of the 'agricultural growth based on small farm efficiency' paradigm, or 'small farm first', or 'traditional' or 'subsistence' agriculture, was enhanced by the publication of *Transforming Traditional Agriculture* by Schultz in 1964 (ibid). Based on the grounds of efficiency and equity, numerous studies reported an inverse relationship between the farm size and production per unit of land, where small farms are generally thought of as having high gross returns than larger farms (Hazel et al. 2007). The success of the green revolution in Asia provided evidence of how the efficiency of small farms could result in poverty reduction and economic growth (ibid). However, it was assumed that the traditional sector could only play a passive role in the process of economic development by providing resources to the 'modern sector' (e.g. plantations, estates, commercial farms and ranches), until the later subsequently expanded to take its place (Ellis & Biggs 2001). Notwithstanding the advantages of small farms over large farms, there has been a strong bias towards large farms, as is evident through access to subsidised credit, protection of the output of large farms and the provision of infrastructure (Hazell et al. 2010). Debates on the role of small farms are longstanding (e.g. Schultz 1964) and continue (see Hazell et al. 2010; Wiggins, Kirsten & Llambi 2010).

1980s to 1990s: In this period, a 'new rural development paradigm' occurred from the commonly top-down approach, characterised by external and national-level policies, to the bottom-up approach, grassroots or process approaches (Ellis & Biggs 2001; Van der Ploeg et al. 2000). Thus, the modernisation paradigm "reached its intellectual and practical limits" (Van Der

Ploeg et al. 2000:395). The new paradigm envisaged the empowerment of rural people through participatory procedures, taking a lead in prioritising issues that affect them.

2000s: Sustainable livelihoods approach

At the dawn of the new millennium, a new approach, known as the livelihoods approach (e.g. Chambers & Conway 1992; Ellis 2000; Scoones 1998), emerged, which questions the role of smallholder agriculture in poverty reduction and economic growth. This period saw the positioning of smallholder agriculture within the livelihoods approach (Balgah & Buchenieder 2011:4). Although the livelihoods approach was developed in the 1990s, the concept gained significant currency only in the current decade (Ellis & Biggs 2001), replacing the more narrowly focused conventional approaches. Environmental issues, vulnerability reduction and disaster risk mitigation approaches are now gaining more recognition. Climate change and its impact on the poor have increasingly gained international recognition (PS 2009).

2.2 THE ROLE OF AGRICULTURE IN ECONOMIC GROWTH AND DEVELOPMENT

Agriculture has long been recognised as an important sector for promoting economic growth and reducing poverty in developing countries (Diao et al. 2007; Hazell et al. 2007). Historically, the role of agriculture in promoting economic growth has attracted the attention of economists (e.g. Johnston & Mellor 1961; Lewis 1954). However, the role of the sector in terms of its contribution to GDP, foreign exchange, employment and savings was often ignored (Moreda 2012:7). Classical theorists were pessimistic about the role of agriculture in economic growth and development.

One example of a classical theory was the “two-sector surplus labour” theory, developed by Lewis in 1954, that did not view agriculture as a major sector for economic growth and development. According to Lewis (1954), the global South countries were assumed to have “dual” economies – made up of the traditional agricultural sector, mainly subsistence, with low productivity, low incomes and savings, and unemployment; and a more advanced, technologically modern industrial sector (Diao et al. 2007: Moreda 2012:7). Based on this view, labour productivity was assumed to be lower in the agricultural sector than in the industrial

sector. Thus, smallholder agriculture was viewed as a labour reserve from which workers could be drawn for the growing industrial and service sectors (Diao et al. 2007; Wiggins, Kirsten & Llambi 2010). Similarly, Lewis (1954) proposed a transfer of surplus labour from the traditional agricultural sectors to the urban industrial sector, where higher wages could be consumed and saved. Based on this thinking, the industrial sector took precedence over the agricultural sector – as a result, agriculture was "squeezed for its labor and resources meant for the expansion of the industrial sector" (Moreda 2012:7).

Lewis's theory influenced the industrialisation strategies adopted in many developing countries between the 1950s and 1970s (Diao et al. 2007). To accelerate the industrialisation process, governments in developing countries began to impose heavy taxes on agriculture, both directly, through export taxes, and indirectly, through pricing and trade protection mechanisms and over-valued exchange rates (Brüntrup & Heidhues 2002:6; Schiff & Valdez 1992, cited in Diao et al. 2007), thereby discriminating against agriculture (Brüntrup & Heidhues 2002:4). Such earlier emphasis on industrialisation created an "urban bias" in development thinking (Brüntrup & Heidhues 2002; Lipton 1977). However, the urban bias indicated that agriculture and industrialisation could not be separated (Diao et al. 2007). Instead, the industrialisation process from the 1950s to the 1970s failed to create enough jobs for the under-employed rural poor (Wiggins et al. 2009:1341). In addition, the slow growth of agriculture posed challenges to development, creating food shortages at the national level and poverty among the rural population (ibid:1341). Historically, few countries have been able to achieve industrialisation without raising productivity in the agricultural sector (Hazell et al. 2007; Hazell et al. 2010). Countries that have failed to improve agricultural productivity generally continue to be characterised by poverty, hunger and economic stagnation (Hazell et al. 2010).

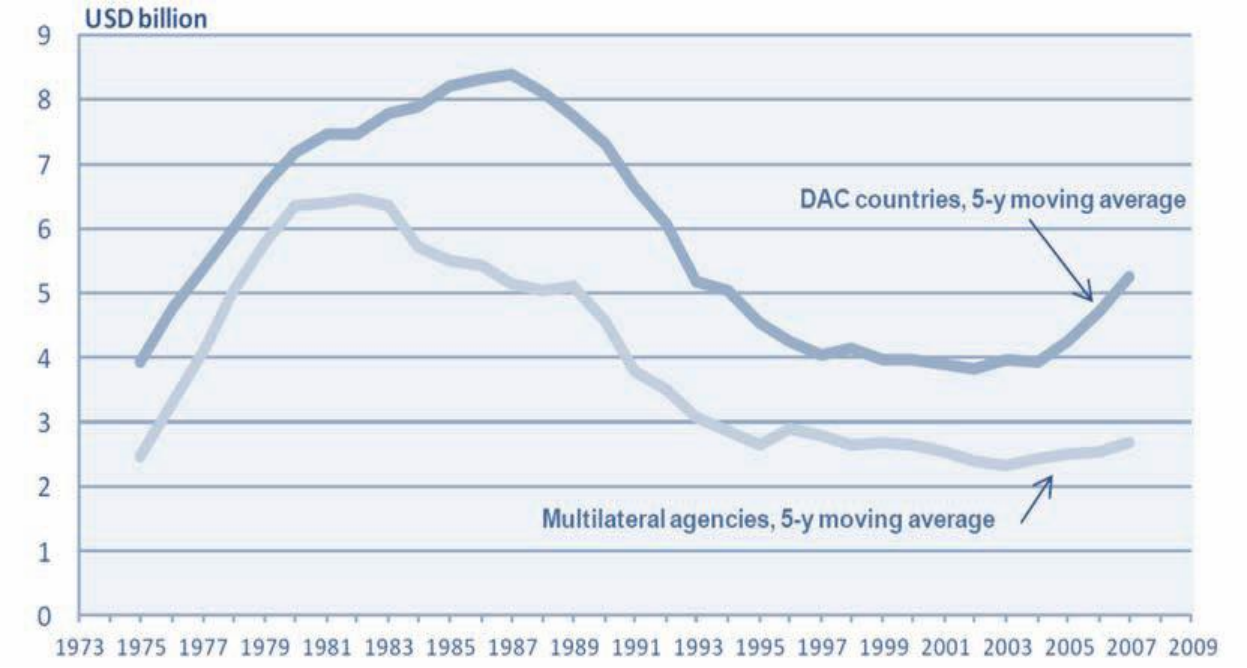
This prompted a reassessment of the role of agriculture in development (Johnston & Mellor 1961; Schultz 1964), based on its multiple functions such as source of food, raw materials and capital, surplus labour and foreign currency, etc. (Wiggins et al. 2009). It was argued that agriculture should play a central role in the so-called development process, particularly during its initial stages (Byerlee, de Janvy & Sadoulet 2009; Christiaensen & Demery 2007).

More recently, however, there has been a renewed debate by major international donors on the role of agriculture as an engine for economic growth and development. For example, it is the

focus of the World Bank's 2008 *World Development Report: Agriculture for Development*. The next section tracks the historical changes in donor funding to agriculture in the global South.

2.2.1 Historical perspective on foreign aid to agriculture and rural development

The history of foreign aid dates back to the implementation of the Marshall Plan, the United State's first official aid to Europe after World War II, amounting to a total of US$13 billion (; Umbadda & Elgizouli 2013). Although this was part of US efforts to support economic recovery in Europe after the war, some critics, like Jeffrey Sachs from Columbia University, saw it as a way to advance US national security interests (Adelman 2007). The success of the Marshall Plan led US President Harry Truman to propose in his inaugural speech that "we must embark on a bold new programme for making the benefits of our scientific advances and industrial progress available for the improvement and growth of under-developed areas" (Esteva 1993:6). This post-war period saw the formation of UN agencies such as UNESCO and UNICEF, as well as other organisations such as Oxfam and Save the Children (ibid). Since then, foreign aid has focused on different areas, with agriculture and rural development being among these, particularly since the 1970s. The history of Official Development Aid (ODA) to support agriculture and rural development in the global South, however, was marked by a "period of increased support", "sustained decline" and "some recovery" (Chimhowu 2013:5), as shown in Figure 2.1.



Source: Adapted from Chimhowu (2009)

Figure 2-1 Trends in aid to agriculture and rural development (ARD), 1971 to 2009, five-year average commitments (constant 2009 prices)

From the early 1970s, there was an increased interest by Donor Aid Committee (DAC) countries and bilateral and multi-lateral agencies in providing assistance to agriculture and rural development (Chimhowu 2013; DFID 2004; Spielman, Zaidi & Flaherty 2011), and is referred to as the "golden era" by Chimhowu (2013). The success of the green revolution in Asia prompted increased aid commitments, promoting modernisation in the sector (ibid). Such commitments were manifested through funding for community development interventions, green revolution-type technologies to improve productivity, and improvements in extension services (ibid). In this period, roughly 70% of the total aid commitment to agriculture and rural development was channelled to agriculture (Chimhowu 2013:6).

The late 1980s and 1990s were marked by a decline in aid support to agriculture and rural development (Chimhowu 2013; Jayne, Mather & Mghenyi 2006; Spielman, Zaidi & Flaherty 2011; Timmer 2005). From 1980 to 2002, the global assistance to agriculture declined from US$6.2 billion to 2.3 billion (DFID 2004:3). Between 1980 and 2002, multilateral agencies reduced their funding for agriculture from US$3.4 billion to US$0.5 billion, while bilateral agencies reduced their ODA to agriculture from US$2.8 billion to US$1.7 billion (DFID 2004).

As a result, ODA assistance to agriculture (both bilateral and multilateral) in South and Central Asia declined by 83%, while in sub-Saharan Africa it decreased by half between 1980 and 2002 (DFID 2004:3) Donor assistance to African agriculture declined severely during the 1990s in absolute and relative terms (Jayne, Mather & Mghenyi 2006; Umbadda & Elgizouli 2013), from approximately US$1.7 billion to US$1 billion (Kane & Eicher 2004). This situation was even worse in Zimbabwe due to the withdrawal of donor support, the bad publicity the country received internationally, and sanctions that were imposed (Scoones 2012). The decline of donor assistance to agriculture led to a loss of confidence in agriculture (ibid). Integrated rural development projects, particularly in Africa, came under scrutiny by donors as they evaluated them in terms of their impact, sustainability and cost-effectiveness (DFID 2004). Agricultural development in the 1970s had, for example, achieved disappointing results (Wiggins, Kirsten & Llambi 2010). The 'training and visit system', which used up large sums of money, was seen as a failure. In addition, the adoption of new development policies, such as the structural adjustment programmes in the 1980s and 1990s, further resulted in the decline of ODA support to agriculture (DFID 2004; Wiggins, Kirsten & Llambi 2010). The structural adjustment programmes (especially in Africa) led to the withdrawal of state intervention in favour of market-led policies (ibid).

Interest by donors in agriculture also declined further in the 1990s, as health, education, gender, poverty reduction and growth, and the environment took precedence (Chimhowu 2013; Kane & Eicher 2004). The 1995 World Summit on Social Development further cemented the focus on social infrastructure and services that led to "a more coherent way to package the social agenda around the Millennium Development Goals (MDGs)" (Chimhowu 2013:7). In addition, the emerging HIV/AIDS pandemic further heightened donor interest in providing aid for health and education at the expense of agriculture (ibid). Donor support to social infrastructure and services increased from 26% in 1976 to 56% by 2001 (Kane & Eicher 2004). This period also saw increased ODA commitments to new areas, such as humanitarian assistance, debt relief, prevention of drug trafficking, environmental protection and emergence food aid (Chimhowu 2013). This shift in emphasis has contributed significantly to the decline in assistance to agriculture and rural development.

Since the turn of the century, agriculture has received renewed interest from donors and governments after years of neglect, due in particular to the spike in cereal prices on world markets in 2007/2008 (Byerlee, De Janvry & Sadoulet 2009; Christiaensen, Demery & Kuhl 2010; DFID 2004; Mortimore 2009; Spielman, Zaidi & Flaherty 2011; Wiggins, Kirsten & Llambi 2010). This renewed interest in agricultural support led to an increase in total aid flow – from US$58 billion in 2000 to US$133 billion in 2011 (Umbadda & Elgizouli 2013). In addition, the entry of large philanthropic organisations (for example the Bill and Melinda Gates Foundation in 2005) into funding agricultural development in Africa has been pointed out as a "catalyst" to the renewed interests by donors in agriculture (Byerlee, De Janvry & Sadoulet 2009; Spielman, Zaidi & Flaherty 2011). The Bill and Melinda Gates Foundation provided US$275 million as funding for agricultural development in 2009 (Spielman, Zaidi & Flaherty 2011). Governments have also shown renewed interest in supporting the sector, notably with the formation of the Comprehensive Africa Agriculture Development Programme (CAADP) by the African Union (Wiggins, Kirsten & Llambi 2010), with a strong focus on the role of smallholder farmers.

The next section attempts to define smallholder agriculture and its contribution to rural livelihoods.

2.3 UNDERSTANDING SMALLHOLDER AGRICULTURE AND RURAL LIVELIHOODS

2.3.1 Defining smallholder agriculture

The fact that most poor rural dwellers in developing countries are smallholder farmers underscores the significance of agriculture to their livelihoods and economic growth. But who are these smallholder farmers and what debates characterise them? In an attempt to construct a general frame of understanding for the subsequent section, this section attempts to define smallholder farming, which in itself is a "challenging task" (Narayanan & Gulati 2002:4) and "problematic" (Cousins 2009).

There is no universally agreed definition for the term "smallholder" agriculture (Narayanan & Gulati 2002:4). There are many definitions, as shown in Table 2.2, depending on the context, country and even ecological region (Moreda 2012:6). The term is often used interchangeably

with small-scale, resource poor, peasant, low input use, low income, and low technology farming (Brüntrup & Heidhues 2002) or family farms (Lipton 2005).

Many scholars define the concept of "smallholder" agriculture on the basis of the farm size, as referring to land less than two hectares being farmed (Narayanan & Gulati 2002; World Bank 2007). This approach, however, fails to account for the quality of resources, types of crops grown or disparities across regions (Nagayets 2005:1). Narayanan and Gulati (2002) argue that such a definition is problematic for three reasons. Firstly, they argue that the notion of "small" varies in different contexts in terms of crop types (ibid: 4). For example, in the context of plantation crops like coffee or banana, small farms can be larger than a small farm used for the production of cereal, such as rice or wheat. Secondly, they argue that smallholder farmers should be characterised as resource poor, rather than on the basis of the size of their landholdings. Such a view is premised on the argument that irrigated and non-irrigated (or rain-fed) land cannot be compared meaningfully – given the fact that a matching of irrigated land and unirrigated (or degraded) land several times bigger would be required to compare productivity. Lastly, the notion of "smallholder" varies widely across regional contexts and is defined based on the size of the landholdings. Asia has a large proportion of small farms (about 125 million landholdings) – with an average size of 1.6 ha, followed by Africa, while Latin America has a lower percentage of small farms under 2 ha (for example, 20% in Brazil) (Narayanan & Gulati 2002:5).

Table 2-2 Definitions of smallholder agriculture or farmers

Author	**Definition of smallholder farmers or agriculture**
Dixon et al. (2004)	Refers "to their limited resource endowments relative to other farmers in the sector".
Lipton (2005:1)	"operated units that derive most labour and enterprise from the farm family"
Narayanan & Gulati (2002:4)	"practicing a mix of commercial and subsistence production or either, where the family provides the majority of labour and the farm provides the principal sources of income"
World Bank (2007:91)	"Family farming, a small-scale farm operated by a household with limited hired labour"

Source: Compiled by author

Acknowledging the diversity of definitions and the lack of a consensus definition, Nagayets (2005:1) argues that "the sole consensus on small farms may be the lack of a sole definition". However, smallholder agriculture is generally characterised by low input, limited resource

endowment, small landholding size, wealth status, poor market orientation and levels of vulnerability (Lipton 2005).

2.3.2 Smallholder agriculture's role in rural livelihoods and poverty reduction in sub-Saharan Africa

Agriculture is an important source of livelihoods, particularly for smallholder farmers who live in the global South, where the majority of the poor live in the rural areas (Narayanan & Gulati 2002). These rural poor are farmers, labourers, transporters, marketers, processors of produce and suppliers of non-agricultural services to households whose income is dependent on agriculture (Kydd 2002:1). About 86% of the rural population depends on agriculture as a major source of livelihood worldwide (World Bank 2007). Rural households tend to diversify[2] into non-farm income sources, such as small-scale rural non-farm enterprises, non-farm employment and seasonal migration due to risk and seasonality (Ellis 2005:8). By engaging in non-farm activities, rural households, according to Ellis (2005:8), reduce risk by combining activities that have different risk profiles and enable them to address the labour and consumption problems associated with seasonality. Several studies (for example Bryceson 2002; 2000; Ellis 2000) in sub-Saharan Africa have observed such cases. Despite the diversification, agriculture remains a major source of rural livelihoods (Maxwell, Urey & Ashley 2001).

A large proportion of the population in the global South is rural. In Africa, about 70% of the total population live in rural areas and depend on agriculture and other non-farm-based activities for their livelihoods (NEPAD 2003). In sub-Saharan Africa, the agricultural sector accounts for approximately 30% of the countries' gross domestic product (GDP), and almost 75% of the total workforce (World Bank 2007). Thus, smallholder farmers are a "key group" to which focus should be paid to in agriculture and rural development (Zhou 2010:3).

The promotion of smallholder agriculture therefore is imperative for meeting the Millennium Development Goals (MDGs) of halving poverty and hunger by 2015. It has been argued (Diao, Hazell & Thurlow 2010; Christiaensen & Demery 2007; Staatz & Dembele 2007) that the performance of economies is highly dependent on the productivity of the agricultural sector in

[2] Rural livelihood diversification refers to "the process by which households construct a diverse portfolio of activities and social support capabilities for survival and in order to improve their standards of living" (Ellis 1999).

sub-Saharan Africa, meaning that the overall economic growth and poverty reduction in this region are heavily influenced by the performance of this sector. An improvement in the agricultural sector, particularly among smallholders, potentially can create jobs for the rural poor, improve food security and provide viable livelihoods, thereby fostering rural development and poverty reduction. However, little progress has been made in Africa over the last three decades to improve agricultural productivity. Land degradation is one of the major contributors of poor agricultural productivity in developing countries.

The next section provides an overview of land degradation. It then discusses holistic management, its origins and criticisms.

2.4 DEGRADATION OF RANGELANDS

2.4.1 Overview of land degradation

Drylands, which include arid, semi-arid and dry-sub humid , occupy about 41% of the world's total land surface (Millennium Ecosystems Assessment 2005) and are home to millions of the world's poorest, marginalized and politically weak people (Brauch & Spring 2009; World Meteorological Organization 2005). It is estimated that between 10 and 20% of the world's drylands are currently already degraded (medium certainty) (Millennium Ecosystem Assessment 2005), increasing by 12 million hectares every year (Brauch & Spring 2009). Land degradation (also known as desertification) affects more than 250 million people in developing countries (Reynolds et al. 2007), with more than 1 billion people facing risks associated with future degradation (World Meteorological Organization 2005). Land degradation, can negatively affect the carbon, hydrological and nutrient cycles, important components of human livelihoods (Tongway & Hindley 2004). Land degradation also reduces the net productivity of drylands by between 4 – 10% (Zika & Erb 2009), exacerbating poverty, causing political unrest and disrupting human communities (Millennium Ecosystem Assessment 2005).

There is no universally agreed definition for and measurement of land degradation (Barrow 1991; Reed et al. 2014; Warren 2002). The United Nations Convention to Combat Desertification defines desertification as land degradation in arid, semi-arid and dry sub-humid areas due to several factors, including climatic variations and human activities (UNEP 1994:sp).

Land degradation can be defined as "the reduction or loss of biological or economic productivity". Land degradation is contextual and cannot be judged independently of its spatial, temporal, economic, environmental and cultural context (Warren 2002).

While some scholars emphasize the biophysical functions and changes associated with land degradation (for example, Dean et al. 1995; IPCC 2001, others are more concerned with the productive potential of the land for human use (UNEP 1992; Kasperson, Kasperson & Turner 1995). Thus, while the former gives priority to the biophysical assessment of natural capital stocks (for example, using ecological and soil based approaches as well as remote sensing) to address land degradation (Reed et al. 2015) the latter, focuses on the assessment of flows of ecosystems, paying attention to the perceptions of local people and economic indicators such as livestock census data (ibid). However, there is a growing body of literature that combines both biophysical and socio-economic assessments in order to provide a more holistic and contextual understanding of land degradation (Klintenberg, Seely & Christiansson 2007; Reynolds et al. 2007; 2011).

The next section reviews some methods/ indicators for assessing landscape or vegetation cover, with a particular focus on communal rangelands.

2.4.2 Biophysical assessment of land degradation

Land degradation due to poor conservation practices (e.g. overgrazing) is prevalent in communal lands (Prince, Becker-Reshef & Rishmawi 2009). As elsewhere, livestock are viewed as a major contributor to rangeland degradation in the communal rangelands of Zimbabwe (Abel & Blaikie 1989; Cousins 1992), for example through overstocking, (Hoffman & Ashwell 2001). According to Scoones (1990), communal farmers in Zimbabwe have maintained high stocking rates exceeding the officially recommended stocking rates for a long time. Abel and Blaikie (1989:14) provided a formal definition of rangeland degradation:

> *an effectively* permanent decline in the rate which land yields livestock products under a given system of management. 'Effectively' means that the natural processes will not rehabilitate the land within the timescale relevant to humans and that capital or labour invested in rehabilitation is not fulfilled.

The biophysical assessment mainly focuses on the ecological and abiotic functions and their changes over time, in order to assess the natural capital stocks. Thus, the approach primarily draws on ecological, soil-based and remote sensing methods to assess the biophysical indicators of land degradation. For example, land degradation in the communal areas of Zimbabwe have been successfully observed and calculated using remote sensing (for example; Kamusoko et al. 2009; Prince, Becker-Reshet & Rishmawi 2009; Whitlow 1988). However, assessment of land degradation extent and severity can vary significantly, based on the methods and scale under consideration (Reed et al. 2015).

In this study, quantitative data supplied by the Agricultural Research Council (ARC) based on a traditional vegetation method complemented by a monitoring process known as the Landscape Functional Analysis (LFA) in the same study area was employed in order to compare and contrast findings from the more qualitative fieldwork undertaken by the researcher. The next section gives a detailed description of LFA.

2.4.3 Landscape Functional Analysis

Landscape change refers to the change of structure and function of an ecological mosaic over a period of time (Walz 2008). LFA is based on the concept of landscape function, coined by Ludwig and Tongway (1997) while working in the Australian rangelands. Since then, LFA has now been adopted worldwide for measuring and monitoring landscape function. The method employs quickly determined in-field indicators to assess the functional status of rangelands (Tongway & Hindley 2004) in order to detect degradation while also tracking recovering areas. The indicators, categorized into three major soil quality habitat indices: stability, water infiltration and nutrient cycling (Ludwig & Tongway 1997; Tongway & Hindley 2004) are described in Table 2.3.

Table 2-3 Soil surface assessement indicators

Indicator	**Description of assessment**	**Functional attribute stability[1] (S), infiltration[2] (I); organic matter[3] (OM)**
Soil cover	The degree to which physical surface cover and projected plant cover ameliorate the effect of raindrops impacting on the soil surface.	S
Perennial grass, basal and tree & shrub foliage cover Perennial grass, basal and tree and shrub foliage cover	Estimate the "basal cover" of perennial grass and/or the density of canopy cover of trees and shrubs	I, OM
Litter cover	The amount, origin and degree of decomposition of plant litter - Plant litter accumulation - strongly related to the carbon, nitrogen and other elements stored in the surface soil	S
Litter cover, origin, degree of decomposition	Percent cover, Local or transported, Nil, Slight, Moderate, Extensive	I, OM
Cryptogam cover	Indicate soil surface stability and elevated levels of available nutrients in the surface layers of soil	S, OM
Crust broken-ness	Extent the surface crust is broken, leaving loosely attached soil material available for erosion	S
Erosion type and severity	Rills and gullies, terracettes, sheet erosion, scalding, pedestalling	S
Deposited materials	Nature and amount of alluvium transported to and deposited on the query zone	S
Surface roughness	Capacity to capture and retain mobile resources such as water, propagules, topsoil and organic matter. High surface roughness high retention and vice versa	I, OM
Surface resistance to disturbance	Ease with which the soil can be mechanically disturbed to yield material suitable for erosion	S, I
Slake test	Stability of natural soil fragments to rapid wetting. Stable soil fragments maintain cohesion when wet - low water erosion potential	S, I
Soil texture	Texture of the surface soil - relate to permeability	I

Notes*: Stability[1]* - ability of the soil to withstand erosive forces, and to reform after disturbance; ***Infiltration[2]*** - rainfall into soil-water (water available for plants to use), and runoff water which is lost from the site, or may transport materials (soil, nutrients and seed) away; and ***Nutrient cycling status (organic matter)*** [3]- how efficiently organic matter is cycled back into the soil?

Source: Peel (2014)

Based on LFA, landscapes are considered to be functional if they effectively trap, store, concentrate and use such resources as water and nutrients (Tongway 2010). While landscapes that lose resources through runoff or winds are regarded as dysfunctional. LFA has also been applied in African rangelands. For example, Palmer et al. (2001) used LFA to establish differences between communal and commercial rangelands in Peddie district, South Africa.

2.5 UNDERSTANDING HOLISTIC MANAGEMENT

2.5.1 Definition and background of holistic management (HM)

The concept of holistic management (HM) was conceived in Zimbabwe by Allan Savory in the 1960s to halt the problem of the desertification of rangelands in Africa (Savory 1983; Savory & Butterfield 1999), and was introduced in the United States by Sid Goodloe in 1969 (Joseph et al. 2002). Besides the concept being presented as a panacea for desertification, in his recent TED Talk in February 2013 (http://www.ted.com/talks/allan savory how to green the world's deserts and reverse climate change.html), Allan Savory also argued that HM could mitigate climate change. In the early stages of its development, the concept entailed short duration grazing (Holechek et al. 1999; Savory & Parsons 1980), and was later refined to become the Savory Grazing Method (SGM) and holistic resources management (HRM) in the 1970s and 1980s respectively (Savory 1983; 1989; Savory & Parsons 1980;). Currently it is known as holistic management (Savory & Butterfield 1999).

The advocates of HM credited the theoretical base of HM to the concept of "holism" first postulated by Jan Smuts (1926) when philosophising about evolution and consciousness. Holism challenged the old mechanistic approaches to science (Savory & Butterfield 1999) based on reductionism, which views a system as a total sum built up by its separate components, instead of 'wholes' functioning within greater wholes (Savory & Butterfield 1999). Based on this concept, Savory argued that land cannot be managed without taking into consideration the culture, beliefs and values of the people using it (Savory & Butterfield 1999; Savory & Lambrechts 2012). Thus, for Savory, land should be managed in "wholes", where people, land and their economy must be taken as "one *indivisible whole*" (Savory 2013: sp; italics in the original).

The advocates of HM contest that the management of natural resources has been largely reductionist in approach and has failed to recognise non-linearities and the complex nature of socio-ecological systems (Savory & Butterfield 1999). Several authors have supported this perspective, arguing that a holistic approach is needed in the management of natural resources – what they refer to as social-ecological systems (Berkes, Colding & Folke 2003; Folke, Colding & Berkes 2003). The proponents of HM, Savory and Butterfield (1999), contend that the conventional reduction approach has only excelled on the mechanical side (e.g. computer

technology, weapons, chemical technology, etc.), while the application of the reduction approach in the non-mechanical field (e.g. agriculture, rangelands, forests, erosion, etc.) has increased problems.

Ideally, HM refers to a decision-making process that enables people to make decisions in a manner that is simultaneously environmentally, socially and economically sound, both in the short and long term (Savory & Butterfield 1999). In other words, holistic management describes a systems thinking approach to managing resources that builds biodiversity, improves production, generates strength, enhances sustainability and improves the quality of lives of those who use it (Neely & Butterfield 2004; Savory & Butterfield 1999). Through HM, land managers are encouraged to introduce holistic principles into their decision-making process to ensure that they simultaneously consider the ecological, social and economic implications of their management decisions across different spatial scales (Savory & Butterfield 1999).

Central to HM is the "holistic context" (formerly known as a "holistic goal"), which incorporates the quality of life one wishes to obtain, the forms of production to support this quality of life and the future resource base (Savory 2012; Savory & Butterfield 1999). Thus, for Savory, the holistic context, providing a unique context for all objectives, goals or actions toward any vision or mission in the "whole situation" is required in order to manage holistically (Savory 12). HM requires people to create and own a "holistic context" describing the things they value most at present and the ecological, infrastructural and human resource base needed for the future (Savory & Butterfield 1999).

Allan Savory distinguished between brittle and non-brittle environments based on distribution of rainfall and humidity throughout the year, where the former is believed to be more prone to land degradation and desertification (Savory & Butterfield 1999). The brittle environments are characterised by low and erratic rainfalls and humidity throughout the year, variable growing season and slow decay of organic matter. In such environments, the effects of grazing and resting are different to those in the nonbrittle environments. While resting is beneficial in non-brittle environments, Savory contends that if brittle environments are rested from physical disturbance like grazing, it results in further degradation (ibid). Instead, he argues that animal impact (e.g.

trampling, dunging, and urinating) is vital in maintaining brittle environments (Savory & Butterfield 1999).

Having outlined its definition and principles central to the concept, it is important to note that HM is not simply a grazing principle but rather a 'management framework' (Savory 1983; 1993; Savory & Buttefield 1999; Savory & Lambrechts 2012).

2.5.2 Evolution of the holistic management concept

The origins of the holistic management concept (formerly known as holistic resources management) (Savory & Butterfield 1999) are based on a long personal search for solutions to address the rapid degradation of semi-arid rangelands in Africa by Allan Savory since the 1960s (Savory & Butterfield 1999).

While working in the Northern Rhodesian and subsequently the Southern Rhodesian Game Department (now Zimbabwe), Savory observed wildlife management before fences were used and indigenous people were removed from the wildlife areas to form protected areas. During this time, Luangwa had massive herds of animals, with approximately 4 000 buffaloes (Savory & Butterfield 1999). Based on conventional wisdom during this period, Savory regarded biodiversity conservation as entailing the protection of selected plant and animal species, which then subsequently leads to an improvement in biodiversity conservation (Savory & Butterfield 1999). When the colonial governments of Northern Rhodesia and Southern Rhodesia decided to convert the Luangwa Valley (Northern Rhodesia) and the lower Zambezi Valley (Southern Rhodesia) into a national park, both governments removed the indigenous people that were living in these areas (Savory & Butterfield 1999). Soon after the relocation of the indigenous people away from these areas, Savory discovered that the vegetation cover began to deteriorate, regardless of the removal of people. Realising that the land was degrading, the department resorted to culling 40 000 elephants (Savory & Lambrechts 2012). However, Savory observed that the culling did not alleviate the situation, prompting him to question the decision-making process in natural resources management (Savory & Butterfield 1999) Thus, Savory and Butterfield (1999) argued that the conventional approach to the management of natural resources is reductionist in its approach. Drawing on Smut's concept of holism, they argued that natural

resources management needs to be managed holistically, taking into consideration environmental, social and economic issues.

2.5.3 HM adoption and its benefits

Today it is estimated that about 16 million ha of land is under HM, with over 10 000 land managers (Savory Institute 2012a) in Africa, South America, Australia and North America (Savory Institute 2012b). Over the years, HM has been tested in both freehold and communal tenure system, but with more emphasis on the former.

According to De Villiers (2013) and De Villiers, Esler and Knight (2014), HM is a potential example of adaptive management aimed to promote resilience in socio-ecological systems. Recent studies in Australia, South Africa and North America reported that HM promotes adaptive capacity among land managers (De Villiers, Esler & Knight 2014; McLachlan & Yestrau 2009; Sherren, Fischer & Fazey 2012), while Hosbasch (2012) observed that it is aligned with the three basic tenets of resilience: managing whole systems, managing for diversity and managing for change. Although the origins of the HM concept lie in rangeland management, the concept can be applicable when managing any defined "whole", such as a town or a village (Savory & Butterfield 1999). In communal areas, HM is thought to be appropriate as it does not encourage destocking, is economical from the outset, is easy to comprehend, and generates income from little cost (Vaughan-Evans 1986, cited in Cousins 1987:74).

2.5.4 Criticism of HM

HM has also been criticised and challenged by scientists in the rangeland science community (De Villiers 2013; Kruger 2012; Savory & Lambrechts 2012), mainly due to the holistic planned grazing (HPG) it promotes. These criticisms range from questioning its scientific basis (i.e. the scientific literature on which HM is based is considered by many rangeland scientists as "inconclusive"), lack of conventional wisdom, Savory's charisma and the claims he makes that HM results in high turnover (Briske et al. 2008; Holechek et al. 2000). HPG, which is the core principle of HM, challenges the mainstream view that large herds are the main agents of range degradation (Savory & Butterfield 1999). Contrary to this view, Savory argues that rangeland degradation is a function of the time that a plant is exposed to grazing before it recovers, rather

than animal numbers (ibid). Due to such controversies, recent studies have criticised the endorsement of HPG in the semi-arid rangelands (Briske et al. 2014; Hudak 2013).

The most frequently cited trial of HPG is the Charter Grazing Trial conducted in Zimbabwe between 1969 and 1978 in conjunction with several stakeholders, including the then Minister of Agriculture and Savory himself (Joseph et al. 2002; Skovlin 1987). The trial achieved mixed results and has been employed in both defending and opposing HPG (Joseph et al. 2002).

In their synthesis of grazing systems, including HPG versus continuous grazing, Briske et al. (2008) concluded that most of the science used to support such grazing systems was either anecdotal or statistically inconclusive due to the poor design of the experiments. They concluded that plant and livestock production were similar, if not higher, in continuous grazing systems than in rotational grazing systems. Holechek et al. (1999) echoed similar sentiments, contending that scientific research has disproved most of Savory's claims, particularly regarding hoof action and improvements in rangeland conditions due to increased stocking rates and densities. Studies by Holechek et al. (1999) and Briske et al. (2008) conclude that rotational grazing, despite its support by governments, does not increase plant and animal production or improve surface soil hydrology when compared to a continuous grazing system. These papers have frequently been referred to in efforts to discredit the HPG advocated by Savory (Itzkan 2011).

However, their conclusions have been refuted by Teague et al. (2008:3), who argue that their studies were small-scale trials based on ecological and livestock production questions in "a relatively limited scope of fairly resilient landscape". Savory (2013) also dismissed the conclusions made by Holechek et al. (2000) and Briske et al. (2008), contending that all studies that attempt to discredit HM or holistic planned grazing refer to derivations or plagiarisations and include short-duration grazing (SDG), cell grazing, management-intensive grazing and, recently, mob grazing (Savory 2013). However, they lack the essential components of HM philosophy, particularly the holistic context (De Villiers 2013).

Despite the lack of scientific evidence, HPG also requires a considerable initial investment of capital (Alfaro-Aguello et al. 2010; Quigley 1987). Quigley (1987) further noted that HPG is labour intensive and controversial, which can limit its adoption. Stinner, Stinner & Marsoff

(1997) noted that HM requires a considerable amount of time and effort, which possibly can limit its adoption.

Carter et al. (2014) have criticised the reported benefits of HM, arguing that they emanate from those associated with the Savory Institute through the selection of participants from ranchers and farmers committed to HM. In other words, such studies are not experimental and often are biased towards HM adopters who were doing well, while ignoring those who have had negative experiences with HM. Thus, this study adopted an unbiased approach, in which HM adopters, non-adopters and dis-adopters were selected.

2.6 SUMMARY

The chapter addressed the following areas of literature that have informed the study: shifting themes in rural development; the relationship between agriculture and economic growth and development; the role of smallholder agriculture in rural livelihoods; and holistic management as a solution to rangeland degradation. Literature on holistic management provided insights regarding the origins, benefits and criticism of HM.

CHAPTER 3: RESEARCH CONTEXT

This chapter describes the research context of the study. It begins with an overview of agriculture and land reform in Zimbabwe. It then reviews the history of policies and programmes aimed to transform communal rangeland management in Zimbabwe in order to understand contemporary communal rangeland management dynamics, and evaluate their successes and failures. The chapter concludes with an overview of the study area in Hwange communal areas.

3.1 AGRICULTURE IN ZIMBABWE

Similar to many southern African countries, agriculture in Zimbabwe is the mainstay of the economy, accounting for approximately 15 to 20% of the country's GDP, one third of the formal workforce, 60% of the raw materials required by the agro-industries, and 40% of the total export earnings of the country (Muir-Leresche 2006). Export earnings are crucial for generating foreign currency and maintaining economic growth in Zimbabwe (ibid). However, agricultural exports fell by 54% and 74% between 2000 and 2007 due to the low production of major export commodities, such as tobacco, tea, coffee, horticultural produce, beef, sugar and cotton lint (Anseeuw, Kapuya & Saruchera 2012). Manufacturing industries are also heavily dependent on agriculture for their raw materials (ibid). Agriculture is a major livelihood activity for the majority of the rural population in Zimbabwe (Anseeuw, Kapuya & Saruchera 2012).

To better understand agricultural development in Zimbabwe it is important to highlight the "thorny land issues" that have characterised the sector since the beginning of this millennium (Mutasa 2010:3). Hence, the following section provides a historical perspective of the land question in Zimbabwe.

3.2 THE LAND QUESTION AND LAND REFORM IN ZIMBABWE

Land has undeniably been at the centre of 'anti-colonial discourse' of the liberation struggle in much of Africa, where it has been a topical issue from the period of colonisation through to the post-independence period. Undoubtedly, the expropriation of land during the colonial era left much of Africa with severe land imbalances between smallholder farmers, large-scale and state farmers (Jayne, Mather & Mghenyi. 2006). Desertification and persistent droughts have exerted

more pressure on African governments to redress the land question (Maguwu 2008). There is no doubt that land was among the key factors that inspired the liberation movements in most African countries, and in Zimbabwe in particular (Alexander 1991; Hanlon, Manjengwa & Smart 2013; Maguwu 2008), where it has dominated the post-2000 political agenda (Groves 2012:340).

The land question in Zimbabwe dates back to the pre-colonial arrival of white European settlers at the end of the 19th century, when Cecil John Rhodes allocated large tracts of land to his victorious soldiers after he conquered the indigenous people in a military war in 1889 (Hanlon, Manjengwa & Smart 2013:1). In addition, the British colonial government rewarded 'white European veterans' of World War II with land (Hanlon, Manjengwa & Smart 2013). By doing this, the white settlers were encouraged to settle for farming purposes, with numerous inducements, such as two years of free training in farming (Hanlon, Manjengwa & Smart 2013). This led to the massive dispossession of land from the black majority to white settlers (Lebert 2003; Rukuni 1994), and saw the creation of the first 'African reserves' in Matabeleland, a process that was later repeated in other parts of the country.

The subsequent enactment of the Zimbabwean Land Apportionment Act in 1930 saw the creation of defined 'European' and 'Native' reserves (Rukuni 2006; Manjengwa et al. 2013) and formalised the dual agrarian structure (Rukuni 1994a:18), cementing white settler control. The 'natives' were forcibly pushed away from the land with the highest agricultural potential to the 'peripheries' (characterised by low agricultural potential), which were then named Native Reserves, and renamed Tribal Trust Lands (TTLs) in 1967. The TTLs were renamed again in 1982, after the enactment of the Communal Lands Act, as Communal Lands (CL). The 1930 law allocated 51% of the high-potential land to 50 000 European settlers, of whom only 11 000 lived on the land, and 30% of the poor soils, which were drier and infertile, to one million Africans (natives[3]) (Jennings 1935, cited in Hanlon, Manjengwa & Smart 2013). The remaining 20% was owned by commercial companies or the Southern Rhodesian government (Crown land), or reserved as conservancies, while about 0.05% was referred to as Native Purchase Areas, which were set aside for richer Africans or small groups of Africans who wanted to acquire land through freehold or leasehold systems (Lebert 2003). This marked the dispossession of the black

[3] Natives was a term used by the Rhodesia Order in Council in 1898 to define African people from South Africa or Central Africa who were non-Europeans (Hanlon, Manjengwa & Smart 2013:32)

majority from their ancestral land (Hanlon, Manjengwa & Smart 2013). Land owned by whites was private, while the land for the native Africans was held under traditional tenure and user rights – an arrangement that is still in use in the Communal Lands in present-day Zimbabwe (Rukuni 1994a).

The large-scale white commercial farmers held good-quality land in the agro-ecological areas/regions I (specialised), II (intensive) and III (semi-intensive), while the communal areas consisted of poor, infertile soils found in the natural region IV (semi-extensive) and V (extensive) (Marongwe n.d.; Scoones et al. 2010). European and African segregation in Zimbabwe was similar to the arrival of the British settlers in Natal (South Africa) around 1843, which led to the creation of the Natal Native Trust in 1864 (Hammar 2007).

In addition to access to land in the best agro-ecological regions, the white farmers also enjoyed massive state support from the colonial government aimed at improving the farming economy (Moyo & Chambati 2013). This was manifested in the provision of extensive communication and marketing infrastructure, irrigation facilities, dams and rural electrification in commercial farming areas, and the availability of loans and subsidies to white farmers (De Villiers 2003; Lebert 2003; Moyo & Chambati 2013). Discriminatory subsidies were used to consolidate the control of white large-scale commercial farms (Lebert 2003). Hanlon, Manjengwa & Smart (2013) estimate that, by 1970, the subsidy was (equivalent to current money) US$40 000 per white farmer per year. By contrast, the peasant sector was mainly subsistence and lacked essential physical, agriculture and social infrastructure (Marongwe n.d.).

After independence was won in 1980, Zimbabwe (formerly Southern Rhodesia) inherited a dual and racially skewed agrarian structure from the colonial era that favoured the minority white farmers (< 1% of the total population) (Moyo & Chambati 2013; Scoones et al. 2012; Zikhali 2008). About 6 000 large-scale white farmers (< 1% of the total population) occupied 39% (i.e. 15.5 million ha) of the total land, of which 75% was located in the prime agro-ecological zone, while one million indigenous African families held 41.4% (i.e. 16.4 million ha) of marginal land (Moyo 1995). This imbalance in access to land meant that land acquisition and redistribution was prioritised after independence (Mutasa 2012; Zikhali 2008).

The average size of land owned by individual white farmers was about 2 000 hectares, while the domestic agro-industrial estate (plantations) holdings were on average more than 5 000 hectares in size (Moyo & Chambati 2013). Acknowledging this imbalance, land redistribution after independence was essential to redress colonial land dispossession. There is no doubt that these trends were the major reasons for the liberation war in the 1970s (Hanlon, Manjengwa & Smart 2013; Moyo 2006; Rukuni 1994; 2006) and "its visions of land and agrarian reform" in Zimbabwe (Moyo & Chambati 2013:5). In contrast to the liberation movements in Mozambique and South Africa, which were led by "urbanized elite", the Zimbabwean regime change was led by people who personally valued land and willing to engage in farming (Hanlon, Manjengwa & Smart 2013).

In the early 1980s, Zimbabwean land reform policy was based on the Lancaster House agreement of 1979 which sought to resolve the land grievances perpetuated during the colonial era. The British agreed that they would contribute UK£75 million towards land purchase of white owned farms (Lebert 2003) and pledged £20 million pounds in 1980 (Scoones et al. 2010).

Based on Lancaster House negotiations, land in Zimbabwe was only redistributed from white to blacks through the 'willing – seller, willing – buyer' principle (Binswanger et al., 2009; Scoones et al. 2010; Manjengwa et al. 2013; Moyo 2013; 2004). Land distribution targeted the landless, poor and overcrowded rural people, various disadvantaged groups and other competent farmers as well as those displaced by war and returning refugees (Moyo 2013; Marongwe n.d).

However, the limitation on land acquisition through the willing – seller – willing - buyer meant that redistribution was expensive and slow (Chaumba, Scoones & Wolmer 2003) and resulted in only the less successful white commercial farmers with poor land quality offering their land to the government for purchase (Manjengwa, Feresu & Chimhowu 2012). In-addition, the adoption of the Economic Structural Adjustment Programme (ESAP) in the early 1990s further pushed up land prices (Moyo 2000). ESAP led to the expansion of land markets to foreigners and rich black commercial farmers. Hence this period saw increased cases of private land subdivisions and consolidation, which perpetuated an increase in private and public demand of land on the market resulting increase in land prices (Moyo 2013). It also precipitated massive retrenchments which led to increased pressure in the communal lands resulting in orchestrated organized invasions

and poaching of natural resources (Moyo 2000). The adoption of market-based mechanisms limited the quality and location of the land acquired in relation to social needs (Moyo 1995).

Given these challenges, land reform progressed at a slow pace between 1980 and 1999 periods (Moyo 2004) and the ambitious target of the reallocation of land to 162 000 households by 1986 set by the National Land Policy were not met (Lebert 2003). By 2000 about 3.5 million ha had been transferred from white farmers to 75 000 black households – a target far below the proposed estimate of 1980s (De Villiers 2003). As a result, the indigenous majority became impatient and restless. This triggered the land invasions of Large Scale Commercial Farms (LSCF) led by war veterans (ex-combatants from the Second Chimurenga), ZANU-PF elites, ordinary citizens from the communal areas and nearby towns, and in some cases, farm workers (Moyo et al. 2008), which shook the Zimbabwean, region and the world. Indeed, the land invasions led to restructuring of the rural landscape (Scoones et al. 2010:22). These land invasions were initially termed 'jambaja' meaning chaos or violence.

The government formalized land invasions in 2002, which then became known as the "fast track" land reform programme (FTLRP) (Kinsey 2010; Helliker & Murisa 2011; Moyo et al. 2009; Scoones et al. 2010).

The FTLRP has ignited vigorous debates among scholars in Zimbabwean studies (Moyo et al. 2008) because of the way it was implemented. Implementation was characterized by violence, corruption as well as legal contestations (Chaumba, Scoones & Wolmer 2003; Clife et al. 2011; Hanlon, Manjengwa & Smart 2013; Helliker & Murisa 2011; Walker 2005). The FTLRP consisted of two models, namely the A1 and A2 models (Matondi & Dekker 2011; Scoones et al. 2010). The A1 schemes were aimed to decongest the communal areas, while the A2 was aimed to promote the continuation of medium-scale commercial farming (Helliker & Murisa 2011). It is estimated that about 150 000 households were settled in A1 schemes and 30 000 households in the A2 schemes[4] (Scoones 2014).

Without necessarily delving into the FTLRP, which was not the subject of this study, it might suffice it to highlight the common debates from the literature. The causes of the 2000s land invasions in Zimbabwe have fuelled highly contested views among academic scholars both

[4] The figures are rough since a full audit have not be undertaken.

internationally and locally. Over the last decade, debates about the FTLRP have been dominated by two broad naratives (Scoones 2014). The first perspective argues that the ruling ZANU PF used FTLRP to defend its political motive (Alexander 2003; Hammer 2005; Sachikonye 2002; Zamchiya 2011). These authors argues that the FTLRP was used by the ruling party, ZANU-PF as a reponse to the outcomes of the referendum of 2000 and panic within the ZANU-PF after realising that it was loosing its support to the opposition party, MDC (Sachikonye 2002). According to these critiques, the FTLRP was characterized by elite capture, disregard of the rule of law, marginalization of farm workers, the collapse of agriculture and national food security (Moyo 2011). The second perspective is the nationalist, populist perspective emphasizing the process of 're-peasantisation', where the land invasions denotes a process where people take back their land from below (Moyo & Yeros 2005; Chambati & Moyo 2013; Hanlon, Manjengwa & Smart 2013). As such, the state and ZANU-PF supported the land invasions as a political will of the people and legalized it as the FTLRP (Moyo & Yeros 2005).

The growing literature on land reform in Zimbabwe (Cliffe et al. 2011; Dekker & Kinsey 2011; Mabhena 2014; Mutupo 2011; Moyo 2009; Scoones 2014; Scoones et al. 2010) reported differential outcomes of the FTLRP. In Scoones et al. (2011:2), "there have been benefits and opportunities as well as costs, challenges and pitfalls" from the FTLRP. It is beyond the scope of this study to examine some of these outcomes. However, the reality is that land remains the major asset that underpins the livelihoods of rural Zimbabwean households.

3.3 LIVESTOCK PRODUCTION

Livestock keeping in Zimbabwe dates back to 1000 AD, and it has been calculated that, by the time of colonisation, native Zimbabweans owned about 500 000 head of cattle (Rukuni 1994a). Livestock production in Zimbabwe depends on forage resources from the rangelands (Assan 2013; Masikati 2010). In the communal farming systems of Zimbabwe, livestock are grazed in the communal grazing areas during the growing season, and later graze arable land in the non-cropping season (Scoones 1990).

Livestock, particularly cattle, have multiple functions such as provision of milk, draught power, social and cultural functions in smallholder farming systems in Zimbabwe. Thus, several studies in Zimbabwe and beyond revealed that cattle in smallholder farming systems have higher

economic returns than in commercial sectors that are mainly single purpose production such as beef production or dairy (Barrett 1992; Campbell et al. 2000; Shackleton et al. 1999; Steele 1981). For example, Scoones (1992) study in Mazvihwa communal areas, central southern part of Zimbabwe found that cattle had a higher economic value than commercial beef production. Barrett (1992) revealed that cattle in the communal areas have high gross return of about US$3.5 per hectare compared to the gross return of less than US$2.4 per hectare for commercial sector. Rukuni (1994) found a positive correlation between average maize per hectare, herd size and subsequently manure usage.

Approximately 89% of the total cattle population in Zimbabwe is concentrated in the smallholder farming sector (i.e. communal areas and resettlement areas) (Mavedzenge et al. 2006). However its off-take for beef production is low (1 to 3%) because cattle are kept for several purposes (Mavedzenge et al. 2006; Ndlovu 1994). Farmers tend to sell old and unproductive animals (Mavedzenge et al.2006).

Today it is estimated that the country has about three million total livestock units (TLU), which translates to a density of about 15 TLUs per square kilometre or 0.44 head of cattle per grazing area (JADAFA 2013). In most cases, the stocking rates in the commercial sector have adhered to the recommended rate of about 0.1 livestock units per hectare in drier areas, and 0.14 in wetter areas (Mavedzenge et al. 2006). The current stocking rates in communal areas are reportedly higher – approximately 0.3 to 0.5 animals per hectare and up to 0.8 animals in stress years (ibid). These high stocking rates, coupled with poor grazing strategies in communal areas, lead to high grazing intensity and pressure on certain palatable grass species (Gusha & Mugabe 2013) leading to land degradation.

3.3.1 Constraints to livestock production in communal lands

Livestock production, particularly of cattle in the communal areas, is constrained by several factors such as a shortage of water and forage, droughts, livestock diseases and mortality, and poor extension services (Chatikobo et al. 2013; Guveya 2008; Masama et al. 2003; Masikati 2010; Mutibvu et al. 2013; Swotwa, Hamudikuwanda & Makarau 2007). Since independence, Zimbabwe has been hit by several severe droughts, namely from 1982 to 1984, in 1986/1987, from 1991 to 1993 and in 2001, leading to a decline in livestock herds (Guveya 2008). Access to

water for livestock in the communal lands is also a limiting factor in livestock production (Mutibvu et al. 2012). Distances travelled to water livestock vary considerably with season, with Masikati (2010), for example, reporting a maximum of 14 km in Nkayi. A shortage of grazing lands due to the expansion of cropland and human settlements also is a major concern in livestock production. However, Sibanda et al. (2011) observed that rangelands converted to croplands were not completely lost, as they are an important source of feed during the dry season when other parts of the rangelands are depleted. In addition, diseases are also a major concern in livestock production in the communal lands, with tick-borne diseases being the mostly frequently cited challenge (Chawatama et al. 2005). This is largely because the acaricides used for dipping cattle are either too expensive for the communal farmers, or unavailable on the market (Masikati 2010; Mutibvu et al. 2012). The problem of livestock diseases is also attributed to the paralysed extension service-delivery system, as it lacks essential resources (e.g. transport) and drugs (Mutibvu et al. 2012). The response rates of veterinary officers have been reported to be low (Mashoko et al. 2007). Homann et al (2007) also noted that the majority of farmers in the communal lands of Zimbabwe are not able to identify livestock diseases and the causes, or to determine the appropriate treatment. In communal lands that share borders with wildlife reserves, livestock depredation by carnivores is also a major challenge (Butler 2000; Gandiwa 2012).

The following section will examine the historical background of communal rangeland degradation and past rangeland management efforts.

3.4 A HISTORICAL OVERVIEW OF COMMUNAL RANGELAND DEGRADATION AND MANAGEMENT INTERVENTIONS

Land degradation narratives of communally grazed rangelands due to overgrazing can be traced back to the period when Native Reserves (now known as communal lands) were created during the colonial era[5], when the indigenous black people were forcibly moved to marginal lands (Guveya 2008). The land degradation narratives have shown a great deal of continuity into the post-independence era (Scoones & Cousins 1989). Thus, policies and programmes aimed to achieve two objectives, namely improved livestock production and rangeland management,

[5] The colonial era began in 1890, when the British South African Company received Royal Charter of Incorporation from the British government.

which have been key features of the agricultural development programmes in the communal lands since the 1920s (Cousins 1992). The major assumptions have been that:

- Livestock production in the communal lands is inefficient;
- There is low productivity in communal lands due to poor management of stock and rangeland feed resources;
- Communal rangelands are overstocked, often in excess of the carrying capacity, resulting in severe environmental degradation;
- Cattle should be used for beef or dairy production, while other uses were viewed as inefficient or less valuable (Cousins 1992).

As indigenous people were pushed away from the so-called "white" land, the Native Reserves became overcrowded (Hanlon, Manjengwa & Smart 2013). The indigenous population in the reserves grew from about 400 000 in 1900 to 940 000 by 1926 (Dore 2001). As pressure increased in the reserves, signs of land degradation became evident (Dore 2001; Hanlon, Manjengwa & Smart 2013). At the end of World War II, reserves were perceived as seriously degraded and overgrazed. Accounting for the causes of degradation, two major narratives arose – namely "the colonial administration's conservation narrative" and "the African nationalist narrative" (Dore 2001:4). The colonial conservation narrative viewed environmental degradation as the result of the inefficient and wasteful farming methods of the indigenous farmers, such as "breaking up and "scratching" the soil, broadcasting seed over an extensive area without the use of fertilisers, and a lack of crop rotation or conservation contours (ibid). This also meant that pastures near cultivated land were wasted, while areas set aside for grazing were eroded (Dore 2001). However, the African nationalist perspective explained environmental degradation as a symptom of "land hunger" (ibid:5).

The colonial government began paying attention to the problem of environmental degradation in the reserves around the 1930s (Guveya 2008). This period saw the formation of the Natural Resource Board (NRB), aimed at addressing the problems of natural resource degradation in both the commercial and native reserves (Mugabe 1998). In response to the crisis of degradation, the establishment of the NRB led to the concept of "centralisation", which involved demarcating land into cropping and grazing areas (Dore 2001; Mugabe 1998) and the introduction of other conservation practices to communal farmers (Mugabe 1998). The conservation of grazing land

was of great significance to the NRB (Mugabe 1998). Soil erosion was said to be high in grazing areas due to overgrazing by livestock in native reserves (Mugabe 1998).). However, a top-down approach generally was taken, without consultation with the users of the environment (i.e. native farmers) and the traditional leadership (ibid). This, in turn, engendered resistance by communal farmers, who only employed conservation practices due to fear of persecution by the NRB personnel (Mugabe 1998).

At the end of World War II, colonial agriculture became a lucrative venture (Guveya 2008), hence indigenous people continued to be forcibly removed from the "white" land, as they were referred to as "squatters" (Hanlon, Manjengwa & Smart 2013). This resulted in a dramatic increase in human and livestock population in the native reserves, which led to a further increased rate and extent of environmental degradation (Murombedzi 1990, cited in Guveya 2008). It was estimated that half of the reserves were overstocked with cattle alone by 145% (Phimister 1993). In response, the colonial government promulgated the Land Utilisation and Good Husbandry Bill in 1948, which became the Native Land Husbandry Act (NLHA) in 1951 (Mlambo 2009; Mufune 1995; Phimister 1993).

The NLHA aimed to reduce imbalances in the ownership of arable land, limit stock herd size in order to maintain the land's carrying capacity (through stocking rates by law and grazing permits), individualising rights in arable land and, where possible, communal grazing areas, and providing security of tenure to boost soil conservation in the native reserves (Mlambo 2009; Mugabe 1998; Phimister 1993; Rukuni 1994). The philosophy of the 'tragedy of the commons' formed the basis for regulating the carrying capacity of the land (Rukuni 1994:26). In general, the idea that colonial Africa was overstocked in the 1960s was largely influenced by Herskovits (1926), who coined the expression 'cattle complex'. Herskovits (1926) posited that pastoralists unnecessarily raise large herds of livestock for cultural reasons, such as social status and prestige. Pastoral systems were historically perceived to be more prone to land degradation than the freehold commercial sector due to the failure of users to collectively manage common-pool resources in a more sustainable way (Hardin 1968). Both empirical and theoretical understandings have challenged this view by indicating that the collective management of common-pool resources is possible (Bromley 1989; Ostrom 1990; Ostrom, Gardener & Walker. 1994).

By 1954, the NRB was alarmed by the rate and extent of soil erosion in the reserves (Phimister 1993). This prompted the colonial government to speed up the implementation of the Act – as it was initially slow – in order to bring the problem of environmental degradation to a halt (ibid). In order to meet this objective, a five-year plan was proposed to transform about 30 million acres of land in the reserves by 1961 (Phimister 1993).

Under the auspices of the NLHA, compulsory destocking was enforced in the reserves. In order to avoid losing their cattle through this exercise, large livestock owners used covert forms of resistance, such as establishing a system of loaning livestock, known as *kuronzera* in ChiShona, to others who did not own or owned a few, and registered the cattle in their names (Mugabe 1998; Scoones & Cousins 1989). This made it difficult for officials to track cattle ownership patterns in the communal lands.

The implementation of the NLHA undermined the chief's authority, while the enforcement of unpopular soil conservation measures such as destocking and contour ridges were opposed by indigenous people and, most importantly, provided fertile ground for the expansion of nationalist movements in the late 1950s[6] (Mlambo 2009). In response to the massive resistance to the NLHA by Africans, the colonial government abandoned the NLHA in 1961 and amended it to allocate grazing land to the peasants (Rukuni 1994). Land in the reserves was expanded from 29 million acres in 1930 to 54 million acres by 1969 (Dore 2001).

In the mid-1960s, after the opposition to the NLHA by the indigenous population, largely as a result of its harshness, the colonial government conceived a new policy on community development (Abel & Blaikie 1990), which acknowledged the role of traditional institutions, particularly the chiefs, while at the same time pursuing the economic and technical objectives of the NLHA (Guveya 2008). These ideas were included in the Land Tenure Act (LTA) of 1970, which gave recognition to what became known as the Tribal Land Authorities in the Tribal Trust Land (TTL) (Guveya 2008). Based on this community development policy, communal grazing schemes were then conceived, subsidised and technically supported by the government (Abel & Blaikie 1990).

[6] In 1957, City Youth League (CYL) and a Bulawayo-based African National Council joined to form the first national political party, called the Southern Rhodesian African National Congress (SRANC), later referred to as ANC (see Mlambo 2009).

In most cases, a community was identified and the boundaries of the grazing were demarcated for their exclusive use. Grazing areas were then fenced and a short-duration grazing regime was usually followed (Froude 1971, cited in Abel & Blaikie 1990). The main aim of the grazing schemes was to encourage communal farmers to control stocking rates on the basis of the carrying capacity of their rangeland ecosystems (Mugabe 1998; Scoones 1989). Mugabe (1998) further contends that, upon acquiring this knowledge, communal farmers were expected to voluntarily engage in destocking. However, the technical reasons behind the destocking policy were largely questioned by the communal farmers and "regarded as an assault on their livelihoods" (Scoones 1989:4). Unfortunately, most of the grazing schemes established during the colonial era were abandoned during the liberation war (Sandford 1980, cited in Abel & Blaikie 1990).

Post-independence livestock policy in Zimbabwe

After independence (in 1980), the new government pursued similar policies to those followed by the colonial Southern Rhodesian government in the 1940s (Cousins 1987; Guveya 2008; Scoones 1989). These were based on the premise of stock controls, destocking, carrying capacity and the assumption that communal lands were overstocked and degraded (cf. Scoones 1989). Grazing schemes were re-introduced by the new government after the war (Abel & Blaikie 1990; Cousins 1992) and hundreds of grazing schemes were implemented all over Zimbabwe in the 1980s and 1990s (Cousins 1992). As was the case in the colonial era, the schemes were based on "demarcation of grazing territory with rights of exclusion" (Abel & Blaikie 1990:3), with the dual purpose of improving livestock production and reducing environmental degradation (Cousins 1988; Scoones n.d.).

However, these schemes in the communal lands were met with widespread resistance for several reasons. The main technical problem of the grazing scheme was its failure to acknowledge the heterogeneity of communal rangeland resources both in terms of time and space (Cousins 1987; Scoones 1989). The patchy use of resources (Scoones 1989) created disputes over access to resources such as vleis, riverine areas, etc. Other limiting factors included boundary disputes, shortage of grazing areas, fears of destocking, shortage of herding labour, internal conflicts and factional struggles, unwillingness of households located in the grazing areas to relocate to other places, and the unwillingness of non-livestock owners to contribute (Cousins 1987; 1988; 1992).

In cases where unfenced grazing schemes were adopted, the inability to exclude the cattle of non-participating owners was evident (Cousins 1987).

After independence, the government also embarked on resettlement models aimed at making grazing land available in communal areas (Moyo et al. 2012). One such model was model D, pursued from 1983 to 1984 to reduce pressure on communal grazing lands by extending communal grazing lands to the communities (Chitsike 2003) under the rotational grazing system. The model was designed mainly for the low rainfall regions IV and V, and involved the use of nearby ranches by livestock farmers in the communal lands (Chitsike 2003). However, the land was still owned by the government (ibid). This legalised the tendency of communal livestock owners during the war of liberation, when they illegally grazed their livestock on the ranches (Gonese et al. n.d). This scheme was not fully implemented in areas such as Matabeleland, however, due to the political insecurity and violence that once characterised this region soon after independence and the general lack of participation (Alexander 1991). According to Alexander (1991), Scott's everyday forms of resistance were also evident in the model D scheme in Matabeleland, such as cutting fences and the poaching of grazing. Mabhena (2014b:104) also observed that the model was perceived by farmers "as a replica of the 'rectangular grid' of colonial administrators", which led to the establishment of line settlement (*amaline*). Other limitations of the model were its ignoring of the *lagisa*[7] system and other traditional practices such as *ukusisa* (loaning) and *amalima* (team ploughing and harvesting) (ibid).

Model D was later improved and renamed the Three-tier Model. The model entails reorganising residential and arable land (including social services), which constitutes the first tier in the model (Gonese et al. n.d.). The second tier entails the development of village paddocks (also known as "near grazing area"), where all the traditional and breeding stock was grazed based on the carrying capacity of the locality (ibid). The third tier entails the development of the annexed neighbouring farm(s) into commercial ranches where all the animals grazed are meant to go directly to the market, rather than back to the communal areas.

[7] Lagisa is a transhumance system of grazing.

3.5 DESCRIPTION OF THE STUDY AREA

This section introduces the study area. The first part of this section provides the geographical and socio-political context of the study. It begins with a discussion of these elements at the national level, before shifting the focus to Matabeleland North. Finally, it describes the three case study sites, namely Monde, Dibutibu and Sizinda, which are all located in Chidobe Ward (2).

3.5.1 Geographical context of Zimbabwe

Zimbabwe is a land-locked country situated within the Southern African region, as shown in Figure 3.1. The country shares its borders with Botswana to the Southwest, Mozambique to the East, South Africa to the South and Zambia to the North and Northwest (see Figure 3.1). Two major rivers – the Zambezi River to the North and the Limpopo River to the South – form the nation's borders with Zambia and South Africa respectively. It also shares a narrow north-western border with Namibia at the Caprivi Strip. The country has an area of 390 757 square kilometres (39.075 million hectares) (Muir-Leresche 2006; ZIMSTAT 2013a) and lies between latitude 15° and 22° South of the Equator, and longitude 26° and 34° East of the Greenwich Meridian.

Administratively, the country has ten provinces, which are further divided into 58 districts, which are then further divided into numerous wards.

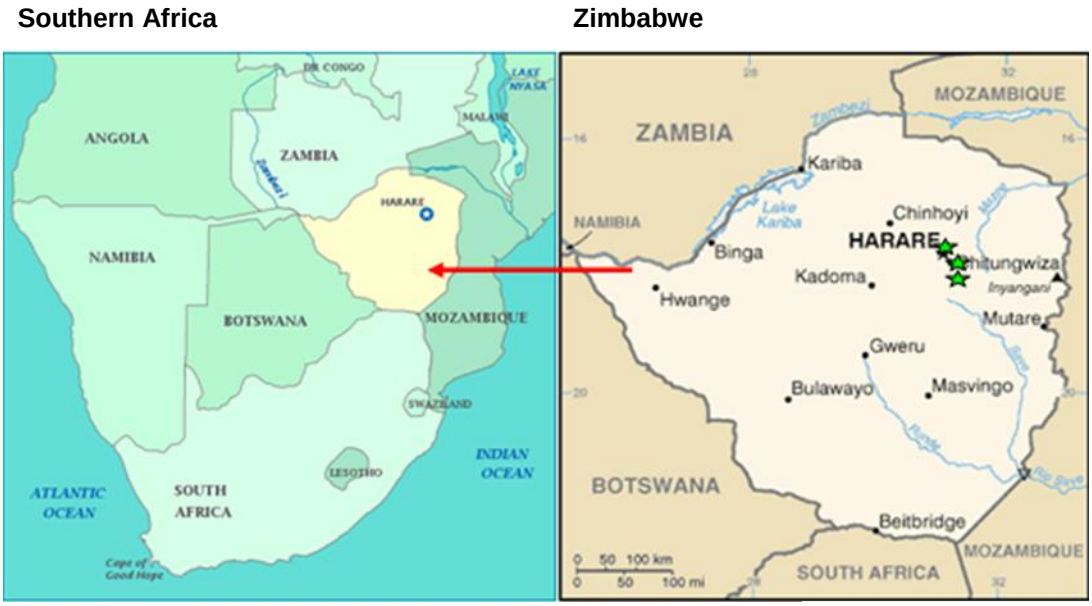


Figure 3-1 Geographical location of Zimbabwe within Southern Africa Source: Duri, Stray-Pedersen & Muller (2013)

3.5.2 Bio-physical characteristics

Zimbabwe is divided into three broad physiographic regions based primarily on altitude – the Highveld, Middleveld and the Lowveld (Muir 1994). The Middleveld covers about 40% of the country and varies from 900 – 1200 m above sea level. The Lowveld covers 35% of the country's total surface at an altitude of less than 900 m. The Lowveld consists of the river valleys of Zambezi to the North and Limpopo to the South. Lastly, the Highveld region is found in the eastern parts of the country at an attitude of between 1 200 and 1 700 m above sea level and comprises 25% of the country. The region extends from the South to the North of the Mozambican border. Although the country lies within the tropics, one-fifth of its terrain is higher than 1 200 m above sea level and three-fifths is between 600 m and 1 200 m, meaning that only the low-lying Zambezi and Limpopo valleys experience tropical conditions (Muir-Leresche 2006:99).

3.5.3 Climate

Most parts of Zimbabwe have a subtropical climate influenced by altitude (Muir-Leresche 2006:99), and are characterised by four seasons, as shown in Table 3.1. The rainfall is varied, occurring mainly between November and March (Muir-Leresche 2006). The dates of the onset and end of the rain season, however, vary from one season to another. The country has an

average annual rainfall of 650 mm (Frost 2001), but varies geographically from about 350 mm to 450 mm per year in the Southern Lowveld to 1 000 mm per year in the Eastern Highlands.

Table 3-1 Seasonal characteristics in relation to the time period

Time period	Seasonal characteristics
Mid-May to August	Cool season
September to mid-November	Hot season
Mid-November to mid-March	Main rainy season
Mid-March to mid-May	Post rainy season

Source: Government of Zimbabwe (2013)

Inter-annual rainfall variability is relatively high, with an average mean of 29% – ranging from 16% in the northern plateau to 48% in the Limpopo valley (Frost 2001). Rainfall also varies from year to year, with consequences for rain-fed agriculture (Hanlon, Manjengwa & Smart 2012). The country received below average rainfall during the 15 years immediately after independence as depicted in Figure 3.2.

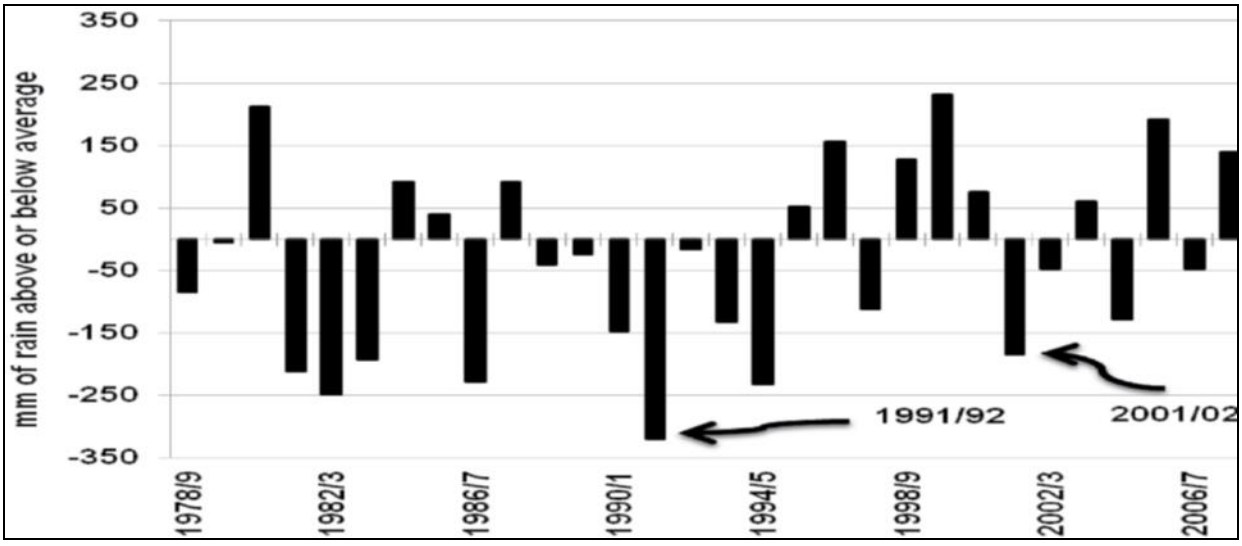


Figure 3-2 Zimbabwe's seasonal rainfall, deviation from the mean (1978-2007) Source: Adapted from Unganai (2011)

Droughts of different magnitude are a common feature in Zimbabwe, with an average of one to three droughts every decade due to the El-Nino Southern Oscillation phenomenon and periodic changes in sea surface temperatures (Chagutah 2010). For example, from 1953 to 2003, the

country experienced fourteen drought years (with rainfall less than 20% of the normal), while another five years were seriously affected by drought (rainfall less than 50% normal) (see Figure 3.2 above). Thus, drought occurs every three to four years, with a severe drought occurring in each decade (Hanlon, Manjengwa & Smart 2012).

Zimbabwe has mean monthly temperatures that range from 15°C in July to 24°C in November. Like rainfall, the mean annual temperature is also affected by altitude (Cousins 1992), as shown in Table 3.2.

Table 3-2 Mean temperature and altitude

Region	Mean temperature (℃)	Height above sea level (m)
Limpopo valley	23	600
Highveld	18 - 19	1 400
Eastern Highlands	15	1 800

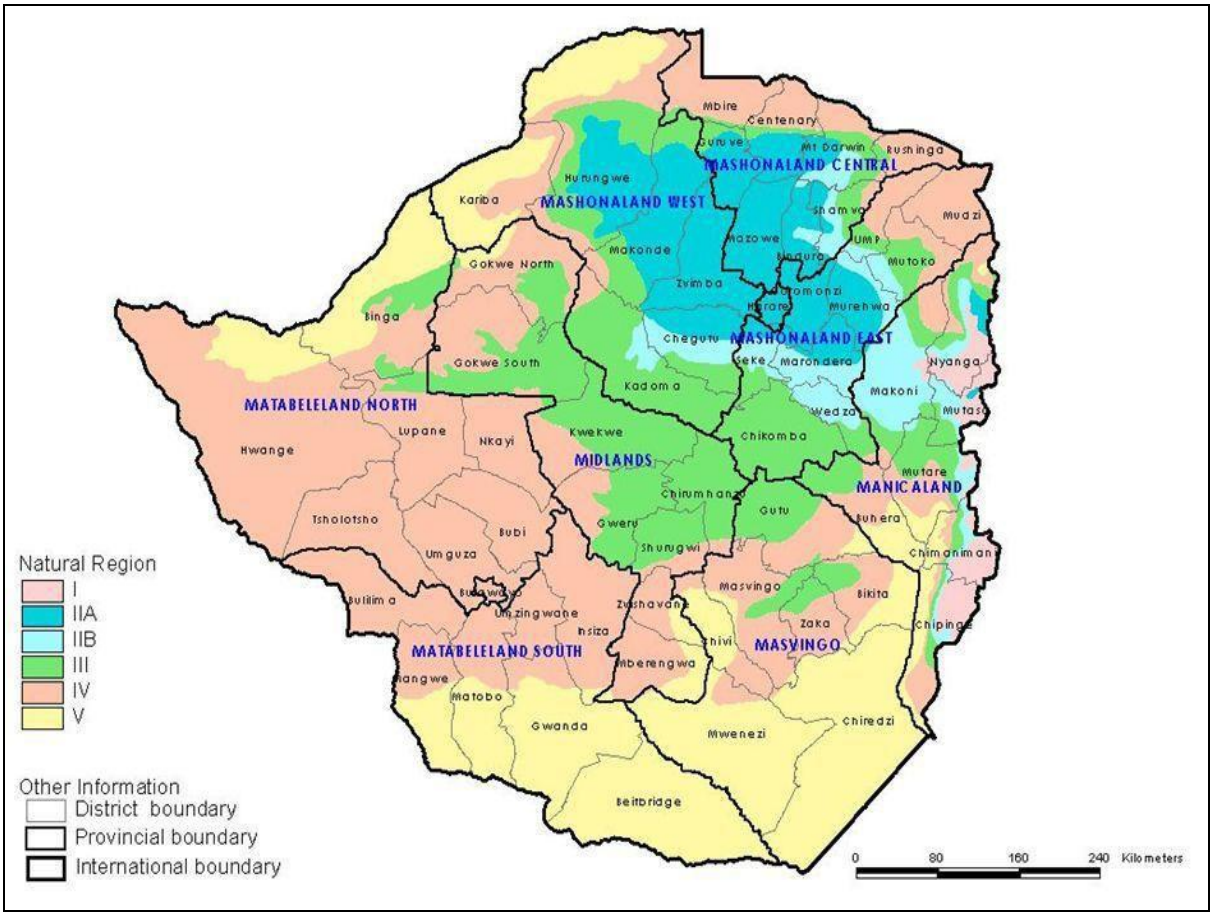
Source: Adapted from Chuma (2012)

3.5.4 The agro-ecological regions and farming systems in Zimbabwe

Zimbabwe is divided into five agro-ecological zones called the agro-ecological regions (AERs). These regions, also known as natural regions (NR), have been classified according to several factors, including various agricultural activities, soil type, vegetation, varying rainfall averages and climatic conditions (Vincent & Thomas 1960), as shown in Figure 3.3 and Table 3.3.

Earlier work by Vincent and Thomas (1960) divided the country into five agro-ecological zones on the basis of spatial distribution of rainfall, which has become the standard agro-ecological classification used in Zimbabwe today (Van Engelen et al. 2004). These categories follow a continuum, where arable agricultural potential decreases from the highest in region I to the lowest in region V, which is more suitable for subsistence and livestock farming (Chikodzi et al. 2013; Rukuni 2006). However, although still in use, some authors argue that this old classification has become outdated and redundant, necessitating re-classification (Chikodzi et al. 2013; Mugandani et al. 2012). Mugandani et al. (2012), for example, recently re-classified the

agro-ecological regions, suggesting a shift of several agro-ecological zones with regard to change in the size of the regions[8].



Source: FAO & WFP (2009)

Figure 3-3 The five agro-ecological regions of Zimbabwe

[8] The study indicated that NR I, IV and V have increased by 106%, 5.6% and 22.5% respectively, while NR II and III have decreased by 49% and 13.9% respectively (Mugandani et al. 2012).

Table 3-3 The characteristics of the agro-ecological regions of Zimbabwe and farming systems[9]

Region	Area (km^2)	Characteristics	No. growing days	Farming systems
I	7 000	• <1 050 mm rainfall per year, some rain year round. • Covers 2% of the total land area. • 18% of the total land is communal land. • Prone to soil erosion when vegetation is cleared. • Mainly covers the eastern parts of the country (Eastern Highlands).	170-200 days	Suitable for diversified or specialised farming. Main crops include tea, coffee, and macadamia nuts.
II (Sub-regions A & B)	5 860	• 700 to 1 050 mm rainfall p.a, confined to summer. • Sub-region IIA receives an average of at least 18 rainy pentads[10], region IIB higher rainfall variability. • Covers 15% of the total land area. • 21% is occupied by communal farmers.	120-170 days	Suitable for intensive crop and livestock production.
III	72 900	• Between 500 and 700 mm rainfall per year. • Covers 19% of the total land area of the country. • Subject to infrequent heavy storms, although characterised by mid-season dry spells. • 39% of the land is communal lands.	60-120 days	Semi-intensive farming. Suitable for livestock production, together with fodder and cash crop production under good farm management.
IV	147 800	• 450 to 600 mm rainfall per year. • It accounts for 38% of the total land area. • Subject to frequent seasonal droughts. • 62% of the total area is communal lands. • Other parts of HCL fall in this region.	60-120 days	Semi-extensive farming. Suitable for livestock production and drought-resistant crops and fodder. Forestry and wildlife/tourism.

[9] Sources: Vincent & Thomas (1960), Muir (1994); Muir-Leresche (2006)), ZCATF (2005).
[10] A rainy pentad refers to "the centre period of three five-day periods (pentads) which together receive more than 40 mm rainfall and two of which receive at least 8 mm rainfall" (Cousins 1992:5).

V	104 400	• >500 mm rainfall per year, very erratic and unreliable. Northern Lowveld may have more rain, but topography and soils are poorer. • It covers 27% of the total land of Zimbabwe. • 45% of total land is communal lands.	70-135 days	Extensive farming. Suitable for extensive cattle ranching, forestry, wildlife and tourism.
Total	39 700			

Source: Compiled by author

Based on the above classification, only 16.8% of the country's total land surface is suitable for intensive farming systems, and a larger share of this land is found in the north-eastern part of the country (Cousins 1992). In an estimated 50% of the remaining land, crop production is risky, thus mainly suitable for livestock production (ibid). When applying the criteria of UNEP's (1992) dry-land definition, which uses Penman's Potential Evapo-Transpiration (P/PET) value of < 0.65, agro-ecological regions II, III, IV and V can be categorised as 'dry-lands', while region I, with a value of 0.9, falls outside this classification (Van Engelen et al. 2004).

The agricultural potential for natural regions IV and V is particularly low due to poor soils and unfavourable climatic conditions, as well as other limiting social and economic factors (Nhemachena et al. 2014). The majority of communal lands of Zimbabwe – which account for 42% of the total land area of the country (Scoones 1990; Scoones et al. 2010), are situated in regions IV and V. Despite this, the communal lands directly and indirectly support about 70% of the rural population in the country.

Agro-ecological regions IV and V, sometimes referred to as the poorly endowed agro-ecological 'peripheries', are prone to droughts and food deficits, which have been predominant features of these zones for many years (Sachikonye 1992:87). These regions include two Matabeleland provinces (viz. North and South), large areas of Masvingo and Midlands province, the Zambezi and Save valleys, the Northern portions of Mashonaland West and the central part of Manicaland (ibid). The study area of the Hwange Communal Lands is located in regions IV and V (Nhemachena et al. 2014). As noted in Table 3.3, the region is characterised by high temperatures, ranging from 25°C and above and an annual average rainfall of less than 450 mm.

3.5.5 Socio-economic profile

According to a recent census, Zimbabwe has a total population of 13 061 239, with an estimated annual growth rate of 2.2% for the period 2002 to 2012 (ZIMSTAT 2013a). However, the population may possibly stagnate due to both the HIV/AIDS pandemic and the high rate of emigration in response to the socio-economic and political crisis that has characterised the nation since the early 2000s. It is estimated that 1.5 to 3 million Zimbabweans live outside the country, although this figure is open to debate (Chuma 2012).

Unlike rapidly urbanising countries in the region, about 67% of the total population in Zimbabwe is rural (ZIMSTAT 2013a). Although there are marked variations across agro-ecological regions and land tenure groups, communal lands have a higher population density than other areas (Murphree & Muzambani 2002). Poverty levels are high in Zimbabwe, with an estimated 16% of

food poverty[11] and 63% of total consumption poverty[12] (TCL) among households (Government of Zimbabwe 2013). According to the International Monetary World Economic Outlook Database, Zimbabwe is now ranked the third poorest country in the world. Poverty is more concentrated in the rural areas than in urban areas (Murphree & Muzambani 2002; Stack & Sukume 2006; World Bank 1996), with about 76% of rural households being considered poor compared to 38.2% in urban areas (ZIMSTAT 2013c). Rural poverty is higher in the communal lands than in other land-use areas (Perry et al. 2003). The ZIMSTAT's Income, Consumption and Expenditure Survey (ICES) 2011/12 report revealed that almost 80% of people in communal lands live in poverty, compared to those living in resettlement areas, where it is slightly less (76.4%).

The pattern of poverty in Zimbabwe mirrors the agricultural potential of the agro-ecological regions[13] – with the drier parts of the country having a high incidence of poverty (Chimhowu, Manjengwa & Feresu 2010; Perry et al. 2003). Poverty in the country correlates with both levels of food insecurity and the agro-ecological regions (Manjengwa, Feresu & Chimhowu 2012). Agro-ecological regions IV and V have high poverty levels, of 94% and 90% respectively, compared to agro-ecological regions I, II and III, which have better agricultural potential (ibid).

Between 2000 and 2008, the Zimbabwean economy experienced unprecedented macro-economic decline in real terms (ZIMSTAT 2011), with a decline in the real GDP by approximately 71% (Robertson 2011). By 2009, the GDP was estimated at US$284 per capita – nearly half of the GDP estimated in 1998, of US$577 per capita (PRP 2012). The period also saw a shortage of foreign currency, resulting in shortages of fuel and basic commodities, which subsequently resulted in the proliferation of parallel markets in both goods and exchange rate markets (ZIMSTAT 2011). By 2008, the annual inflation rate reached 231 million percent (Robertson 2011). This period saw an economic meltdown, marked by joblessness and hyper-inflation (ibid). Most companies in the manufacturing, agriculture, mining, distribution, tourism and other sectors were seriously challenged and some even closed down.

However, in 2009, the formation of an inclusive government, which brought together three political groups, namely ZANU-PF, MDC-T and MDC-M, aimed to spearhead economic, political and constitutional reforms and saw the economy of the country grow by 5.4% for the

[11] The food poverty line (FPL) refers to the "minimum consumption expenditure necessary to ensure that each household member can (if all expenditures were devoted to food) consume a minimum food basket representing 2 100 calories" (ZIMSTAT 2011).
[12] The total consumption poverty line (TCPL) is "derived by computing the non-food consumption expenditures of households whose total expenditures per capita just equal the value of the Food Poverty Line (FPL). The TCPL is also referred to as the upper line (ZIMSTAT 2011).
[13] See section 1.5.4 on agro-ecological regions.

first time in a decade. This resulted from the introduction of a multi-currency system in order to halt the hyperinflationary trends in the economy (BTI 2014; ZIMSTAT 2011). Several currencies were adopted as legal tender: United States dollar, South African rand, Botswana pula and the British pound. This policy was also aimed to "restore stability of prices and credibility in monetary system" (ZIMSTAT 2011:7). By 2010, the real GDP increased by 11.4%, reaching a peak of 11.9% in 2011 (Government of Zimbabwe 2013). However, it started to decline again, to 10.6% in 2012 and 3.4% in 2013 (ibid). In 2013, Zimbabwe was ranked 156 out of 187 in terms of the Human Development Index (World Bank 2014).

The next section describes the area in which the three case studies are located. Beginning with an overview of Matabeleland North Province, it describes the Hwange District before introducing the three case study areas in more detail.

3.6 PROFILE OF MATABELELAND NORTH PROVINCE

Matabeleland North Province is one of ten administrative provinces in Zimbabwe, covering 19% of the total area of the nation (AOAD 1992, cited in Hill & Katerere 2002). Located in the north-western part of the country, it shares international borders with Botswana and Zambia, and provincial borders with Matabeleland South (south), Midlands province (east) and Mashonaland province. Situated in the middleveld, the province is largely rural, with three major urban areas, namely Victoria Falls, Hwange and Lupane. Communal lands cover approximately 39% of the total land of the province (Hill & Katerere 2002).

Dominated by one of the largest minority ethnic groups, the Ndebele[14], it has a population of 749 017, comprised of 360 776 males and 388 241 females (ZIMSTAT 2013b) and accounting for 5.7% of the country's total population (ibid). Between 2002 and 2012, the population of the province grew by 0.5% compared to the national average of 1.1% (ZIMSTAT 2012). The province has the lowest population density in the country (10 persons per square km) (ZIMSTAT 2012), which can be attributed to the low agricultural potential of the region. According ZIMSTAT (2013c), the province has the highest rate of poverty, with 81.7% of the households living in poverty and 36.9% in extreme poverty. Matabeleland region has seen little development initiatives as compared to other provinces since independence (1980) due to ethnicity and political exclusion (Mabhena 2014a; Bird & Shepherd 2003). Because of the region's loyalty to the Ndebele-led nationalist party, ZAPU, the region has had bad relations with the ZANU-PF led

[14] Ndebele refers to various ethnic groups who live in Matabeleland including the Zulu group which came to Zimbabwe under the leadership of Mzilikazi from South Africa, Kalanga, Sotho, Venda, Jahunda, Nanzwa (Nambiya) and other groups (Mabhena 2014a).

government (Alexander & McGregor 2001). Soon after independence, a civil war nicknamed *gukurahundi* broke between the military forces of the new elected ZANU PF government led by President Mugabe and the minority Ndebele ethnic leading to deaths of many civilians in Matabeleleland and Midlands provinces (ibid). A five brigade army was deployed by President Robert Mugabe in Matabeleland and Midlands to uproot 'dissidents'. Given the experiences, Bird & Shepherd's (2003:605) study found that Matopo district – one of the districts in Matabeleland – was chronically poorer than other semi-arid areas in Mashonaland as a result of "historical discrimination and political exclusion" of the region.

Generally located in the middleveld (915 to 1220m) and characterised by low, erratic rainfall and poor soil fertility, crop production in this province is deemed risky without irrigation (Vincent & Thomas 1960). Thus crop production in communal areas is constrained. Due to rainfall seasonality, the region is prone to acute water shortages (AOAD 1992, cited in Hill & Katerere 2002). Nevertheless, the province was once known as the 'Brazil of Zimbabwe' due to its history of cattle production. The region is prone to droughts every two to three years (ZIMVAC 2010).

Hwange District is one of the eight districts in Matabeleland North province and is located about 300 km from the second capital city, Bulawayo. The district comprises three distinct geographical areas, namely Victoria Falls, Hwange town and Hwange rural areas. The district is multicultural, with approximately thirteen languages spoken. However, the dominant languages are those of the *Ndebele*, *Tonga* and *Nambiya* tribes, and traces of *Shona*.

According to the national census conducted in August 2012, the populations of Hwange are distributed across the three areas as illustrated in the Table 3.4.

Table 3-4 Hwange District population and gender distribution

Region	Males	Females	Total population	Household number	Average household size
Hwange rural	30 687	31 983	62 670	14 893	4,3
Hwange urban	18 501	19 021	37 522	9 903	3,9
Victoria Falls	16 254	17 494	33 748	3 755	3,7
NATIONAL	**6 234 931**	**6 738 877**	**12 973 808**	**3 076 222**	**4,2**

Source: Adapted from ZIMSTAT (2013b)

Situated in agro-ecological regions IV and V, at an altitude of 800 m, Hwange District is characterised by erratic and low rainfall, averaging between 450 mm and 650 mm per annum (see Table 3.5), and high temperatures, ranging from 35°C to 40°C during the summer months (October to February) and with lows from 15°C to 20°C during the winter months (April to July)

(Zimbabwe Vulnerability Assessment Committee [ZIMVAC] 2011). It is also characterised by Kalahari sandy soils and small patches of clay and loamy soils (Scholes & Parsons 1997). Derived from granitic or gneissic parent materials, these soils are sandy and infertile, low in nitrogen (N), phosphorus (P) and sulphur (S), and have a low cation exchange capacity (CEC) due to low clay and organic matter contents (Nyamapfene 1989; 1991). The district is also vulnerable to climate change and variability, coupled with multiple stressors (for example endemic poverty and limited access to capital, markets, infrastructure and technology) at various levels, with a low adaptive capacity (Nhemachena et al. 2014). Thus, agriculture is a risky venture in this region (ibid), and the district is one of the food insecure zones in the country (ZIMVAC 2011).

Table 3-5 Average total rainfall of Hwange District during the growing seasons from 2004 to 2013

Season/ year	**Annual rainfall (mm)**
2004/5	586.1*
2005/6	533.9*
2006/7	747.2*
2007/8	750.5*
2008/9	937.3*
2010/11	718**
2011/12	371.3**
2012/13	564.3**

Source: Compiled by the author

*From Moyo et al. (2012); **Agricultural Research and Extension Services, Hwange District (2013)

Despite these constraints, rural livelihoods in Hwange District are primarily based on rain-fed agriculture – the primary occupation of three quarters of the population (Nhemachena et al. 2014). Most households depend on crop production as their main source of food and generally run low on food supplies at the beginning of the growing season, forcing them to depend on the market to access sufficient food during the lean season[15] (ZIMVAC 2011). These lean periods are marked by increased demand for and low availability of cereals, subsequently pushing the prices of staple foods higher. The main food crops cultivated include maize, sorghum, millet, round nuts and some cow peas (ZIMVAC 2011). In general, according to ZIMVAC (2011), own crop production contributes to 82% for the better off, 74% for the middle group, 43% for the

[15] The lean season begins in September and stretches until harvest time in April/May.

poor and 38% for the very poor of their consumption requirements.[16] Typical of most parts of Zimbabwe, the agricultural season in this region begins with land preparation in September and October (before the rains) and continues up until the harvesting period (April to May). However, the main constraints to crop production include high input prices, low output prices, inadequate rainfall, poor soils, poor access to markets, lack of labour, lack of draught power, inadequate extension services, traditional norms, gender issues, wildlife and pests (Nhemachena et al. 2012).

Livestock are also an important part of the livelihood portfolios of the Hwange households. Livestock production includes rearing of cattle, goats, sheep and donkeys. Livestock sales (mainly goats rather than cattle) also are an important source of income for the middle and better-off households in the region, contributing 25% and 61% of annual cash income for the middle and better-off groups respectively (ZIMVAC 2011). As is the case in many rural households in Zimbabwe and beyond, cattle are a symbol of social status and wealth in the region. In addition, cattle play a crucial role in crop production for many households – as they provide manure and draught power for these rural households.

Tourism-based activities are also important livelihood activities in this drier region because of its proximity to Victoria Falls[17] and Hwange national park, both of which are major tourist resorts for both internal and international tourists (Nhemachena et al. 2014). The production of forest-based handcraft products (curios) is also an important source of income. Roughly 18% of the households derive their income from forest-based activities such as crafting (Nhemachena et al. 2014). However, the production of these handcraft products is constrained, requiring official permission to access trees, scarcity of timber sources and poor markets, which result in low prices and unfair exchange (ibid).

Additionally, households also depend on remittances from relatives working elsewhere. Some are locally employed by wealthier households for weeding, land preparation and harvesting, while others sell fish and worms for fishing (ZIMVAC 2011).

Generally, Hwange households are exposed to several hazards, including periodic droughts, crop destruction by wild animals, and livestock health hazards due to the presence of wildlife (ZIMVAC 2010).

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[16] Four wealth groups were identified by ZIMVAC (2011:30) based on ownership of cattle and goats, acreage of land cultivated and other product assets such as ploughs, scotch carts and fishing rods. Based on the wealth ranking, cultivated land ranges from 1 to 4 acres for the "very poor", to 4 to 8 acres for the "better off". In terms of livestock ownership (especially cattle), the "very poor" have no livestock, the "poor" own 0 to 3, the "middle" own between 2 and 5, and the "better off" own up to 10.

[17] Victoria Falls is ranked 7th as one of the wonders of the world.

Study sites in detail - Dibutibu, Monde and Sizinda

The study was conducted in three communities[18] situated in Chidobe Ward[19] (2), namely Dibutibu, Monde and Sizinda. Chidobe Ward, as shown in Figure 1.4, has a total population of 4229 and is one of the 20 wards located in Hwange District (ZIMSTAT 2013b) under the chieftaincy of Chief Mvuthu. The ward is located about 10 km from Victoria Falls and lies in agro-ecological region V. To the north it is bordered by the Zambezi River, which serves as a major source of fish and also rafting and canoeing activities. Six villages are found in Chidobe Ward: Chidobe, Monde, Sizinda, Ntabayengwe, Chisuma and Dibutibu.

The soil types in the three communities vary from predominantly granitic sandy soils, referred to locally as "*ihlabathi*", to clay loamy soils known as "*isibomvu*" in isiNdebele. During the growing season, livestock are grazed in the communally owned grazing lands (referred to locally as *amadlelo*) situated far away from the crop fields, and during the non-growing season they are grazed in the crop fields (locally referred to as *amasimo*).

[18] The researcher is aware of the fact that the term "community" is problematic to define (cf. Cousins 1992). Therefore the term as used in this study does not necessarily refer to communities in which residents share the same values, history, language or culture.
[19] Ward is a smaller administrative unit after district

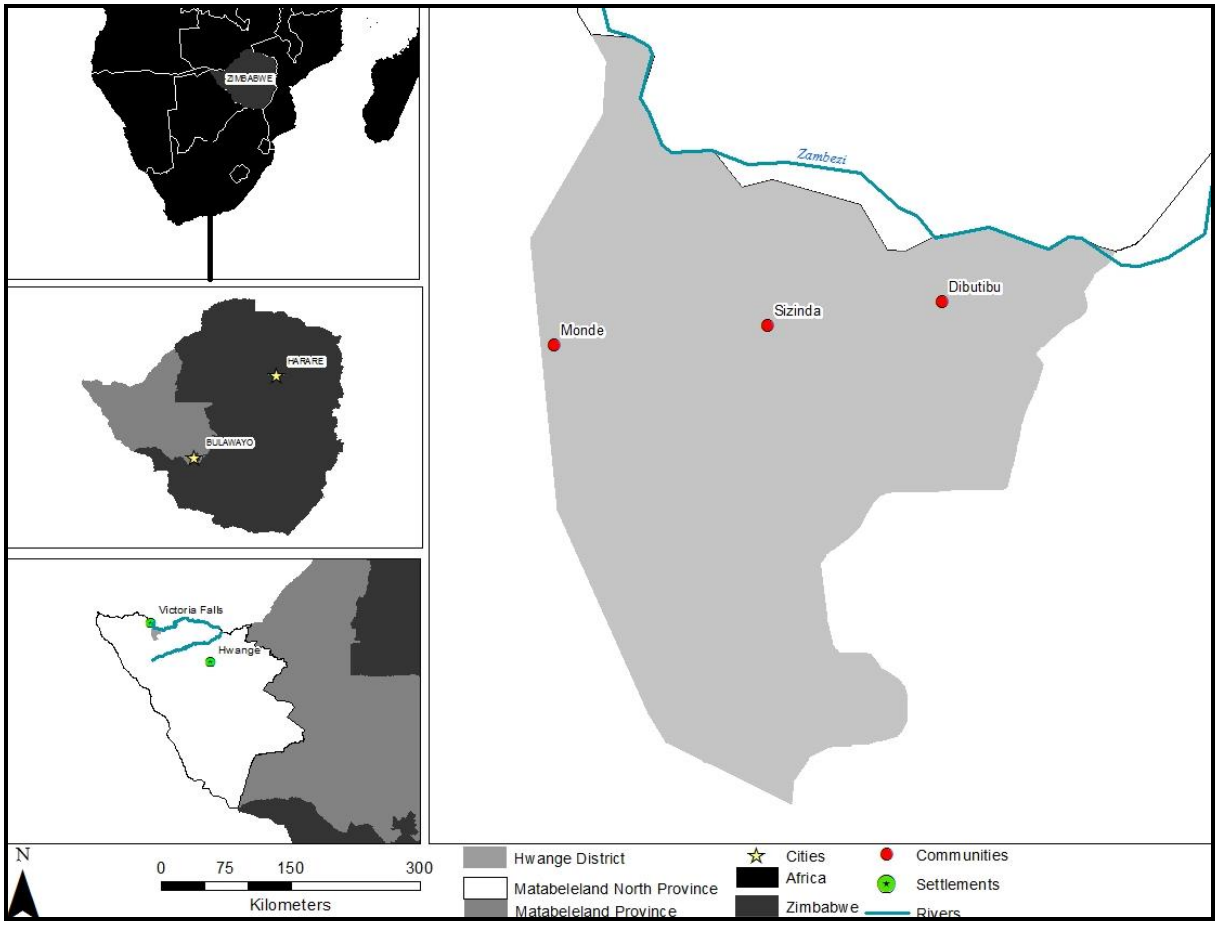


Figure 3-4 Location of Chidobe Ward (2)

The three communities comprise the following populations (Table 3.6).

Table 3-6 Number of households and total population for each community

Community	Number of households	Total population	Area (ha)*
Dibutibu	101	479	1 433
Monde	246	1 095	----
Sizinda	140	627	1 769

Source: Compiled by author

Monde is a community of 246 households and has a total population of 627 people. The soils are generally sandy and infertile, thus a key limiting factor in crop production is poor soil fertility. There are nine 'kraals' or villages within this community, each named after its kraal head (*usobhuku*): Zikhali, Zulu, Ngwenya, Mofat, Mpala, Tshuma, Thebe, Mhlangu and Ziwoya or Banda. The community consists of different ethnic groups, namely Ndebele, Shona and foreign nationals, particularly from Zambia and Malawi.

Some older inhabitants revealed that they were forcibly removed by the colonial government from their original places such as Esigodini, Lower Gweru, Lupane and Matopos in the 1950s to make way for large-scale white farmers. Such inhabitants are mainly Ndebele-speaking people.

Others are pensioners from Wankie Colliery who have sought rural homesteads in this community after retirement, but originating from elsewhere – either in Zimbabwe or Malawi. Some are employees of the nearby Victoria Falls, looking to break away from the expensive urban life and are attracted by the proximity of this community to the resort town.

Monde is one of the first communities in which holistic management (HM) was implemented in HCL. Table 3.7 shows the historical timeline of HLLM events in Monde.

Table 3-7 Timeline of HLLM events in Monde

Year	Experience with HLLM
2006	• Farmers were trained in mat making in preparation for HPG and the goat project • The villagers were trained in HM, and 10 village-based facilitators were trained.
2007	• Goat banking project[20] started by the ACHM. Forty households benefitted from the goat project – each household received 10 goats, and a total of 400 goats were allocated to 40 households. Repayment of goats was due 12 months from the date of signing the loan agreement at an interest of three weaned goats per year (2 females and 1 male) for three years • 10 villagers trained as herders and two as animal health workers
2008	• Community garden established for villagers • Mange disease outbreak attacked goats, most households lost their goats • Villagers taught about crop field animal impaction
2009	• Construction of water point and tank, commercial water meter installed
2010	• The ACHM introduced community mobilisation strategy
2011	• Tank closed by ZINWA due to unpaid bill of nearly US$4 000
2012	• The ACHM exited Monde
2013	• Tank and garden now dysfunctional. No water for livestock

Source: Author

Holistic management in Monde began in 2006. Farmers were mobilised through the cascade approach and trained in HM in order to train other villagers. In 2010, the ACHM changed its community mobilisation strategy to what they call “community action cycle” (CAC), which never yielded any positive results. By 2012, the ACHM had abandoned the implementation of HM in Monde.

Dibutibu, like Monde, is situated in Chidobe Ward (2). The community consists of 101 households from three “kraals” or villages, with a total population of 479 people and an area of

[20] The goat banking project was introduced as an alternative to the weak banking system that was weakened by hyperinflation.

approximately 1 433 ha (Extension Officer 2013, per com). The three "kraals" are under kraal heads *S. Ncube*, *Ncube* and *Ndlovu*. The soils are predominantly heavy clay soils, thus better in terms of soil fertility than the other two sites. According to the ACHM officer who was working in this community, most villagers in Dibutibu "have their things", meaning that they are "rich". Just like Monde, Dibutibu is inhabited by multiple ethnic groups, including Ndebele, Shona and a few Chewa. Most of the farmers are pensioners from Wankie Colliery mine. About 80% of the total households in Dibutibu are large livestock (cattle and donkey) owners (ACHM n.d.).

HLLM was launched in 2010 after the villagers invited the ACHM to implement it in their community. However, the adoption of both HPG and animal impaction was low. Thus, Dibutibu was classified as a "struggling community" with regard to the implementation of HLLM.

In Sizinda, HM began in 2008 (see Table 3.8 for a detailed histotrical time line). Sizinda consists of 140 households, with an estimated population of 627 people distributed across three villages under three kraal heads – *Dube*, *Makupira* and *Marathuza*. The soils are predominantly poor Kalahari sandy soils. About 33% of the total households in the community are large livestock owners (ACHM n.d.). In contrast with the multi-ethnic nature of the other study areas, the villages are inhabited mainly by the Ndebele and Nambiya ethnic groups.

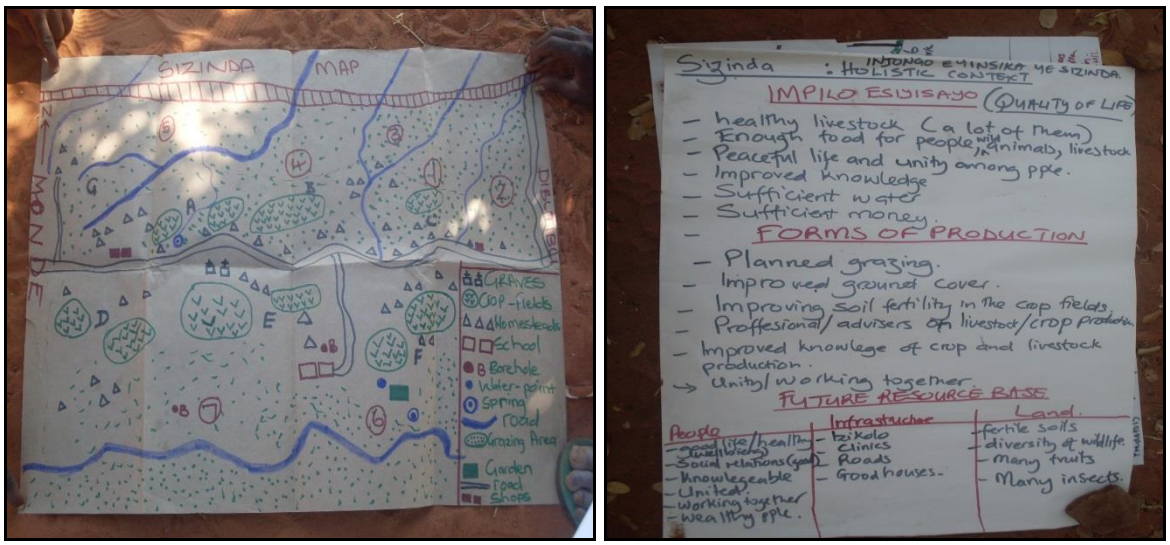
Table 3-8 A historical timeline of HM in Sizinda

Year	Experience with HM
2008	• Farmers taught to make mats for use as kraaling material • Farmers trained in HPG and animal impaction of crop fields
2009	• Goat banking project began (five goats per farmer) • ACHM built water tank and tough
2010	• Community garden established next to water tank • Demarcation of grazing paddocks for both wet and dry season • Herders trained in preparation for HPG • Core group formed
2011	• CADEC donated fencing material to community garden
2013	• Community received kraaling material (boma sheet) from the ACHM

Source: Author

Holistic management was first launched in Sizinda in 2008, in preparation for a "goat banking project". The adoption of the programme began in 2009 when one of the early adopters began impacting her crop fields using the goats she had received from the ACHM. In 2010, farmers

were mobilised and trained in HM using the community action cycle. By 2010, farmers, with assistance from the ACHM, had demarcated 14 paddocks (*ukuhlela amadlelo*). In line with HM principles, farmers also formulated a "holistic context"[21] (*injongo yensika yeSizinda*). Both the holistic context and planned grazing were in written form and were shown to the researcher, as illustrated in Figure 1.5 below. As of 2013, the farmers adopted HPG and were combining it into a community "land management herd" (LMH). In 2013, the community received a boma sheet (kraaling materials) and this enabled farmers who were members of the core group to have an impact on their crop field using the community herd. In 2013, 18 farmers adopted the animal impaction of crop fields, 17 of whom used livestock from the LMH while one used own livestock. Twenty-three farmers adopted HPG. Thus, Sizinda is considered a "success story"[22] of HLLM by the ACHM and has become their showcase area.



Source: Author translation

Figure 3-5 Grazing paddocks (left) and holistic context (right) in Sizinda

3.7 SUMMARY

This chapter sought to provide a clear context of the study. It has provided an overview of the role of agriculture in the Zimbabwean economy and a detailed discussion of the issue of land reform in that country. The history of rangeland management policies was reviewed, debating their successes and failure. The chapter then provided a detailed overview of the Matabeleland North province describing the study area. The next chapter discusses the conceptual framework employed in this study.

[21] The holistic context was translated from isiNdebele vernacular into English by the researcher.
[22] The community is classified as a "successful community" by the ACHM.

CHAPTER 4: UNPACKING THE CONCEPTUAL FRAMEWORK

This chapter describes the theoretical frameworks adopted as analytical frameworks to understand the impact of HLLM on the livelihoods of smallholder farmers in the Hwange Communal Lands. Although the livelihoods perspective remains central in this study, other perspectives will be integrated in order to address issues of agency, politics and power. Thus the conceptual framework used in this study integrates four concepts, namely:

- The sustainable livelihoods approach (Carney 1998; Chambers & Conway 1992; Scoones 1998; 2009)
- The actor-oriented approach (Long 1989; 2001; 2004)
- Everyday forms of resistance (Scott 1985)
- Everyday politics (Kerkvliet 1995; 2009)

Bonnin and Turner (2012) suggest that the reactions and impacts of a new programme on the livelihoods of its beneficiaries can be analysed better by adopting an actor-oriented livelihood approach combined with everyday politics and resistance. The next section presents each individual concept in detail.

4.1 THE SUSTAINABLE LIVELIHOODS APPROACH (SLA)

The sustainable livelihoods approach has dominated rural development thinking and practice in the past decade (Scoones 2009:171). Originating from "village studies, household economics, gender analysis research, agro-ecosystem analysis, rapid and participation appraisal, studies of socio-environmental change, political ecology, sustainability science and resilience studies (and many other strands and variants)" (Scoones 2009:174; also for a detailed description see, Morse & McNamara 2013:22-29), it came into prominence in the early 1990s as a concept to address rural development, poverty reduction and environmental management, as noted by Scoones (1998) and Carney (1999). The livelihood approach is largely attributed to the work of Sen (1981) on entitlements and of Robert Chambers (1983; 1994) in the mid-1980s and 1990s (De Haan 2012:346). As Scoones (2009) noted, the rise of the livelihood approaches in the early 1990s was due to the growing frustration with the Washington Consensus in the late 1990s, coupled with the desire of the newly elected Labour government in 1997 in the United Kingdom to shift the focus of its development efforts (also see, De Haan 2012; De Haan & Zoomers 2005). Solesbury (2003:2) argued that the proactive, self help imaged potrayed by the sustainable livelihoods approach matched well with the image that the UK's new Labour administration wanted to demonstrate (also see, De Haan 2012:346; Morse, McNamara & Acholo 2009).

The first paper on sustainable livelihoods was by Chambers and Conway (1992), and marked the emergence of an approach that became known largely as the 'Sustainable Livelihood Approach' (Carney 1998; Chambers & Conway 1992; Scoones 1998). Generally regarded as the 'foundation paper' of the work on sustainable livelihoods (De Haan 2012:346; Small 2007:28), it coined the first definition of sustainable livelihoods. These authors hold that "a livelihood comprises assets (stores, resources, claims and access) and activities required for a means of living" (Chambers & Conway 1992:7). A sustainable livelihood is one that "can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term" (Chambers & Conway 1992:7).

Building on Chambers and Conway's (1992) definition, Carney (1999:4) modified and described sustainable livelihoods as follows:

> A livelihood comprises the capabilities, assets (including both materials and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain and enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.

This definition became widely used and adopted by different development agencies (De Haan 2012), particularly the DFID. Since its emergence, the livelihoods approach has been widely used by development agencies and NGOs to foster development in both urban and rural areas (Gaillard et al., 2009). The concept was adopted, formalised and widely promoted by the UK's Department for International Development (DFID) as the 'Sustainable Livelihoods Framework' (De Haan 2012).

The basics of the sustainable livelihoods approach

De Satgé et al. (2002:59) note that there is "no single 'right way' to analyse and understand livelihoods". In line with this thinking, De Haan (2012:346) noted that, in its initial stages of development, "the explanation of the Sustainable Livelihoods was supported almost as a rule by a diagram, of which plenty of variants were circulating after a few years". Most of such variants have their roots in development organisations – "displaying in this way their own interpretation of Sustainable Livelihoods" (ibid: 346). Some of the variants that emerged include the Institute of Development Studies (IDS) (Scoones 1998); the DFID (DFID 1999); Oxfam International; CARE and United Nations Development Programme (UNDP). Notwithstanding these variations,

most livelihoods interpretations emphasise the significance of assets, livelihood strategies and outcomes, as well as the enabling or constraining roles of policies, institutions and processes. In general, the assumption is that poor people pursue a range of livelihood outcomes, for example health, income, reduced vulnerability, etc., by drawing on a range of assets – normally presented as a pentagon (i.e. human, natural, social, physical and financial) in order to pursue various livelihood activities. Some of the key elements of the livelihoods framework are explained in detail below.

Vulnerability context

The vulnerability context refers to the multiple factors that are beyond people's control that make them vulnerable or benefit them (Adato & Meinzen-Dick 2003; De Satgé et al. 2002). Despite vulnerability being viewed in most cases as negative, it can also create good opportunities (Adato & Meinzen-Dick 2003; Kollmair & Gamper 2002). Trends (e.g. new technologies) and seasonality (e.g. prices) can be positive as they create new opportunities to secure livelihoods. Poor people struggle to cope with stresses and shocks and are generally not well equipped to capitalise on any positive trends (DFID 1999). The vulnerability context in the SL framework include *trends*, which are usually long term and often occur on a large scale (Twigg 2001), and *shocks* and *seasonality*, which refer to seasonal changes. The vulnerability context includes trends in resources, technology, governance, population, etc., while the shocks include natural shocks, e.g. floods, earthquakes, economic and conflict, while seasonality shocks include employment, prices, production, food availability, etc.

Assets or capitals

Assets form a "livelihood building block" for poor people (Farrington et al. 1999) and are variously defined in the livelihoods literature. Ellis (2000) refers to assets as different forms of capitals employed directly and indirectly by people to generate household survival options, sustenance and well-being. Capitals or assets can either be held as "private or as common property, rented, borrowed, grabbed, stolen or conquered" (De Haan 2012:347). It is not important whether poor people own the assets or not, but what is more important is their access to them when needed (ibid).

SLFs define and categorise assets in different ways. Most frameworks (e.g. DFID and Oxfam) graphically present five capitals or assets (i.e. natural, social, human, financial and social) constituting an 'asset pentagon'. However, adaptations have added either cultural capital (Bebbington 1999) or political capital (Baumann & Sinha 2001; Ludi & Slatter 2008) or both in

what has been called a "community capitals framework" (Emery, Fey & Flora 2004). More recently, several studies have echoed the need to incorporate cultural capital in development thinking and practice (Daskon 2010; Daskon & Binns 2010; Daskon & McGregor 2012; Mpofu 2012a; 2012b) in order to achieve "culturally appropriate development" (UNDP 2004). In this study, cultural capital has been added. The assets that have been employed in this study are described in Table 4.1. The researcher therefore employed a modified DFID framework, with an additional cultural capital as the sixth capital as depicted in Figure 4.1.

Table 4-1 Forms of assets or capitals within the SLF

Social	Although the concept is criticised as being "poorly defined" (Onyx & Bullen 2000:24), several definitions exist. Woolcock and Narayan (2000:226) define social capital as "the norms and networks that enable people to act collectively". This definition places more emphasis on the sources rather than the consequences of social capital (Cramb 2004). Putnam (1993: 35-36) defined it as "features of social organization, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit". In the context of rural livelihoods, people draws upon social networks, trust within the social networks, membership in formal and informal groups (both cultural and religious groups), general support from different groups, etc. to achieve livelihood outcomes (De Satgé et al. 2002; Kollmair & Gamper 2002). Social capital is important in natural resources management (Petty 2003).
Human	Skills, knowledge, ability to labour and good health, enabling people to pursue different livelihood strategies and meet livelihood objectives (DFID 2000). At the household level, human capital critically influences how other assets are used. It is influenced by factors such as the size of the household, skills possessed by individual members within the households, health, etc.
Natural	Natural stocks such as land, air quality, marine resources, wildlife, forestry, soils, water, climate, minerals, etc. where resources and flows crucial for livelihoods are derived (DFID 1999; Scoones 1998). The rural poor depend on natural capital for natural resource-based activities (e.g. agriculture, fishing, livestock production, weaving, etc.) in order to make a living.
Physical	Human-made resources, e.g. clinics, roads, housing, dams, water and sanitation, energy, communication and information sources like radio and television, and tools to support livelihoods (DFID 1999).
Financial	Assets and entitlements with a cash value or equivalent that people draw upon to achieve their livelihood objectives. Divided into two main sources – available stocks and regular inflow of money (Kollmair & Gamper 2002). The former refers to cash, savings and 'liquid assets' (e.g. livestock and crops without liabilities attached and independent of third party), while the regular inflow of money comprises remittances, pensions and other transfers from the state.
Cultural	Include *embodied* (intangible or material), *objectified* (tangible) and institutionalised entitlement (Bourdieu 1986, cited in Daskon & McGregor 2012). Culture is a multidimensional concept commonly conceptualised based on different contexts and disciplines (Daskon & McGregor 2012). There is no universally accepted definition. In the context of rural livelihoods, cultural capital comprises embodied (the local systems of knowledge, beliefs, norms, customs and rules) and objectified (artistic artefacts) assets, which play an important role in the everyday lives of locals. Several authors (e.g. Adato & Meinzen-Dick 2002; Daskon 2010; Daskon & Binns 2012) have criticised the SLF for inadequately addressing the issues of traditional cultural and religious values, even in the category of social capital itself (Morse & McNamara 2013). According to Daskon and Binns (2010), cultural values and norms enable us to understand how local people access other livelihood capitals such as social, economic, physical and environmental capital. Additionally, Daskon (2010) argued that people's values, customs, norms and traditional knowledge strengthens resilience and sustain rural livelihoods in vulnerability situations. Calls have been made to integrate cultural capital into development thinking (Bebbington 1999; Daskon 2010; Daskon & McGregor 2012; Mpofu 2012a; 2012b) for "cultural appropriate development" (UNDP 2004).

Source: compiled by Author

Policies and processes

There are many structures in the external environment that have both a direct and indirect influence on livelihoods, enabling or constraining the livelihood strategies of poor people. Policies and processes affect how people make use of and access the assets or capitals in pursuit of livelihood strategies. Such factors can affect livelihoods positively or negatively and can be grouped into the physical, political or institutional, and the economic environment.

The SLA approach also identifies formal and informal structures and laws that determine access to, and exchange terms between, different assets and returns to livelihood strategies, affecting the livelihood strategy either positively or negatively, thereby either generating or reducing vulnerabilities (Adato & Munzein-Dick 2002). Institutions include organisations, policies and legislation that determine the way in which livelihoods can be pursued. These structures operate at all levels, from the household level to international level (De Satgé et al. 2002). Global processes of change constantly affect rural people, who have limited control or the information necessary to anticipate the change. For example, international organisations (e.g. the World Bank, the International Monetary Fund (IMF)), political and trade institutions (e.g. the SADC) and national and provincial structures (e.g. municipalities, community-based organisations (CBOs, NGOs)) link rural people with natural resources and markets.

Livelihood strategies

Livelihood strategies comprise a range and combination of activities and choices that individuals or households perform to achieve livelihood goals, commonly known as livelihood strategies' (DFID 1999). People engage in different livelihood strategies, both sequentially and simultaneously. Households that undertake few strategies are very vulnerable, as they have limited options to fall back on when the other strategy has failed or is insufficient to make a living (De Satgé et al. 2002).

Rural individuals and households integrate various activities available to them, rather than relying on a single activity in a process known as "diversification" (Ellis 1999). The concept of livelihood diversification refers to the "process by which rural families construct a diverse portfolio of activities in their struggle for survival and in order to improve their standards of living" (Ellis 1998:4). Literature on diversification has identified several reasons why rural households diversify their livelihood strategies. Diversification can be done to overcome barriers and cope with shocks and stresses – a process that Bouhom, Douangsavah & Rigg (2004:613) called distress diversification, or occurs as a result of new opportunities, in what

Turner (2007) termed selective diversification. Bryceson (2002) and Ellis (2000) categorized the reasons for diversification as "pull" and "push" factors. Push factors include low profits margins derived from agriculture due to reduced farm size, poor access to land, and increased risk of agriculture due to climatic variations (Moreda 2012). While pull factors are mainly attributed with opportunities that offers higher returns than agriculture. Bryceson (2002) contend that push factors largely influence diversification of livelihoods into non-farm activities in sub-Saharan Africa.

Livelihood strategies are dynamic, affected by the status of the assets available, and influenced by changing structures and processes at different local, national and international levels. Therefore, when investigating livelihoods it is crucial to understand the interactions between complex and dynamic processes and the outcomes of different strategies (Kollmair & Gamper 2002).

Livelihood outcomes refer to the results of livelihood strategies, such as improved sustainability of natural resources and food security, reduced vulnerability (better resilience due to improved asset base), improved well-being, such as health, self-esteem, sense of control and maintenance of cultural aspects (Kollmair & Gamper 2002). These outcomes can either be sustainable or not sustainable (De Satgé et al. 2002). It is generally agreed that livelihood strategies that do not degrade natural resources are sustainable (see Chambers & Conway 1997; Scoones 1998). Over-utilisation of natural resources can diminish the natural resource base.

The SL framework is a model that seeks to investigate the various interrelated causes of poverty and how best to alleviate it. It provides a platform to analyse the livelihood assets of poor people, the vulnerability context and the policies-institutions-processes that, together, affect the livelihood strategies employed to achieve livelihood outcomes.

The interpretation of the livelihoods approach

The livelihoods framework has been interpreted in several ways. The DFID's framework is one of the most well-known livelihood interpretations that gained currency in development practice.

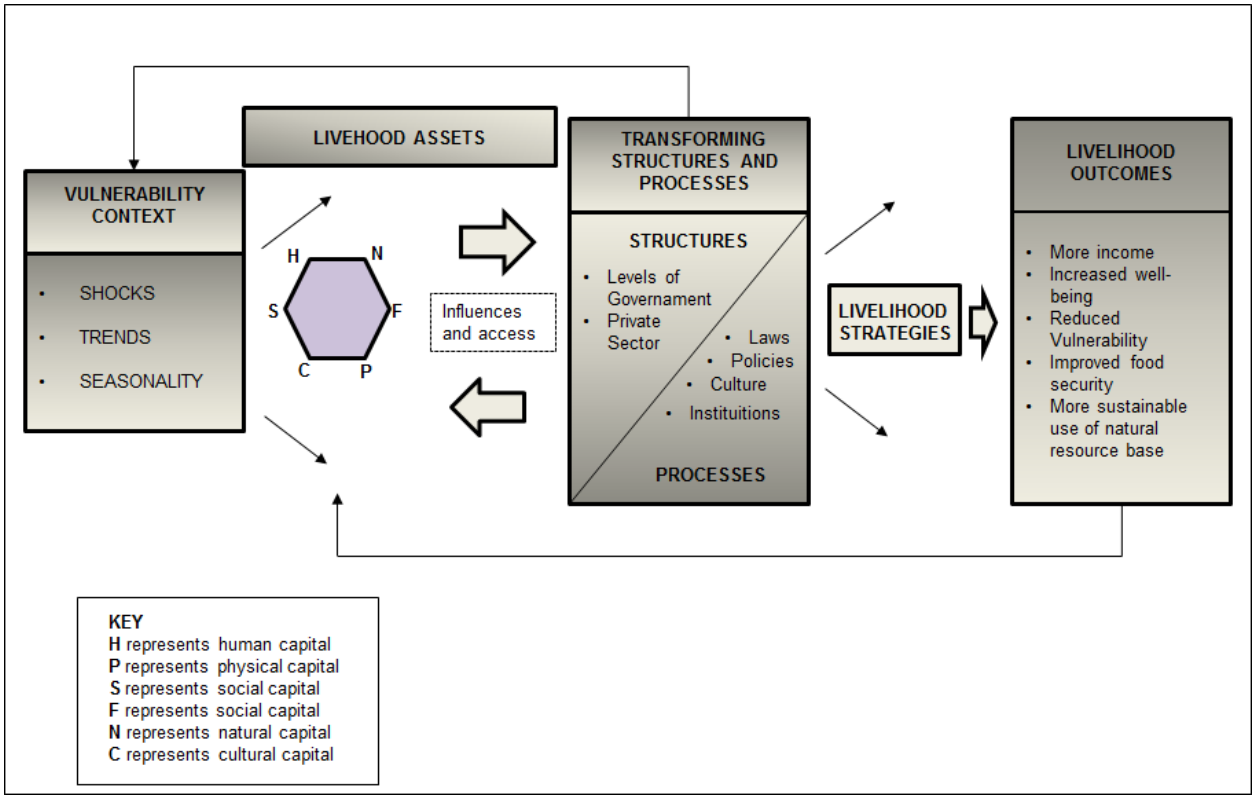


Figure 4-1 Modified DFID Sustainable Livelihoods Framework

Source: Adapted from DFID (2000)

As illustrated in the DFID version above, the SL framework is made up of five distinctive interlinked elements. It is based on the notion that people operate in a *context of vulnerability* in order to access different *assets* or *capitals* (e.g. natural, financial, human, physical and social), which are in turn influenced by prevailing social, institutional and organisations known as *transforming structures and processes*. This influences the *livelihood strategies* that are available to people in pursuit of a range of *livelihood outcomes* (e.g. health, income, reduced vulnerability, food security and a more sustainable use of natural resources).

Critique of the livelihoods perspective

In recent times, the application of the livelihoods framework in development practice has waned due to some identified limitations (Mensah 2012:8; Prowse 2008). Despite its usefulness in rural development thinking, some scholars (De Haan & Zoomers 2005; Murray 2001; O'Laughlin 2004; Scoones 2009) have expressed concerns about the ability of the approach to engage and link livelihoods with wider development issues due to its failure to address key issues. For example, the SL framework has been persistently criticised for emphasising material access and ability while ignoring social processes, particularly power relations and political influences (Arce

2003; Carr 2013; De Haan 2012; De Haan & Zoomers 2005; Jakimow 2012; 2013; Kanji, MacGregor & Tacoli 2005; O'Laughlin 2004; Scoones 2009) and cultural norms and practices (Adato & Munzein-Dick 2003; Bebbington 1999; King 2011). Kay (2006:465) argues that the analysis of poverty has to be imbedded in power relations as it is these that continually reproduce poverty and are a major setback in addressing poverty (Kay 2006:465). The also SLF tends to over-emphasise the economic aspects of livelihoods playing down the day-to-day politics of the poor (Bonnin & Turner 2012; Turner 2012).

Early critics, for example Murray (2001), provided a powerful critique of the SLA. He noted that the approach is inadequate in its treatment of other elements of vulnerability, such as high inflation, extreme civil conflicts and ripples of mass redundancy. Such trends are also important in understanding the vulnerability context of poor people. Murray (2001)'s critique also goes beyond the neglect of power, and focusses on the conceptual problems inherent in the approach's application of the term 'capital'. He argued that "equating 'assets' theoretically with varieties of 'capital', through the 'asset pentagon'….intellectually distorts our understanding of capital and politically distorts our understanding of the causes of poverty" (Murray 2001:7). Instead, Murray (2001) draws attention to the fact that capital in general is best understood in relational terms (and thus implies, for example, the antagonistic social relation between capital and labour), rather than something held by rural households. According to Murray (2001), another limitation of the approach is its inadequate definition of the term 'sustainable', thus raising some key questions, such as for whom is it sustainable,, what criteria will be used to assess the term, and over what period of time?

In his interrogation of the rise of the notion of social capital, Ben Fine (1999) argues that the use of the term (for example, by the World Bank) suggests a community or region with limited collective capacity, thus indicating a need for an intervention aimed to improve its assets. However, Fine (1999) argues that such an approach understates wider political and economic factors that influence access to resources and issues of inequality. Additionally, the idea of identifying five capitals, especially the DFID framework, has been criticised for encouraging a 'one-size-fits-all' approach, where assets are used uncritically and ignore local agency (Arce 2003; Jakimow 2012; Staples 2007).

O'Laughlin (2004) criticized the livelihoods approach for ignoring power relations, particularly class and gender relations, as she notes that:

> Documenting complexity and diversity in the livelihoods of the poor does not assist very much in indentifying the relations of inequality that underlie poverty, most of which

> extend far beyond the boundaries of local communities and livelihood groups. Class, not as an institutional contextual variable, but as a relational concept, is absent from the discourse of livelihoods. Accordingly political space is very limited – focussing mainly on 'empowering' the poor, without being clear about how this process takes place or who might not be 'disempowered' for it to occur (O'Laughlin 2004:387).

Another limitation of the SLF is that it tends to be "atemporal" because of its blindeness to historical processes (Kay 2006:465). For example, it gives insufficient attention to structural changes and household dynamics, for example in cases where household members migrate nationally or internationally, often not returning (ibid).

Recently, in his review of the livelihood concept and approaches, Scoones (2009) provides a detailed assessment of four major reccurent failings of the livelihood perspectives, also echoed by O'Laughlin (2004), including lack of engagement with economic processes of globalization and their link to local livelihoods, lack of emphasise on politics and power relations, lack of engagement with global environmental change (e.g. climate change) and its impacts, and the limited engagement of livelihoods approaches with debates about ongoing agrarian change in the developing countries.

Since the SLF is claimed to be a 'holistic' approach, it requires the analysis of many aspects, generating massive information that may be difficult to manage (Kollmair & Gamper 2002). Others argue that the layout of the SLF, particularly that of the DFID model, although claiming to start with the poor, rather displays a left to right reading (De Satgé et al. 2002; Hamilton-Peach & Townsley 2006:1), making poor people difficult to locate in the schematic diagram.

Acknowledging the limitations of the SLF, Scoones (2009:183) argues that there is need for "re-energising of livelihoods perspectives with new foci and priorities to meet these challenges". Thus, scholars such as Small (2007) argue that attempts should be made to integrate SL with other constructs, such as Long's actor-oriented approach, which takes into consideration specific local cultural, historical, gender, spatial and power aspects (Bonnin & Turner 2012:97). The next section describes the actor-oriented perspective in detail.

4.2 ACTOR-ORIENTED APPROACH AND SOCIAL INTERFACE ANALYSIS

Answering to the identified shortcomings of the SLF approach, this study also employs the actor-oriented perspective, particularly social interface analysis (Long 1989; 2001; 2004). This

perspective enables us to understand a range of responses to the promotion of an intervention such as HLLM.

Anchored in the development sociology tradition, the actor-oriented approach (AOA) (Long 1989; 2001; 2004) was developed as a critique of, and alternative to, earlier structural theories such as modernisation, neo-Marxist and political theories that promote linearity, determinism and institutional hegemony (Long 2001:1). Long criticised these earlier structural theories for failing to fully conceptualise the sources and dynamics of social heterogeneity. Thus, for Long (2001; 2004), structural theories downplay how affected groups or local actors interpret, mediate and transform development interventions. Long's (2001) actor-oriented perspective recognises diverse responses of actors to similar situations, meaning that individuals, households and even groups respond in different ways to a similar phenomenon (Small 2007:33), thus the process of development and change is replete with negotiations and conflicts. AOA originated from the interactionist and phenomenological studies of the 1960s and 1970s, consensus to a social-constructionist perspective that entails the "remaking of society through the ongoing self-transforming actions and perceptions of a diverse and interlocked world of actors" (Long 2001:5).

Long (2001:13) argues that "all forms of external intervention necessarily enter the existing lifeworlds of individuals and social groups affected, and in this way they are mediated and transformed by these same actors and structures". For Long (2004:15), development and policy interventions incorporate a range of "negotiated orders, accommodations, oppositions, separations, and contradictions". As such, he contends that, to fully understand the everyday processes by which "images, identities and social practices are shared, contested, negotiated, and sometimes rejected by various actors", we need to analyse the degree to which the lifeworlds of specific actors, together with their social and cultural perceptions, are autonomous or at times "colonized" by more extensive frames of ideology, institutions, and power (ibid: 2004:16).

The AOA acknowledges human agency, which is considered as multidimensional, with actors having different interests and acting strategically, although constrained by social structures (Long 2001). The notion of human agency (knowledge and capabilities) posits that social actors (i.e. collectively or as individuals) have certain capacities of assessing or interpreting social experiences and responding to problematic situations (Long 2001). In the context of a planned intervention, Long (2001) argues that the AOA enables the identification and analysis of social actors that interact in with each other. In the context of this study, a planned intervention is taken as the implementation of HLLM in the agro-pastoral communities of HCL.

Besides human agency, social actors are also characterised by their 'lifeworlds', or their 'lived in' or 'taken for granted' social world, which evokes certain actions, interactions and meanings. Lifeworlds are the lived realities that people adaptively construct for themselves. Thus, lifeworlds are the "sum total of mental maps and models that people have built to allow them to cope in their environments", influenced by past experiences and individual or shared understandings (Douthwaite et al. 2001:n.p). These lifeworlds influence the way people respond to a new technology (or intervention).

As observed by Long and Liu (2009:71), AOA enables a nuanced understanding of the social and cultural discontinuities and ambiguities inherent in the "battlefields of knowledge" (Long & Long 1992) that influence relationships between local actors, development officials and other stakeholders, such as researchers themselves. The image of "battlefields of knowledge" entails the "idea of contested arenas in which actors' understandings, interests and values are pitched against each other" (Long 2004:15).

Through the adoption of the social constructivist perspective, Long (2004) acknowledges the existence of 'multiple social realities', that is that people (and even institutions) have different understandings and beliefs that conflict with each other during interactions. In order to understand the dynamics of these interactions, Long developed the notion of "social interface". As defined by Long (2004:28), this:

> [occurs] at points where different, and often conflicting, lifeworlds or social fields intersect; or, more concretely, in social situations or arenas in which interactions become oriented around problems of bridging, accommodating, segregating or contesting social, evaluative and cognitive standpoints.

Central to the concept of social interface is the livelihoods concept. According to Long (2001:54), livelihood "best expresses the idea of individuals and groups striving to make a living, attempting to meet their various consumption and economic necessities, coping with uncertainties, responding to opportunities, and choosing between different value positions". This definition is similar to the one provided by Chambers and Conway (1992), described in section 4.1.1. In order to understand the impacts of HLLM on the livelihoods of its beneficiaries, the concept of social interface was used to examine in detail how discrepancies in knowledge, power and cultural interpretations are, as Long (2004:16) argues, "mediated and transformed at critical points of linkage or confrontation" in the study sites.

The actor-oriented approach, however, is also not without pitfalls. Despite the multiple strong features of the approach[23], some scholars (Olivier de Sardan 2004; Gledhill 1994) have expressed concerns about its ability to address broader issues of power and structure, and the fact that it lacks modification. Olivier de Sardan (2004) argues that the approach has become narrow and repetitive in character, and its major concepts hardly changed since 1980.

The actor-oriented approach has also been criticized for neglecting broader issues of power and structure because it places the actor strategies at the centre of its analysis while downplaying broader causal issues (Gledhill 1994).

Despite the above-mentioned limtations, the approach provides some useful insights in rural development discourse. In order to fully understand how actors construct their lifeworlds, Turner (2012) argues that the concept of everyday politics and resistance must also be taken on board. Consistent with this call, the conceptual framework used in this study draws on the concept of everyday politics and resistance (Kerkvliet 1995; 2009; Scott 1985), discussed in detail in section 4.3.

4.3 EVERYDAY POLITICS AND RESISTANCE

To further understand how agro-pastoralists have reacted to the HLLM in the study sites, I also draw on two more concepts: everyday politics, as put forward by Kerkvliet (1995; 2009), and everyday forms of resistance, as put forward by Scott (1985). As noted earlier, the livelihood perspective has been criticised for neglecting the significance of understanding and acknowledging the everyday politics of rural households (Turner 2012). Based on the concepts of everyday politics and resistance, the researcher seeks to understand the different responses of the farmers to HLLM in the study sites, thus try to explain "why local actors might shirk, sidestep, avoid, or resist" (Turner 2012) the HLLM programme in the study sites.

Contrary to conventional political studies that associate politics with authorities, the Kerkvliet concept of everyday politics emphasises the importance of investigating the daily lives of the ordinary local people to explore their reactions to the prevailing order and, more importantly, to the unequal allocation of resources. As Kerkvliet (2009:232) wrote:

> Everyday politics[24] occurs where people live and work and involves people embracing, complying with, adjusting, and contesting norms and rules regarding authority over,

[23] The approach is dynamic, a non-culturalist approach to anthropology, field-enquiry oriented, draws upon case studies and addresses conflicts, negotiations, discords and misunderstandings (Olivier de Sardan 2004).

[24] Politics, according to Kerkvliet (2009:232), refers to the "control, allocation, production and use of resources and the values and ideas underlying those activities".

> production of, or allocation of resources and doing so in quiet, mundane, subtle expressions and acts that are rarely organized or direct.

Everyday politics, according to Kerkvliet (2009), differs from conventional politics, such as advocacy and official politics[25] in that it involves minimum or no organisation, and remains a low-profile and private behaviour of individuals who may not even consider their actions as political. He also suggests that everyday politics be divided into four main groups – "support, compliance, modifications and evasions, and resistance" (Kerkvliet 2009: 233). By adopting this conceptual framework, Kerkvliet explored how peasant farmers in Vietnam successfully subverted the collective farming system by continuously resisting through actions, such as, inter alia, fake work points, family farming and engaging in black markets.

This study also draws upon the concept of everyday forms of resistance (Scott 1985), which has been a focus in agrarian studies (Kerkvliet 2009). The notion of peasant resistance is best represented by the scholarly work of Scott (1985) in a village in Malaysia and, more recently, that of Kerkvliet (2005; 2009). Scott (1985:290, italics in original) defined subordinate resistance as:

> Any act(s) by member(s) of a subordinate class that is or are *intended* either to mitigate or deny claims (for example, rents, taxes, prestige) made on that class by superordinate classes (for example, work, land, charity and respect vis-à-vis those subordinate classes).

Based on the above definition, Scott's concept of "everyday forms of peasant resistance" describes everyday tactics drawn upon by peasants to protect their material and physical interests undertaken individually or collectively. Such tactics, however, are not openly declared but remain covertly acted upon. These tactics include quietly damaging farm equipment, covertly stealing the seeds or small portions of the yielded crops of landlords, working slowly and foot dragging, picking crops during certain times of the day – such as in the morning – for those paid by weight, and so on. As Scott (1985) demonstrated, fears of repression discourage the peasants from openly declaring their actions, hence drawing on covert tactics. Other factors, such as the heterogeneity of peasants and relations with the superordinate classes (e.g. landlords), restrain the peasants from undertaking collective and mobilisation activity. Equally important, the need of peasants to survive on a daily basis does not render any large-scale resistance ideal (Holmes 2007).

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[25] According to Kerkvliet (2009:232), conventional politics is mainly limited to official and advocacy politics. He defines advocacy politics as "direct and concerted efforts to support, criticize and oppose authorities, their policies and programs, or entire ways in which resources are produced and distributed within an organization or a system of organizations". On the other hand, official politics involves "authorities in organizations making, implementing, changing, contesting and evading policies regarding allocation" (Ibid: 231).

Since Scott's and Kerkvliet's original work, the concepts of everyday politics and resistance have been extended to research in other fields, such as gender, colonialism, labour, the global economy, migration, living space, livelihoods and shadow economy (Chang 2013). Like the peasants presented by Scott in his study, smallholder farmers are similarly constrained to openly contest the promoted conservation technologies (cf. Holmes 2007). The specific constraints faced by these farmers depend on the local, political, economic and social circumstances (Holmes 2007).

Farmers in the HCLs of Zimbabwe are constrained in several ways, yet debates on the new conservation technologies are not heard in the public sphere (Scoones n.d.). Instead, covert tactics are employed (Scoones 2012). Several authors have drawn upon this concept in assessing different external conservation projects in the communal lands of Zimbabwe, as well as in other fields. For instance, the concept has been used to demonstrate how local farmers resisted a grazing scheme project (Alexander 1991; Cousins 1992; Scoones n.d.), more recently in conservation farming (e.g. Chitongo 2013; Gukurume, Nhodo & Dube 2010; Nhodo, Gukurume & Mafongoya 2012) and political crises since the 2000s (Willems 2010) .

Due to the "sanctions" targeted at the Zimbabwean government, NGOs have become major recipients of funding from important donors, such as the DFID. As Scoones (2012) argues, a "complex politics of funding in agriculture" has arisen, where the donors are supporting new agricultural technologies. In order to obtain this much-needed funding, the NGOs are now designing and implementing conservation projects that can be supported by these donors, without considering the efficacy of such interventions for the targeted beneficiaries. Zimbabwe experienced a political and economic crisis from 2000 to 2008, which saw a collapse in government institutions and services such as AREX, veterinary services and the District Development Fund, as well as a decline in rural infrastructure (Chimhowu 2007). NGOs have become the only recourse for farmers to access some of the services they need. Hence, farmers are willing to engage with the NGOs in the hope of obtaining seeds and water supply, for example. In this way, the farmers are constrained from publicly declaring their views, as this will turn away the NGOs, thereby pushing them towards "everyday forms of resistance". The above frameworks will later be applied to interprete the research findings in this study.

4.4 SUMMARY

This chapter has outlined the conceptual framework that was used to assess the impacts of HLLM on the livelihoods of its targeted beneficiaries. This study adopted a conceptual framework that combined the sustainable livelihoods framework, actor-oriented approach and

the concept of everyday forms of politics and resistance addressing some key weaknesses of the standard version of the livelihoods framework. Chapter five presents the research design and methodology applied in this study.

CHAPTER 5: RESEARCH DESIGN AND METHODOLOGY

A methodology, according to Newing (2011:63), is "a plan of carrying out a particular piece of research in order to address the overall aim". This research was aimed at determining the impacts of a community-based rangeland training programme on the livelihoods of its beneficiaries in HCLs based on the perspectives of the beneficiaries themselves, using a conceptual framework that integrates an actor-oriented livelihood approach with concepts from the everyday politics and resistance developed by Turner (2012) and Bonnin and Turner (2012).

To arrive at this objective, a multiple case study approach was employed in order to collect a diversity of perspectives from the beneficiaries themselves. Empirical data were collected during the researcher's three months' tenure as a research intern for the ACHM in Zimbabwe, from 1 July to 31 September 2013 (see Appendix I). Data was collected using several qualitative data collection methods, which include Participatory Rural Appraisal (PRA) tools, semi-structured interviews, focus group discussions (FGDs), informal discussions, key informant interviews and participant observations. Qualitative field methods enabled a nuanced understanding of the vulnerability context of the farmers, how they have responded to the HLLM programme, and determined the participant-defined livelihoods impacts.

5.1 RESEARCH DESIGN

A research design, according to Babbie and Mouton (2001:74), is a "plan or blueprint" of how one intends to conduct research. From a list of empirical research designs, evaluation research design was selected because the study is concerned with assessing the impact of a community-based training programme on the livelihoods of its smallholder farmer beneficiaries in HCLs. Evaluation research, also known as programme evaluation (Babbie & Mouton 2001) refers to "a form of applied research which aims to produce information about the implementation, operation and ultimate effectiveness of policies and programmes designed to bring about change" (Clarke & Dawson 1999:3).

Evaluative research has no specific research methodology of its own but rather relies on existing social science research methods and methodologies in order to glean information (Clarke & Dawson 1999; Hall & Hall 2004). Hence, evaluation research is similar to any "basic" social research[26], but differs in objective or purpose. Despite the use of some quantitative data, the research was largely qualitative in nature. This research design, according to Babbie and Mouton (2001), is referred to as the naturalistic/qualitative evaluation research design, with its roots

[26] "Basic" research, for example scientific research.

based in the key principles of a qualitative research paradigm. Qualitative research involves "understanding the world of the subjects, listening to their voices, and allowing those voices to be heard in the analysis and the report" (Hall & Hall 2004:150). In this case, the participatory and qualitative research design was chosen because it allows for a deeper and nuanced understanding of complex issues as the studied population narrates their stories and experiences with HLLM. Thus, in qualitative research, "the meaning is socially constructed by individuals in interaction with their world" (Merriam 2002:3). Using a quantitative research methodology alone was unlikely to capture the complex and dynamic effects of HLLM on the livelihoods of smallholder farmers.

Quantitative data were obtained from the South African Agricultural Research Council – Animal Production Institute on ecological land monitoring in Dimbangombe, Sizinda and Monde[27], which started in 2010. The researcher was not part of the research team involved in this ecological monitoring research. Although the data was unpublished during the time of the research, it had already been collated and analysed. Therefore, the data was employed to reflect and compare with the perceptions of the farmers.

The initial plans were to use both qualitative and quantitative approaches. However, a lack of appropriate baseline data and rigorous monitoring and evaluation data over time necessitated concentration on the former. This, however, did not constrain the study, as the qualitative methods provided an understanding of the farmers' opinions, perceptions and feelings about HLLM that could not be easily quantified or ascertained using a quantitative approach. By using open-ended questions, Gabarino and Holland (2009) argue that qualitative methods "capture judgments and perceptions and allow complex analysis of often non-quantifiable cause-and-effect processes". In the same vein, Hall and Hall (2004:150) add that qualitative research enables a better understanding of social processes compared to structured questionnaires, which collect a 'snapshot'. Typically, the goal of qualitative research designs, according to Kaplan and Maxwell (2005), is to understand a phenomenon from the perspective of participants within specific social and institutional settings which resonates with the aim of this study.

From an evaluation research perspective, using a qualitative research design is not new. The qualitative approach gained currency in the late 1970s and 1980s as an alternative to the classical experimental research design (Babbie & Mouton 2001). In evaluation research, the appropriateness of qualitative research is also based on the purpose of the study. This view

[27] This involves a USAID-funded long-term ecological monitoring programme in collaboration between the ARC and ACHM.

accords with Babbie and Mouton's (2001) observations that qualitative research is appropriate in formative rather than summative evaluation. In this regard, the approach is justified because the purpose of the study is to give feedback to ACHM and other stakeholders in order to improve the implementation of HLLM.

Despite the above merits, there are several valid criticisms of the qualitative research methodology. Bryman (2008:391), for example, notes issues of replicability, subjectivity generalizability of findings and lack of transparency as key limitations in qualitative research.

5.2 CASE STUDY RESEARCH DESIGN

This evaluation study employed a case study approach in order to determine the impacts of holistic land and livestock management on the livelihoods of smallholder farmers in HCLs based on the perspectives of the beneficiaries themselves. A case study is an "indepth examination of a single instance of some social phenomenon, such as a village, a family, or a juvenile gang" (Babbie 2007:298). Since this study is not only descriptive or exploratory but also provides explanatory insights into the adoption patterns, benefits and challenges of HLLM, the case study design is appropriate. Case study method can also capture a range of social, cultural and political factors that maybe related to the phenomenon under investigation that might be unknown in advance (Bhattacherjee 2012).

The strength of the case study approach in a qualitative paradigm is that it enables the use of multiple methods (Denscombe 2010). In this study, a combination of document analysis, Participatory Rural Appraisals (PRA), semi-structured questionnaire interviews, focus group discussions, key informant interviews and participant observation was employed to collect data. These multiple methods enabled triangulation, hence promoting the truthworthiness of the results (Babbie & Mouton 2001). The importance of triangulation is underscored by Hall and Hall (2004:99), who note that it gives "researchers greater confidence in their findings if they are supported by the use of different methods which result in the same conclusion". Creswell (2009:191) further underscores the significance of triangulation in adding validity to the study when common themes are established from numerous data sources or participant perspectives.

The case study approach enables the researcher to gain an in-depth understanding of a phenomenon in its natural environment and draws from a range of actors' perspectives. This approach can involve a single case or multiple cases (Yin 2009), using more or less similar methods (Bryman 2008:58). In an attempt to answer the research questions posed in this evaluation study, this study was undertaken in three case study sites. The importance of using

multiple cases allows for a rich qualitative evaluation, seeking to generate rich information on the subject under investigation. However, case studies have their own limitations. These include lack of rigour, difficulty in generalisation, and that they can yield large amounts of data (Yin 2009).

5.3 SELECTION OF RESEARCH SITES AND SAMPLING METHODS

This study made use of three case studies. A review of archival documents at the ACHM offices facilitated the selection of three communities, namely Monde, Sizinda and Dibutibu (see Table 5.1), which fall within Chidobe Ward (2) under Chief Mvuthu.

Table 5-1 Selected communities, showing the year in which HLLM started, current status and a comment

Community	Year started	Status	Comment
Dibutibu	2010	Active	"Struggling"
Monde	2010	Exited	"Dropped out"
Sizinda-Sentali	2010	Active	"Successful"

Source: ACHM (2013a)

The study was restricted to three communities[28], given the limited resources and time available. This allowed for an in-depth understanding of the phenomenon under investigation and offered insights into the impacts of the HLLM on the livelihoods of its beneficiaries. In addition, farmers from other communities within the HCL where HLLM was implemented were interviewed in order to corroborate and improve the generalisability of the research findings[29].

The ACHM implemented HLLM in eighteen communities within the HCLs (see Figure 5.1). Of the eighteen communities, two communities dropped out[30] and sixteen are still active participants. This study employed a purposive sampling strategy to select three study sites from the total of 18 communities. Purposive sampling involves selecting a sample based on the researcher's knowledge of the population, its elements and the purpose of the research (Babbie & Mouton 2001:166). There also was consideration of the different histories of adoption of the HLLM programme in each community in order to capture the diversity in views of "adopters", "non-adopters" and "dis-adopters" with regard to the HLLM as much as possible[31].

[28] The researcher uses the term "community" throughout this research in an uncritical manner. However, the researcher is aware of the dangers of treating people who live in the same location as a homogenous and mutually supportive collection of people with the same interests (see Van Aalst et al. 2008).
[29] Other communities visited include were Chisuma, Chiguswi/Chibombo, Ndajila and Mabale.
[30] Monde and Chidobe dropped out.
[31] The terms "adopters", "non-adopters" and "dis-adopters" in this study are defined according to definitions used by Place et al. (2005:43), see definitions provided in section 1.6.

The three communities represent degrees of success in the implementation of the programme (i.e. "successful", "exited" and "struggling", hence making it possible to determine the success and failures of the programme based on diverse perspectives from adopters, non-adopters and dis-adopters. This information was gleaned from the ACHM monitoring reports, which were reviewed before the primary data collection commenced. Based on this review, the researcher established that Monde community dropped out of the programme, Sizinda was reported to be a "successful" community, while Dibutibu was reported to be a "struggling" community – on the verge of dis-adopting the programme. By studying these three contrasting cases "using more or less identical methods" (Bryman 2012:72), the researcher felt that the three study sites would give a cross-sectional perspective on the impact of the programme on local people's livelihoods.

Several other criteria were employed in selection.

I. The time of implementation of the HLLM programme. In each of these communities, the HLLM programme had been implemented since 2010 (approximately three years)[32]. However, it should be noted that three years (since 2010) is still a short period of time from which to draw some conclusions on the impacts of HLLM on the livelihoods of agro-pastoralists.
II. The existence of longitudinal ecologically monitored data. The South African Agricultural Research Council – Animal Production Institute set up a monitoring programme to test whether HPG results in improved forage production, increased ground water resources and, ultimately, improved stream flow and water quality on the Dimbangombe Ranch, Sizinda and Monde. The programme started in 2010.
III. Location in one ward in close proximity to each other. This enabled the researcher to understand the impacts of the programme on the livelihoods of its beneficiaries within a similar geographical context.
IV. Logistical considerations. Since the researcher was relying on public transport to access the research sites, the communities were chosen due to their proximity to Victoria Falls and Dimbangombe Ranch, where the researcher was residing and working as an intern. The selection of Monde was also motivated by an ACHM senior officer, who indicated that the organisation was considering resuscitating the programme in the community and was keen to "know what went wrong". The officer's view was that the failure of the programme in this community portrayed a bad image of the programme, given the fact that the ACHM once had "big billboards advising a USAID-funded project there".

[32] Note that the USAID-funded HLLM officially started in 2010, but that ACHM began to work with some communities, such as Monde and Sizinda, before then, in around 2005, without funding.

Source: ACHM (2013a)

Figure 5-1 Location of the ACHM and fifteen of the communities in which HLLM programme was introduced

During the period of the fieldwork, the researcher stayed at a school in one of the three study sites – Sizinda – for three days every week, while the other two days were spent at the ACHM's Research, Monitoring and Evaluation (RME) office or visiting other communities. This flexibility allowed continuous crosschecking of findings

5.3.1 Sampling size and population

The sampling frame constituted all the residents in three sites – Dibutibu, Monde and Sizinda.

The sample size of this study was largely influenced by the principle of "saturation"[33] (Newing et al. 2011:74). "Saturation is reached when you can 'make sense' of the data in terms of

[33] Saturation refers to the stage in qualitative data collection when collecting more data produces little new important information or understanding relevant to your research questions (Newing et al. 2011).

identifying areas of consensus or other patterns, and when collecting more data produces little important new information or understanding that is relevant to your research questions" (Newing et al. 2011:74).

5.3.1.1 Respondent selection

This section highlights how participants of the PRA workshops and individual farmers were selected. PRA participants included all residents in each of the three communities. Thus, the workshop participants represented a cross-section of adopters, non-adopters and dis-adopters, without any particular bias towards any of each group. In addition, they included different age groups (from the youth to the elderly) and genders. Meetings were held at nearby schools or in "common" village meeting places. Between 20 and 35 people from each village participated in the workshops (see Table 5.2).

Most of the respondents in the semi-structured interviews participated in the PRA workshops. They were selected as follows;

- **Sizinda:** The selection of respondents was easier because the ACHM was actively involved in this community. Hence, updated information was available regarding active HLLM adopters. The adopters were identified with the help of the ACHM field officer responsible for this community. The ACHM field officer organised a meeting, during which the purpose of the study was explained and the researcher was introduced. Twenty-three farmers were adopters of the programme ("active core group"[34]), using HPG and crop field animal impaction. The researcher later visited the community alone without the ACHM officer. Due to time constraints, only twelve (12) out of twenty-three (23) HLLM adopters were randomly selected and interviewed for this study. However, non-adopters and dis-adopters were interviewed opportunistically during the data collection period. This sampling strategy is known as convenience sampling. In total, four (4) non-adopters and two (2) dis-adopters were interviewed.
- **Monde:** The ACHM is no longer active in this village, and there was a lack of data on the programme participants, with no field officer working in this community. A review of ACHM documents (e.g. monitoring reports, monthly reports, etc.) established that the ACHM exited the area in 2011 because many farmers became dis-adopters. A review of the ACHM's archival data enabled the listing of farmers or households who used to participate in the HLLM, although information on early adopters of the programme was

[34] Core group refers to "a group of people that ACHM closely work with that have come together that are affected and willing to do something about bare land/interested in land restoration" (ACHM 2013a).

not available. Based on communication with the ACHM field officers who were once stationed in this community, the researcher established that forty farmers had participated in the programme, but were now dis-adopters no longer practising any HLLM principles. Again, due to time constraints, only 15 dis-adopters were randomly selected from a total of 40 dis-adopters. The researcher opportunistically interviewed any adopter and non-adopter he learned of during the data collection period. Only one farmer in this community was still using the principle of animal impaction and was then was selected as an "adopter". Twelve non-adopters were also randomly selected and interviewed. Unlike the case in Sizinda, there was no ACHM field officer operating in this community, hence the researcher approached the community leaders (village head, *usobhuku*), introducing the purpose of the study to the village head, who then called a meeting to introduce the researcher to the community members.

- **Dibutibu:** The selection of respondents for semi-structured interviews was also difficult in Dibutibu. The researcher identified "active HLLM participants" with the help of the ACHM field officer working in this community. Similarly, due to limited time and resources, the researcher randomly selected ten "HLLM active participants" from a total of thirteen participants who were considered "active core group members". However, it was noted that most of these farmers were mainly claiming that they were practising HLLM, but in reality had not practised any HLLM principles to date. Such discrepancies between farmers' claims and their actual actions made classification of these farmers as adopters very difficult. However, despite their partial involvement in the HLLM, these farmers were taken as "prospective adopters". A list of four farmers who dis-adopted animal impaction of crop fields was provided by the ACHM officer, and all were interviewed. Two non-adopters were also opportunistically interviewed. Since the programme included livestock and non-livestock owners, no efforts were made to identify or separate them.

5.3.1.2 Selection of research assistants

Two research assistants were engaged for the PRA workshops, which were facilitated by the researcher and the assistants. Assistants were fluent in and familiar with all the local languages (i.e. isiNdebele, Nambiya and ChiShona). One was a student teacher at a nearby school, and the other one was a member of the village development committee in Monde. They were knowledgeable about different community development projects in all the three communities. By excluding the ACHM and extension officers from acting as research assistants and facilitators,

the researcher created a non-threatening environment so that participants could give honest and unbiased opinions on HLLM.

The research assistants had inadequate experience in running workshops and the use of participatory tools, thus limiting the reliability of the data. They therefore were trained by the researcher. The tools were pre-tested at household level during the pilot stage, after which the pre-designed tools were changed or modified to improve the quality of the information generated.

5.4 DATA COLLECTION METHODS

In order to answer the research questions posed, this study employed several qualitative research methods entailing PRA tools (mapping, seasonal calendars, Venn diagrams, transect walks, spider web, SWOT), semi-structured interviews, key informant interviews, focus group discussions, informal interviews and observations. Bryman (2012:68) argues that qualitative methods are viewed by many as the most appropriate methods in a case study approach, as they allow for the "generation of an intensive, detailed examination of a case".

5.4.1 Document review

The study included a review of documents at the ACHM, including baseline reports, monthly reports, minutes of meetings, quarterly reports, project proposals, and annual and evaluation reports. During the research period, the researcher worked as an intern in the Research, Monitoring and Evaluation (R, M & E) department of the ACHM, which provided an excellent opportunity to access the archival documents of the project (see Appendix I). Questions arising from the document review were debated with the ACHM officials in order to seek further clarification. Published relevant media reports were also consulted and were useful tools for triangulation and reflection on the research findings, and for obtaining the perspectives of other stakeholders about HLLM and farmers' experiences with HLLM elsewhere. Some of the questions that guided the document review are included in Appendix G.

5.4.2 Participatory Rural Appraisal (PRA) techniques

PRA techniques (Chambers 1994a; 1994b) refer to a family of approaches, methods and behaviours aimed to enable poor local people to express, share, improve and analyse the realities of their lives and conditions themselves, and to plan, act, monitor and evaluate their actions (Chambers 1994a:1; Chambers 1983). PRA methods "include the idea that local people can and should conduct their own appraisal and analysis" (Chambers 1994b: 1253). PRA methods were

developed from Rapid Rural Appraisals (RRA), which emerged in the late 1970s and early 1980s as alternatives to conventional methods, such as surveys based on questionnaires. Conventional methods of data collection were seen as being extractive in nature – that is, they gather and take away data from research participants. In 1988, the term "participatory rural appraisals" was first coined and it gained currency in the 1990s (Chambers 1994b).

The main purpose of the participatory tools used in this study was to assist farmers in identifying challenges they face in crop and livestock production, livelihood strategies and analysing the impact of holistic management on their livelihoods. Figure 5.2 shows group sessions in progress during workshops. These tools include a livelihoods calendar, hazard identification, Venn diagrams, spider webs and SWOT analysis as summarized in Appendix B. PRA techniques were deemed appropriate in this study based on their several strengths:

- Use of visuals, such as maps and diagrams, are valuable in communities with low literacy levels (Newing 2011).
- They avoid writing as much as possible – making it appropriate for participants with limited literacy skills and enabling easy communication with all relevant participants.
- Create a flexible learning process that is open-ended and adaptable.

Source: Author

Figure 5-2 Workshops in progress

The researcher prepared a participatory toolbox before going to the field (at Stellenbosch University). Upon his arrival, a pilot test of the prepared participatory methods was undertaken at household level to aid the researcher in selecting tools appropriate for the study. These enabled participants to identify hazards and risks faced by farmers in crop and livestock production,

explored their livelihood activities and evaluated the impacts of HLLM on the farmers' livelihoods.

Table 5-2 Profile of participants in PRA workshops

	Monde	**Sizinda**	**Dibutibu**
Youth	12	2	3
Men	15	8	8
Women	9	22	10
Total	**36**	**32**	**21**

Source: Author

5.4.3 Semi-structured interviews

The researcher conducted semi-structured interviews with individual farmers using an interview guide (Bryman 2012) (see Appendix D). Denscombe (2010:175) and Flick (2011:11) underscore the value of using semi-structured interviews by noting that they allow the researcher to be flexible in ordering the topics for discussion with the interviewee. A tape recorder was used to record the interviews. This provided the researcher with diverse views from the farmers with regard to the impacts of the programme on their livelihoods and the constraints that limit the adoption of HLLM. The semi-structured interviews were open ended in order to promote discussion and allow for flexibility, ensuring various aspects regarding the benefits and challenges of HLLM could be explored as topics arose. The semi-structured interviews were conducted with HLLM adopters, dis-adopters and non-adopters in order to capture diverse views regarding the successes and failure of HLLM. Figure 5.3 illustrate interviewing in progress. A total of 62 semi-structured interviews were conducted in across all the study sites (see Appendix H for detailed demographic profile of respondents).

Figure 5-3 Semi-structured interviewing in progress

Source: Author

5.4.4 Focus group discussions (FGDs)

Focus group discussions (FGDs) are "pre-arranged group interviews that usually follow an interview guide" (Newing 2011). There is no agreement about the number of participants in FGDs, although between six and eight people are recommended, and they can last from one to three hours (Newing 2011). One advantage of using FGDs is that they save time and money (Babbie & Mouton 2001). However, the limitations of using FGDs are many. Due to a low degree of control and small sample size, FGDs cannot achieve internal validity and generalisability, hence they are more appropriate in exploratory research than in descriptive and explanatory research (Bhattacherjee 2012:42). For the purposes of this study, a total of three group sessions were facilitated by the researcher, with:

- Eight ACHM field officers (see Appendix F)
- Six village heads and committee members in Monde
- A feed-back session with the ACHM field officers once data collection was completed.

Source: Author

Figure 5-4 Focus group discussions

5.4.5 Key informant interviews

Key informant interviews are important data gathering tools in qualitative research. A key informant is viewed as a knowledgeable or expert person in the issues under investigation. Key informant interviews were conducted with the village heads (in each community), agricultural extension officers (operating the study sites), veterinary officer and District Administrator in July and August 2013 (see Table 5.2). In order to understand benefits and challenges of HLLM at community level, traditional leaders such as village heads were interviewed in each community. These traditional leaders also enlightened the researcher about the historical accounts of HLLM

in their communities. Additionally, experts such as the district adminstrators, veterinary officers, ACHM field officers and village based facilitators (VBFs) to understand the constraints faced by farmers in crop and livestock production and how HLLM is addressing these challenges. Key questions were prepared in advance to serve as an interview guide (see Appendix E).

Table 5-3 Profile of key informants

Key informant	Position and organization of the key informant	Date and place of interview
Mr D	Village Head, Sizinda	July 2013
Mr M	Village Head, Sizinda	July 2013
Mr N	Village Head, Dibutibu	July 2013
Mrs S	Village Head, Dibutibu	August 2013
Mr N	Village Head, Dibutibu	August 2013
Mr N	Village Head, Monde	August 2013
Mr Z	Village Head, Monde	August 2013
Mr Z	Village Head, Monde	August 2013
Mrs N	AREX, Agricultural Extension senior officer	August 2013
Mrs M	AREX, Agricultural Extension worker (Ward 2/Chidobe)	July 2013
Mr	Veterinary officer, Hwange offices	August 2013
Mr T	District Administrator, Hwange	August 2013
Mr N	Former, Village-based facilitator (VBF), Monde	August 2013
Mr M	Village-based facilitator, Monde	August 2013
Mr M	ACHM field officer, Sizinda	August 2013
Mr N	ACHM field officer, Dibutibu	August 2013

Source: Author

5.4.6 Participant observations

Participant observation is a qualitative data collection method with its roots in ethnographic studies. It allows researchers to glean information through immersion and participation in the studied population in its natural setting. Participant observation, according to Babbie (1998:33), is “a method of data collection in which the researcher becomes a participant in the social event or group under study”.

The researcher stayed at the local school in Sizinda for several days. This provided an excellent opportunity to better observe the research participants and interact and talk with farmers in their natural setting. During this period, the researcher participated in various HLLM activities, for example when farmers were shifting the movable kraal in Sizinda. This provided an excellent opportunity to observe and talk with HLLM adopters and to observe directly how the farmers were using the HLLM in their farming practices.

Direct observations were also recorded during field visits and photographs were taken. The researcher accompanied the villagers during herding sessions and also when moving the kraals (animal impaction of crop fields). An observation matrix was employed during the participant and direct observations. Information was also collected through informal discussions and notes were taken.

5.4.7 Informal conversational interviews

In a qualitative research design, informal interviews are also important data collection methods (Newing 2011). These are "chance conversations (with individuals or groups of people)" which may enable the researcher to relevant information related to the study (ibid:100). According to Newing (2011), informal interviews provide background and contextual information, cross-check information obtained through other methods, and capture information that could have been overlooked by the researcher. Thus enabling the researcher to gain an in-depth understanding of the "whole" situation of under investigation (ibid). One of the strength of informal interviews is that they generate "unguarded information with minimum structuring by the researcher" because it allows people to speak without any knowledge of what the researcher wants to hear or whether the researcher agree with them or not (Newing 2011:100).

During the course of the data collection process, the researcher had informal conversations with farmers in the study sites, ACHM officials, and other stakeholders. The researcher conducted informal conversational interviews with farmers across all the study sites. During these interviews, various topics regarding the constraints in crop and livestock production, history of holistic management in the study sites as well as the benefits and challenges of holistic management were discussed. Several informal discussions were also conducted with ACHM officials, thus enabling the researcher to cross-check information gathered from the farmers.

In April 2013, the researcher attended an NGO leaders' seminar at Dimbangombe Ranch in Victoria Falls and took the opportunity to conduct informal conversational interviews with other NGO officials who were implementing or considering implementing the programme in the areas in which they were working. The perceived benefits and challenges of HLLM in the communities where these officials were based were discussed, and follow-up e-mails enquired about their experiences in implementing the programme. At this time the main purpose was to triangulate and reflect on some of the findings, and to establish whether some of the findings were area specific (Hwange only) or generalisations.

5.5 DATA ANALYSIS

In qualitative research, "data analysis is *simultaneous* with data collection" (Merriman 2002:14, italics in the original). In other words, data analysis in qualitative research starts with a first interview, observation or document assessed in the study, thus allowing the researcher to make some changes or even redirect data collection and test emerging "concepts, themes and

categories against subsequent data", rather than to wait until the data collection is finished (ibid: 14). This reasoning was employed in the data analysis.

Qualitative data was coded based on recurrent themes and common word usage. Once the first coding was completed, the researcher reviewed it by re-reading the data repeatedly, "looking for finer detail within the text that might be dealt with under new codes" (Hall & Hall 2004:156). The data was then organised into dominant themes. In order to illustrate these themes, quotes were selected from the transcripts of the PRA workshops, semi-structured interviews and focus group discussions were selected.

In order to analyse the data an actor-oriented livelihoods perspective, combined with everyday politics and resistance as developed by Turner (2012) and Bonnin and Turner (2012), was employed. Although conventional economic models such as econometric and economic surplus are considered "best practice" in impact evaluation, they have been found lacking in trying to understand complexities (Douthwaite et al. 2003).

Although the original plan was to use a standard version of the livelihoods framework for this evaluation study, it was inadequate to explain why farmers decide to adopt or ignore other aspects of HLLM as livelihood strategies. Acknowledging the limitations of the livelihoods perspective, other concepts were identified that could be combined with the livelihoods framework in order to explain how farmers have responded to HLLM. A framework that could be used in evaluation research, called an "actor-oriented livelihoods perspective, combined with everyday politics and resistance" and proposed by Turner (2012) and Bonnin and Turner (2012), was adopted.

After coding the data, it was grouped based on the five units of the SL framework, namely the vulnerability context, assets, institutions-processes, strategies and livelihoods outcomes. Since the aim of the study was to assess the impact of the project on the livelihood assets of the farmers, the impacts were also grouped according to the five types of livelihood assets, namely physical, natural, social, financial and human capitals. Using the notion of "vulnerability" within the context of the sustainable livelihoods framework, a number of risks or threats to crop and livestock production reported by the farmers were analysed.

After completion of the fieldwork, the researcher's preliminary findings were presented to the ACHM fieldworkers and the to Research, Monitoring and Evaluation department to cross-check its validity. By cross-checking data with the ACHM field officers, the researcher was able to test the reliability of the data and to incorporate it into the final data analysis. During the feedback

sessions, the ACHM officers were asked to provide their opinions and comments on the researcher's findings. In addition, the researcher was able to test the validity of the research findings during the write-up phase, when he was unexpectedly called upon to present the preliminary findings of the research to the USAID team that visited the Research Alliance for Disaster Risk and Reduction (RADAR) at Stellenbosch University. The team was familiar with the HLLM programme in the HCLs and the outcomes of an evaluation of the programme undertaken by an independent evaluation group. After the presentation, the USAID team was asked about their opinions on the research findings – whether there were any "similarities", "differences" and "surprises" between the findings of this study and their recently completed evaluation report. Based on the foregoing, a methodological framework presented in Figure 5.5 was used.

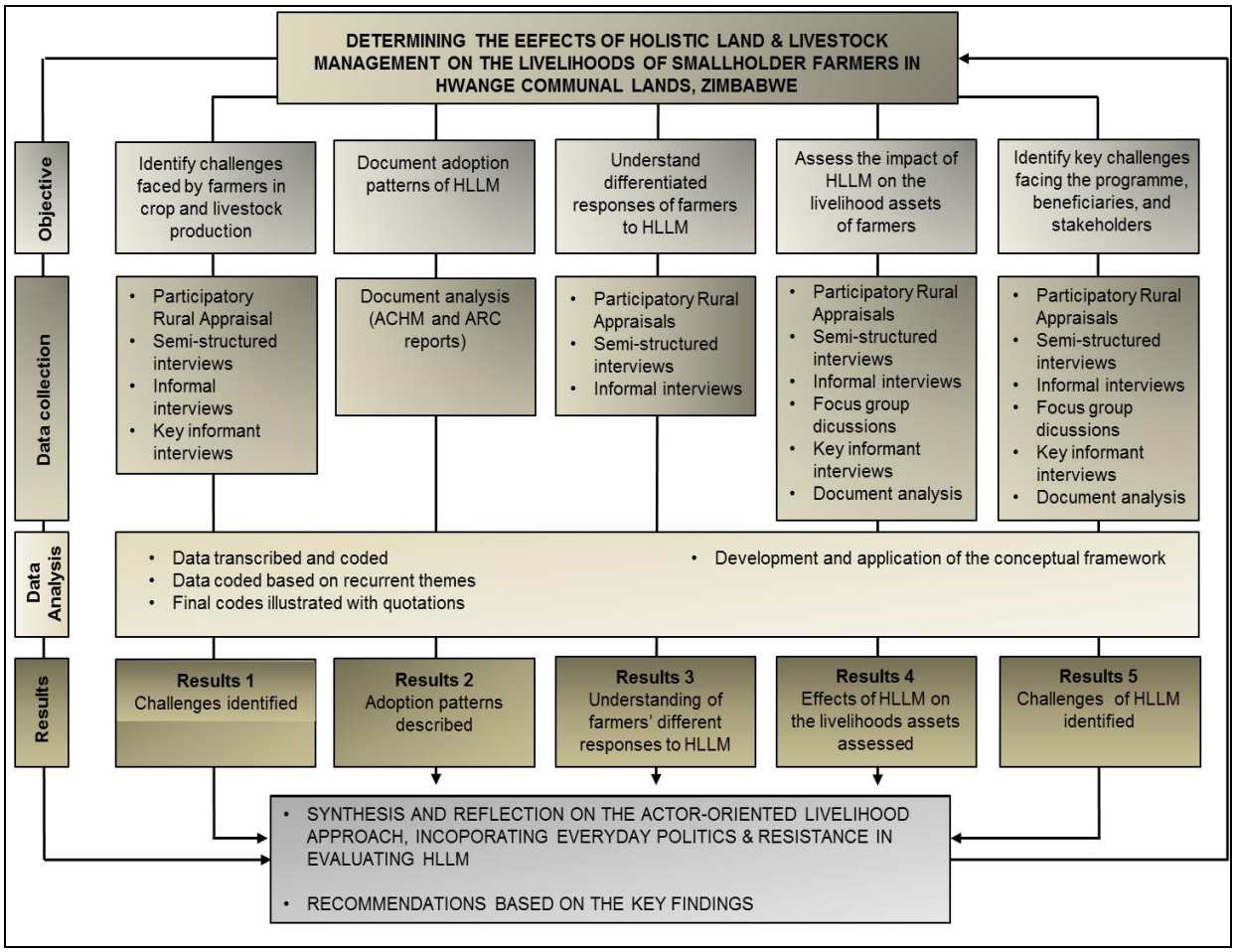

Figure 5-5 Methodological framework for the study

5.6 ETHICAL CONSIDERATION AND POSITIONALITY

Ethics concern the morality of human conduct (Edwards & Mauthner 2012:2). In social research, ethics refers to the researcher's moral deliberation, choice and accountability throughout the research process (Edwards & Mauthner (2012:2). According to Mouton (2001), ethical issues stem from the interaction of researchers with other people, other beings and the environment. Ethical issues were considered important throughout the research process in this study.

Consistent with literature on ethical issues, human participants in this study participated willingly without any form of coercion. They were informed about the purpose of the study and about the confidentiality of information collected and their guarantee of privacy and anonymity. Due to high illiteracy rates in the study areas, a written consent form was considered inappropriate and was instead communicated verbally by the researcher. In order to ensure that the research was ethically conducted, the researcher closely followed Patton (2002)'s checklist regarding appropriate moral and legal principles of the participants. Similarly, the researcher sought consent from the ACHM, USAID/OFDA and ARC to use some of their material for the purposes of the study (see Appendix I).

Another issue of particular ethical concern, which was also a limitation of this study, is related the researcher's own positionality in the study. Grounded in feminist epistemologies, the issues of positionality and reflexity has gained currency in recent years in social research (for example; Chacko 2004; England 1994; Moser 2008). Literature on positionality emphasizes the importance of researchers to acknowledge partiality, subjectivities and biographies through reflectivity.

Since the researcher was partially funded by the implementing agent, ACHM and also worked as an intern during the fieldwork period, the author's subjectivities in relation to the knowledge of HM could have influenced the study process and outcome. To address some of the issues of positionality, the author adopted what Patton (2002) termed 'pragmatism' or 'methodological appropriateness' where flexibility and range of multiple methods were applied. Thus, informal conversations, semi-structured interviews, PRA tools, and focus group discussions were used depending on the circumstances. ACHM officials were absent during the field research and interviews to ensure an objective and impartial reporting.

5.7 SUMMARY

This chapter has outlined the qualitative research methods used for the study. These comprised the collection of secondary and primary data. The chapter also provided a detailed description of the collection, consolidation and analysis of the data. In the next chapter, an exploration of the benefits and challenges of HLLM is presented.

CHAPTER 6: EXPLORING THE BENEFITS AND CHALLENGES OF HLLM

This chapter presents the findings derived from the fieldwork carried out in the HCLs of Zimbabwe from July to August 2013. The objectives of this study were to identify the challenges faced by agro-pastoralists in crop and livestock production, to document adoption patterns of HLLM, understand the different responses of farmers to HLLM, assess the impacts of HLLM on the farmers' livelihood assets, and identify the challenges faced by farmers, the ACHM and other stakeholders in the implementation of HLLM.

Farmers in the study sites pursue an array of livelihood strategies that include both agricultural and non-agricultural activities. Dryland farming was found to be a major livelihood, notwithstanding the drought-stricken conditions generally found in natural region V. The majority of farmers preferred to grow maize, rather than small grains that can withstand the drought conditions, largely due to the preference for maize as a staple food (Nhemachena et al. 2014). Although small grains are perceived by the government to be more adapted to drought conditions than maize, they are reportedly prone to attack by quelea birds.

With an estimated unemployment rate of more than 70% in Zimbabwe[35] (Robertson 2011), curio carving was also identified as an important source of income in the study sites. The proximity to tourist resort areas such as the Victoria Falls offers wood carvers a ready market for their products. For some, craft trading has become more desirable than agriculture, particularly in Monde. Due to the multifaceted challenges to agriculture, some agro-pastoralists are becoming less willing to engage in agriculture, seeking alternative non-farm income-generating activities such as crafting and trading. One farmer in Monde explained:

> I have given up farming because there are so many challenges we face here which limits any meaningful agricultural productivity here. Farming is just a waste of time – elephants destroy our fields every year, lions eat our livestock, the soils are so poor …. I am concentrating with selling of curios to feed my family.

However, the interviews revealed that the major constraint to curio carving was that the carvers first need to obtain a permit to harvest trees from the Forestry Commission before they can harvest trees. The use of forest products is governed by statutory instruments such as the Forest Act (Chapter 19:05 of 1996) and the Communal Lands Forest Products Act (Chapter 19:06) (Nhemachena et al. 2014). The wood carvers said that their carving tools had been confiscated

[35] Unemployment rate in Zimbabwe is contested.

by officials from the Forest Commission some years ago and that the local markets along the Bulawayo-Victoria road had been closed.

Vegetable gardening was also an important source of livelihood for the villagers in the study sites. At Sizinda, the improved water facilities and community garden supported by the ACHM had created an opportunity for villagers, particularly women, to engage in vegetable gardening. According to the ACHM field officer, the community garden comprised 46 households, with 34 women and 12 men. Farmers sell the vegetables to the local supermarkets in Victoria Falls and use the proceeds to pay school fees and buy books for their children. Some have also established small gardens in their backyards, and fetch water to water their gardens from the refurbished water points using scotch carts. In Monde, the PRAs and interviews revealed that vegetable gardening was curtailed by a shortage of water. However, a community garden for those suffering from HIV/AIDS had been established by the private Wild Horizon ranch. In Dibutibu, gardening was also undertaken near streams and boreholes. Similar to Monde, the major constraint was water, which dries up as the dry season advances (August to October).

Piecework[36] and cutting and selling thatch grass were also identified as sources of income in the study sites. Piecework activities include erecting or maintaining fences for other villagers, brick moulding, and several female-gendered livelihood portfolios, such as petty trading and mat-making, while sewing and fire place production is only undertaken by women. As the regions are situated close to the Zambezi River, fishing was also identified as a major source of income.

Traditional dancing was identified as a source of income for youths who are hired to perform for tourists at hotels, restaurants and guesthouses in the Victoria Falls area, where wage employment in hotels, guesthouses and safari lodges also are key sources of income. Many villagers were pensioners from Wankie Colliery, located 100 km away.

6.1 CROP AND LIVESTOCK CONSTRAINTS

It is important to identify the challenges faced by farmers in crop and livestock production as perceived by the farmers themselves before exploring the impacts of HLLM. This is done in order to ensure an understanding of the farmers' "life worlds" or "lived experiences" and to evaluate whether or not the HLLM is aligned to the farmers' needs and priorities. This section discusses the complex and interlinked challenges faced by farmers across the study sites.

[36] Piecework is a word that is often used for locally available non-farm or farm work.

6.1.1 Livestock production

Recurrent drought

Recurrent drought, referred to as *izulu* in the isiNdebele vernacular, was reported as a major constraint in livestock production in agro-pastoral communities in Zimbabwe, with the decline in livestock population in Matabeleland, for example, viewed as a direct consequence (*Daily News*, 21 March 2014). Farmers there lost a large number of livestock in 2008 (referred to by locals as *umunyaka seZambia*, meaning 'the year of Zambia'[37]). As one farmer in Sizinda recounted: "Drought is a major challenge in this area. Most people in this area do not have a lot of cattle because of drought of 2008. In 2008 alone, I lost 18 beasts – it was terrible. There was no forage at all." In 2012, about 9 000 cattle succumbed to drought in Matabeleland (*News Day*, 28 December 2012)[38], while Matabeleland North province alone lost about 1 000 cattle in 2013 (*The Chronicle*, 25 March 2014). Similarly, respondents from the study sites viewed drought as a major constraint in livestock production. A farmer in Dibutibu explained: "This area is always affected by droughts and because of that, it is impossible to build a large herd of cattle … they get to 15 then go down to five again. It is always like this here."

The HCL is situated in region V, where droughts generally occur every two to three years (ZIMVAC 2013). According to the extension officer, the loss of cattle due to drought has undermined the draught power capacity of most rural households in the study sites. Agro-pastoralists in the study sites responded to droughts through various coping and adaptation strategies. For example, some illegally graze their livestock in the Victoria Falls National Park, while others take their livestock to Dimbangombe Ranch.

Exposure to water shortages for livestock

Water has been identified as a major constraint to livestock farming – both in terms of quality and quantity. In Monde and Dibutibu, but not in Sizinda, low, erratic rainfall coupled with high evaporation rates make water a scarce resource. Rivers and streams (both perennial and seasonal) are important sources for watering livestock. Distance to water sources changes seasonally, being invariably longer in the dry season, when many sources of water dry up. In Monde, farmers travel about seven to ten kilometres to the Masuwe River during the dry season to water their livestock because the nearby streams dry up in the summer. However, to avoid travelling this distance, farmers prefer to water their livestock at their homes, fetching water at nearby

[37] The area was hit by drought in 2008 and it was at the same time when the country was undergoing high inflation rates and there was no food in the shops. The residents in these communities were given passes by the emigration officers who allowed them to go to Zambia to buy foodstuffs, hence it became known as "umnyaka seZambia".
[38] *News Day* (28 December), Dry spell sparks fears in Matabeleland.

boreholes and taps (see picture in Figure 6.1 below). During the fieldwork in Monde, containers used by individual farmers to water their livestock were seen at most kraals. Although the Dibutibu River is close to Dibutibu, the farmers reported that the streams dry up during the dry season, leaving small pools that become dirty. Livestock consuming this dirty water are prone to internal parasites. This was reiterated by an AREX officer, who explained that most livestock, particularly cattle and goats, die due to internal parasites like liver fluke after drinking dirty water during the dry season.

Some Dibutibu farmers claimed that, once the nearby pools have dried up, they travel about 8 km to the nearby Sizinda community, where the ACHM has constructed a water trough to water their livestock.

Figure 6-1 Farmers in Monde using buckets to water their livestock Source: Author

Livestock predation

Approximately 60% of the area in the Hwange Communal Lands is adversely affected by wildlife (District Administrator 2013, per. comm.). The three study communities share borders with national parks, such as the Victoria Falls National Park and other private ranches, such as Wild Horizon. Given this proximity, human-wildlife conflicts are inevitable, with a high incidence of livestock losses to predators such as lions, spotted hyenas and wild dogs. According to the extension officer they were seven reported cattle attacks and two reported donkey attacks by lions in Chidobe Ward from 2012 to 2013. One farmer reported that he lost a total of five cattle due to lions in the grazing areas at night between 2012 and 2013. In 2011, over 300 predator conflict incidents were reported in Hwange, with a majority being on cattle, followed by donkeys (Victoria Falls Wildlife Trust 2012). The total value of livestock losses was more than US$91 000.

It also emerged that lions sometimes attack cattle in kraals/enclosures. In such cases the farmers should report to the CAMPFIRE division of the National Parks – part of the government's initiative to address the conflict between farmers and predators. According to the Parks authorities, a lion costs US$6 million, so the killing of a lion carries a penalty of 10 years in jail. However, the farmers reported that the Parks authorities did not respond and farmers felt powerless. A Monde farmer complained:

> Our situation in this area is really terrible and sad. If we see a lion attacking our livestock we are not allowed to kill it. The Parks say we must live with them (lions). We are supposed to report to them (CAMPFIRE) so that they can chase them away for us. But these people do not come in time; they come at their own time. Sometimes they don't even come at all! Suppose you kill the lion, you will rot in jail. So there is nothing we can do about it. We just have to live with it.

During the fieldwork it became clear that the CAMPFIRE programme was failing to reduce human-wildlife conflicts in the study sites, although in literature it has been considered a "success". The farmers reported that lions sometimes attack cattle during the day, especially when livestock are left unattended, while hyenas are lethal predators at night. Cases of predation were also high during the non-growing season, when farmers let their livestock roam freely in the grazing areas in all the study sites. Farmers in Monde revealed that cattle have a tendency to browse in the Fuller Forest Concession without herders towards the end of the dry season, which makes them vulnerable to predators.

Livestock diseases

During the PRA workshops and interviews the farmers revealed that livestock diseases *(izifo*) are a major challenge in the area. The most prominent cattle diseases in the study sites are tick-borne diseases, lumpy skin, liver fluke and heart water disease, while goats suffer from mange (*isikwekhwe*). According to the agricultural extension officer, these diseases were worsened by the "poor livestock management" practices of the agro-pastoralists in this area.

Lack of markets for livestock

Farmers in all three study sites reported that they were confronted with a lack of appropriate markets in which to sell their livestock. They were selling their livestock to the middlemen at the farm gate level. Locally referred as *amagamula*, the middlemen were mainly from Victoria Falls and Hwange and were buying livestock, especially cattle, from farmers at 'giveaway' prices. During the fieldwork, the farmers in the study sites reported that, while cattle were sold for between US$150 and US$250, and goats fetched around US$25 to US$40, middlemen were selling the meat at more than double the price for which they bought it. This concern was not

confined to the study sites only. Zenzele Moyo, reporting for African Story Challenge, also noted that, elsewhere in Matabeleland South, middlemen were also benefiting from low cattle prices of US$250 to US$350 and selling them at double the price.

Lack of grazing areas

The farmers also revealed that a shortage of grazing lands constrained livestock production in the study sites. The communal grazing lands are an important source of feed for livestock. However, due to poor soil fertility and the expansion of human settlements, the farmers indicated that the grazing lands were encroached and converted into crop lands, leading to reduced grazing areas.

The farmers in Monde also indicated that they had lost some of their grazing areas to the private ranchers, such as Wild Horizon. Likewise, farmers in Dibutibu also reported that their grazing lands were reduced due to the allocation of business stands for the construction of guest lodges and safaris by the Hwange Rural Council. However, in Sizinda, grazing areas were generally considered adequate, although shared with neighbouring communities such as Chidobe and Chisuma.

Management-related problems

Management-related problems include lack of *acaricides* to control ticks, and drugs to treat other livestock diseases. Farmers reported that drugs were either expensive or not available in the markets. In response to the crisis, some farmers indicated that they were buying the drugs in Zambia. Dipping was also a challenge in livestock production. In Sizinda, farmers complained that the dip tank was located far away from the community (in Chidobe), necessitating travel over long distances to dip their cattle. The route to the dip tank is arduous, causing farmers to refrain from dipping their cattle. According to the extension officer, poor management practices were one of the major problems contributing to the decline of livestock herds in the study sites. For example, she explained how farmers used to allow their pigs to roam freely, spreading mange disease to the goats.

Other challenges

Other important challenges observed in livestock production were snares, landmines and army worms. Snares, set by local hunters to catch wild animals, were identified as a concern, especially when livestock were left grazing unattended. According to the extension officer, about 20% of the grazing areas in Chidobe Ward were also affected by army worm in the 2012/2013 wet season.

6.1.2 Constraints to crop production

Wildlife menace

Wild animals (*inyamazana*) were identified as a major concern in crop production in all the study sites. Farmers identified elephants, baboons and monkeys as the most common wild animals destroying their crops. At Monde, farmers identified elephants as the major culprits in destroying crops during the growing season. Baboons and monkeys were also identified as culprits, digging out seeds during the planting period. Chief Mvuthu[39], quoted in *The Chronicle* (2014), explained the problem of wild animals destroying crops for his subjects this way:

> There are lots of elephants coming from the National Park and the forestry which ravages fields in areas along Victoria Falls highway in Ndlovu, Monde crossing into Mbizha. We are completely defenseless against these beasts though we have asked for help from the Parks to no avail. This has gravely affected our livelihoods as food security in the area is under threat.

According to the extension officer, elephants destroyed approximately 4 ha of crop fields in Chidobe Ward in 2012. They were more of a nuisance in Monde than in other communities due to the village's proximity to the Fuller Forest Concession, while farmers in Sizinda indicated that they were not a major concern since they were relatively far from the Fuller Forest Concession, and that communities like Chidobe, Monde and Ntabayengwe effectively shielded them. In Dibutibu, farmers said that elephants were infrequent as they do not favour the clay soils due to its stickiness when is wet.

As indicated by the senior extension officer, the problem of elephants is not an area-specific problem (for example, Chidobe), but affects all wards in Hwange District. Echoing this view, Chief Mvuthu's counterpart, Chief Shana, also reported crop losses due to wild animals in Milonga, Lumbara and Jambezi (*The Chronicle* 2014). The farmers indicated that sorghum was favoured the most by elephants.

Bird attacks on crops

The three study sites are situated in the agro-ecological zones IV and V, characterised by low, erratic rainfall. In order to adapt to these climatic conditions, drought-resistant crops such as small grains are grown[40] (ZIMVAC 2011). According to the respondents, these crops are susceptible to bird attacks (*inyoni*), particularly by quelea birds. According to the extension

[39] Chief Mvuthu is the chief of Chidobe Ward.
[40] Small grain crops include sorghum, finger millet and rapoko.

officers, the national parks that are in the vicinity of these communities provide good hatching grounds for these birds. These birds were also a source of income and meat for the villagers.

Soil fertility

Poor soil fertility is another major problem in crop production identified by the farmers. *Umlabhathi ufile*, meaning "soil fertility is poor", was a commonly heard statement in Monde and Sizinda. Livestock farmers in the study sites use various ways to retain soil fertility and ultimately improve crop production, such as applying manure or ash, or leaving the land fallow. Livestock owners use manure from their livestock. Those who do not own livestock said that they were practicing *ukhulakisa* – meaning fallowing and/or applying *umlotha* – ashes from household kitchen fires. According to the senior extension officer, the problem of poor soil fertility is further heightened by the farmers' unwillingness to apply chemical fertilisers. Contrary to the widespread promotion of chemical fertilisers by extension officers, farmers in all the three study sites believed that the application of chemical fertilisers was detrimental to the natural fertility of their soils. "Fertilisers damage soils permanently", was commonly stated by the farmers. The extension officer said that even if the farmers are supplied with the chemical fertilizers, they tend to sell it. Given this belief, some farmers prefer to buy manure from other livestock owners at US$40 per scotch cart. In addition, the senior extension officer explained the complex relationship between soil fertility and rainfall in Hwange District, saying: "Due to the Kalahari sands which characterise most of the region, if it rains too much there will be leaching and if the rains are too low, the soils have a low moisture retention capacity."

Lack of seeds

During the PRAs and the interviews, the farmers also indicated that a lack of seeds was also a constraint. Lack of money to buy seed or its unavailability on the markets was often cited as a major issue, leading to a delay in planting crops.

Seasonality of risks/threat in livestock and crop production

The respondents also reported seasonal variations in risk and exposure with regard to crop and livestock predation. These were manifested in crop damages by wild animals, livestock predation, rainfall intensity, bird attacks, pests and water availability. The agricultural extension officer reported some of the seasonal variations of risk that were faced by farmers in the 2012/2013 growing season in all the study sites, as set out in Table 6.1 below.

Table 6-1 Seasonal threats to crop production in the 2012/2013 growing season in the three sites

Stage of plant growth	**Period of the year**	**Major crops lost**	**Threat/risk**
Planting	October–December	Maize	Baboons digging out and eating the seed
Emerging plants	November–December	Maize/cow peas	Locusts, aphids and grasshoppers/hilder pests eating the plant.
Early vegetative growth	December–January	Maize/cow peas/ groundnuts	Army worm and grasshoppers
Milk and hard dough	February–April	Sorghum/millet	Quelea bird attacks on crops, especially small grains, e.g. finger and pearl millet
Hard dough	April–June	Sorghum/millet	Elephants and baboons. Finger millet is favoured the most by elephants

Source: Author's field data (2013)

Exposure to rainfall variability

Key informants in the study area mentioned that rainfall variability was problematic for crop production. For example, the extension officer mentioned that rainfall distribution in 2012/2013 was characterised by several dry spells (a cycle of 14 days without rainfall during the growing season). The extension officer said that Chidobe Ward experienced three dry spells in the 2012/2013 growing season, resulting in poor crop yields. During hazard identification, farmers in all the study sites indicated that the crop failures in the area were largely due to unreliable rainfall patterns.

Other challenges

Other challenges such as pests, for example locusts (*intete*) and army worms, and weed infestations (*isona*) were also identified as concerns in crop production.

The interrelatedness of the problems

The challenges faced by agro-pastoralists in the HCL are multifaceted and complexly interrelated. For example, due to droughts, farmers were encouraged by the government and NGOs to grow drought-resistant crops such as sorghum and pearl millet, which are better adapted to the harsh climate than maize, but vulnerable to bird attacks, particularly by quelea birds. Small grains were also favoured by elephants just before harvesting. The study also established that poor soil fertility in the study sites caused farmers to open up new fields, which in turn reduced the size of grazing areas, while poor access to clean water for livestock made livestock vulnerable to internal parasites.

6.2 TRACING THE ADOPTION PATTERNS OF HLLM PRACTICE

By reviewing secondary data such as quarterly and monthly reports from the ACHM, statistics of HLLM adoption were extracted. HLLM adoption across the study sites varied considerably, as shown in Table 6.2. Farmers using the HLLM adopted two main components, namely holistic planned grazing (HPG) and animal impaction of crop fields (AIC).

The study revealed that the adoption of HLLM in all the study sites was very low, ranging from partial adoption, dis-adoption to full adoption. In Sizinda, the average core group size was 60 members, while in Dibutibu the average core group size was 20 members (ACHM 2013a). However, the core group membership in the community was not sufficient to induce the adoption of HLLM. In other words, not all core group members were adopters. For instance, from a total of 60 core group members in Sizinda, only 23 farmers were adopters of HPG, while another 37 core group members were non-adopters. Similarly, in Dibutibu, the average core group size was 20 members (ACHM 2013b), yet at the time of the fieldwork none of the farmers were practising animal impaction or HPG, as shown in Table 6.2.

Table 6-2 Use of HLLM principles over time in the three communities from 2010 – 2013

	Number of households adopting animal impaction of crop fields			**Number of farmers adopting holistic planned grazing**		
Year	**Monde**	**Sizinda**	**Dibutibu**	**Monde**	**Dibutibu**	**Sizinda**
2010	n.a.	11	3	n.a,	0	n.a
2011	n.a.	4	1	n.a,	13	23
2012	1	1	0	0	0	23
2013	0	18	0	0	0	23

*n.a. data not available

Source: Author's compilation

Adoption of animal crop impaction varied considerably across the study sites. In Monde, only one household continued using animal impaction of crop fields after the ACHM withdrew its support in 2011, leading to partial adoption. The reason for continued use of this component was that it led to better yields than was possible previously. However, this farmer opted out in 2013.

Sizinda, by contrast, saw an interesting pattern in the adoption of animal impaction of crop fields, with an increase to 18 households in 2013. This was found to be because the community had obtained kraaling material, locally referred to as "boma sheeting", which had enabled them to combine their herds into one. Seventeen of these households were using livestock from the land management herd (LMH)[41] (Box 6.1), while only one farmer was using her own livestock (eight cattle). Some farmers adopted both animal impaction and HPG, leading to full adoption of HLLM.

[41] Land management herd refers to the animals that are bunched and herded together to restore degraded land.

Box 6.1: Animal impaction of crop fields using livestock from the community land management herd in Sizinda

Sizinda received overnight kraaling material, popularly known as a "boma sheet", from the ACHM in 2013. The "boma sheet" is 50 m by 50 m. The community contributes 15% towards its purchase, while the ACHM pays 85% of the total cost. In Sizinda, 17 households used livestock from the community land management herd (LMH) in 2013, which consisted of 46 cattle and five donkeys belonging to 13 different livestock owners, while four farmers, although active members of the core group were non-livestock owners. The farmers take turns kraaling the LMH in their individual fields for nine nights.

Source: Author's compilation

Before the community procured kraaling material, the adopters of animal impaction of crop fields used their own livestock, along with locally available materials such as branches and zinc sheets to make kraals for overnight kraaling. The major reason cited for adopting the animal impaction was to improve crop yields. Figure 6.2 shows a movable kraal installed in a crop field (left) and a crop field impacted (right).

Figure 6-2 Boma sheeting in the crop field (left) and after the impaction in Sizinda (right).

Source: Author

Only four farmers adopted animal impaction between 2010 and 2011 (ACHM 2013b). However, these farmers dis-adopted in 2012. During the time of the fieldwork in 2013 there was no farmer practising animal impaction in Dibutibu.

The uptake of HPG in all the study sites was also very slow, but similar to the animal impaction of crop fields it also varied considerably between sites. In Monde, for example, no farmers were reported to be practicing HPG. The ACHM terminated its operations in Monde in 2011. Similar

to Monde, none of the farmers in Dibutibu who adopted HPG were found to be implementing HPG. However, if asked, the farmers claimed that they were practising HPG, yet they were not herding together following the grazing plans promulgated by the ACHM officials. In contrast to Monde and Dibutibu, 23 farmers adopted the HPG, thus were combining herds following grazing plans. Among then 23 farmers, 17 were livestock owners while six were non-livestock owners.

The adopters in Sizinda reported that they have a written holistic context[42] referred to locally as *injongo yensika yeSizinda*, and a grazing plan that they created with the assistance of the ACHM field officers. The holistic context consisted of three parts, namely the kind of life the farmers want (*impilo esiyifisayo*), the forms of production to achieve that kind of life (*okuzaletha leyimpilo*) and the future resource base (*ikusasa*). A total of 14 paddocks – seven paddocks for the wet season and seven paddocks for the dry season, were demarcated by the farmers with the assistance of the ACHM officials.

6.2.1 Reasons for non-adoption and dis-adoption of HLLM

The respondents cited several challenges associated with the adoption of the HLLM programme (see Figure 6.3). These challenges have led to a lack of interest by farmers to adopt or continue with the HLLM principles (i.e. HPG and animal impaction of crop fields).

[42] The holistic context was written in the local IsiNdebele language and was translated to English by the author.

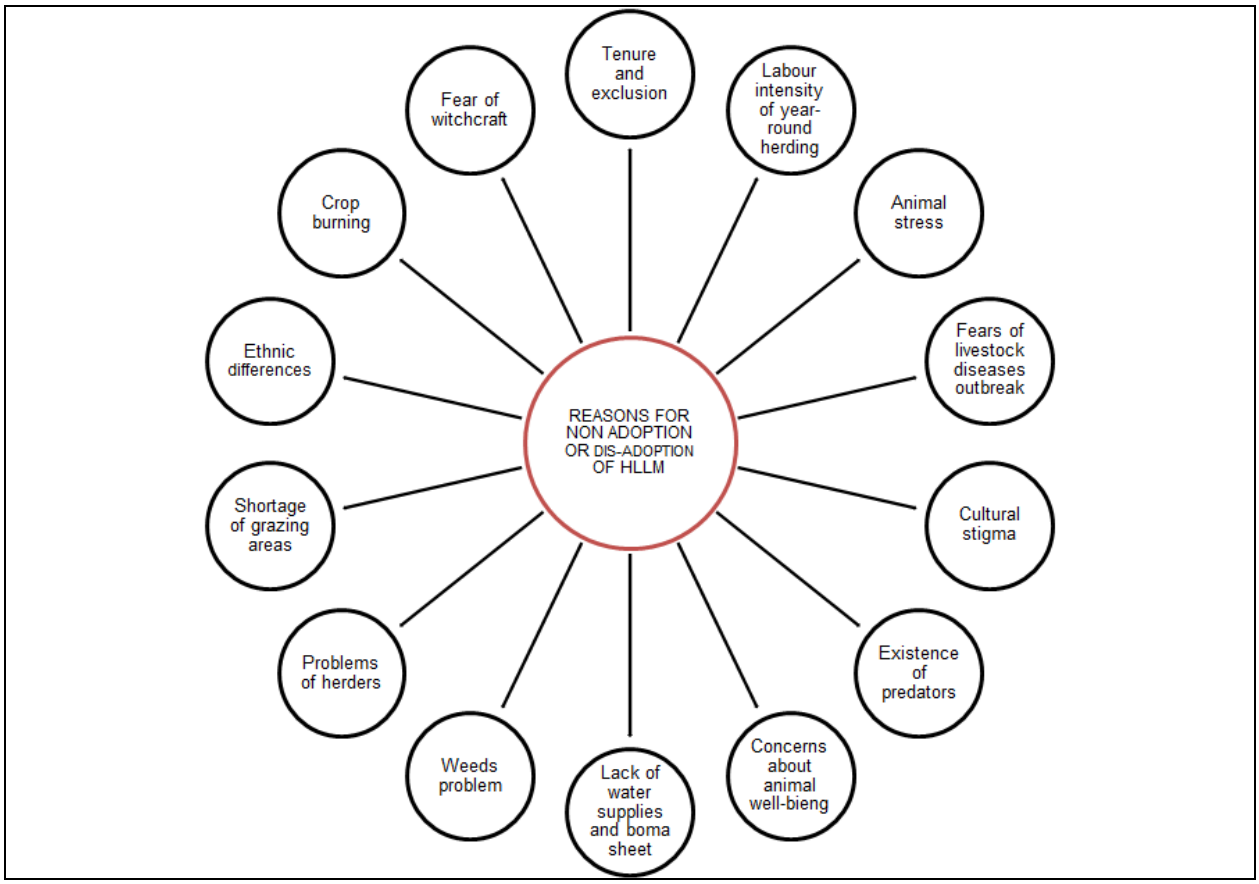

Figure 6-3 Reasons for non-adoption or dis-adoption of HLLM.

In terms of animal impaction of crop fields, lack of appropriate kraaling material was cited as a main deterrent to the adoption of the concept. In the absence of the proper kraaling material, farmers indicated that they used tree branches and sticks – a process locally referred to as "making mats" for kraaling, and other locally available material such as used iron roof sheets. The farmers noted that this process was labour intensive. Even in Sizinda, where the community had access to boma sheets, some farmers still indicated that it required time and effort as the boma was moved every nine days to another crop field. Animal impaction adopters also cited weed infestation as one of the key problems of animal impaction. Another reason why animal impaction of crop fields, particularly in Dibutibu, had not been well received was that, when rainfall was low, it resulted in crop burning due to the high concentration of nutrients, thus further exposing crops to the raging effect of drought.

Consistent with literature on HPG (for example, Quigley 1987; Stinner, Stinner & Marsolf 1997), labour was identified by farmers as a key constraint to the adoption of HLLM across the study sites. Farmers noted that HPG required high labour for herding, since farmers are

encouraged to herd the livestock in both growing and non-growing seasons. The farmers indicated that, particularly in the dry season, herding was an additional obligation that was "unnecessary" and a time when they normally engaged in non-farm activities such as carving and piecework, thus restricting their labour capacity during the non-growing season. According to the extension officer, the issue of labour was further heightened by the short supply of labour due to migration and impacts of HIV/AIDS. Indeed, farmers in Sizinda and Dibutibu complained that most of the herders that were trained by the ACHM had abandoned herding in search of better off-farm employment opportunities, like canoeing and tour guiding in and around Victoria Falls.

Fear of livestock disease outbreaks was also a common concern, especially among the non-adopters and dis-adopters of the HLLM programme in all the three study sites. Some farmers were reluctant to "bunch" and "herd together" due to fear of disease transmission. As noted by one non-adopter in Dibutibu, "some farmers here do not vaccinate their livestock. I cannot take my 'clean' livestock and mix with those that are not properly vaccinated". This finding supports Brown and Carr's (2014) observation in Zambia that farmers were not keen to "bunch" and herd together due to fears of disease transmission. The veterinary officer also supported this view and suggested that a proper animal treatment system should be set up before farmers even start the implementation of HPG. After the implementation of HPG in Monde, farmers lost many goats due to an outbreak of mange disease.

Since HLLM does not involve fencing off grazing paddocks, HPG adopters frequently cited difficulties in excluding the livestock of non-participants from both within the community and neighbouring communities. Farmers in all the study sites revealed that their grazing areas were also utilised by neighbouring communities, curtailing their efforts to rehabilitate the grazing areas. For example, in Sizinda and Dibutibu, farmers indicated that their grazing areas were also used by the neighbouring communities of Chidobe and Chisuma. Additionally, the use of "key resource" patches (Scoones 1989) led other farmers to dis-adopt the HPG. For example, one dis-adopter in Sizinda said:

> While we [HPG adopters] were following grazing plans, there were times when we had to graze our livestock in the poor grazing areas in order to improve them, while the non-adopters were busy grazing their cattle in the better grazing areas.

Thus, tenure is critical in any grazing management scheme in the communal areas (Scoones 2014, pers. comm.).

The ACHM officials indicated that ethnic differences were also a major challenge in the implementation of HPG. In Monde and Dibutibu, the ACHM officials indicated that there was lack of cooperation between farmers due to the fact that the villagers were from different ethnic groups, such as Ndebele, Shona, Chewa and others. Such diversity in ethnicity was problematic in terms of cooperation to enable the successful roll out of the programme. Explaining how this ethnicity diversity curtails any meaningful cooperation in development programmes towards a common good in Monde, one farmer said: "People here do not cooperate at all. My neighbour there is Mubwidi[43], the next one is Shona, and do you think it will work?"

Another challenge noted was the lack of trust among farmers, which limits the uptake of HLLM. Despite the fact that herders and village-based health workers were trained before the implementation of HPG, some livestock owners were doubtful whether non-livestock farmers could do a proper herding job, preferring to do it themselves. The knowledge of non-cattle-owning herders was questioned by the livestock owners, who did not trust them with their livestock. One former herder complained that livestock owners used to question his knowledge on livestock since he did not own any livestock, saying "do you know where the heart of a cow is?" Thus the cattle owners perceived that the dissemination of HLLM should come from farmers who own livestock and have better knowledge of livestock rearing, rather than from non-livestock owners. The Village-Based Facilitators (VBFs) reported that the cattle owners distrusted the trained VBFs without livestock, as well as their advice, due to their perceived lack of experience with livestock According to Samuels (2006), a good herder ensures the well-being of animals by guaranteeing their safety, comfort and health. The herders, however, also complained about a lack of protective clothing such as rain coats and boots, as well as low wages from livestock owners. The ACHM used to pay herders US$25 as an incentive for herding. However, the ACHM changed its policy in 2013 and no longer pays a herding allowance. Indeed, farmers reported that most herders left herding in search of better non-farm activities (e.g. work as guides, canoeing, etc.)

Other farmers expressed concerns about the well-being of livestock when grazed under HPG as prescribed by the ACHM officials. They were not happy with the way cattle were herded under HPG. Based on the HPG principles, livestock are concentrated at high densities and kept moving to induce a heavy livestock impact over limited spatial and temporal scales with the objective of restoring degraded land and/or enhancing its productivity (Peel 2014). Farmers view this as "stressful" for animals, as they do not rest or feed well. This finding confirms Worthington's

[43] Mubwidi is a local word referring to foreign nationals from Zambia and Malawi.

(1984) observation in the Charter Grazing Trials that cattle under HPG are highly stressed in the early years before acclimatisation (Joseph et al. 2002). The farmers explained that when livestock, for example cattle, are grazing they have a tendency to graze until late afternoon, and that when it becomes hot they also like to stand in the shade and rest. As one non-adopter explained:

> When cattle are "bunched" like that [the HPG way] they do not feed well. Only those that move in front graze well, and the rest of the cattle behind won't feed well. The ones that will be in front urinate and dung while they graze. Those at the back will not graze when they smell the dung of those in front. So they will keep moving without grazing, hoping to find an opportunity to graze until the day is finished. This, without a doubt will affect the well-being of the cattle.

Farmers also cited livestock predation as a limiting factor in the adoption of HLLM (see section 6.1.1 for more detail on predation). Some farmers were not eager to adopt animal impaction of crop fields due to the existence of predators in the crop fields. Farmers in Monde and Dibutibu indicated that crop fields were located far away from homesteads, where predators roam freely in the night, thus deterring them from adopting animal impaction. For example, in Monde, farmers indicated that lions broke into a "community herd" during the period when they were implementing HPG and attacked one cow and several goats. However, the farmers said the ACHM was not forthcoming in compensating the loss. The existence of predators in the grazing areas limits farmers from exploring the potential of overnight kraaling of animals to improve bare land, as suggested by the HPG principles.

The shortage of grazing areas, particularly in Monde and Dibutibu, was also perceived as a constraining factor to HPG adoption (see section 6.1.1). Lack of adequate water for livestock in the dry season, especially in Dibutibu, was a major limiting factor in HPG adoption. Fear of witchcraft and its impact on animals was also mentioned as a major constraint to the adoption of HPG. This resulted in other farmers not being keen to herd animals together, due to the strong belief that some farmers used witchcraft that leads to still birth. The veterinary officer echoed these concerns when asked about the challenges that limit the adoption of HLLM, saying "some farmers in the communities believe that other farmers use 'juju' on their livestock, which will result in various consequences on animals".

The farmers also indicated that some HPG principles were against the customary practices of herding. For example, livestock were not herded in the dry season, while goats and donkeys were

not herded even in the growing season. In addition, some farmers (for example in Monde) reported that the bunching of goats may lead to poor breeding rates.

6.2.2 Challenges in implementation

Lack of funding was cited as a major concern by NGOs planning to implement HLLM in other communities. They indicated that funding was generally erratic in Zimbabwe, but that HLLM requires long-term funding that currently is scarce in the country. Savory believes that the benefits of HLLM are longer term, and this view concerns 'prospective' NGO partners who need to show tangible results in the short and medium term, as prescribed by most donors. One such NGO official had this to say:

> The ACHM says this is a 100-year project. But our donors want to see quick and tangible results. So if you follow some of Savory's principles you will end up without a job! You have to select what works.

The above finding supports Brown and Carr's (2014:17) conclusions that HLLM requires at least three to five years of donor support in order to ensure that all key planning, capacity, multi-stakeholder coordination and farmer training is met and rooted. Literature on HPG in commercial farming reported similar findings, reporting that HPG requires more investment of capital and time (for example, Alfaro-Aguello et al. 2010; Quigley 1987; Stinner, Stinner & Marsoff 1997). Some NGO officials said the ACHM training courses are very expensive and beyond the reach of many organisations. Others mentioned that the controversy surrounding HPG deters the adoption of HLLM, for example the idea that overgrazing was a function of time to which a plant was exposed to grazing, rather than animal numbers.

6.3 BUT HOW DO FARMERS RESPOND TO HLLM?

This section describes how the farmers responded to the implementation of HLLM. These responses varied considerably across the sites.

Embracing HLLM

Some farmers adopted the animal impaction of crop fields individually or collectively across the study sites. The main reason cited for adoption was to restore soil fertility. Adoption of the principle enables them to address one of their key priorities, which is improved maize yield, thereby improving food security at the household level. Thus, despite the lack of proper kraaling materials, some farmers used locally available material such as zinc and branches (see Figure 6.4).

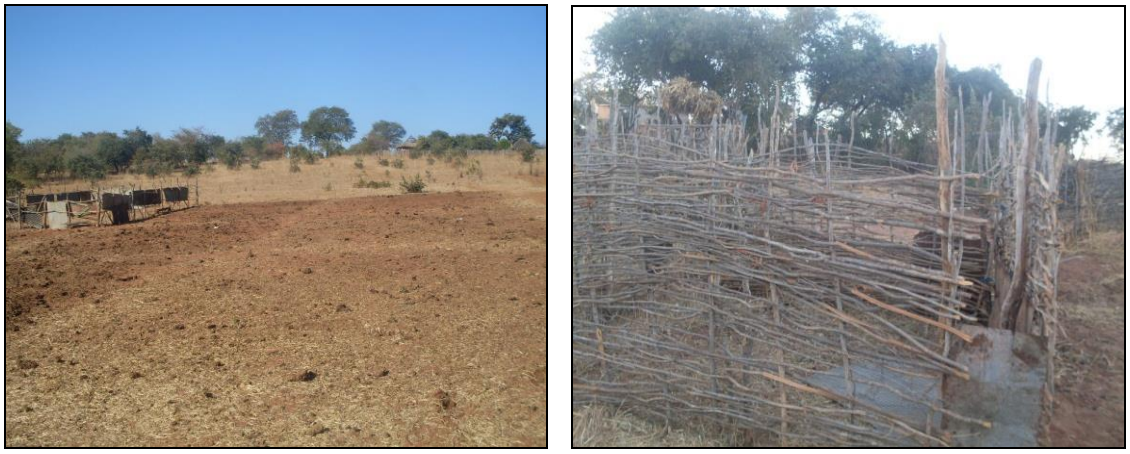

Figure 6-4 Individual farmers using different kraaling materials to impact their crop fields in Sizinda

Some farmers (n = 18), for example in Sizinda, combined herds in order to impact their crop fields (see section 5.3). The farmers indicated that combining herds enabled them to impact large pieces of land, since most farmers owned small herds (less than five cattle). Some non-cattle owners also joined the group to improve soil fertility by using livestock from the group. These non-cattle owners indicated that they used to buy manure from the livestock owners. Most farmers in these study sites do not apply artificial fertilisers, believing that "it will completely damage the soils" (see section 6.2.2); instead, manure plays a critical role in the soil improvements of these crop fields.

Box 5.2 Increased farm yields for non-livestock owners

Case 1

Ms N is a widow who stays in Sizinda. Although she does not own any livestock (neither cattle nor goats), she is an active core group member of the HLLM programme. Typical of most of the land in the community, she says her land is infertile and has been unproductive for years. Although she also received training from the ACHM in 2010, she had not adopted animal impaction of crop fields until 2013 because she had no livestock. In 2013, the core group members obtained a boma sheet, which they now use as a movable kraal to impact crop fields in the non-growing season. Since Ms N is an active core group member, her crop fields are also impacted. Before HLLM, she said they used to buy farm manure from livestock owners at US$40 per scotch cart load, which was expensive for her, as she could hardly afford to buy food for her household. This resulted in poor yields every year. Although 2013 was her first year, she was convinced that the animal impaction of crop fields can result in good crop yields due to improved soil fertility.

Source: Author's field notes (2013)

Although most farmers acknowledged that animal impaction of crop fields improved soil fertility, some expressed deep-seated apprehension over penning livestock in one kraal due to a fear of transmission of diseases and livestock predation (see section 6.2.1). In order to address these concerns, some adopters across the study sites preferred to impact their crop fields individually, rather than combining herds as prescribed by the ACHM officials.

Despite the ACHM terminating its support in Monde, one farmer was still practising animal impaction of crop fields. Although the NGO was not monitoring his results, he was eager to keep on implementing the practice, monitoring his output and doing further experiments on this component of HLLM (see Box 6.3).

Box 6.3 Experimentation

Case 2: Mr N

Mr N is a retired headmaster who owns 15 cattle. He moved from the Lupane rural area to Monde 30 years ago. According to Mr N, one of the key constraints that limit crop production in his area is poor soil fertility, which reduces productivity.

"Realising that our soils in these areas are very infertile, I decided to try it [the impaction of crop fields] myself and it has really improved my yields. … I use my own cattle to treat my crop fields. When I first tried in 2010, I used 13 cattle (which I had at that time) and I penned the livestock in one place within my crop field for two weeks. I then moved to another area.

"That year, the yields were very good! You can ask my wife – we had a very good harvest! In the previous years [before we started using the technology] we used to harvest nothing in our crop fields. Realising the yield was better in 2010, we got very keen with this idea and we now do it every year. In all the areas, we are now harvesting three bags (50 kg bags) of maize more from our plots that we have treated where I used to get about one.

"Although the ACHM is no longer working with us in this community, I will continue doing it alone, without their support. My wife and I are actually thinking of doing our own research with regard to this principle. We want to test how many years it will take for the areas that we treated using the animal impaction of crop fields before the fertility depletes again. We [my wife and I] are doing our own monitoring since we started impacting our crop fields in 2010." In order to avoid livestock predation, the farmer said that he was impacting crop fields within the immediate vicinity of his homestead.

Source: Author's field notes (2013)

Some farmers also adopted HPG. They identified several reasons for adoption, which included reduced herding labour, as farmers take turns to herd, sharing veterinary drugs, and perceived improvement in breeding rates due to an increased number of bulls, quick identification of diseases, reduction in predation and reduced problems of crop destruction due to stray animals.

Farmers resisting some HLLM components

Some farmers who had initially adopted animal impaction, for example in Dibutibu, dropped out after one season of trial. During the interviews, these farmers said that, with low rainfall, animal impaction leads to "crop burning" due to concentrated nutrients. This was attributed to the fact that the dominant soil type in Dibutibu is heavy clay soils. One dis-adopter further explained that "if we do animal impaction of crop fields here [Dibutibu], then we will need to grow small grains otherwise maize will be burnt". Notwithstanding the suitability of grain crops in these areas, farmers preferred growing maize, as it is the common staple food. In this case, adoption of the principle heightens the vulnerability of farmers to drought.

Regarding HPG, some farmers were reluctant to adopt the concept, thus maintained their herding status quo despite vigorous HPG promotion. Farmers were sceptical about HLLM due to the several constraints and concerns mentioned in section 6.5.2. However, these constraints were not declared openly in the hope of getting other benefits. Thus, farmers responded by ignoring the HPG prescriptions. In Monde, the ACHM officials repeatedly indicated that the villagers were "not willing to work together", hence the ACHM decided to terminate its services, as they perceived the project to be a "waste of resources". In this case, the abandoning of the implementation of HLLM in Monde took place as a result of actions acted out individually but never publicly declared, and without organised opposition.

Some farmers, for instance in Dibutibu, claimed that they were practising HPG, yet they were still practising their traditional herding practices. Farmers in Dibutibu were hoping to benefit from improved water supplies from HPG. According to the ACHM officials, community members in Dibutibu wrote a letter to the ACHM (after seeing that the ACHM provided water and the garden in Sizinda and Monde) inviting the organisation to implement the HLLM programme in their community[44]. The farmers claimed that the ACHM promised them that they would establish a water point and a community garden, "as they did in Monde and Sizinda", but failed to honour its promise. Subsequently, farmers in the community began to lose interest in the programme.

[44] Due to a poor record-keeping system, the researcher could not find this letter in the ACHM's archival documents. However, this fact was confirmed by the Research, Monitoring and Evaluation Unit at ACHM..

It is significant that these findings are consistent with those from a much earlier study of grazing management regimes in Zimbabwe (Cousins 1992; Scoones 1989), revealing that farmers continue to respond to external agents very strategically, seeking primarily to improve their livelihoods. Disjuntions between the new technologies and the realities of the local farming system was in part the major reason of the low levels of adoption of HLLM, particularly HPG. This finding is a key theme in the literature on grazing regimes in communal lands of Zimbabwe. For example, Cousins (1992) and Scoones (1989) (in the case of systematic use of 'key resources') noted sharp contrasts between farmers' current herding practices and the Short Duration Grazing (SDG) promoted by extension workers leading to a failure of the implementation of the grazing schemes.

Absenteeism during meetings

The ACHM officials complained about absenteeism in the meetings with farmers, especially when the HLLM meetings clashed with other NGO meetings, such as ORAP[45]. One ACHM field officer explained:

> Most farmers do not want to participate in programmes which do not give immediate benefits. When our meetings clash with other NGO meetings, for example ORAP, villagers choose to attend ORAP meetings because they get quick benefit – in the form of food handouts. When they don't see these quick benefits, they then start to lose interest in the programme. Our programme is a "100-year" project – which offers long-term benefits, so it's a challenge. Farmers give priority to such programmes as ORAP. In such cases, we have to cancel or postpone the meetings to a later date.

This view was also illustrated by a farmer in Dibutibu, who said "nowadays if Dimbangombe calls a meeting, people are no longer keen to participate. People are just losing interest". From the above quotes it is clear that the farmers were more interested in programmes that offer immediate benefits without any consideration of future planning and reflection, rather than HLLM, which offers long-term benefits.

Adapting HLLM principles

Although Sizinda has been cited as "successful" in terms of farmer adoption of HPG, farmers were found not to be following the full prescriptions of HPG as promoted by the ACHM officials in the non-growing season. The adoption of HPG was intended to reduce the herding labour requirements. However, traditionally, livestock in Sizinda are not herded during the non-growing

[45] ORAP (Organisation of Rural Association for Progress) is another NGO operating in the area that gives farmers food aid.

season. In contrast, HPG principles encourage farmers to herd their livestock all year round, even during the non-growing season. According to the ACHM officials, livestock must be moved and kept bunched in the grazing areas in order to produce the impact on soils with the objective of restoring degraded lands. Although herding during the dry season means extra labour requirements, the farmers in Sizinda were combining their herds as they used the herd to impact their crop fields during the non-growing season. It was observed that farmers participating in HPG in Sizinda, although they were combining their livestock and sending them to the grazing areas, the animals were left unattended during the day. However, farmers were following the dry-season grazing plan, which they designed with assistance from the ACHM officials. In so doing, the farmers "cut corners" without the intention to resist, but to reduce the labour requirements of herding, which most farmers perceived as unnecessary during the non-growing season.

Other adopters in Sizinda, particularly livestock owners, put their livestock into a community land management herd during the day for grazing, but kraaled their livestock in their own fields due to concerns about the safety of their cattle if they were kraaled in the community herd during the night. In such cases, these farmers were impacting their crops using their own livestock.

Relaying information through social networks

In order to inform livelihood decision-making processes with regard to HLLM adoption as a coping strategy and as a means of coping with the "unknown" consequences of adopting the technology, farmers draw upon different social networks. Knowledge regarding the benefits (e.g. improved crop yield) and problems (e.g. burning of crops) associated with HLLM is exchanged among extended family members, neighbours and friends from different households within and outside communities during visits. For instance, some adopters of animal impaction in Sizinda indicated that they learnt about the benefits from their relatives both in their community and outside in other communities. Such knowledge exchanges have led to the spontaneous adoption[46] of the animal impaction of field crops.

Non-adopters also drew upon the experiences of their kin and relatives to make adoption decisions. For example, a non-adopter in Dibutibu mentioned that he had never tried animal impaction of crop fields after he was told about the consequences of burning the crops by his father who had tried it. There also were reported incidents in other communities within the ward where farmers had spontaneously adopted animal impaction of crop fields due to knowledge

[46] In this case, spontaneous adoption involves the adoption of HLLM without receiving formal training from ACHM.

sharing between farmers from different communities. For example, one farmer in the Chidobe community was reported to be impacting his crop fields after he received training from adopters in Sizinda. Thus these farmers exchanged precise information on HLLM that can be used to accept or ignore the HLLM programme, hence reflecting the importance of social capital.

6.4 IMPACTS OF THE HLLM PROGRAMME

This section presents a brief description of the farmers' perceptions on the impacts and benefits of the HLLM programme.

The commonly perceived benefit of animal impaction of crop fields is soil fertility restoration. Some adopters indicated that the principle also improves soil moisture-holding capacity more so than the untreated ones due to improved organic matter. Soils in animal-impacted crop fields were also easier to work on, since most farmers were combining animal impaction of crop fields and conservation farming (*magachombo*)[47]. However, in Dibutibu, farmers reported that animal impaction of crop fields led to burning of the crops if the rainfall was insufficient, given the fact that the dominant soil type is clay soil. One dis-adopter summed up what other dis-adopters noted:

> The animal impaction of crop fields is good, but if we do it here [Dibutibu], we will then need a good rain season. But our area is very hot and rainfall is not always reliable. Once you impact you have to pray that it will rain well, otherwise the crops will be burnt due to the increased concentration of nutrients. In most cases, if we impact we will then be forced to grow small grains, otherwise our maize will be burnt.

The most perceived benefits of HPG were improved grazing areas and, subsequently, improved animal health and reduction in herding labour if farmers herd together. However, non-adopters associated the adoption of HPG with increased herding labour.

Farmers in the study sites, except in Dibutibu, reported that the implementation of HLLM resulted in improved access to water for both livestock and farmers. In Sizinda, the ACHM installed an electrical water pump, constructed a water reservoir and trough, and provided some fencing material for the establishment of a community garden (see Figures 5.5 and 5.6). Since an electric water pump is used, farmers have established a water fund, to which all the community members make contributions of money to pay for the electricity bill and for the caretaker responsible for the smooth operation of the pump.

[47] Conservation farming is a conservation agriculture package that is practised by smallholder farmers in the communal lands using small farm implements such as the hand hoe to create planting basins (Mazvimavi & Twomlow 2008).

Figure 6-5 Water trough in Sizinda

Due to the improved access to water supplies in Sizinda, HLLM also led to the establishment of a community garden. With assistance from the ACHM and CADEC, which provided fencing material, a community garden was set up. The community garden involves 46 households. Farmers reported that they were now able to feed their family as well as selling some garden produce to the supermarkets in Victoria Falls. Some farmers reported that they used money from these proceeds to pay for their children's school fees and books. The farmers indicated that their efforts to pursue vegetable gardening before the implementation of HLLM were derailed by the lack of water, particularly during the dry season. "Water was a key challenge here. Now they [the ACHM] built us a water tank. Now we are growing vegetables and tomatoes and sell to TM [a local supermarket" was a common expression of HLLM participants and non-participants in Sizinda. Thus, the accessibility of water in Sizinda has helped farmers to improve their financial capital.

Figure 6-6 Community gardening in Sizinda

In Monde, the ACHM also installed a water tap and a community garden during the implementation of HLLM. However, all these facilities are now malfunctioning, as the water bill became high and farmers failed to pay. The water bill accumulated to approximately US$4 000 and water tap was closed by Zimbabwe National Water Authority (ZINWA) in 2011 (see Chapter 3 and Figure 6.7).

Figure 6-7 Malfunctioning water trough and tank in Monde

In order for the farmers to adopt animal impaction of field crops they require appropriate kraaling material. Thus, in Sizinda, the ACHM helped a group of farmers to procure kraaling material, commonly referred to as "boma sheet" (see section 5.2). Access to the kraaling material has helped adopters, particularly the non-livestock owners, to improve their soil fertility.

Some farmers explained that they received goats from the ACHM in 2008 under the 'goat banking' project, funded by USAID. According to the ACHM officials, this project was a 'loaning system' targeted to benefit the old-aged households, which each received 10 goats, and who were expected to pay back 13 goats after a three-year period. However, the farmers in these study sites reported that the majority of goats died due to an outbreak of diseases, especially *esikhwekhwe* (mange). Farmers, particularly in Monde, blamed the bunching of the goats under the banner promoted by the ACHM.

The implementation of HLLM has led to the formation of core groups[48], although they were found to be defunct in Monde and Dibutibu. In Sizinda, adopters who became active core group members reported that this enabled them to share livestock for the impaction of crop fields, an ongoing reciprocal action. These farmers were combining herds into a land management herd (LMH). Interestingly, this practice started in 2013 after the community obtained the kraaling

[48] A core group is made up of self-selected community members who are affected by land degradation and are keen to restore the land (ACHM 2013a).

material that is necessary for impacting the crop fields from the ACHM. After the harvest, the core group members took turns to kraal livestock from the community land management herd in each individual farmer's field. According to the ACHM programme officer, the key facilitation factor here was the family ties and kinship between core group members, and a common ethnicity, namely they were mostly Nambiya.

Core group members also share labour, such as moving the kraaling material from one farmer's crop field to another making the adoption of animal impaction easier. They also share information about HLLM, leading to spontaneous adoption. For instance, such cases were reported in communities such as Chidobe, where one farmer adopted animal impaction of crop fields after he received training from one of the early adopters from Sizinda. Farmers also share veterinary drugs and insecticides to spray their vegetable gardens, and undertake joint problem-solving of farming issues. For example, the distance to the dip tank from the community reduced farmers' willingness to dip cattle until the core group, with assistance from the ACHM field officers, constructed a cattle race.

However, disagreements between core group members can result in disputes, with some abandoning the group, as one adopter illustrated:

> When we obtained the boma sheet, there were disagreements regarding whose field to start the animal impaction. These disagreements resulted in other farmers withdrawing their livestock from the land management herd. After some disagreements we decided to start at the village head's field.

Some non-group members indicated that a joining fee was required, an arrangement likely to hinder others from joining and limiting the benefits of animal impaction for current members. As one non-adopter explained: "The core group members who have been participating in the programme now think that they own the project, hence some villagers now feel excluded."

Farmers stated that some HLLM principles were detached from their cultural and traditional practices. For instance, the HPG encourages farmers to herd different livestock species together in order to promote non-selective grazing. However, most farmers indicated that goats and donkeys traditionally are not herded, even during the growing season. Customarily, goats and donkeys graze freely in the grazing areas, as long as the farmers ensure that they do not get into the fields. More so, in HPG the farmers are encouraged to herd livestock throughout the whole year. This means that farmers must herd their livestock even in the dry season. This is at odds with the traditional practice of herding livestock, which are only herded during the wet season to protect crop fields. In the dry season, livestock are not herded. This results in increased herding

labour in a season when the farmers are supposed to be resting. The farmers drive the livestock to the grazing areas – normally around the harvested crop fields – and leave them to graze until the evening, when they are kraaled. Most farmers do not have time or labour to herd animals during the dry season.

The farmers also indicated that their knowledge of animal health, particularly on how to diagnose and treat livestock diseases, had been improved due to the training they received from the ACHM officials. The farmers indicated that they also received training on ecological literacy. The training had improved their awareness of ecological and environmental degradation in their grazing areas. In Sizinda, core group members are now able to monitor any changes in their environment as a result of the HPG. During the fieldwork, most respondents in the study sites demonstrated a good understanding of HLLM principles. The knowledge retention tests undertaken by the ACHM two months after the farmers received the ecological literacy also support this finding. For example, the test indicated that Sizinda had an average retention mark of 91% (ACHM 2013b).

6.4.1 Findings from quantitative data

This section presents some of the findings of the on-going scientific ecological monitoring survey currently being undertaken by South Africa's Agricultural Research Council (ARC) in collaboration with the ACHM. In line with Table 6.3, 6.4 and 6.5 (see Appendix C for more details), scientifically monitored data using traditional vegetation monitoring methods complemented by landscape functional analysis (LFA) conducted in the rangelands of Dimbangombe Ranch, Sand Forest, Sizinda and Monde suggested that there is little evidence that the communal rangelands in Sizinda and Monde have reached a state where self-sustaining vegetation has been established (Peel 2014). It must be stressed here that assessing changes in range conditions due to HPG in the study sites is difficult because, among other factors, the covariate situation, such as the state of the rangelands before HPG implementation, is not known (Peel 2014, pers. comm). Thus, the conclusions drawn in this section are presented tentatively, as this is still work in progress.

Vegetation changes in the study sites

In general, the survey results indicate that grass cover (distance and tuft size) with regard to distance. The ACHM/Dimbangombe (49 mm) had the highest cover (tufts closest together), followed by Monde (58 mm), then Sizinda (77 mm) and lastly Forest (94 mm). The survey indicates that all the sites have high proportions of perennial grasses – Dimbangombe (85%),

Forest (80%), Monde (89%) and Sizinda (77%). As expected, the more fertile basalt has a higher proportion of perennial grasses than Forest on the sandy soils. At the end of 2013, the survey indicated that in terms of grass standing crop[49], Dimbangombe was in a moderate condition (1129), Forest had a low-moderate grass standing crop (548), while Monde and Sizinda were said to have a low herbaceous standing crop. The overall ranking of all the grass parameters indicate that Dimbangombe was ranked first, followed by Monde, then Forest and lastly Sizinda. The same rankings were also recorded in the 2011/2012 season.

Table 6-3 A comparison of the vegetation condition of a number of important parameters in Dimbangombe, Forest, Monde, and Sizinda

Grass parameter - current	**Dimbangombe**	**Forest**	**Monde**	**Sizinda**	**Rank/4 from left to right**	
					11/12	**12/13**
Perennials (%)	85	80	89	78	2, 4, 1, 3	2, 3, 2, 4
Cover (distance – mm)	49	94	58	77	2, 3, 1, 4	1, 4, 2, 3
Cover (tuft size – mm)	24	15	8	4	1, 2, 3, 4	1, 2, 3, 4
Standing crop (kg/ha)	1129	548	<100	<100	1, 3, 2, 4	1, 2, 3, 4
Overall rank					**1, 3, 2, 4**	**1, 3, 2, 4**

Source: Peel (2014)

Landscape functional analysis (LFA) results

The results to date of the LFA, using mean stability index, infiltration index and nutrient cycling index, clearly indicate that Dimbangombe (ACHM) is in a markedly better condition than its neighbouring Sand Forest, with Monde ranked second while Sizinda is ranked fourth (see Table 6.3). When comparing the vegetation and LFA indicators, the survey indicated that Dimbangombe (ACHM) is in a better condition, followed by Monde (2), Sand Forest (3) and Sizinda (4) (Table 5.4).

[49] Grass standing crop is basically "a function of herbaceous production and represents the portion of production that remains after utilisation" (Peel 2014).

Table 6-4 A comparison of the landscape function indicators in Dimbangombe (ACHM), Sand Forest, Monde and Sizinda

Soil parameter/rank	**Dimbangombe (ACHM)**			**Sand Forest**			**Monde**			**Sizinda**		
	2010	**2012**	**2013**	**2010**	**2012**	**2013**	**2010**	**2012**	**2013**	**2010**	**2012**	**2013**
Stability	1	1	1	4	3	4	2	3	2	3	2	3
Infiltration	1	2	1	1	1	2	3	3	3	4	3	4
Nutrient cycling	1	1	1	2	2	2	4	4	3	3	3	3
Overall rank	**1**	**1**	**1**	**2**	**2**	**2**	**3**	**4**	**2**	**4**	**3**	**4**

Source: Peel (2014: unpublished report)

Table 6-5 The vegetation and landscape function indicators and overall ranking for the study area

Vegetation/ soil parameter/ rank	**Dimbangombe basalt**			**Sand Forest**			**Monde**			**Sizinda**		
	2010	2012	2013	2010	2012	2013	2010	2012	2013	2010	2012	2013
Perennials (%)	1	2	2	4	4	3	2	1	1	3	3	4
Cover (distance, mm)	2	2	1	3	3	4	3	1	2	1	4	3
Cover (tuft size, mm)	1	1	1	1	2	2	3	3	3	4	4	4
Standing crop (kg/ha)	1	1	1	2	3	2	3	2	3	4	4	3
Stability (%)	1	1	1	4	3	4	2	3	2	3	2	3
Infiltration	1	2	1	1	1	2	3	3	3	4	3	4
Nutrient cycling	1	1	1	2	2	2	4	4	3	3	3	3
Overall rank	**1**	**1**	**1**	**2**	**3**	**3**	**3**	**2**	**2**	**4**	**4**	**4**

Source: Peel (2014)

6.5 LIVELIHOOD OUTCOMES AS A RESULT OF HLLM

Maize yield in animal-treated crop fields versus conventional farming practice

The adopters indicated that the maize yield in animal-treated crop fields was higher than in conventional plots. However, farmers could not provide detailed written records of yields and most did not remember how many bags they harvested from the animal impacted crop fields. Those farmers, who could recall, however, reported an increase of about two to three bags in their maize yield compared to prior to adopting the HLLM principle. These claims were validated by secondary data, particularly the ACHM evaluation reports (see Table 6.6). The extension officer reported that a combination of animal impaction of crop fields and conservation farming was helping the farmers to obtain better yields, with maize yields in animal impacted crop fields approximately three to five times higher than in conventional crop fields, with variations in yields mainly due to management of the number of the days the livestock are successively kraaled (ACHM 2013b). The farmers reported a general increase in crop yield,

although only used for household consumption with no excess to sell. This is due to small livestock numbers, which only allow farmers to impact small plots.

Table 6-6 Average yield from animal-impacted crop fields versus control plots

Year	Average yield per hectare (ton per hectare)					
	Monde		Sizinda		Dibutibu	
	Animal impacted	Control plot	Animal impacted	Control plot	Animal impacted	Control plot
2009/10[50]	1.7	0.4	-	-	-	-
2010/11	2	0.1	4.4	1.8	2.6	0.68
2011/12	-	-	5.1	-	5.4	-
2012/13	-	-	1.4	-	-	-

Source: ACHM (2013e)

The farmers also suggested that improved soil fertility as a result of animal impaction enabled them to practise intercropping, which previously was not possible. For example, intercropping maize with cow peas (*nyemba*), *mashamba* and sweet potatoes (*mbambaira*) intensified production on a small piece of land. Adopters of animal impaction stated that they no longer had to till large pieces of land for better yields, but instead concentrated on smaller pieces of land, thereby saving time and labour.

6.6 SUMMARY

This chapter presented the challenges faced by farmers in both crop and livestock production. It also detailed adoption patterns as well as challenges that limit the adoption of HLLM. Farmers identified several challenges limiting them from adopting the programme, such as fear of diseases outbreaks, labour intensity, fears of witchcraft, cultural stigma, tenure and exclusion, animal stress, existence of predators, crop burning, ethnic differences, and lack of water supplies. The chapter discussed the impacts of HLLM on the livelihoods of the smallholder farmers in the study sites. Findings in the field indicated that the programme secured low levels of adoption. , while a comparison with Quantitative LFA results served to confirm that compared to Dimbangombe ranch ,the communal rangelands are not yet self sustaining .

[50] These results were combined for Monde and Sizinda.

CHAPTER 7: ANALYSIS: ADAPTING A MULTI FACETED ANALYTICAL APPROACH

The introduction of HLLM in the Hwange Communal Lands can be viewed as a social arena replete with encounters of individuals or groups of actors representing different lifeworlds, divergent objectives and perceptions, and supported by different resources, interacting at the interface. These social actors are mostly differentiated in terms of relations of power (Long 2001). The HLLM programme involved a variety of actors, such as individual farmers (both non-livestock owners and livestock owners), the ACHM officials, traditional leaders, core group members and herders. These actors each are pursuing their own short- and long-term objectives – strategising, manoeuvring, negotiating, participating, rejecting or accepting – all within a similar geographical and historical context.

In order to unravel this complexity, the analysis of this study draws upon a combination of four conceptual frameworks, namely the actor-oriented perspective, the livelihoods approach, everyday politics and resistance as depicted in Figure 7.1 (For a more detailed explanation of the conceptual framework see Chapter 4) as suggested by Turner (2012) and Bonnin and Turner (2012). The study has also applied six major capitals from an SL framework, namely the physical, natural, social, human, financial and cultural capitals, in order to assess changes to farmers' livelihoods as a result of HLLM in the study sites.

A combination of these frameworks provides a heuristic tool to understand the impacts of HLLM on the livelihoods of the targeted beneficiaries. It also enables us to explain and understand the diverse responses from farmers to the promotion of HLLM in the Hwange Communal Lands. Beginning with an analysis of the impacts of HLLM in the study sites,

7.1 APPLICATION OF THE APPROACH TO THE STUDY SITES

The next section revisits the different case studies in order to identify how farmers in the study sites have responded to HLLM commencing with a brief overview of the HLLM process in each site.

(a) The Monde story

Holistic management in Monde began in 2006 (see Chapter 3). A few farmers were mobilised through the cascade approach and trained in HM in order to train others. In 2010, the ACHM changed its community mobilisation strategy to what they call a "community action cycle" (CAC), which never yielded any positive results. During the time of the fieldwork, none of the farmers was practising HPG. However, one farmer was still using the animal impaction of crop

fields, despite this being abandoned by the ACHM in 2012. The primary reason for adoption was improved maize yield due to improved soil fertility. The farmer was even willing to do his own experimentation, thus reflecting agency.

According to the ACHM quarterly report (1 January to 31 March 2011), Monde failed to make progress with regard to the implementation of HLLM because of "development sprawl from Victoria Falls town", and partly due to the inexperience of the ACHM in the community mobilisation called the "cascade approach"[51] (ACHM 2011). However, several challenges emerged during implementation, as cited by the farmers themselves. Their experiences with HLLM in Monde can best be summarised by the following excerpt from the village head regarding their experience with the HLLM programme:

> Every day when I look at the tank, the water trough, and the garden which were constructed by Dimbangombe people but no longer functional, my heart aches. Our livestock were drinking clean water and we were growing good vegetables from the garden. The sad part is that they (Dimbangombe) never said "good bye!" We never rejected their project. We wanted them because they built us a water tank and water trough for watering our livestock. We had some few problems with them though. … When they first came here, they acted as if they wanted to teach us how to take proper care of our cattle, but we later realised that they wanted to learn from us and take our knowledge. … They wanted to benefit from us as they were inviting the "white people" to come and see our livestock in one big herd. We told them that it was better for each farmer to take his or her herd for penning rather than penning in one big kraal, and the ACHM officials will just come to inspect. They said we must herd our cattle for the whole year, even in the non-growing season. Traditionally, we do not herd cattle in the dry season. Their idea of improving pastures was good, but the problem was to bunch livestock together. But who will have that time? People were also not happy because they lost a lot of goats due to disease outbreak as a result of the ACHM. The Dimbangombe said we must make mates using sticks to kraal livestock during the night, which deters lions, but one day the lions broke into kraal. The Dimbangombe people also promised to buy a fence for our vegetable garden and clear the water bill of US$4 000. They never did! They left us stranded – we are struggling to water our livestock.

Drawing from the above excerpt, it is clear that a disjuncture between farmers and ACHM officials was evident in Monde. Disputes between farmers and ACHM officials emerged during the implementation of HLLM. These issues became the focal points of conflicts over the

[51] The ACHM has since changed to the "community action cycle".

implementation of HPG. The ACHM responded by terminating their services in 2011, citing that the implementation was a waste of time and resources, as the farmers were not prepared to work with the ACHM. Thus, the analysis revealed that covert forms of resistance by farmers in Monde led the ACHM to abandon the implementation of HLLM.

(b) The Dibutibu story

HLLM was launched in 2010 after the villagers invited the ACHM to implement the programme in their community. However, the adoption of both HPG and animal impaction was low (see section 6.2). Thus, the ACHM classified Dibutibu as a "struggling community" with regard to the implementation of HLLM. By 2013, only four households had adopted animal impaction, each using their own livestock, but they opted out after one season trial. Although the farmers claimed that they were practising HPG, discrepancies between the farmers' claims and their actual adoption were evident. Analysis of findings revealed that farmers pretended to comply with HPG principles and were misleading the ACHM by claiming that they were practising HPG in to gain other development projects, as they "saw what the ACHM did in Monde and Sizinda", notably water point improvements and providing a community garden. There is no doubt that when these farmers' expectations were not met, they started losing interest. One of the village heads expressed his disappointment during an interview:

> I am really disappointed with people from Dimbangombe. Here, our major problem in this community is water for livestock. When the Dimbangombe people arrived in our community, we were very happy. We saw what they did in Monde and Sizinda – they constructed a water point (a borehole, tank and water trough) and a community garden for the people in this community. Now their livestock are drinking clean water and the garden is doing very well. They are selling the vegetable produce from the garden and make some extra cash. We were hoping that they were going to do the same here. In this village, ground water is abundant but we need a donor to help us establish more boreholes. Instead of the Dimbangombe people helping us, they now say that villagers must contribute financially towards the establishment of a water point. Where are we going to get the money from? (Author's field notes, 2013).

Thus farmers were willing to engage with the ACHM, despite their scepticism around HPG, in the hope of obtaining water and the establishment of community gardens. In other words it was not core elements of the HLLM programme that farmers were interested in or the conservation of natural resources, which was the main focus of the HLLM. Indeed, disputes between the ACHM and farmers were played out around the issue of water, where farmers claimed that the ACHM promised to improve their water supply.

(c) The Sizinda story

The implementation of HLLM in Sizinda began in 2008 and the community is still active in the HLLM programme (section 3.6). As noted in section 3.6, the community is considered a "success story" of HLLM by the ACHM. The farmers accrued many benefits from the adoption of the HLLM programme (see Table 7.2). The adoption of animal impaction resulted in increased soil fertility, leading to increased maize yield. However, several challenges related to the adoption of animal impaction were identified. Nevertheless, some farmers pro-actively adapted to these constraints.

7.2 ANALYSIS OF FARMERS' RESPONSES TO HLLM REVISITED

This section applies Long's (2001; 2004) actor-oriented approach (particularly interface analysis), coupled with everyday politics (Kerkvliet 2009) and resistance (Scott 1985), to gain a nuanced understanding of how farmers have responded to HLLM, thus moving away from merely simplistic views on farmers' decisions on whether or not to adopt this system, as postulated by several adoption theories . The analysis clearly demonstrates that farmers were responding to HLLM in different ways, even though their situations were similar. The farmers were accommodating, accepting, adjusting and even quietly contesting the implementation of HLLM elements across all the study sites in order to make full use of the programme.

7.2.1 Everyday politics

Farmers employed a range of mechanisms and tactics that are part and parcel of their everyday politics in response to the promotion of HLLM in the study sites. These everyday politics involved complying with, adjusting to or quietly contesting the ACHM's efforts to promote the HLLM in HCLs. In the context of the study, the everyday politics of farmers included compliance, apathy, false compliance, absenteeism during meetings, modifying the HLLM to suit their needs, adopting certain elements and ignoring others, maintaining the status quo despite vigorous promotion by the ACHM, and non-compliance (see Table 7.1). These actions closely mirror Kerkvliet's (2009) four types of everyday politics: support, compliance, modifications and evasions, and resistance, as shown in Table 7.1.

Table 7-1 A summary of the nature of quotidian politics observed in the implementation of the HLLM programme across the study sites

Types of everyday politics	Specific tactics or acts of farmers
Manifestations of support	• Core group membership in order to access resources e.g. boma sheeting, herding labour, soil fertilisation • Relaying information about HLLM, its benefits and limitations through social networks
Evasions and modifications	• Villagers claiming that they are practising HPG while maintaining traditional herding practices in order to gain critical water infrastructure (false compliance); and apathy when farmers' expectations were not met – these were evident in Monde and Dibutibu • Adopters cutting herding labour during the non-growing season by sending livestock to the grazing paddocks without herders. This was witnessed in Sizinda.
Compliance	• Complying with HPG, e.g. Sizinda adopted all aspects • Farmers accept animal impaction as a strategy to copy with soil fertility constraints
Covert resistance	• Passive non-compliance with HPG, e.g. in Monde and Dibutibu • Absenteeism at HLLM meetings, especially when there are ORAP meetings • Maintaining their status quo, lack of cooperation between farmers.

Thus, some farmers, for example in Dibutibu, falsely complied with HPG in order to obtain other benefits such as the water supplies that come with the HPG package. Thus a discrepancy between farmers' claims and the actual practice with regard to HPG implementation was evident. These farmers in Dibutibu viewed HPG adoption as an opportunity to gain improved access to water supplies (physical capital), rather than for the intended conservation benefits (natural capital) *per se*, which was the main focus of the programme. These farmers' actions mirrored the everyday politics concept of modifications and evasions described by Kerkvliet (2009:237) in the context of Vietnam, where struggles (over the provision of water supplies) reflected "indifference to the rules and processes regarding production, distribution, and use of resources". This is confirmed by the fact that none of the farmers in all three communities mentioned land degradation as a major concern in livestock production, thus revealing a lack of consensus between the farmers' priorities and needs versus what the ACHM was seeking to achieve. These struggles reveal discrepancies in values and interests at the social interface between the ACHM and the farmers.

Other farmers adopted elements of HLLM to address their specific needs, complying with certain aspects of the programme while ignoring others, leading to partial adoption. In Sizinda, for instance, seasonal differences were observed in programme uptake, with some farmers fully

adopting the HPG only in the wet season and only partially in the dry season. This adaptation of HPG principles clearly reflects Kerkvliet's (2009:237) "everyday modification and evasions", where farmers "cut corners" by doing things that do not comply with what authorities expect from them, without intending to resist. Thus, such farmers' actions were intended to reduce the labour requirements of herding, but without necessarily resisting the HPG principle.

Absenteeism at meetings was also part and parcel of the everyday politics played out among the agro-pastoralists across the study sites, particularly when the HLLM meetings were held concurrently with other NGO meetings that offered immediate direct and indirect benefits for them. In such cases, ACHM officials were forced to cancel or postpone meetings, thus revealing differences in priorities and needs at the social interface between farmers and the ACHM.

Some farmers across the study sites had also adopted the animal impaction of crop fields individually or collectively (core groups) as a way of coping with soil fertility constraints, thereby meeting one of their key priorities – improved food security at household level.

Fearing the risk of diseases posed by combining herds with other farmers to impact crop fields in Sizinda, one farmer used only her own livestock, while another farmer in Monde adopted animal impaction similarly only using his own animals despite the withdrawal of support from the ACHM, eager to replenish the soils and improve maize yields and thus food security at household level. The study findings show that this last-mentioned farmer was eager to individually test how long an animal-impacted crop field could sustain a reasonably good yield. This shows that famers have agency, and thus should not be taken as passive recipients and have adaptive capacity.

Through social networks such as family, friends and neighbours, farmers exchanged knowledge during visits, thus enabling the relay of information about the benefits and limitations of HLLM within and beyond communities. Such networks enable decision making and, mostly importantly, are a way of coping with the unknown consequences of animal impaction. These exchange networks mirror Kerkvliet's (2009) concept of everyday support politics, where interpersonal relations between households and families, neighbours in a village or in a community are a daily routine through which to access resources.

7.2.2 Everyday forms of resistance

The implementation of HLLM, particularly HPG, was also met with resistance across the study sites, where some farmers resisted it through more quiet and subtle means. Here, resistance can be viewed as the farmers' struggles to maintain their traditional herding practices.

Conflicts over knowledge between farmers and ACHM officials, particularly in the implementation of HPG, were observed across the study sites, reflecting a complex social interface between trusted traditional and new scientific knowledge. Various underpinning assumptions of HPG became areas of major dispute between the farmers and the ACHM officials. The contrasting knowledge and belief systems of farmers and ACHM officials are cause for conflict, reflecting Long and Long's (1992) notion of "battlefields of knowledge" and the contested arenas in which actors' understandings, interests and values are pitched against each other.

Despite their opposing views, the farmers' perspectives remained unvoiced in public spaces dominated by ACHM officials, so that the hegemonic view of ACHM officials seemingly prevailed (Scoones n.d.). The farmers' perspectives were kept silenced due to the other opportunities presented by the HPG. In other words, farmers have subtle agency and do not resist the programme, not wanting to forfeit access to other resources they really need, such as water supplies that come as part of the HLLM programme (cf. Scoones 2012). The farmer thus employs forms of "everyday resistance" (Scott 1985). According to Scott (1985:xvi), everyday forms of resistance include action such as "foot dragging, dissimulation, desertion, false compliance, pilfering, feigned ignorance, slender, arson, sabotage or refusal to understand".

In the context of this study, some farmers quietly resisted HPG through simple non-compliance. For instance, some farmers in Monde reported that they simple ignored the requests by the ACHM to combine and herd livestock together, but rather maintained their traditional practices. This was confirmed by the ACHM officials, who reported that there was lack of 'buy-in' from the community members and a lack of coordination and cooperation among farmers. Disputes between farmers and the ACHM arose over disease outbreaks, which led to high numbers of goat deaths between 2007 and 2008, while the risk of livestock predation and water issues became major sources of conflict over the implementation of HPG in Monde. In response, the ACHM even changed its community mobilisation strategy in 2010[52], but this did not yield any positive results. This led the ACHM to quietly abandon the implementation of HLLM in Monde in 2011. Similarly, the study revealed that farmers in Dibutibu were falsely complying with HPG in order to gain the water supply that came as part of the HLLM package. The farmers invited the ACHM to implement HLLM in the hope of accessing an improved water supply, not because of an interest in land restoration – the main principle of HLLM.

As illustrated in the above analysis, disputes over contrasting knowledge systems and HPG implementation are played out in other social arenas, although debates in the public spheres are

[52] The 'cascade' approach was used prior to 2010,

constrained. Although farmers are powerless due to the fact that they are not supported by any institutions or donors, they draw upon a range of covert tactics of resistance (Scoones n.d).

7.3 CHANGES IN LIVELIHOODS ASSETS OF FARMERS

This section analyses and interprets the perceived impacts of HLLM on the livelihoods of farmers applying the livelihoods capitals framework. In this study, six capitals were employed, namely human, social, natural, financial, physical and cultural capital[53]. The impacts of HLLM on the livelihoods of its intended beneficiaries are assessed in terms of impact indicators that are clustered under these six livelihood capitals. This section of the study provides a detailed description of the impact of the overall HLLM on the farmers' assets, along with livelihood strategies across the study sites. In the absence of rigorous baseline and interim monitoring reports, the change in farmers' assets over time was described by the respondents' experience before and after the implementation of HLLM.

These impacts were based solely on the perceptions of the beneficiaries themselves, as appropriate socio-economic baseline data was lacking, thus posing one of the limitations of the study. The next sections present these changes as reported by the farmers in each community.

7.3.1 Financial capital

The farmers gained little improved financial capital from the adoption of HLLM principles across all the study sites. As most adopters owned very few animals they were only able to impact small plots of land, thus reducing the benefits accruing from the animal impaction technique. However, increases in maize yields due to animal impaction were used largely for household purposes, thus improving food security at household level. While there also was no reported financial gain from livestock land restoration of crop fields and watershed, a core element of HLLM, increased the income of farmers in Sizinda from the selling of produce from the community garden to the supermarkets in Victoria Falls. Proceeds were used to pay for school fees and books for their children. Before the establishment of the water point and community garden, vegetable gardening was constrained by the lack of water supply (see Chapter 5). Thus, it is rather the establishment of community gardens, which is not a core element of HLLM that had more direct and indirect financial benefits for the farmers. Hence, community gardens were mostly supported eagerly by the farmers. Given the soaring rates of rural unemployment in Zimbabwe, farmers who were trained as herders gained an improvement in income, as the ACHM paid them a stipend of US$25 per month. However, some herders

[53] See Chapter 2 for a detailed description of the capitals.

abandoned herding for other off-farm activities after the ACHM terminated this incentive in 2013. This clearly shows that herders accepted HPG as a key source of employment and income, rather than in an interest to improve rangeland condition.

Table 7-2 Similarities and differences in financial capital across the three study sites

Community	Type of financial capital	Changes as a result of HLLM
Monde	Income	• No change
Sizinda	Income	• Increased income from community garden
Dibutibu	Income	• No change

The reported improvements in financial capital pertained mainly to the establishment of community gardens in the study sites.

7.3.2 Natural capital

Natural capital in the context of the study sites includes soil, water and grazing areas. The primary focus of HLLM is on building the farmer's natural capital (i.e. restoration of degraded crop fields and watersheds) through training in HPG and animal impaction (human capital). Thus, this analysis highlights that the HLLM principles (i.e. animal impaction and HPG) affected the farmers' natural capital in different ways, as shown in Table 7.3.

Table 7-3 Similarities and differences in natural capital across the three study sites

Community	Type of natural capital	Changes as a result of HLLM
Monde	Soils (crop fields)	• Improved soil fertility
	Grazing	• No change in condition of rangeland • LFA results showed rangeland not in self-sustaining state (still at risk of land degradation)
Sizinda	Soils (crop fields)	• Improved soil fertility
	Grazing areas	• Perceived increase in forage and reduction of bare land due to HPG • However, LFA results indicated that rangeland was not in stable state
Dibutibu	Soils (crop fields)	• Improved soil fertility, but resulted in crop burn
	Grazing areas	• No change in forage

In all the study sites there was clear evidence that animal impaction of crop fields had a significant impact on improving soil fertility, hence improving the farmers' natural capital. Indeed, adopters reported improved maize yields due to animal impaction. From the outset, farmers perceived soil fertility (i.e. natural capital) to be poor, particularly in Monde and Sizinda. Thus, some farmers were interested in animal impaction as a solution to soil fertility constraints, which would improve food security at household level. However, the quantified impacts of animal impaction on food security remain to be determined.

From the analysis, however, it was clear that animal impaction negatively affected natural capital where clay soils were the dominant soil type, coupled with low rainfall. For example, in Dibutibu, the study showed that impaction had led to crop burn, compromising food security at the household level. In order to cope with the risk of crop burns, farmers were forced to grow drought-resistant crops such as small grains, which were less favoured as a staple crop than maize. Thus, the principle was not an appropriate strategy in this community, as it heightened farmers' vulnerability to the already existing challenges posed by drought. This explained why few farmers (only four) had adopted the principle in Dibutibu since its implementation in 2010, and abandoned it after only one trial season. This suggests that animal impaction cannot be promoted as a 'one-size-fits-all' approach.

The perceived impacts of HPG on farmers' natural capital were different across the study sites. In Sizinda, adopters perceived an improvement in forage and a general reduction of bare land in their grazing areas due to the implementation of HPG. In contrast, no such changes were perceived in Monde and Dibutibu. Farmers in Dibutibu were doubtful that HPG would result in improved rangelands, with some even suggesting that the planting of banner grass would be more beneficial. These perceptions, however, contradict the results of a quantitative landscape functional analysis conducted by the ARC[54] (see Chapter 5), which found that Monde rangelands were in a better state than those in Sizinda, where HPG was actively implemented. Peel (2014, Pers comm) suggests, however, that these results are tentative, as data on covariate factors, such as stocking rates, the conditions of the rangeland before the implementation of HPG and adoption rates, are still lacking. Thus, the impact of HPG on the ecological conditions was not easy to determine in the short term and was likely to be a primary function of the factors mentioned above. More research is required to understand these factors before any conclusions are drawn.

[54] The results are part of the on-going long-term monitoring programme to appropriately test the impact of HPG on rangelands.

7.3.3 Physical capital

Although the main focus of HLLM is to restore degraded crop fields and watersheds (natural capital), farmers across all the study sites were interested in accessing physical capital, such as water points, tanks and water troughs, etc. The impacts of HLLM on the farmers' physical assets were varied across the different sites, as shown in Table 7.4.

Table 7-4 Positive and negatives effects of HLLM on physical capital across the three study sites

Community	Type of physical capital	Changes as a result of HLLM
Monde	Water supplies	• Improved access to water for livestock and human consumption (water tank and water trough constructed) (+) • Water tap closed and currently defunct (-) • Community garden dysfunctional (-)
	Livestock	• 40 farmers received goats under 'goat banking project' in 2007 (+) • Increased goat mortalities due to HPG (-)
Sizinda	Water supply	• Improved access to water for livestock and human consumption (water tank and water trough constructed) (+) • Community garden established (-)
	Livestock	• Farmers received goats under the 'goat banking project' (+) • Increased goat mortality (-)
	Other	• Received kraaling material (boma) sheet from the ACHM in 2012 (+) • Livestock handling facility (cattle race) constructed (+)
Dibutibu	Water supply	• No improvements in water supply (-)
	Livestock	• No improvements in livestock due to HLLM (-)

+ means positive; - means negative

From the outset, the vulnerability assessment found that the water supplies of farmers across the three study sites were insufficient, particularly during the dry season. Thus, in Sizinda and Monde, farmers had improved water supplies for human and livestock consumption as well as for agricultural purposes. While the key aim of improving water supplies was to ensure that livestock were watered adequately, farmers saw it as an opportunity to pursue a new livelihood strategy, principally community vegetable gardening. This enabled them to directly improve food security at the household level and to increase financial capital through the sale of vegetables. This was confirmed in Sizinda, where farmers were selling vegetable produce to the local supermarkets in Victoria. The income generated was used to pay school fees and buy books for their children.

However, in Monde the water tap and tank became dysfunctional in 2011 due to the farmers' failure to pay the water bill. This created conflict between the farmers and the ACHM, with farmers insisting that it was the ACHM's duty to pay the bill (see Chapter 5). In Dibutibu, water supplies were not improved, as the main focus of HLLM was land restoration. It appeared that the establishment of the community garden, which kept adopters interested in HLLM, had more direct and indirect benefits for the farmers rather than HPG, which is the core element of HLLM. In addition, adopters in Sizinda also accessed kraaling material (boma) from the ACHM, thereby enabling farmers to enhance their natural capital through animal impaction.

7.3.4 Human capital

Human capital (mainly in the form of skills and knowledge) is needed to enable farmers to employ new technology and practices (Adato & Meinzen-Dick 2002). HLLM focused on building the farmers' skills and knowledge to implement HPG and animal impaction of crop fields. Farmers (adopters, non-adopters and dis-adopters) at all three sites demonstrated a good understanding of HPG and animal impaction. Knowledge gained through ACHM training on animal impaction enabled the farmers to replenish their soil fertility (natural capital), leading to improved yields.

Although the farmers gained improved knowledge of the ecological condition of their rangeland through HPG, this did not result in the adoption of the components in all the study sites. Farmers (non-adopters and dis-adopters), particularly in Sizinda and Monde, were less interested in adopting this element because they perceived it as more herding, hence labour-intensive (human capital constraints) while adopters in Sizinda overcame this, reducing herding labour in the wet season by taking turns to herd.

While the HLLM trainings were focused mainly on building human capital for land rehabilitation, farmers were also trained in animal health issues, with farmers gaining knowledge and skills about how to diagnose and treat livestock diseases. Research undertaken by Homann and Van Rooyen (2007) has established that the majority of smallholder farmers in the rural areas of Zimbabwe are not able to properly diagnose and treat livestock diseases. This, coupled with poorly resourced veterinary extension services (Chatikobo et al. 2013), results in livestock vulnerability to disease. Farmers, particularly in Sizinda, acknowledged that an increase in knowledge and skills to identify and treat livestock diseases had reduced their reliance on extension officers. Indeed, some farmers revealed that they were travelling to Zambia to buy drugs for their livestock.

Through HLLM, farmers' organizational skills and problem-solving ability was also enhanced in Sizinda. This was demonstrated when farmers organized themselves and constructed a cattle race in order to address the problem of dipping.

7.3.5 Social capital

Social capital entails relations of trust, reciprocity and exchange, common rules and norms, social connectedness, networks and groups (Adger 2003). The impact of HLLM on the social capital of farmers also varied considerably across the three study sites. The HLLM led to the formation of farmers' community core groups. These core groups were formed to encourage farmers to work together in land restoration activities. However, this does not mean that all core group members were adopters, or that all adopters were core group members.

In Sizinda, the establishment of a core group led to the enhancement of farmers' social capital. Those who joined the core group did so primarily to restore soil fertility (using livestock from the community land management herd), share knowledge, and acquire herding labour and livestock drugs. It also provided access to kraaling material (physical capital) from the ACHM. Reciprocity was evident in this scenario, where non-livestock owners were helping livestock owners to herd the animals in return. Adopters in the core group took turns to herd animals in the wet season, giving others the opportunity to work in the fields, thus augmenting farmers' human capital (i.e. labour).

Interestingly, only the Sizinda core group was still functional, while the group in Monde had been disbanded and in Dibutibu it was almost defunct. One of the ACHM officers suggested that the reason why the core group in Sizinda was maintained was because group members were close members and kin. This suggests that the pre-existence of social capital (bonding social capital) enabled the maintenance of the core group in Sizinda, reinforcing and reflecting trust and cooperation within these social bonds. In addition, it enabled the Sizinda farmers to solve other problems as a group, advantaging non-members and members at the community level.

Nevertheless, the formation of a core group also had some negative impacts on the farmers' social capital. For example, some members withdrew because of internal conflicts (for example, disagreements regarding on whose crop fields to start impaction). Some non-adopters who were willing to join the group felt excluded, perceiving it difficult to join at a later stage.

In contrast, the unsuccessful and short-lived formation of core groups in Monde and Dibutibu can be attributed partly to constraints related to social capital. Unlike in Sizinda, villagers in these two study sites were from different ethnic groups and backgrounds and had a poor history

of mutual cooperation, while there was a lack of trust between farmers (see Chapter 6), a factor that significantly hindered the adoption of HLLM.

7.3.6 Cultural capital

Based on Bourdieu's (1986) concept of cultural capital, cultural capital in this study is understood as embodied culture – that is the local knowledge, beliefs, customs and norms of villagers in the study sites. From the analysis, it is clear that HLLM neglected farmers' cultural capital across the study sites, so that some of the HLLM principles were at odds with farmers' traditional belief systems. For example, the implementation of HPG encouraged farmers to herd livestock even in the non-growing season, leading to increased herding labour, while traditionally livestock were not herded during this period. The study found that other work traditionally is undertaken in the dry season, with more immediate gains, such as the creation of wood artefacts for sale to tourists at the Victoria Falls resort town. Thus, the adoption of HPG in the dry season was considered detrimental to the human capital (i.e. labour) needed for other non-farm activities. Farmers were also against the herding of goats and donkeys together, since these species traditionally are not herded even in the wet season. Some farmers also disliked the idea of combining herds in HPG due to suspicions of witchcraft among livestock owners, which was thought to affect animal behaviour. Thus, due to many cultural taboos, HPG was not generally supported by the farmers.

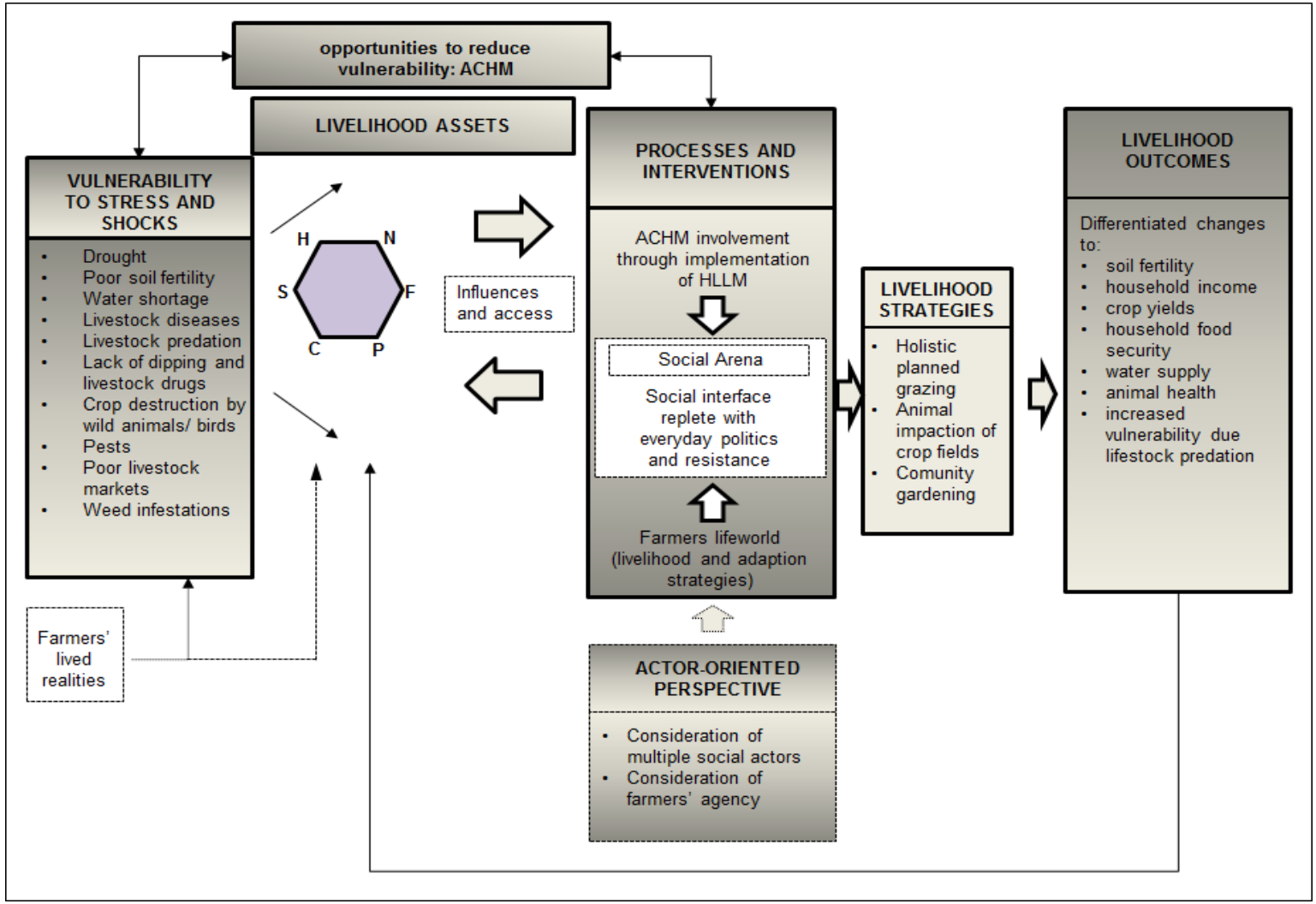

Figure 7-1 A modified DFID livelihood framework intergrating the actor-oriented approach and everyday politics and resistance

7.4 SUMMARY

This chapter compared the impacts of HLLM in the study sites through the application of an actor-oriented livelihoods approach, coupled with everyday politics and resistance. Similarities and differences were identified with regard to the impacts of HLLM on farmers' livelihood assets. The actor-oriented approach demonstrated that farmers have agency in their pusuit of livelihoods. Thus, they responded to the implementation of HLLM by negotiating, accommodating and contesting by drawing upon quiet, subvert and indirect tactics. As the analysis demonstrated, the HLLM has not had a significant impact on all six capitals of the SLF in any study sites, indicating that HLLM in its present form cannot adequately sustain rural livelihoods.

CHAPTER 8: CAN HLLM SUSTAIN RURAL LIVELIHOODS?

This study aimed to assess the impact of HLLM on the livelihoods of the smallholder farmers in the Hwange Communal Lands. This chapter summarises and synthesises the findings, revisits the objectives, and identifies the key limitations of the study, before presenting recommendations to inform possible changes to HLLM, proposing areas for further research.

8.1 SUMMARY AND SYNTHESIS OF MAIN FINDINGS

The need to assess the efficacy of HM in communal areas has been identified in the literature. This study focused on assessing the impacts of HLLM on the livelihoods of its targeted beneficiaries based on their perspectives. To achieve this, it integrated four conceptual frameworks for the purpose of analysis. With the application of the sustainable livelihoods framework receding in development practice in recent times, the results have illustrated the value of adopting an actor-oriented livelihoods approach, coupled with notions of everyday politics and resistance, in evaluating the impacts of a new agricultural technology such as HLLM. The study indicated that the actor-oriented perspective and the concepts of everyday politics and resistance are useful additions to conventional livelihood analysis. Thus the integrated model can be useful in livelihoods research as it prompts researchers to consider aspects of livelihoods often ignored in conventional livelihoods approach (i.e. power relations, politics and agency). The main findings of the study are summarised according to the following lines of inquiry of the study, namely the key challenges for the smallholder, explaining different HLLM adoption and the impact of HLLM on farmers' livelihoods.

8.1.1 Key challenges for smallholder farmers

Several constraints were identified by the farmers, namely droughts, water shortages, livestock predation, livestock diseases, shortage of grazing areas and lack of markets. Most constraints identified by the farmers were similar across the study sites.

Drought was an important constraint in crop and livestock production across all the study sites. Generally, Hwange District is prone to recurrent droughts (Nhemachena et al. 2014; ZIMVAC 2010), thereby challenging livestock production. Swotwa, Hamudikuwanda and Makarau (2007) and Masikati (2010) noted that pastures in the drier parts of Zimbabwe are rainfall dependent, leading to variations in both quality and quantity. Consistent with other studies in other communal lands of Zimbabwe (Chatikobo et al. 2013; Masikati 2010; Mutibvu et al. 2013), farmers were also concerned with livestock diseases. The problem of livestock diseases was exacerbated by the high costs of drugs due to the removal of subsidies on government animal

health services like dipping and vaccines (Perry et al. 2003). As observed by Masikati (2010), the removal of subsidies has resulted in a short supply of acaricides, leading to high prices. In this study, the farmers reported that they now buy drugs in Zambia if they are not available locally. Hwange District was also prone to livestock diseases due to the existence of wild animals (ZIMVAC 2010). Linked to the problem of diseases, Homann and Van Rooyen (2007) observed that most smallholder farmers in the CLs of Zimbabwe are not able to appropriately identify livestock diseases and determine the appropriate medication. Crop raiding by elephants was also identified as a major constraint to crop production, leading to food insecurity.

Water shortage was also identified by farmers as a constraint to livestock production in the study sites, except in Sizinda. Studies conducted elsewhere reported similar findings (Masikati 2010; Mutibvu et al. 2013). Like many communal lands, Hwange District is situated in the drier areas, characterised by low and erratic rainfall (Vincent & Thomas 1960), thus the main sources of water are seasonal and unreliable (Chatikobo et al. 2013). Farmers also stated that livestock predation was a main challenge in livestock production across all the study sites. This finding concurs with Butler's (2000) findings in the Gokwe Communal Lands.

The shortage of grazing areas as a major concern in livestock production, particularly in Monde and Dibutibu, has also been observed by Svotwa, Hamudikuwanda and Makarau (2007) and Chatikobo et al. (2007) in other parts of Zimbabwe. The reduction of grazing areas in this study was attributed to both the expansion of human settlements and commercial purposes such as wildlife ranching and tourism activities.

Although land degradation fundamentally was perceived by the ACHM as a concern in the study sites, with the community mobilisation strategy centred mainly on land degradation, farmers across the study sites did not perceive it as a concern in livestock production. Thus, the study established that some farmers, for example in Dibutibu, questioned the relevance of HPG in their grazing areas.

Regarding crop production, poor soil fertility was identified as a main concern. The literature indicated that most communal lands (CLs) in Zimbabwe are dominated by poor, infertile soils (Nyamapfene 1991; Vincent & Thomas 1962). Quelea birds were also reported to be a major concern in crop production. This problem is mainly attributed to the proximity of national parks that offer breeding grounds for these birds.

8.1.2 Explaining different HLLM adoption

The case studies showed that adoption of the HLLM (both animal impaction and HPG) was low in all three study sites, showing either dis-adoption or partial adoption. When comparing adoption rates, there are clear differences across the study sites. In general, the study established that animal impaction of crop fields was well appreciated by the farmers in all the study sites, despite the fact that it is not the core principle of HLLM. This finding concurs with those of Brown and Carr (2014), who noted that the concept was well received and popular in all the study sites they visited in Zimbabwe. This is attributed to the fact that it addresses one of the key priorities of farmers, namely an increase in yield for improving food security. More importantly, animal impaction has immediate and intangible benefits. Despite this benefit, adopters indicated that they were only impacting small areas due to too few livestock, meaning that this may not be significant to address food security at the community, district or national level.

However, lack of appropriate kraaling material and the existence of predators in the crop fields were cited by farmers as major limiting factors in the adoption of the concept across all the study sites. This suggests the need for the provision of appropriate kraaling material by the ACHM in order to encourage the adoption of animal impaction.

The study also established that, in areas dominated by clay soils, such as Dibutibu, it can lead to crop burning if rainfall is low. The study thus raises the question of promoting animal impaction as a 'one-size-fits-all' approach in different agro-ecological environments. This supports Mpofu's (2012a) conclusion that most NGOs in Zimbabwe employ a 'one-size-fits-all' approach, ignoring the heterogeneity of agro-ecological regions leading the promotion of inappropriate technologies. This suggests the need for the ACHM to take different local climate and environmental conditions into account when promoting animal impaction of crop fields.

Regarding HPG adoption, it also was established that the adoption of the element was low across all the study sites. HPG adopters identified reduction of herding labour during the growing season, reduced livestock deaths due to predation and thievery, reduction of crop field damage by stray animals, quick identification of diseases, perceived improvements in forage and removal of snares as major reasons for adopting it. However, several major constraints were also identified, including fear of disease transmission, inability of participants to exclude non-participants' livestock from the grazing schemes, high herding labour requirements, suspicion of witchcraft, lack of trust with herders, shortage of grazing areas, concerns about the well-being of

the animals and cultural stigma. Some of these challenges raise questions about the viability of the HPG.

Since HPG does not use fencing to demarcate grazing paddocks, the adopters identified incursion of grazing areas by the livestock of non-participants. This finding is similar to that reported by Cousins (1987; 1988) in unfenced grazing schemes in the 1980s and 1990s. While the use of fencing is desirable in terms of excluding non-participants' livestock, it creates boundary disputes between communities (Cousins 1987; 1988). Thus, unfenced grazing was thought to reduce such conflicts. Unlike in fenced grazing schemes, no boundary disputes were reported. However, the use of key resources such as vlei and riverine (Scoones 1989), was a major concern as some farmers across the study sites, who revealed that they were not keen to adopt HPG due to the fact that, as they rotate their livestock according to grazing plans, the non-participants utilise the productive grazing areas. The shortage of grazing areas, for example in Monde and Dibutibu, was also cited as a problem that limits the adoption of HPG. Farmers revealed that grazing areas were becoming small due to the expansion of human settlements. Cousins (1987) reported similar findings in the grazing schemes.

As also observed by Brown and Carr (2014), farmers identified fear of disease transmission as a deterrent to HPG adoption across the study sites. This suggests the need for the ACHM to ensure a veterinary service is in place before the implementation of HPG. Farmers also reported that HPG was more labour intensive, as it encouraged farmers to herd livestock throughout the whole year. This concurs with Stinner, Stinner and Marsolf's (1997) and Quigley's (1987) findings in the context of commercial farming systems, as they observed that the HM approach requires considerable investment of time and effort and thus deters adoption. Fear of witchcraft was also identified by farmers as another deterrent to HPG adoption. These findings are similar to those of Brown and Carr (2014), who noted that farmers were not keen to adopt HPG in the Bulilingwe and Mangwe communities in Zimbabwe due to fear of witchcraft and its impact on animals.

8.1.3 Understanding different responses to HLLM by farmers

The actor-oriented perspective (Long 2001; 2004), which also informed this research, used social interface analysis to probe the dynamics and emergent negotiations inherent in the implementation of a new agricultural technology such as HLLM, with the primary aim of understanding the interactions of interests, values, knowledge and power (Long 2001; Long & Liu 2009). Thus, the HLLM programme is understood as a social arena in which social actors represent, defend and sometimes "discover" their own individual or collective interests and

values within the same geographical and historical context (Long & Jinlong 2009:81). Thus, the interface analysis enables a more insightful interpretation of a range of responses of social actors to a seemingly similar structure and process of intervention. The social interface analysis further emphasises human agency as social actors construct their lifeworlds and negotiate power relations (Long 2001; 2004). Based on this view, Bonnin and Turner (2012) argue that the concepts of Kerkvliet's (2009) everyday politics and Scott's (1985) everyday forms of resistance are useful in understanding how individuals construct their lifeworlds.

The results of this study concur significantly with the conceptualisation and previous applications of the actor-oriented approach. The analysis of the results showed that farmers have reacted to the implementation of HLLM in multiple ways, including complying, adapting or modifying, and ignoring the HLLM principles. The implementation of HLLM therefore has been met with differing degrees of resistance, compliance and acceptance among farmers in the HCL. This is consistent with Long's (2001) observations that development interventions lead to struggles over meaning and processes at the social interface, particularly the ACHM-farmer interface.

The analysis of the results showed that some farmers had fully or selectively adopted or adapted both HPG and animal impaction of crop fields, leading to partial adoption. The modification or adaptation of HLLM principles could be indicating a need for new strategies to promote the technology in the communities.

The study showed that farmers call upon a diverse range of social networks to inform livelihood decision-making processes and also to reduce livelihood vulnerabilities associated with the programme. In other words, farmers learned from their neighbours' and families' successes and problems with regards to the implementation of HLLM elements. The findings reflect Kerkvliet's (2009) category of 'everyday political support', where networks are maintained in order to share resources such as land, labour, money and emergence assistance.

As shown in the analysis, some farmers falsely adopted HLLM principles as a way to secure other benefits that come as part of the HLLM package. This concurs with Kerkvliet's (2009) everyday politics of the evasion type and is consistent with the findings of Gukurume et al. (2010) in the context of conservation agriculture (CA), where farmers misled NGOs by falsely adopting CA to gain seed and fertilisers. These types of actions are well practised by smallholder farmers in Zimbabwe.

The study also revealed that some farmers quietly resisted the HLLM programme through passive non-compliance and non-cooperation. Covert resistance is not a new phenomenon in the communal lands of Zimbabwe with regard to the implementation of new agricultural technologies. In the context of the implementation of grazing management schemes in the communal lands of Zimbabwe, Scoones (n.d.) and Alexander (1991) reported different farmers' tactics that concur with ‑Scott's (1985) "everyday forms of resistance" or "hidden transcripts", where poor people may not seek to challenge their superiors openly, but use underground tactics such as apathy and passive non-compliance. More recently, Gukurume, Nhodo & Dube (2010) also observed similar covert forms of resistance. The study established that such resistance eventually led to the abandonment of HLLM implementation by the ACHM in Monde.

This research questions the wisdom of the ACHM in promoting HLLM based fundamentally on land degradation, which is not considered by the farmers to be a concern. Thus, these farmers' actions could be signalling that an appropriate bottom-up approach is necessary when implementing HLLM in order to align it with the needs and priorities of farmers. As Vetter (2005b) notes, there is a need to integrate efforts to improve rangelands with those of others aimed at addressing broad development issues.

8.1.4 Asset accumulation

Can HLLM sustain rural livelihoods? This is a crucial question, given the investment made by USAID of US$4.9 million (USAID 2012). According to the sustainable livelihoods framework (SLF), HLLM would only sustain rural livelihoods if it enhanced all six the capitals identified, namely financial, social, natural, human, physical and cultural capital. The analysis of the results showed that HLLM did not have a significant impact on all the farmers' assets in any of the study sites.

HM is focused mainly on building farmers' natural capital through restoring degraded watersheds and crop fields to health (Savory & Butterfield 1999). There was clear evidence that the adoption of animal impaction of crop fields had a significant impact on restoring soil fertility, thus enhancing the farmers' natural capital. Nevertheless, the principle was found to be inappropriate in areas with clay soils and low rainfall, as it lead to crop burning. Some HPG adopters perceived an increase in forage as a result of HPG implementation, although this contrasted with the scientific data, which indicated that there was little evidence to indicate that the rangeland had reached a self-sustaining vegetation cover. The programme provided little in

the form of financial capital, although an increase in income was reported in Sizinda due to the establishment of a community garden.

HLLM also focused on building the farmers' human capital in the form of knowledge and skills to implement HPG, animal impaction of crop fields and other livestock management skills. The farmers reported that their knowledge of their environment and livestock had increased. Improved knowledge and skills in the form of animal impaction, was key to the increase in crop yield, while increased knowledge on animal health enabled some farmers to identify and treat livestock diseases.

Although the primary focus of HLLM was land restoration, the farmers gained physical capital in the form of water supplies, kraaling material and cattle race at the community level, for example in Sizinda. The improved water supply in Sizinda necessitated farmers to pursue a new livelihood strategy – community gardening. However, the sustainability of the improved infrastructure could be questionable.

Holistic management encourages the building of social networks, thus augmenting farmer' social capital (De Villiers, Esler & Knight 2014; McLachlan & Yestraue 2009). HLLM has enhanced farmers' social capital through the formation of core groups. The study revealed that those who joined the core group did so primarily to benefit in particular ways (see Chapter 6). Membership of core groups also provided a significant benefit to non-cattle owners. Sizinda was the only site with a functional core group, while the other two were largely defunct. ACHM officials suggested that, because the core group members in Sizinda were close neighbours or kin – as they belong to the same Nambiya ethnic group, they had greater ease in maintaining or continuing with the group activities (see 1.5.6). This could suggest that there was an already existing strong bond of social capital before the formation of the core group. Nevertheless, some members abandoned the group because of internal conflicts.

A growing new theme has emerged in the literature that recognises the significant role of cultural capital in rural livelihoods (Daskon & McGregor 2012; Mpofu 2012a). The study found that HLLM, particularly HPG, neglected farmers' cultural capital in the form of embodied culture. Farmers indicated that HPG required them to abandon customary herding practices. This finding is consistent with that of Mpofu (2012a), who found that NGO-led programmes in Zimbabwe were ignoring the cultural values of their beneficiaries. This could indicate a necessity for the ACHM to consider the cultural values of farmers in order to achieve what UNDP (2004) called "culturally appropriate development".

There is an interrelationship between assets. Thus, all capitals may not have been improved directly due to the adoption of HLLM, but an improvement in one capital led to advancement of another capital. For example, the improvement in water supply (physical capital) in Sizinda resulted in enhanced financial capital in the form of income from selling vegetables.

8.2 REVISITING THE OBJECTIVES

The first objective of the study was to identify the major constraints faced by farmers in both crop and livestock production in the study sites. The aim of this was to understand the lived realities of the farmers, which influence the potential of HLLM adoption by its targeted beneficiaries. It was established that farmers in the study sites faced several challenges, presenting both opportunities and constraints to HLLM adoption.

Objective two was to document the adoption patterns of HLLM principles (i.e. HPG and animal impaction of crop fields) across the three study sites. It was established that the rate of adoption was very low in all the study sites.

The third objective was to identify the challenges faced by the targeted beneficiaries, the ACHM and other stakeholders. In Chapter 5 it became apparent that the targeted beneficiaries were faced by several constraints that limited the adoption of HLLM. The study also established that the ACHM and other stakeholders were affected by a lack of long-term funding to implement HLLM successfully.

The fourth objective was to understand the different responses of farmers to HLLM across the study sites. The study found that the farmers responded to HLLM in multiple ways, despite the fact that they operated in similar situations, as postulated by Long (1989; 2001).

The last objective sought to assess whether or not there were any changes in farmers' capitals due to the programme. The study concluded that in none of the study sites did the programme have a significant impact on all the six capitals identified in this study, namely natural, human, social, human, physical and cultural capital.

8.3 LIMITATIONS OF THE STUDY

This study encountered three main challenges, which are:

1. Due to time and resource constraints, the study covered only three study sites, omitting many other sites where HLLM is promoted.
2. This study was largely dependent on qualitative data, as rigorous baseline data and socio-economic data was lacking. In addition, the study mostly followed participatory and

qualitative methods, thus, quantitative analysis of responses is lacking. A quantitative analysis may have revealed important findings, such as patterns of difference and similarity within and between the three case study villages.

3. The findings of the study cannot be generalized, as the sample size was too small to represent the entire population where HLLM was implemented and the local context might not be the same in all the sites where HLLM is being implemented.

8.4 FURTHER RESEARCH AND RECOMMENDATIONS

Although the importance of using the SLF as an analytical framework in the evaluation of new agricultural technologies has been long underscored, the framework is becoming relegated to the periphery in rural development thinking due to several limitations, which include downplaying power and political issues. Calls have been made to integrate the framework with other social theories, such as the actor-oriented perspective and everyday politics and resistance. This calls for further research to continuously apply and test the "actor-oriented livelihood approach, coupled with everyday politics and resistance" as an analytical framework in evaluating new agricultural interventions such as HLLM. This study focused on three communities, thus further research is required that focuses on communities from different agro-ecological regions where HLLM is being implemented in order to fully comprehend the impacts of HLLM on the livelihoods of smallholder farmers.

The study has revealed that farmers are more concerned with immediate problems than with long-term concerns such as land degradation. These everyday challenges, such as water shortage, livestock diseases, poor access to markets and poor soil fertility, are prioritised by farmers in the study sites. No farmer identified land degradation as a major concern in livestock production across the study sites. This does not mean that land degradation is not happening. There is a need for the ACHM to revisit its strategy of community mobilisation, which is currently based on land degradation alone. Instead of land degradation, the ACHM must use farmers' priorities and interests as 'entry points' to encourage adoption, for example by rather speaking about drought. The ACHM must attempt to integrate the HLLM with other broad development issues, like water, livestock diseases and improvements of livestock markets.

While land restoration is the major focus of HLLM training, the study showed that farmers were interested in accessing new livelihood opportunities that the programme had to offer. Therefore, linking the HLLM with other development needs could be an effective strategy for encouraging the adoption of the HLLM.

In order to improve the effectiveness of HLLM, the ACHM also needs to pay greater attention to the social, cultural and environmental concerns of the farmers in each community. Given the fact that HM has been declared a 'holistic' approach, the ACHM must be flexible in incorporating cultural practices. Future research needs to be done on the impact of cultural capital and its implications for HPG adoption in the study sites. Understanding the implications of cultural capital in HPG will help the ACHM tailor acceptable HPG practices for the communities that fit the existing patterns. There also is a need to integrate cultural capital into the implementation and to roll out HLLM in the communities in order to achieve what has been referred to as a "culturally appropriate development" (UNDP 2004).

The ACHM also needs to ensure that a proper veterinary service is in place to avoid any livestock disease outbreaks as a result of herding together. Some HLLM principles are not well suited to clay soils, for example in the case of Dibutibu. Thus, as Vetter (2005b:14) suggests, it is important that rangeland scientists "differentiate between blocks of communal land along a number of criteria (agro-ecological, social, politico-institutional and economic) and come up with credible ways of improving livelihoods that are applicable to those homogenous blocks". Additionally, HLLM in its current form is necessary, but not enough, to sustain rural livelihoods in the study sites. There is a need to complement HLLM with other development efforts.

It is not clear whether the successful implementation in Sizinda is directly related to the core principles of HLLM (i.e. HPG and animal impaction), or whether it is related to not wanting to disappoint the ACHM by rejecting HPG, thereby forfeiting their chances of gaining more development. Commenting in relationship to the implementation of conservation farming in the communal lands of Zimbabwe, Gukurume, Nhodo and Dube (2010:47) further underscore this view by noting that most farmers in the communal lands of Zimbabwe have been working with these NGOs for a long time, hence farmers fear that:

> If they opt out of the programme, they might be left out of future programmes by these NGOs. Thus, their participation … is merely more cosmetic than genuine, since they participate out of fear of disappointing the NGOs that have been aiding them for a long time during times of need.

Thus further research that explores these "adopters" as a distinct group of farmers can provide useful insights with regard to HPG. Such insights from programme adopters may enable the ACHM to accommodate farmers' views and develop a programme that would be acceptable in the communal lands.

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PERSONAL COMMUNICATIONS

Scoones I 2014. Research fellow, Institute of Development Studies, email on 8 June 2014 about holistic management in Hwange Communal Lands to explain what is expected in an evaluation of HM.

Peel MJS 2014. Programme Manager of the Rangeland Ecology Programme and Savanna Ecosystem project, South Africa's Agricultural Research Council – Livestock Production Institute, email on 23 June 2014 about ecological data to explain how to use the quantitative data.

APPENDICES

APPENDIX A: HOUSEHOLD CASE STUDIES

Box 2 Increased farm yields – how does it work for women

Case 2

Mrs IM is a 57-year-old widow living in Sizinda. She is an active core group member. She owns three cattle and eight goats. Ms IM is one of the well-known HLLM users, particularly of crop field over-night kraaling in her village and even beyond. Thus, she has vast experience with HLLM. She started crop field animal impaction in 2009 when she first received the training from ACHM. She used seven goats to treat her fields.

"In 2010, ACHM taught us how to make mats using small sticks of wood which we then used to make movable kraals. We were taught how to use our livestock to fertilize our crop fields."

"I was one of the very few farmers who started to treat my crop fields using livestock. When I first started, I did not have any cattle so I used my own seven goats which I got from the ACHM's goat banking project."

However, she indicated that making mats for moveable kraals required a lot of labour, so some farmers were not keen to do it. Her neighbours and friends began to laugh at her and mock her, saying that "the people from Dimbangombe [ACHM] were using her". But she was not discouraged by this as she thought that treating her fields using her goats as she was taught by ACHM was the best solution to improve crop yields, hence making her family "eat well". She started impacting her crop fields around her homestead using the goats and the yields of maize were much better than what she used to get before. "That year, I harvested two 50 kg bags of maize where I used to get only 10 kg."

"Realising the good yields, I now do it every year. This has helped me to feed my family and I won't stop doing it. All those people who used to laugh at me and mock me are also using this principle to improve soil fertility in their crop fields. They have realised the good yields that I am getting in the small plots that are treating using my goats."

"Nowadays, I don't even plough very big places on my fields anymore because it's a waste of time given the fact that the soils are very poor. I now concentrate more in the small plots where I have treated. By so doing, I am harvesting much better than those who cultivate large areas that are infertile. This year [2013], I received an award of goat from ACHM for good yields."

She also said that the she now shares the knowledge and experience that she has gained using this principle over the years with other farmers in the community and beyond. She says that she

have travelled to other places such as Mutare, through farmer exchange visits supported by ACHM, to teach other farmers of what can be achieved using the principle of crop field animal impaction.

Like other adopters, Mrs IM indicated that the harvest they obtain from the animal-treated crop fields were only for household consumption and not for sale, as it was too little to even meet her household needs. She said that the area she impacted is still very small due to the small number of livestock she owns. However, she says she will not stop treating her crop fields using animals.

Mrs IM said that, in 2013, as members of the core group they procured a boma sheet that they use as a movable kraal. She is convinced that the availability of the boma will enable her and her other colleagues to treat much bigger areas than before.

“We thank Dimbangombe for giving us this knowledge, now our yields has improved a lot.”

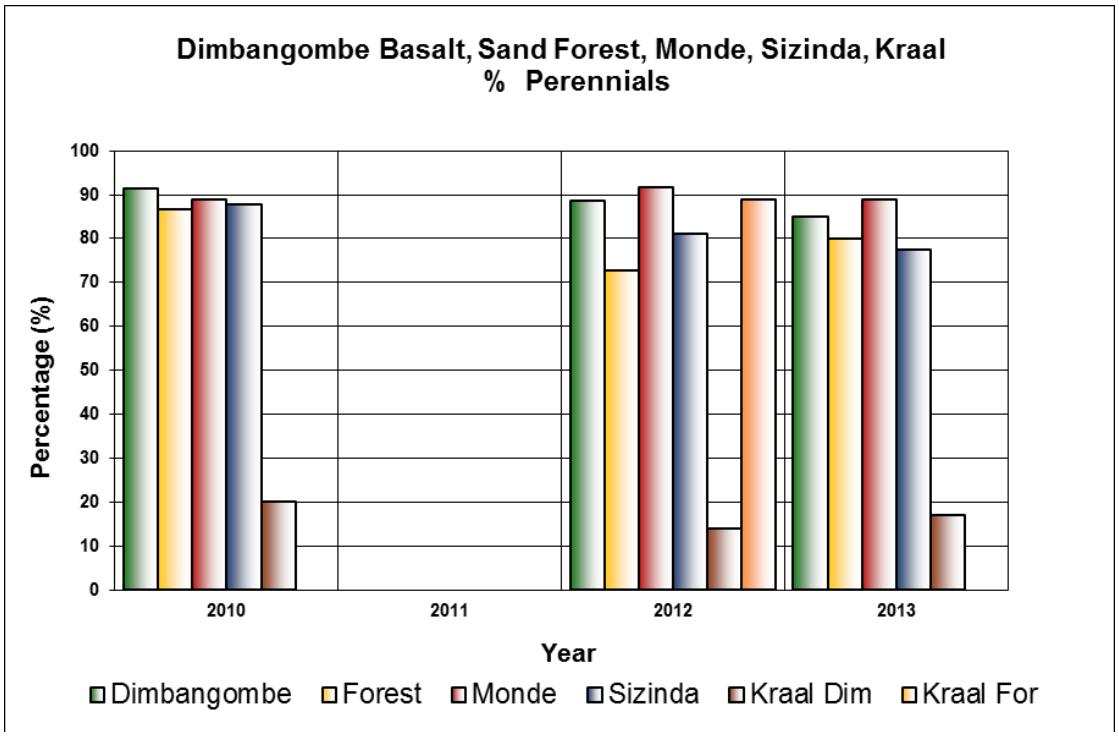
Source: Sizinda

APPENDIX B: PARTICIPATORY RURAL APPRAISALS TOOLS USED

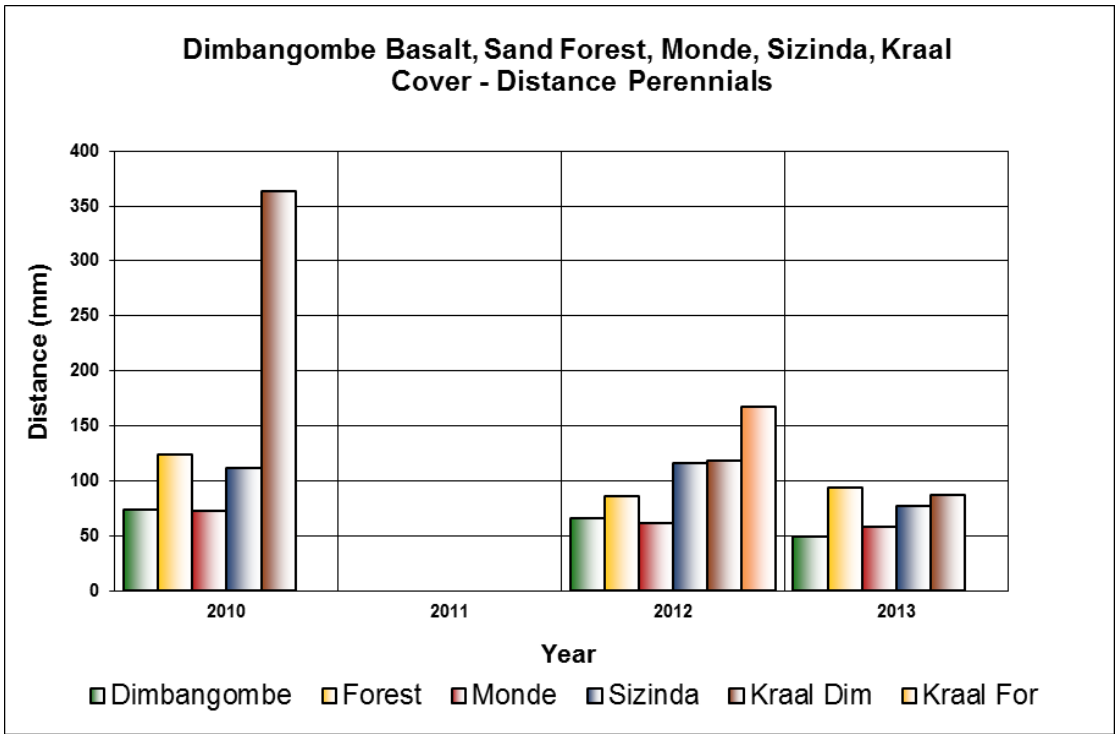
Tool	Function	Advantage
Community mapping	• Maps spatial dimensions of natural resources and other resources • Identifies resources such as water sources, grazing areas, and crop fields)	• Create a "relaxed atmosphere" for participants (Everson et al. 2007:7) • Provides a good understanding of the problems and opportunities in a given community • Visual manifestation of resources and hazards
Hazard/ problem listing	• Identifies perceptions of problems/ hazards/risks faced by farmers in crop and livestock production	• Quick and easy identification of farmers' problems, needs and priorities
Transect walk	• Visual identification of resources (rangelands, crop fields, etc.) • Information then presented on a transect diagram	• Enables ground truthing and verification of the information provided during other techniques • "Helps break the ice – dispels suspicion" (Moser & Stein 2011:471)
Livelihoods calendar	• Identifies livelihood activities at different times of the year • Shows 'temporal dimension' of resource use • Identifies period of particular stress and vulnerability	• Easy to apply; useful in identifying hazards and seasonal risks
Timeline/ events calendar	• Provides visual representation of events that have taken place since HLLM was introduced • Identifies specific changes brought about by the programme	• Provides a quick outline of historical events in a community
Venn diagrams	• Depict key role players/institutions and their relationships with the local communities and each other	• Identify weak relationships that can be built on • Stimulate debate between participants as people share their knowledge and impressions about various stakeholders
Amoeba/spider web/Evaluation wheel	• Used to monitor and evaluate key areas of the programme (e.g. holistically planned grazing, crop field animal impaction, etc.) • For analysing the importance of, or progress in, different aspects of the intervention • Indicators or criteria to evaluate over the project period are first identified by participants (e.g. soil fertility, forage availability, etc). Each aspect/indicator is represented by one arm of the frame of the web and graded by using a scale (e.g. scale of 1 to 10). Each issue/indicator was assessed separately and after that all marks were connected with a line to form the "spider web" or "amoeba"	• Stimulates detailed discussions with programme beneficiaries on the overall changes due to an intervention and to identify future priorities • Relatively easy and quick tool to use for analysing impact of an intervention • Provides visuals to which participants can easily relate
SWOT	• Constructs charts that show the strengths, weaknesses, opportunities and threats/ limitations of the HLLM	• Simple exercise and people can readily participate • Participants do not necessarily have to reach a consensus, but all ideas generated can be recorded even though they might be contradictory

APPENDIX C: ECOLOGICAL DATA

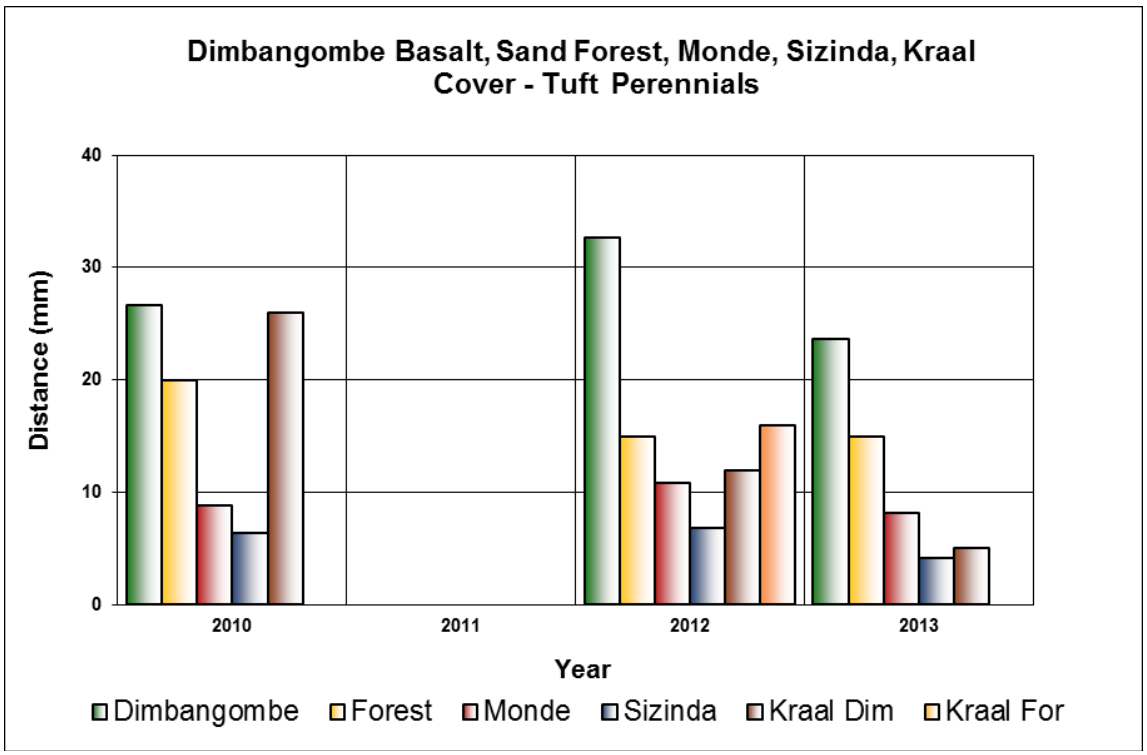
a) Percent perennials grasses present – Dimbangombe Ranch, Sand forest, Monde, Sizinda and kraal



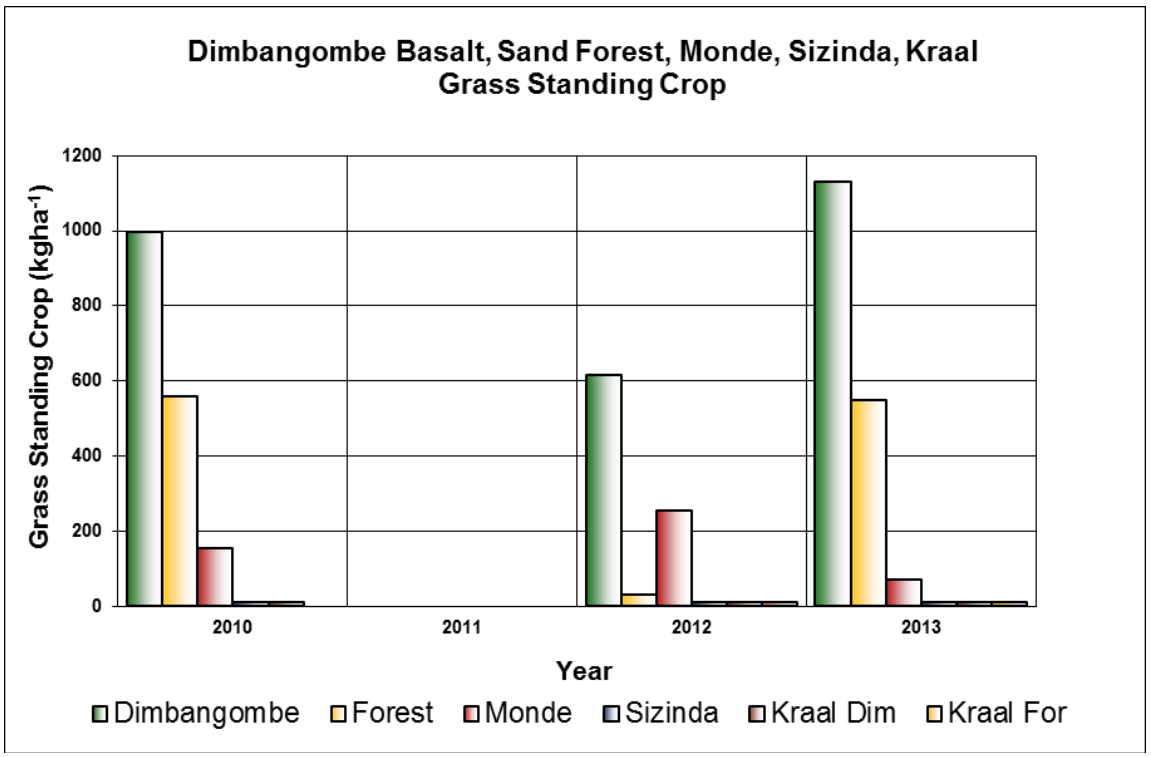
b) Mean distance to perennial grasses – four areas and two kraals



c) Percent of grass cover



d) Percent of grass standing crops



APPENDIX D: SEMI STRUCTURED INTERVIEW GUIDE

Semi-structured interview guide with HLLM adopters

Date:...../……./…… Household number:…… Village:……..

Bio-details
Age:……. Sex:……Number of dependents:……Occupation:……..

Guiding questions

1. What are the challenges your household face in crop and livestock production?
2. What is your understanding of HLLM?
3. For how long have you been practicing HLLM?
4. What principles of HLLM do you practice in your farming activities? (Holistic planned grazing/ animal impaction of crop fields)
5. How did you receive training on HLLM?
6. What made you adopt the HLLM in your farming activities?
7. What are the main advantages of using HLLM?
8. What are the main disadvantages / challenges of using HLLM?
9. What changes do you notice on the environment (soil fertility, grazing lands etc.) as a result of practicing HLLM?
10. How does participating in HLLM add value to your livelihoods and the livelihoods of those you live with?
11. In your opinion, how does HLLM impact women and men?
12. How much land under HLLM (animal impaction) did you have in maize production last growing season? What was the yield as compared to the yields from conventional crop fields?
13. In your village, how many households are practicing HLLM?
14. After ACHM stop working in this village, will you continue to practice HLLM?

Semi-structured interview guide with HLLM dis-adopters

Date:...../……./…… Household number:…… Village:……..

Bio-details
Age:……. Sex:……Number of dependents:……Occupation:……..

Guiding questions

1. What are the main trends affecting your livelihoods, with regards to crop and livestock production in the last 3-5 years? (Environmental, social, economic etc.)
2. How do these trends affect agricultural productivity?
3. How do you cope with such trends?
4. How do you see the role of local NGOs in supporting your efforts?
5. What is your understanding of HLLM?

6. What were the main advantages of practicing HLLM during the time you were using the practice in your farming systems?
7. What were the main disadvantages?
8. When did you decide to dis-adopt the HLLM practices in your farming systems?
9. What were the major factors which influenced the dis-adoption of HLLM in your area?
10. What do you think needs to be done to improve the role and uptake of the program in your area?

Semi-structured interview guide with HLLM non-adopters

Date:...../……./…… Household number:…… Village:……..

Bio-details
Age:……. Sex:……Number of dependents:……Occupation:……..

Guiding questions

1. What are the main trends affecting your livelihoods, with regards to crop and livestock production in the last 3-5 years? (Environmental, social, economic etc.)
2. How do these trends affect agricultural productivity?
3. What are the reasons that hinder you from practicing HLLM?
4. What are the advantages of HLLM?
5. What are the disadvantages of practicing HLLM?
6. Have you observed any differences (environmental; agricultural yields etc.) between lands where HLLM (holistic planned grazing and animal impaction) is practiced compared to the conventional practices?
7. What impacts did you observe on the lives of those practicing HLLM?
8. What are the major factors that influence non-adoption of the program in this community?
9. What do you think needs to be done to improve the role and uptake of HLLM in this area/
10. Do you think HLLM participants will continue to practice after the ACHM leave this area?

APPENDIX E: KEY INFORMANT INTERVIEWS (WITH DISTRICT ADMINISTRATOR, AGRICULTURAL EXTENSION OFFICERS, VILLAGE HEAD)

General questions

What are the key functions of your organization? Would you kindly give me a brief introduction into your work? What are the general needs of farmers in this area? What are the trends (environmental, social and economic etc.) that affect livelihoods in this area? How do these trends affect agricultural productivity?

Guiding questions

1. **How do you see the role of HLLM in addressing the farmers' needs in this area?**
    - What are the challenges (environmental, social, economic etc.) which limit crop and livestock production in this area?
    - Are you aware of HLLM program? What is your understanding of HLLM?
    - How does HLLM fit into this area? (relevance)
    - To what extent can HLLM be viewed as of significant use in this area?
2. **What methods were used by ACHM to promote HLLM? How effective was it?**
    - What are the key achievements so far?
    - What major challenges were encountered during promoting HLLM?
    - What are the advantages and disadvantages of implementing HLLM in the area?
    - What differences in agricultural productivity have you observed between conventional systems and HLLM farming systems?
3. **How does HLLM impact the livelihoods of the farmers in the area?**
    - What changes (positive, negative, intended, unintended etc.) do you observe in households and the whole villages as a result of practicing HLLM?
    - How do you see the impact in terms of food security and income generation?
    - How does HLLM impact gender issues (e.g. access to resources etc.)?
4. **Why do farmers choose to adopt, dis-adopt or not to adopt HLLM?**
    - How is the level of adoption?
    - What are the reasons for adoption, non-adoption and dis-adopting HLLM?
    - Are some principles more sustainable than others? Which ones? Why?
    - Is there any adoption pattern of some HLLM principles that farmers choose. If so why?
    - In your opinion, do you think farmers will continue practicing HLLM after the withdrawal of ACHM?
    - How can HLLM be more effectively promoted?

APPENDIX F: FOCUS GROUP DISCUSSIONS WITH ACHM FIELD OFFICERS

General questions:

What are the key functions of your organization? Would you kindly give me a brief introduction into your work? What is the main difficulty part of your job? What are the general needs of farmers in this area? What are the trends (environmental, social and economic etc.) that affect livelihoods in this area? How do these trends affect agricultural productivity?

Guiding questions

1. **How do you see the role of HLLM in addressing the farmers' needs in this area?**
    - What are the challenges (environmental, social, economic etc.) which limit crop and livestock production in this area?
    - Are you aware of HLLM program? What is your understanding of HLLM?
    - How does HLLM fit into this area?
    - To what extent can HLLM be viewed as of significant use in this area?
2. **What methods were used by ACHM to promote HLLM? How effective was it?**
    - What are the key achievements so far?
    - What major challenges were encountered during promoting HLLM?
    - What are the advantages and disadvantages of implementing HLLM in the area?
    - What differences in agricultural productivity have you observed between conventional systems and HLLM farming systems?
3. **How does HLLM impact the livelihoods of the farmers in the area?**
    - What changes (positive, negative, intended, unintended etc.) do you observe in households and the whole villages as a result of practicing HLLM?
    - How do you see the impact in terms of food security and income generation?
    - How does HLLM impact gender issues (e.g. access to resources etc.)?
4. **Why do farmers choose to adopt, dis-adopt or not to adopt HLLM?**
    - How is the level of adoption?
    - What are the reasons for adoption, non-adoption and dis-adopting HLLM?
    - Are some principles more sustainable than others? Which ones? Why?
    - Is there any adoption pattern of some HLLM principles that farmers choose. If so why?
    - In your opinion, do you think farmers will continue practicing HLLM after the withdrawal of ACHM?

APPENDIX G: DOCUMENT REVIEW

Document review at ACHM was guided by the following questions;

1. What Holistic land and Livestock Management practices were developed and promoted in Hwange Communal Lands? How many communities was HLLM promoted? How is the level of adoption? How many years have been the HLLM programme promoted? What is the ACHM's rationale behind promoting HLLM?
2. How does HLLM benefit the farmers in the area? (livelihood impact)
3. What documented agricultural output (crop yield and forage) has been reported as a result of the HLLM in the area? What are the observed difference in maize yields and forage production in the area as a result of the programme?
4. What are the challenges that are being faced by the both the programme beneficiaries and ACHM in Hwange Communal lands? What is being done to address these challenges? What can be done to improve the implementation of the programme?

APPENDIX H: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS INTERVIEWED

Demographic characteristics	Study sites							
	Monde		Sizinda		Dibutibu		Total	
Adoption status	**28**	**100**	**18**	**100**	**16**	**100**	**62**	**100**
Adopters /prospective adopters[55]	1	3.6	12	66.7	10	62.5	23	37
Dis-adopters	15	53.6	2	11.1	4	25	21	33.8
Non-adopters	12	42.9	4	22.2	2	12.5	18	29
Gender	**28**	**100**	**18**	**100**	**16**	**100**	**62**	**100**
Male	10	65.3	7	38.9	12	25	29	46.7
Female	18	35.7	11	61.1	4	75	33	53.3
Age	**28**	**100**	**18**	**100**	**16**	**100**	**62**	**100**
20-29	3	10.7	3	16.7	-	-	6	9.6
30-39	6	21.4	2	11.1	1	6.3	9	14.5
40-49	5	17.9	5	27.8	5	31.3	15	24.1
50-59	3	10.7	4	22.2	7	43.8	14	22.5
60-69	7	25	4	22.2	3	18.8	14	22.5
>70	4	14.3	-	-	-	-	4	6.4
Marital status	**28**	**100**	**18**	**100**	**16**	**100**	**62**	**100**
Never Married	1	3.6	1	5.6	-	-	2	3.2
Married	18	64.3	11	61.1	13	81.3	42	67.7
Divorced	-	-	-	-	-	-	-	-
Widowed	9	32.1	6	33.3	3	18.8	18	29.0
Education	**28**	**100**	**18**	**100**	**16**	**100**	**62**	**100**
No education	3	10.7	1	5.6	-	-	4	6.4
Primary	18	64.3	14	77.8	9	56.3	41	66.1
Secondary	6	21.4	3	16.7	6	37.5	15	24.1
Diploma	-	-	-	-	1	6.3	1	1.6
Degree	1	3.6	-	-	-	-	1	1.6

[55] Prospective adopter refers to the respondents in Dibutibu who were claiming to use HLLM.

APPENDIX I: PERMISSION TO USE ARCHIVAL DATA

AFRICA CENTRE FOR HOLISTIC MANAGEMENT

Pvt Bag 5950
Victoria Falls
Zimbabwe
263-712- 214 584
www.achmonline.org
Reg. W/O 19/94

04 June 2013

University of Stellenbosch
Private Bag X1
Matieland
7602
SOUTH AFRICA

Re: Permission for Mr. Tapiwa Chatikobo to use ACHM archival data

This letter serves to confirm that Africa Centre for Holistic Management (ACHM) would allow Mr. Tapiwa Chatikobo permission and access to use our archival data for study purposes only. Pursuant to this ACHM will evaluate first the kind of data that Tapiwa needs and the potential for co-authoring articles.

I hope this will help Tapiwa's ethics clearance for the purpose of his study

Yours faithfully,

E.MUFANDAEDZA
RESEARCH, MONITORING AND EVALUATION SENIOR MANAGER

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4 April 2013

Tapiwa H. Chatikobo
9 Dunkeld Avenue
Bishopscourt
Cape Town
South Africa

Ref: 3-Month Internship

Dear Tapiwa,

It is with pleasure that I inform you that the Africa Centre for Holistic Management (ACHM) is offering you an internship beginning 1 July 2013 and ending 30 September 2013. This internship will provide many opportunities for you to learn about Holistic Land & Livestock Management as it is practiced on our Dimbangombe Learning Site, in the neighbouring Hwange Communal Lands, and among some of the NGOs trained by ACHM to implement their own programmes.

Your internship supervisor will be Edward Mufandaedza, who heads our Research, Monitoring & Evaluation unit. He would like to see your research proposal as soon as it is completed. Our Training and Consulting department, headed by Simon Garikayi, is our fastest growing and most in need of the services an intern can provide, especially one with your skills. This is where we anticipate you will spend most of your time. You will also have opportunity to learn from and with our Hwange Communal Lands Programme Director Fezile Ncube and her staff, and have access to the data they collect each month.

In exchange for the work you do, we will provide a small stipend that covers cost of your meals and accommodation over the 3-month period.

If you are in agreement with the terms of this internship, please confirm by letter of acceptance.

Yours sincerely,

Huggins Matanga
Executive Director