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'Socio-economic and livelihood impacts of environmentally supportive bio-enterprise development for the agro-/pastoral communities in Samburu Heartland, Kenya'.

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Chapter 1: Background and rationale

1.1 Overall background and rationale

Deepening poverty and loss of natural resources in the Arid and Semi-Arid Lands (ASAL):

Traditional lifestyles in many areas of the world are adapting poorly to the influence of population pressure, globalization and changing socio-economic ambitions (Allen, 1987; Dejene, 2004; Easterly and Levine 1997). In the Arid and Semi-Arid Lands (ASAL) of Africa traditional pastoralism practices no longer provide sufficient livelihood returns. As a result most pastoralist communities do not maintain adequate diet and living conditions (USAID, 2007). Unlike many rural communities across the more fertile parts of the globe, pastoralists have had little opportunity to adapt to these challenges and external influences. In the fragile ASAL environment of the Horn and Eastern Africa the situation is acute: traditional practices no longer provide sufficient food and income for the vast majority of its resident and transitory populations (Kenya Food Security Steering Group, 2008; Ngugi and Nyariki, 2001).

Pastoralist communities in Kenya are almost solely dependent on livestock products: mainly milk, meat, blood, hides and skins for their livelihood (GoK, 2005a). Opportunities for alternative livelihoods, including agriculture, are limited due to high rainfall variability, recurrent droughts, harsh climatic and environmental conditions (Fratkin, 1991; Homewood, 2008; Olivier de Sarden, 2005). This population faces increasing challenges that undermine their ability to sustain and improve their

livelihoods. They are often forced to adopt survival strategies for long periods of time. The Kenya National Bureau of Standards record that pastoralists experience the highest incidences of poverty and have the least access to basic services compared with populations in other areas in the country (KBS, 2007). As pastoralism predominantly relies on access to water and grazing resources (Fratkin, 1991; Galvin *et al.*, 2004; Smith 1992) intensifying competition over resources, due to increasing scarcity, is leading to violent human conflict. This is becoming a common outcome of basic pastoral survival strategy (Mkutu, 2002) and causes greater vulnerability and constrains human and animal development in these pastoral areas (Eriksen and Lind, 2009; Unruh, 2005;). Vulnerability of agro-pastoral and pastoral (referred to as agro/pastoral) communities is also seen as largely a consequence of historical and social marginalisation. ‘Appropriate changes in government policy directives towards pastoralism needs to be initiated’ (Nori, *et al.*, 2008). Homewood (2008: 252) asserts that “Most African governments continue to hold entrenched views about pastoralism being environmentally destructive and economically irrational, though research over the last three decades has repeatedly confirmed the ecological efficacy and sustainability of mobile transhuman pastoral production systems”.

Against this stark neglect it is surprising to find that pastoralism in 2001 contributes around 25% of Kenyan’s Gross Domestic Product (Simpkin, 2004) and it is estimated that over 70% of the livestock in Kenya are owned by pastoralists (GoK, 2004). Further, it is estimated that 90% of the gazetted national parks and game reserves are located in drylands areas predominantly occupied by pastoralist communities (KEFRI, 1992). Despite this, mounting pressures are forcing pastoralists to diversify their livelihoods

beyond their traditional reliance on livestock (Ridgewell, *et al.*, 2007; Ridgewell and Flintan 2007). International humanitarian organisations (such Oxfam GB and Save the Children US) and research institutes (for example, International Centre for Insect Physiology and Ecology (ICIPE) and Department of Range Management, University of Nairobi) are seeking ways to improve the welfare of the ASAL inhabitants, either through enhancement of existing livelihoods or promotion of alternative ones (Orindi, *et al.*, 2007). This type of external support, together with the direct response to increasing land and grazing pressure, has stimulated change and subsistence patterns are being gradually established through integration into the cash economy. However, people lack the necessary skills and knowledge to make the right choices and identify the most successful income-generation activity available (Flintan, 2008). It is also necessary to consider that ‘strategies just based on income generation can be vulnerable because many people become reliant on the income generated by a few’ (Brockington, 2001). Additionally, poverty is not just an issue of income but also denial of basic rights (Wilding, *et al.*, 2006). A key aspect of development in these regions is, therefore, the equal participation of women and the minorities in economic and social development processes. As resource competition grows people/wildlife conflict is also increasing. Under current law pastoralist communities receive few benefits from wildlife conservation (Orindi, *et al.*, 2007; Oba, 2001) and therefore have little incentive to accommodate the welfare of wildlife if it is in competition with their own resource needs.

Bio-products, often coined as ‘non-timber forest products’ (NTFPs) in the international environmental conservation arena, provide alternative sources of livelihoods and are an important part of traditional pastoral coping strategies, filling seasonal and other food or

income gaps and providing a buffer in times of hardship or emergency (Arnold and Ruiz Perez, 2001; Chikamai and Kagombe, 2002; Shackleton and Shackleton, 2004). In some parts of the Kenya ASAL bio-products/NTFPs make up over half of household annual income (Neima, 2008). However, the potential of bio-products has not been fully realised due to lack of access to credit, transportation, information on price fluctuation, storage facilities, access to market and low product price (Feto, 2009; Neumann and Hirsch, 2000). These constraints create opportunity for intermediaries to place themselves as almost unavoidable links in the marketing chain where they buy the products at low price and sell at high price (Hill and Farkas, 2006). The marketing and value chains are often complex involving great numbers of people including harvesters, traders, and wholesalers through to the end-users in the international market. The long chain means that the harvesters receive disproportionately low returns for their efforts of harvesting and transporting, mainly by foot, of marketable plant materials to the point of sale. The low returns from the utilisation of living natural resources leads to un-sustainable use (such as destructive harvesting methods and charcoal production) (Hill and Farkas, 2006; Onyango, 2009; Wren, 2007; Wren 2008a,b; Wren and Powys, 2008;). The increasing evidence of unsustainable practices is a growing concern of international environmental agencies (Barany, *et al.*, 2001; Dwasi, 2002; Malleret-King, 2000;)It is expected that this will lead to the subsequent loss of genetic material and collapse of ecosystem resilience, which is likely to have a devastating impact on the future of the ASAL landscape and its population (Perrings, *et al.*, 1997).

Challenges of assisting livelihoods change in the ASAL:

Developing new enterprises, particularly community based enterprises, requires significant investment into infrastructure, training and management, including active and well facilitated extension services. To date there has been very little business support made available by government or development actors to improve livelihoods of communities within the ASAL. As a result, the predominant outlet for raw materials or semi-processed products with commercial value (i.e.; gums, resins, honey, aloe, other medicinal or bodycare plant extracts, livestock/products and semi-precious stones) from the vast ASAL lands of Africa is the informal market, operating on the basis of high numbers of supply-chain actors carrying low risk and minimal finance (as referred to above). To find a method to redress the situation, three organisations based in Kenya: Laikipia Wildlife Forum (LWF), African Wildlife Foundation (AWF) and Northern Rangeland Trust (NRT) have partnered to instigate a programme approach to support growth of viable, sustainable bio-enterprises in the ASAL. The resulting initiative, the ‘Bio-enterprise Development Programme’ (BDP), is a core subject of this research study.

Existing knowledge/literature gaps:

‘Humanitarian approach starts with securing immediate food needs’ (Kirkemann and Martin, 2007) may be justifiable in terms of keeping people alive, but what comes after that is of equal importance. A critical UN review of existing development programmes across Africa identified that very few donor-funded initiatives effectively address more than a couple of the Global Millennium Development Goals (GMDG), and many have not grasped opportunities to direct activities towards achieving tangible results within their programme timeframes (Prowse and Scott, 2001). Non Government Organisations

(NGOs) can address the constraints through specialised techniques but frequently suffer from lack of sustainability because of their welfare orientation, small scale, low absorptive capacity, and lack of exposure to best practices of micro and Small and Medium Enterprise (SME) finance (Gamba, 2005).

At a Natural Resources Management Working Group meeting in Ethiopia 2008, it was agreed that most development-led livelihood approaches are well founded, but the basic research and structuring and the speed and scale of these livelihood initiatives are often not adequately instigated along business lines to become viable (Flintan, *et al.*, 2008). A range of academic papers and publications underpin this conclusion, (Easterly and Levine, 1997; Fratkin, 1991; Ghani and Lockhart, 2006; Olivier de Sarden, 2005; Twarog, 2006;). The fact remains that the vast majority of pastoralists are dependent on external aid to meet their basic needs. This was referred to in a recent Oxfam study which indicated that as much as 80% of the pastoral population in Kenya receives food or cash relief (Fitzgibbon, *et al.*, 2007).

1.2 Justification of this study

In response to the existing research gaps, this research study attempts to contribute new knowledge to assist the process of improving the socio-economic status and livelihoods of these communities. In tandem, this study attempts to assess whether and to what degree the bio-enterprise approach stimulates and incentivises positive community management of natural resources. This research study follows the impact of the BDP, and other bio-enterprise development initiatives that have been established and are

operating in the ASAL regions of Kenya. The study is also interested in the longer-term application of the learning experiences from these projects and promoting successful approaches to actors and stakeholders in other parts of the African ASAL. It is intended that this research study will assist in increasing the understanding, skills and resources of resident NGOs, Community Based Organisations (CBOs) and government departments to equip them to better assist agro/pastoral communities to diversify their livelihoods by developing climatically resilient, socio-economically and environmentally sustainable bio-enterprises.

Underlying this study is the assumption that supporting agro/pastoral communities to develop and improve their livelihood in the ASAL of sub-Saharan Africa, where the futures of human, the landscape and wildlife are interwoven, is a distinct and realistic challenge. The study intends to stimulate greater understanding within the development, government and commercial sectors of the nature of these challenges and of effective approaches to assist agro/pastoral communities to successfully adapt their livelihoods and improve their resilience to climate change.

The study takes particular regard of the statement made by O’Leary (1985: 5): “It is crucial that the design of management and delivery systems is closely responsive to and supportive of the conservation needs and the needs and vision of the communities, realistic but are also innovative, visionary and proactive”. Currently there is a lack of detailed analysis of the type of behavioural patterns that agro/pastoral communities need to evolve in order to engage in and embrace alternative, complimentary or additional enterprises that provide livelihoods and are environmentally supportive. There are few

empirical studies that have examined the performance and the short and longer-term impact of diversified (as opposed to traditional) enterprises on agro/pastoral livelihoods and the environment in the ASAL. Additionally, there has been little evaluation of the potential for environmentally and socio-economically supportive bio-enterprises in the study area. This research study endeavours to bridge this knowledge gap.

1.3 Aims and objectives of the study

Specific Aim: The specific aim of this study is to analyse whether and how bio-enterprise development in the ASAL can be implemented in a manner that improves agro/pastoral livelihoods and the management of natural resources, and to assess what socio-economic and community-related structures are necessary for such a process.

The main objectives are:

Objective 1. To evaluate the approach and examine the effectiveness of activities and methodologies of commercial and development-sector initiatives designed to enable agro/pastoral communities to achieve viable and environmentally sustainable bio-enterprises in the ASAL.

- The evaluation is made through four case studies of bio-enterprises that have been developed over recent years in the ASAL of Kenya.

Objective 2. To analyse the factors affecting the selection and adoption of bio-enterprise by agro/pastoralist in the ASAL in the Samburu Heartlands of Kenya.

- The analysis is made in the context of the BDP, operating with agro/pastoral communities in the Samburu Heartlands. The study evaluates the level and rate of uptake, the effect of community attitudes, awareness, social and economic structures and the impact of principal factors such as climate change and insecurity.

Objective 3. To compare the research findings on the type and scale of natural resource pressure in the Samburu Heartland with the perception of the resident and transient communities.

- Assessment is made of the perception of the communities located in and around the Kirisia Forest Reserve, through purposive interviews, about the increasing pressure on natural resources, and challenges and benefits they observe from engaging in sustainable bio-enterprises. The study compares these perceptions with findings of published research and formal development studies.

Objective 4. To examine how lessons learned from the case studies can inform similar debates on pastoral livelihoods and conservation/environmental management in the drylands of Kenya.

- The conclusions provide coherent information that may increase the understanding of development and government sector agencies of effective approaches to assist agro/pastoral communities to develop adaptive livelihoods that incentivise positive management of natural resources and improve their resilience to climate change.

1.4 Main research questions

Main research question for Objective 1.

(i) On what premise have the approaches and methodologies of these initiatives been devised; and what has informed the selection of the approaches taken? *Rationale of existing initiatives*

(ii) What level of investment has been made in these initiatives and what has resulted in the short to medium-term (3-5 years), and anticipated to result in the longer-term (10 years plus)? *Costs and benefit of existing initiatives*

(iii) Have these initiatives developed as economically viable operations providing benefit to the communities and the environment, and to what degree? *Impact of existing initiatives*

Main research question for Objective 2.

(iv) What are the main bio-enterprise types and the major factors that affect the selection and adoption of these bio-enterprises by agro/pastoralists in the ASAL of Kenya?
Background and relationships

(v) Whether and how challenges can be overcome. *Learning points and potential solutions*

(vi) What are the positive factors of the bio-enterprise approach as perceived by the stakeholders and how can these be utilised to encourage wider up-take?

Harnessing positive experiences.

(vii) How can the embedded community social and economic structures be enhanced to enable and facilitate such processes? *Utilising community structures.*

Main research question for Objective 3.

(viii) What is the perception of communities in Kirisia of the causes of increased natural resource pressure, and of the effect this is having on their livelihoods and on the environment? *Perceived cause and effects of land use pressure by user groups*

(ix) What has been recorded in existing research data as the main causes of increasing natural resource pressure and the effects this has had/is having on the lives of communities and the environment? *Existing research findings on the causes and effects*

(x) What do communities involved with bio-enterprises perceive as being the main challenges and benefits to their lives and their environment from engaging in bio-enterprise activities? *Perceived benefits and dis-benefits of engaging in bio-enterprises by participating communities*

(xi) What has been recorded in existing research data and identified/endorsed through the activities of this study as being the main impacts of bio-enterprise development on the livelihoods of the participating communities and on the local environment?

Research findings on the effects on socio-economic status and environment.

Main research question for Objective 4.

(xii) What are the main lessons learnt from the case studies in terms of pastoral livelihoods and conservation/environmental management; which activities and technologies have had the most positive effect and have potential for scale-up and replication? *Lessons learnt.*

(xiii) How do these lessons/learning points translate to other ASAL regions and communities? *Relevance to other parts of the ASAL.*

(xiv) How do these lessons/learning points relate to commercial investors, development organisations and government agencies operating in the ASAL? *Relevance to other stakeholders and actors in the ASAL.*

(xv) What further data is required to assist development and government sector agencies to increase their knowledge about how to assist agro/pastoral communities to develop viable and sustainable bio-enterprise that can affect positive socio-economic and environmental change? *Further research required to assist future sustainable bio-enterprise development in the ASAL.*

1.5 Conceptual background

1.5.1 Concepts:

Pastoral communities are both subjects and objects of change and that they have much strength and much knowledge about their own situation. This can be seen by the adaptive strategies of pastoral communities to drought mitigation. This factor puts strong emphasis on the question of sustainability in economics, environmental and social well-being of people, governance and policy as well as their linkages. Achieving sustainable livelihoods requires the integration of local knowledge and community strengths with contemporary science, appropriate technology, enabling policies, effective and transparent governance structures, education and training, and credit and investment (*IIDS, 1999*).

The sustainable livelihoods approach (SLA), adopted by many international development agencies (such as; IIDS, IDS, FAO, DFID, Practical Action, ODI), is an integrated development method that draws on the main factors that affect poor people's livelihoods and the typical relationships between these factors. The sustainable livelihoods approach allows for the development of indicators to measure improvements in livelihood systems and the sustainability of these systems (*IIDS, 1999*). This approach is a way to improve understanding of the livelihoods of poor people; it can be used in planning new development activities and in assessing the contribution that existing activities have made to sustaining livelihoods (Chambers and Conway, 1992). SLAs help us to understand environments, politics, economics, adaptive capacity and complex institutions, all deemed core to sound development policy (Batterbury 2008).

The SLA is a central concept to this study as the specific focuses of its research is on the use of bio-enterprise development as one of the strategies adopted by pastoral communities to increase socio-economic and environmental sustainability. To this effect the study evaluates the pre-requisites of the communities and support agencies involved in bio-enterprise development that are exist and are required to achieve these goals. This includes key factors such as existing local knowledge, community strengths, governance structures, education and training, use of appropriate technology, credit and investment. In future context of the SLA, this study investigates the interest in and capacity of governance and development sectors to utilise this method, and the potential linkages with the development of policy that can effectively support sustainable livelihoods in Kenya's ASALs. The resulting information from this study adds to the examples and evidence of the SLA.

Other concepts that are reflected in this study include;

Community-Driven Development (CDD)' which focuses on the engagement of communities as equal partners in development processes. Social capital is an important element in sustainable CDD processes. 'Planning for Community-based economic development' (CBED) is a process that ensures that communities are involved in the planning and are adequately empowered to drive interventions. Local Economic Development (LED) approaches recognise that no value chain exists in a physical or cultural void. 'Sustainable Livelihoods and Pro-Poor Market Development' are based on a broad field of practice called pro-poor or inclusive market development. The labels of 'Value Chain Development' and 'Market Systems Development' are widely used throughout these approaches. These both refer to the processes that are involved in

producing goods (and services), starting with raw materials and ending with the delivered product (also known as the supply chain), and placing a value on each. Capturing the value generated along the chain is an approach taken by many management strategists. Sustainable Livelihoods Approaches (SLAs) and Making Markets Work for the Poor approaches have many similarities: both make links with macro processes and structures, encourage holistic thinking, build on existing strengths and assets, and strive to achieve sustainable outcomes.

1.5.2 Definitions:

‘Socio-economic status’ includes the measurable social and economic improvement experienced by the agro/pastoralists that are participating in the BDP and other bio-enterprise development initiatives in the ASAL region of Kenya. These areas are defined in the study as ‘livelihood improvements’, as outlined below:

- Changes to the wellbeing of communities involved in the bio enterprises
- Increase in relative income
- Changes in livelihood opportunities of the marginalized groups (including women)
- Changes in social and governance power structures
- Increase in skills of the participating communities

Livelihoods status is defined by this study by the following areas:

- Economic status (hard currency and/or trading capacity, i.e barter)
- Capacity for choice in where individual resources are invested
- Ability to achieve basic human rights of access to health, wealth and education

‘Livelihood’ refers to the capabilities, assets (including both material 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 or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Chambers and Conway, 1992).

IISD defines a 'livelihood' as the capabilities, assets (stores, resources, claims and access) and activities required for a means of living. A livelihood is sustainable if it can cope with and recover from stress and shocks, maintain and enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation (IISD, 1999).

The sustainable livelihoods approach is based on two key components:

- a *framework* that helps in understanding the complexities of poverty (see example in figure...)
- a set of *principles* to guide action to address and overcome poverty

(Chambers and Conway, 1992).

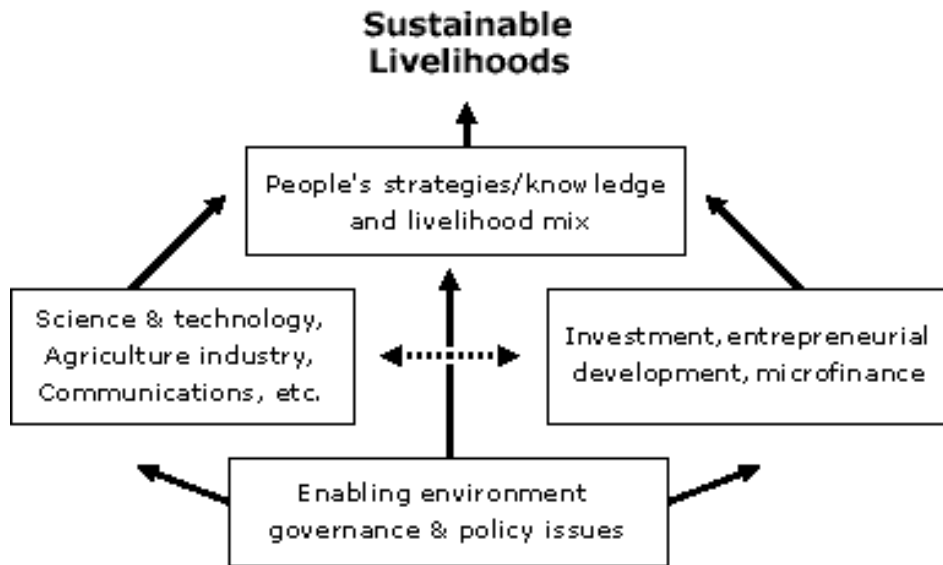


Figure 1.1 Sustainable livelihoods approach (compiled by IIDS, 1999)

SLA has seven guiding principles. They do not prescribe solutions or dictate methods. Instead, they are flexible and adaptable to diverse local conditions (Chambers and Conway, 1992).

The guiding principles are:

- **Be people-centered.** SLA begins by analyzing people's livelihoods and how they change over time. The people themselves actively participate throughout the project cycle.
- **Be holistic.** SLA acknowledges that people adopt many strategies to secure their livelihoods, and that many actors are involved; for example the private sector, ministries, community-based organizations and international organizations.

- ***Be dynamic.*** SLA seeks to understand the dynamic nature of livelihoods and what influences them.
- ***Build on strengths.*** SLA builds on people's perceived strengths and opportunities rather than focusing on their problems and needs. It supports existing livelihood strategies.
- ***Promote micro-macro links.*** SLA examines the influence of policies and institutions on livelihood options and highlights the need for policies to be informed by insights from the local level and by the priorities of the poor.
- ***Encourage broad partnerships.*** SLA counts on broad partnerships drawing on both the public and private sectors.
- ***Aim for sustainability.*** Sustainability is important if poverty reduction is to be lasting.

‘Bio-enterprise’ referred to throughout the study defines an enterprise that can bring about, through its business development, environmental as well as socio-economic benefits. In the BDP, AWF and LWF literature the word ‘Bio-enterprise’ refers to the ‘sustainable utilisation of indigenous plant-based products that yields both environmental and livelihoods benefits’. The bio-enterprises studied and discussed in this thesis include plant based products such as; honey and beeswax, ethnobotanicals, bodycare ingredients and sustainable charcoal (see Chapters 5 and 6).

It has been demonstrated that there are a number of suitable indigenous plant products in the ASAL that have potential for viable commercialisation and can lead to establishing environmentally and economically sustainable bio-enterprise. However, the rapid

establishment of sustainability protocols and externally monitored certification systems is a critical requirement to ensuring that over-harvesting is not encouraged by increasing trade in natural plant products (Wren, 2007; Wren 2008a,b; Wren and Powys, 2008). By research of the application and up-take of these mechanisms and systems, this study assesses how effectively these bio-enterprises develop sustainable utilisation and bring about tangible incentives that improve community conservation of natural resources.

‘Impact analysis’ is required to track the impact of the bio-enterprise development approaches and activities on community livelihoods and the environment in the study region. This research study builds the core research data by evaluating the impact of the BDP, exploring other existing bio-enterprise models and learning experiences for assisting agro/pastoral livelihood diversification and development. For the environmental impact to be quantitatively measured, a long term survey at least 7-10 years is required to provide reliable information concerning: (i) amount of land degraded, and (ii) change in biodiversity, as a result of these activities. It is, therefore, only possible for this research project to lay the foundations for this longer term study, and to draw from qualitative data arising from perceptions of the environmental impact/change from interviews with resource users and actors.

‘Agro-pastoral and pastoral communities’, referred to in this study as ‘agro/pastoral’ communities, are the transitory tribes of the ASAL, which includes the target region of this research study, the ‘Samburu Heartland’. Pastoral communities are predominantly self-organised groups who constantly move across the region with their livestock: goats, sheep and *Bos indicus* cattle; the latter hold the greatest cultural importance as well as

trading value. Morton's (2007: 1) definition states that; "Pastoralists are people who depend on livestock or the sale of livestock products for most of their income and consumption, where livestock is mainly grazed on communally-managed or open-access pastures, and where there is at least some tendency for households or individuals to move seasonally with livestock". To reflect the grey area that lies between classing people of the ASAL as pastoralists or settlers, Morton includes:

- Those who have dropped out of pastoralism through loss of livestock, but have some desire to return to it, and;
- People in farming systems involving extensive livestock production, where livestock is less important than cropping for household income and consumption. Such people are often referred to as agro-pastoralists, especially where livelihoods and cultures are shaped by livestock-dependency.

In general terms, 'agro-pastoralists' are members of the same tribal groups who have chosen to remain largely static. The reasons are generally due to two opposing socio-economic circumstances: individual tribal members, who have gained sufficient wealth and position, acquire suitable land to conduct agricultural activities and gain better income/lifestyle by staying in one place. The other common reason for agro-pastoralism is misfortune, disabling pastoral families from moving with livestock.

'Pastoral destitution' refers to the growing numbers of pastoralists that have fallen into deep poverty and unable to acquire livestock, or those that through ill-health have lost mobility and durability for coping with the extremes of a migratory life in the ASAL.

The term 'Group/s' is used throughout this thesis in different contexts. When applied to 'pastoral groups', as referred to above, this describes the self-organised groups of Pastoralists within defined community structures, such as clans (see 4.3). Such groups are generally based around the migratory herding of livestock. When referring to marginalised groups the term 'group/s' is used for a collection of people within a community that are relegated or confined to a lower or outer edge of their society, and with low social standing. The term 'Group Ranch' is used for land held in trust by the County Council for a registered number of people who were based in the area. The land is shared by all registered members and managed by Group Ranch Committees which are made up of a number of elders. These committees work closely with the local Provincial Administration and other Government Departments.

1.6 Study location

The Samburu Heartland stretches from the extensive Laikipia plateau, NW of Mount Kenya, to the Northern Frontier District, including Samburu and parts of Isiolo District and spans the 53,000km² of the Ewaso Nyiro ecosystem. The vast majority of the area cannot sustain agriculture (less than 600 mm annual rainfall) and wild harvesting provides a common source of food and income. The target communities of this study are ethnically diverse and include Mukogodo Maasai, Kikuyu, Meru, Turkana, Samburu and Pokot. It is widely accepted that they are amongst the poorest and most vulnerable on the African continent. The study location is described in detail in Chapter 3.

1.7 Structure of the thesis

The literature review in Chapter 2 provides an extensive overview and discussion on the literature available to date that concerns the subject of this study. In Chapter 3 the selection of the most appropriate research methods used to undertake this study are introduced, and explained in context to the main research questions. The framework on which the fieldwork is explained and the analytical tools employed for the data collection and impact evaluation are justified. The characteristics of the ASAL, its transient pastoral populations, the landscape and tribal groups of the geographical study area selected for the field work are explained in detail in Chapter 4. This chapter provides insight into the research setting, the environmental and the prevailing socio-economic conditions in the Samburu Heartlands. The explanation of these conditions and the interwoven nature of the challenges provide important perspectives to the study and underline the rationale for the chosen objectives.

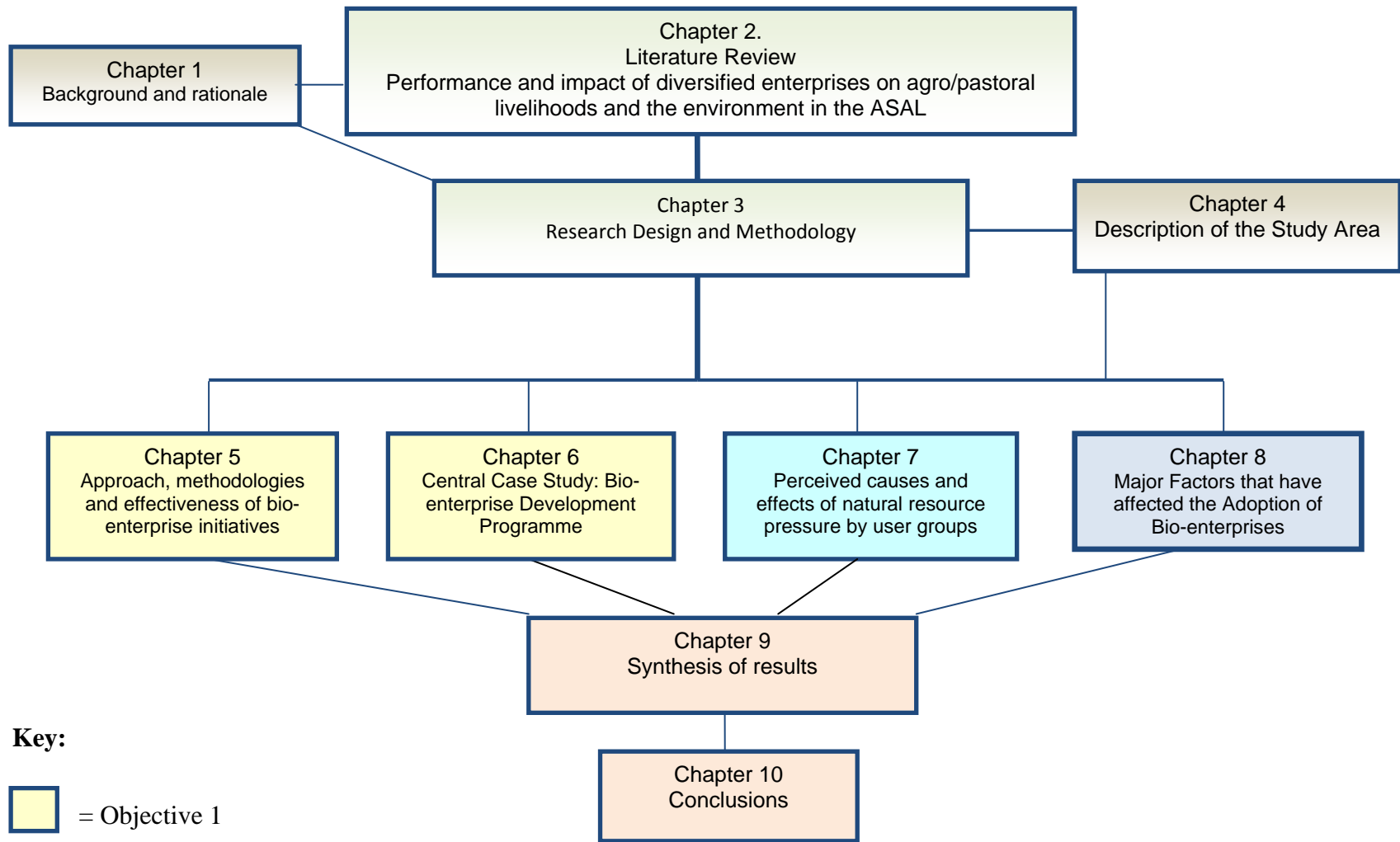
The main analytical chapters of this dissertation, Chapter 5, 6, 7 and 8, provide the body of this study, presenting the new research material that has been achieved as a result of the data collection and the evaluation and discussion of these findings. Chapter 5 and Chapter 6 are designed to address Objectives 1; to evaluate the approach and examine the effectiveness of activities and methodologies of initiatives designed to enable agro/pastoral communities to achieve viable and environmentally sustainable bio-enterprises in the ASAL. Chapter 5 analyses four existing diversified enterprises conducted in agro/pastoral communities, and compares the level of success of specifically orientated development-funded support schemes. A more in-depth study of one of the

initiatives, the BDP, is described and examined in detail in Chapter 6. Chapter 7 is designed to address Objective 3, by focusing on the causes and effects of increasing pressure on natural resources by user-groups in the Kenyan ASAL. The questions raised under Objective 2 and 3 are the focus of Chapter 8 that discusses the relationship between the perceptions of the communities and actors and how these can be enhanced to encourage the up-take of complimentary or alterative bio-enterprises.

The literature review in Chapter 2 and the research data, evaluation and lessons learnt in the analytical Chapters 5, 6, 7 and 8 provide the material for Chapters 9 and 10. These last two chapters are shaped to address Objective 4; which calls for the presentation of the lessons learned from the case studies and how they can inform similar debates on pastoral livelihoods and conservation/environmental management in other localities.

The structure of the research study is illustrated by the flow diagram in Figure 1.2

Figure 1.2 Flow diagram of the structure of the thesis.



Key:

- = Objective 1
- = Objectives 2 and 3
- = Objective 3
- = Objective 4

Chapter 2. Literature review

2.1 Introduction

This literature review provides information and insights pertaining to the background to pastoralism, the perceived causes of poverty, the issues concerning pastoral rights, the debate around environmental degradation and traditional pastoral practices and the need for pastoral livelihood diversification. In this chapter explores the existing level of research knowledge available on the effectiveness of existing commercial and development sector initiatives designed to enable agro/pastoral communities to achieve viable and environmentally sustainable bio-enterprises in the ASAL. Particular emphasis has been placed on searching for literature that indicates the types of constraints and opportunities that affect the selection and adoption of diversified livelihood activities by agro/pastoralist in the ASAL, particularly where they can be classed as bio-enterprises. An extensive search has also been made for published studies that provide information about the coping strategies that pastoralists are adopting to counter the effects of climatic extremes and reduced access to natural resources and the challenges and benefits they observe from engaging in alternative and complementary livelihood diversifications, in particular concerning sustainable bio-enterprises. In exploring the breadth of published research knowledge and the emerging views that surround this topic, this review has facilitated a closer evaluation of the specific research gaps that pertain to the aims and objectives of this study. Further, the information gained through the literature review has enabled this research study to focus more precisely on the salient issues that characterise these research gaps and has brought a closer alignment of the overall thesis.

2.2 Causes of poverty and famine in the pastoral regions of Africa

There is much evidence within the extensive pool of literature that significant study has been made over an extended period of time on the deep causes of poverty and hunger in Africa. The United Nations in 1975 (UN, 1975: 25) stated that “To understand poverty and causes of hunger the concept of food security has had to move away from analysis of the global food balance sheet”. Sen (1981, 1985) and Kratli and Swift (1999) suggest that the deepening famine crisis in Africa has led to the realisation that the roots of poverty and food insecurity are woven more intrinsically around access to food rather than in its availability. Three-quarters of the world’s poorest citizens, such as those living on less than 2 US dollars per day, are dependent on the environment for their basic livelihoods, according to the World Resources Institute (UNDP 2008). Poverty also stems from the denial of basic rights. Hogg (1986) affirms that Social exclusion in the form of limited social and economic representation of women and minorities is manifest across Africa

Although globally there is a vast body of research focused on determining the main underlying factors behind the escalation of poverty in Africa and other developing countries, very few studies provide detailed recommendations on how to tangibly assist communities to gain equitable, sustainable livelihood improvements (Duerbeck, 2009). Socio-economics, poverty, food insecurity, inadequate infrastructure and services constrain the benefits accruing from diversification (Aregu and Belete, 2007; Homewood, 2008). Homewood, in her book, *Ecology of African Pastoralist Societies*, asserts that it is important to emphasise that, “Alongside the biophysical factors driving pastoralist mobility and resource-use decisions, there are always powerful and frequently

overwhelming social and political forces affecting those decisions” (Homewood, 2008: 80). Referring to the political responsibilities to the communities of Kenyan ASAL, the Ministry for Northern Kenya (2009) stated that; due to the extreme natural conditions, lack of transport, infrastructure and communications, the challenges of developing commercial businesses in the ASAL regions is insurmountable. Due to the poor business investment conditions the predominant outlet continues to be the informal market for raw materials or semi-processed products with commercial value (such as; gums, resins, honey, aloe, medicinal plant extracts, livestock products and semi-precious stones) from these vast dry lands. Informal markets operate on the basis of high numbers of supply-chain actors carrying low risk and minimal finance. Hill and Farkas (2006) underline this point by defining the informal market as largely exploitative; ‘low prices offered for materials and lack of traceability drives unsustainable resource utilisation.

Biophysically, low rainfall amounts, high rainfall variability, high temperatures, degraded soils and droughts characterise the ASALs (Ogallo, 1994) and climate change is expected to intensify the features of the ASAL climate (Christensen, 2007; Oba, 2001; Schreck and Semazzi, 2004). Recent data and climate modelling has verified that Africa is steadily warming and that the climate is changing towards greater extremes; the models predict further warming and changes in rainfall patterns (Magrath and Simms, 2006). Climatic graphs show that Africa has warmed 0.7°C over the 20th century, which is a 0.05°C warming per decade. Future warming projections range from 0.2°C per decade, low scenario, to more than 0.5°C per decade, the high scenario (Hulme and Murphree, 2001) i.e. 4 to 10 times faster than observed to date.

Pastoral livelihoods are derived mainly from livestock foraging on the natural woody vegetation, grass and use of water resources as a common property. Opportunities for alternative livelihoods, including agriculture are limited due to rainfall variability, recurrent droughts, harsh climatic and environmental conditions (Ame, 2006; Berger, 2003; Pkalya *et al.*, 2003). In Kenya, the severe drought that started in 2008 and lasted until well into 2010, resulted in significant human as well as considerable livestock loss. A workshop was held in Nanyuki in September 2011, organised by Future Agricultures Consortium and DE (DE, 2011), to explore ‘new pathways to strengthen pastoralist livelihoods’; to discuss research findings and critically reflect on future options and opportunities following the 2008-2010 drought in the region. Participants, including pastoral leaders, group ranch and private ranch, development and government sector representative, deliberated over the impact and ramifications of the drought. The pastoral representatives indicated losses of over 60% of their total livestock number during this period; a situation that they felt was largely exacerbated by lack of access to grazing areas traditionally used by pastoralists in drought conditions due to increasing private land ownership. The increasing prevalence of illegal grazing was also discussed (i.e. night grazing on private ranches and temporary occupation of forest reserves), and the movement of women and youths to casual short term employment as means of securing sufficient food for their families.

Referring to the impact of the previous 1999 to 2001 drought, the book by Aklilu and Wekesa ‘Drought, livestock and livelihoods: lessons from the 1999–2001 emergency response in the pastoral sector in Kenya’ (Aklilu and Wekesa, 2002) furthers the debate on increasing pastoral instability. The book illuminated the difficulties of providing

humanitarian assistance to pastoral communities, indicating that food aid can permanently disrupt migration routes and that water interventions can lead to environmentally damaging concentrations of herds and water related conflict. The authors argue that external assistance should focus rather on supporting pastoralists to improve their livelihood base, such as; the provision of community-based animal health care, market support to stabilise grain purchases, developing new skills in alternative enterprise activities, and making direct interventions to maximise returns to pastoralists who engage in drought-related livestock sales.

Although the residents of the ASAL have been leaving pastoralism for many decades, unable to access adequate fodder to support livestock or social support to rebuild herds, large numbers have fallen out of pastoralism as a result of these recurrent drought crises (Lind and Letai 2011). Yet, these crises have also led to innovation and cooperation, opening new pastoral livelihoods avenues. Dr Jeremy Lind and John Letei have examined pastoral responses to the drought crisis of 2009. They propose that crisis is an opportune moment for critical reflection and suggest that it “unmasked vulnerability as well as wealth, time-old coping strategies as well as innovation, conflict as well as cooperation” (Lind and Letei, 2011: 2).

2.3 Drivers of diversification and challenges

2.3.1 Emerging diversification strategies

In their discussion of pastoral coping mechanisms to the increasing challenges in the ASAL, Easterly and Levine (1997) stress that pastoralists are moving from subsistence to integration into the cash economy, diversifying their livelihoods beyond their traditional reliance on livestock (Fratkin and Mearns, 2003; Ridgewell, *et al.*, 2007; Ridgewell and Flintan, 2007). Loss of land through privatisation (Galaty, 1994; Igoe and Brockington, 1999; Thompson and Homewood, 2002; Rutten, 1992), and for wildlife conservation (Igoe and Brockington, 1999; Homewood, 2005) and the spread of farming communities around key resources all constrain the opportunities to economically develop traditional pastoral livestock based enterprise. Although Maasai are often able to negotiate with private land owners for grazing access for their herds (Berger, 1993; Grandin and Lembuya, 1987; Western, 1993). As a result pastoralist families are diversifying into other livelihoods (Homewood *et al.*, 2001, 2004). This is further illuminated by Chinogwenya and Hobsen who identify four dominant livelihood systems that are emerging across the Horn of Africa (Chinogwenya and Hobsen, 2009: quoting Save the Children, 2007) viz:

1. Livestock-based livelihoods whereby households rely on rearing camels, cattle, sheep and goats. The survival, number and condition of these livestock determine a household's wealth and ability to continue its traditional livelihood pattern. Mobility and the ability to access natural resources like pasture and water are fundamental to the continuation of this livelihood.

2. Agro-pastoral livelihoods that combine extensive livestock rearing and rain-fed cereal production for household consumption. Agricultural cultivation is restricted mainly by the availability of labour within the household. Mobility remains important for these households.

3. Sedentary farmers practice mixed farming, cultivating food crops along with modest sheep and goat herds. Wealth is determined by land holdings and oxen ownership.

4. Ex-pastoralists who have lost their livestock and depend largely on human labour. They are often settled on the peripheries of major urban centres. Most are engaged in low-skilled labour.

However, livestock remain the culturally valued mainstay for most families (*et al.*, 2005). Little (2001) suggests that for relatively wealthy pastoralists, diversification is a strategy of investment, for the impoverished it is a matter of survival and income options vary by proximity to the nearest town and by the gender and wealth of the herder.

2.3.2 Diversification challenges

In the 1980s, studies of a range of Maasai communities showed that pastoral products, particularly milk, constituted the majority of the dietary energy intake, and that Maasai communities' trade pastoral products for grain and other food, and many cultivate as well (Homewood, 1992; Nestel, 1986, 1989). This pattern changes with local conditions. Loss of land through privatisation (Galaty, 1994; Igoe and Brockington, 1999; Rutten, 1992; Thompson and Homewood, 2002), expropriation for wildlife conservation estate (Homewood, 2005; Igoe and Brockington, 1999) or for agribusiness (Homewood *et al.*,

2001) and the spread of farming communities across migration corridors and around key resources have all contributed to limiting traditional livestock movement. As a result, pastoralist families are showing a rapid diversification into other types of production system and income based livelihoods (Homewood *et al.*, 2001; Thompson and Homewood, 2002).

The challenges of entering income generation activities are many. B. Smith (1992), referring to Hogg. (1986), accords that whilst pastoral communities have had no problem understanding a money-exchange economy and have exercised entrepreneurial skills readily, people lack the necessary skills and knowledge to identify and take-up alternative income generation activities. Pastoralists find it difficult to access capital for starting up a business due to their nomadic nature and lack of access to acceptable collateral and livestock is not considered as reliable collateral by the majority of banks and other lending institutions (Smith, 1992). There may be an unfavourable legal and regulatory environment and, in some cases, discriminatory practices together with a lack of access to appropriate technology (Stevenson and St-Onge, 2005; Xu et al., 2005). In pastoralist areas a common and major constraint is a lack of access to markets due to the often isolated nature of pastoral groups and homesteads. Although pastoral communities have long experience in the money-exchange economy and have exercised entrepreneurial skills readily (Smith, 1992), they lack the necessary technical and business skills and knowledge to identify and take-up alternative income generation activities (Aklilu and Wekesa, 2002; Hogg, 1986). Such studies show that a low skills base outside the spheres of pastoralism, together with little access to infrastructure and services, limits

opportunities for pastoralists to engage in viable alternative or complimentary enterprises that improve livelihoods of the communities living within the ASALs.

Current diversified activities, such as trading, wage employment, retail activities, property ownership and sales, gathering and selling wild products, and farming (Little 2001), raise small rewards. As livelihood insecurity continues to intensify, the search for suitable diversification has led to the identification of livelihood niches that relate to the exploitation of indigenous plant products, such as honey production, ethnobotanicals and essential oils (Raina, *et al.*, 2009). The use of indigenous plant products as an income source is well defined in many areas of the world and serves as a complimentary function to other livelihood activities (Berhanu, 2004; Shackleton and Shackleton, 2004). They are important in filling seasonal income gaps and acting as buffer in times of hardship and an activity of the last resort (Ruiz Perez and Arnold, 1995). However, the lack of access to equitable markets, due to the often isolated nature of pastoral groups and homesteads, means that most individuals are able only to sell to informal traders. There is little coordination and/or collaboration to access markets further afield, for example, organising linkages with traders in the cities, and/or sharing of transport. Studies of existing diversified livelihood enterprises in the ASAL, conducted by Oxfam GB over the last three years (such as Fitzgibbon, *et al.*, 2007), have revealed that the majority of products are traded through the unofficial market for very little financial reward, particularly for those at the bottom of the supply chain. This common situation means that natural resources provides little monetary value and incentive to promote harvesters to manage them positively. Studies also highlighted the chronic lack of capacity for investment in new diversified enterprises, the absence of micro-credit and the increasing rural-urban interaction (Bryceson, 1999; Bryceson and Jamal, 1997; Ellis, 2000). The

diversity of additional income-generating activities is limited only by opportunity and access (Homewood, 2008). This situation is worsened by the wide-spread lack of commercial orientation, business acumen and necessary skills of the development agents who are involved in instigating and providing support to community-based enterprise initiatives in the ASAL (Little, 2001; Monela, *et al.*, 2001).

Income diversification as a risk strategy is often taken to imply a trade-off between a higher total income involving greater probability of income failure, and a lower total income for greater income security (Ellis, 2000). For example, women need to ensure that they have a certain amount of money to hand to feed the family and therefore may prefer to have a small but more secure income. Men, however, may be willing to take more risks and are keen to see larger returns for their input, for example from livestock sales (Ridgewell and Flintan, 2007). Diversification from traditional pastoralism also impacts on the patterns of land use. The expansion of agro-pastoralism has resulted in the exploitation of land that has traditionally been held for communal use, such as land alongside water courses that provided grazing opportunities for clan members during drought periods. Land privatising has led to well-watered land being almost entirely enclosed and held by individual herdsmen (Gebre, 2001).

2.3.5 Increasing conflict and insecurities

Increasing conflict and insecurity in the pastoral lands of the Kenya ASAL is a growing challenge to pastoralism and can limit the opportunities for diversification from the nomadic livestock base. Researchers have ascertained that the predominant factors are directly linked to land tenure; the crux of economic, cultural and socio-economic change. Several studies discuss the factors driving the conflict as including; historical intertribal

disputes, the difficult nature of interaction between customary and state-run systems, structural factors including population growth, environmental degradation and slow economic development (Huggins, *et al.*, 2008; Verhagen *et al.*, 1999; Wehrmann, 2008). Also frequent drought together with expanding populations of people and livestock has increased resource competition and conflicts. Kratli and Swift (1999) assert that all conflicts are ultimately over resources, due to their scarcity in pastoral areas. This view is shared by Markakis (1997), Mkutu (2002) and Kahl (1998) who suggest that resource scarcity ultimately leads to violent pastoral conflict. The conflict, in turn, increases vulnerability and constrains human and animal development in these pastoral areas (Eriksen and Lind, 2009).

In general emergencies, households need cash to purchase grain. This requires that livestock are sold, and other ways of generating cash are sought. Businesses also suffer during these times because people are unsettled, and are poorer than usual so their purchasing power is reduced. Additionally people will have less time for non-survival based activities, such as handicraft making (Wawire, 2003). Muhammad (2002: 18) describes that during the years of conflict and drought in Darfur, Sudan, “the big concern that faced people was finding the means to buy grain. The breakthrough for women in Darfur during the famine was to turn to traditional handicrafts. The spirit of tradition brought women together to develop and invent in accordance with circumstances”.

As crises have become more commonplace, pastoralists are planning further ahead than they would have done in the past. Increasingly pastoralists spread risk by investing in different livelihood strategies such as livestock and non-livestock income generation

activities. However, Little (2001) cautions that livelihood diversification is not the panacea that many policy makers and development actors assume it to be. Research shows that most diversification strategies generate low incomes and can increase risk during periods of stress. Herd mobility and livestock sales or seasonal labour migration (Hampshire and Randall, 2000) remain the major means of managing risk in pastoral areas.

2.3.4 Formal verses informal trade

Many pastoralists are still relying on informal methods of exchange such as bartering, trading and providing gifts as in Mongolia (Robinson, 1999). Encouraging the expansion of markets may result in the marginalisation of such methods. Services that were once given free are now being charged for, and the traditional benefit sharing methods that have been important in helping communities get through crises such as drought, are losing their importance. For example, women are engaged in selling traditional medicines and herbs mostly in urban centres. Traditionally, such services were offered free among the members of the Maasai community, but now it is an emerging source of income for women (Bee, *et al.*, 2002). The creation of markets challenges these social norms and provides new opportunities, however as described above they can also result in restrictions. These norms are being renegotiated, both implicitly and explicitly, as households face the costs and benefits of these new opportunities (McPeak, 2006).

2.3.5 Formation of groups and cooperatives

Collective action is well known as a positive community-development force. Group formation can build social capital and enhance income generation and access to resources

(Coppock, *et al.*, 2006). However in general within pastoralist societies there tends to be less of a history of collective behaviour than in more sedentarised groups (Monela, *et al.* 2001). Theoretically, low levels of physical assets limits participation of an individual in collective action. Other factors such as environmental uncertainty and lower level of dependence on the resource have been found to be more significant in limiting membership than limitation of assets. Poor pastoralists depend on their informal networks to have access to other assets (Binot, *et al.*, 2009). Maintaining a good working cooperative that represents all of its members is highly challenging, as a result cooperatives are often plagued by financial problems including debt and corruption. Further consensus is difficult to reach amongst a diverse group of members: there can also be disparity in power between men and women (IIRR, 2004: 83).

2.4 Is Pastoralism a major cause of environmental degradation?

In the Arid and Semi-Arid Lands (ASAL) deepening poverty has an immediate impact on the natural resources. It is widely reported in published and unpublished reports that the expansion of pastoralism in this fragile environment is leading to significant losses in important natural habitats. These views may be seen to largely rise out of a set of presumptions that were promoted through the expounded ‘fortress conservation’ model, developed during the 20th century, based on exclusion of consumptive use, dominated colonial and later post-Independence administrative conservation policies. This model had emerged from a particular conjunction of social and historical dimensions peculiar to the West (Homewood, 2008) as demonstrated in Kenya’s recent conservation history. Both Barany *et al.* (2001) and Malleret-King (2000) indicated in their research that the wide concern of international environmental agencies is that increasing land pressuring

from expanding resident and transitory populations, exacerbated by growing trade demand, is causing unsustainable utilisation of indigenous resources in Kenya. There is strong evidence, however, that indicates that the increasing population and loss of communal lands to settlers and industry have caused measurable loss of natural resources that have long sustained the lives and culture of people within the ASAL (Smith, 1992; Oba, 2001). Additionally, multiple users competing for grazing and water resources intensify this situation, especially during periods of pasture and water scarcity caused by climatic extremes (Mazer and Stakhanov, 2005). One of the fundamental challenges, identified by Moore (1986), is that as more land is removed from communal access by private interests, often by the young and the more educated elite, older values are under pressure especially decision-making processes which have traditionally been in the hands of clan elders. A.B Smith, in his book, 'Pastoralism in Africa' (1992), asserts that well established and viable management systems are therefore being undercut, with the result that there are fewer controls that steer and constraint social behaviour and individual competition for resources. It is posed that by ignoring traditional land-use management practices, absentee herd owners and their stock may be accelerating range degradation. Nassef, *et al.* (2009) expound that effective pastoralism is a rational use of the drylands, and that pastoralist livestock keeping has unique adaptive potential to climatic variability and presents the key areas of intervention that would allow pastoralists to autonomously adapt to an increasingly variable climate. Further, it can be argued that pastoralism has an important ecological value, because it maintains biodiversity and prevents soil degradation and bush encroachment (Flintan, 2008).

The particular interplay of pastoralism and wildlife conservation has been explored in detail and the research is presented in several publications reviewed for this study (Brockington and Homewood, 2001; Homewood and Rogers, 1991). This research has demonstrated that extensive pastoralism has co-existed alongside wildlife populations for centuries, and many rangeland habitats, in part created by pastoralists have maintained significant levels of plant as well as animal bio-diversity. These previous studies have shown that the interplay between pastoralism and the landscape has been important in maintaining certain habitats.

There are however, some preconditions for the pastoralist livelihood system to be effective and sustainable in terms of the natural environment. From historical records and botanical surveys conducted during the first half of the 1900s when both population densities and land pressures were lower, traditional practices of gathering domestic food and health supplements, hunting small wildlife and harvesting indigenous plants appear not to have posed a serious threat to these natural resources in the ASAL. However, reports produced by NGOs operating in the target area of this study, conducted over the last five to eight years, suggest that natural resource loss is increasing and have evidence that there is a direct relationship between growing resident and pastoral populations, the increasing demands on natural resource-use and environmental losses (AWF, 2008; Wren 2008a,b; Wren and Powys, 2008). Perrings, *et al.* (1997) maintains that 'the effects include loss of genetic material and collapse of ecosystem resilience; our "insurance" against the fundamental uncertain effects of economic and population growth'. The reports from the Africa Wildlife Foundation and Laikipia Wildlife Forum indicated that this situation will worsen unless communities are sensitized and assisted in engaging in

more rewarding livelihood alternatives that promote positive management of diminishing natural resources (Wren, 2007; Wren 2008a,b; Wren and Powys, 2008). This point is reflected in global terms on viewing the tenuous position of modern as well as traditional medicine commonly used today. Plants harvested from natural populations continue to be the most important source of medicine to cover the primary health care needs of more than two third of the world's population (Duerbeck, , 2009). Despite alternative sourcing strategies by cultivation, the global industry is still dependent on wild collected plants as raw materials for food, medicine and cosmetics (over 90% of commercially used plant species are sourced from wild collection, this is over 70% of material trade; only 500 plant species are commercially cultivated today (Traffic International; 2010). The figures that illustrate the threat to our wild plant resources are more than alarming: about 15,000 wild collected plant species are threatened in at least part of their natural habitats (Schippmann *et al.*, 2006). Not only over-harvesting causes this threat but also land-conversion and other forms of habitat destruction or modification.

Charcoal is widely considered one of the most destructive forms of natural resource-use in the drylands. Charcoal provides domestic energy for 82% of urban and 34% of rural households in Kenya. The charcoal industry represents an estimated annual market value of over US\$ 427 million (Ksh. 32 billion), about half of the tourism industry's revenue of US\$ 1 billion (Ksh 75 billion) in 2007 (UNDP-GEF, 2008). Given the low national forest cover of about 6%, it is estimated that over 75% of the 1.6 to 2.4 million tonnes of charcoal is used annually, and mostly unsustainably harvested from the ASAL (GoK, 2005b). Increasing population and rising poverty levels continue to exert pressure on Kenya's forest resources, illegal logging, charcoal making and encroachment of forests

for agriculture and settlement is widespread. Approximately 17% of global greenhouse gas (GHG) emissions result from deforestation and forest degradation (Raina, *et al.*, 2009). Mitigation is largely dependent on reducing the intensity of unsustainable charcoal production and illegal logging.

Eco-tourism in some areas of the ASAL has flourished over recent years, driving further the national and international level interests in wildlife conservation. However, Orindi, *et al.* (2007) states that ‘under current law pastoralist communities receive few benefits from wildlife conservation’. Bocoum, *et al.* (2003) in their paper ‘Social inclusion: a pre-requisite for equitable and sustainable natural resource management: two experiences in Mali calls for the involvement of all stakeholders in the managing of common property resources’. As discussed in the Annual Entomology Review, ‘Forest Habitat Conservation in Africa Using Commercial Insects’ (2010), environmental degradation is expected to worsen unless communities are stimulated and assisted to engaging in more rewarding livelihoods alternatives that promote positive management of the diminishing resources. Several authors have supported conservation strategies for protected natural habitats through the direct involvement of local communities who have traditionally depended on their resources’ (Scherr, *et al.*, 2003; Schmid, *et al.*, 2005; Taylor, 2005). These studies have provided key information that demonstrates that reversing tropical forest degradation is possible through the provision of incentives to the local community through commercial insect products (Snodgrass, 1993).

2.5 Government response to pastoral poverty

During the late 1990s, Members of Parliament for pastoralist constituencies in Kenya established a Pastoralist Parliamentary Group (PPG). Owing to hostility from the government it became dormant, but was revived in 2003, following the election of the National Rainbow Coalition (NARC) government. The current coalition government has furthered this interest in developing the ASAL regions of Kenya by established the Ministry of Northern Kenya and Arid Lands (MoNK) in 2009 to bring forward investment, infrastructural and human development within these regions, as indicated in Box 1.

Box 1: Mandate of the Ministry of Northern Kenya

- Infrastructural development
- Planning and encouragement of townships along main roads
- Livestock development
- Livestock industries
- Water supply
- Natural resources management
- Mineral resources exploration and development
- Tourism development
- Human resources development
- Irrigation development
- Tapping of solar and wind energy

Prioritization of programmes and projects for fast-tracking by the Government:

- Improvement of Livestock Marketing Systems
- Implementation of Special Programmes
- Arid Lands Resource Management Project

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Although, increasingly there is more government and development emphasis on assisting pastoral communities to adopt new approach in dealing with water and grazing management, conflict resolution and land fragmentation, the fact remains that pastoralism is grossly under-valued and little supported (Fratkin, 1997). The

IUCN study, 2010, “Economic Importance of Goods and Services Derived from Dryland Ecosystems in the IGAD Region” (Niem and J. Manyindo, 2010) estimated the annual potential value of livestock in Kenya as \$2.5 billion, while natural products that might be

derived from dry-land ecosystems is \$3.6 billion, a total of \$6.1 billion, equivalent to 50% of the annual Gross Domestic Product (GDP). The worsening food crisis and vulnerability to extreme climatic conditions have illuminated the need for more effective policy and developmental strategies in drylands. Although there is an extensive body of work and research on de-agrarianisation policy there is very little study on how people exit pastoralism and the requirements of supporting this transition. As pastoralists continuously adjust their livelihoods to a changing resource-base and shifting political and economic conditions there are very many models of pastoral innovation (Lind and Letei, 2011). Despite this, there is little research that captures these innovations and recommends supportive policy changes and development approaches.

The MoNK is mandated to achieving food security and sustainable land management and livelihoods in arid environments, and to close the developmental ‘gap’ between northern Kenya and the rest of the country. The ministry has established five directorates:

- Infrastructure development
- Human capital development
- Food security
- Policy and research
- Partnership and investment

The crucial determinant of pastoral ecology is the extent to which pastoral people can maintain flexible access to seasonal resources, and mobility to exploit them (Behnke, 1993; Niamir-Fuller, 1999a; Turner, 1999a). Land tenure continues to be a challenge to pastoral communities (Lane, 1998; IIED, Pastoral Land Tenure Programme). Access and

availability are declining in many ASAL areas, with intensification of production and privatisation of rangelands (Sullivan, 2001; Schreckenber, 1996). National policies in some ASAL countries, such as Tanzania, Kenya, Somalia and Ethiopia, continue to create incentives for subdivision of community land, reflecting the limited value attached by policy makers to pastoralism, the high value attached to land ownership, and a lack of appreciation of the opportunities for enhancing nature-based livelihoods (Brockington, 1999; Brockington, 2001; Shivji, 1998).

Access to grazing land is becoming more restricted as traditional communal land is increasingly sold to individuals and large scale investors (Nunow, 2010). As a result, the land tenure system of the community is becoming endangered and the access of pastoral communities to what were traditionally communal resources is reducing making it more difficult to move with livestock and improve livestock systems, (Baker and Hoffman, 2006; Jacobs, 2003). For example, where common grazing land underwent a planned transition to private ownership in many parts of the Kenyan Masailand, many individuals have been unable to maintain their pastoral enterprises on the remaining land areas and have lost their foothold in pastoral systems (Homewood, 1992; Galaty, 1994; Rutten, 1992). Recent policy dialogue between review commissions and local communities in Kenya and Tanzania has provided opportunities for communities to present their case for extensive land management - strengthening individual rights within the framework of community tenure (Shivji, 1998; Toulmin and Quan, 2000; Xu *et al.*, 2005). Additionally, the implementation of the new government constitution has brought about better regional representation. The new decentralised system of government has

enabled decisions concerning the allocation of public resources much closer to ordinary people, as well as the land reform processes (Lind and Letei, 2011).

Recent Kenyan government policy regarding forestry and wildlife management attempts to increase economic benefits of wildlife to the local people while empowering them. Kenya's National Economic Recovery Strategy for Wealth and Employment Creation (2003-2007) state that non-timber forest products play a major role for local villages specially women. Some of the commercial non-timber forest products include Aloe bitter gum, gums and gum resins, indigenous fruits, like *Tamarindus indica* and herbal medicines. It has been estimated that Kenya exported about 470 tons of aloe between 1994 and 2000, worth US\$4,700,000 (US\$10/kg, according to NAREDA records). Major producing districts at that time were Baringo, Samburu, Laikipia, Taita-Taveta and West Pokot.

The international policies relating to the wild harvesting of indigenous plant materials are additional areas to consider. CITES provided the legal framework for all CITES listed endangered plants, and for these species there is limited opportunity for commercialisation. The case of indigenous CITES listed species approved for sustainable utilization and commercialisation, CITES requirements include proof of exploitation from sustainable source (CITES, 2002). In some countries in the region, such as Kenya, the government has brought about a national Act to protect and guide wildlife conservation and management; such as the Wildlife Conservation and Management Act (Section 67 Cap376), under which there is now a regulation framework and licensing system for the domestication ('artificial propagation') and exportation of indigenous plant

materials/extracts. The regulatory and licensing schemes are still largely undeveloped, and there is little practical implementation of those that have been formulated, such as the sustainable wild harvesting standards for indigenous aloe (Mukonyi, *et al.*, 2010; Wren, 2008a,b). As a result there is no or insufficient legal regulation of indigenous plant materials, and the vast majority of these sourced from the drylands of Kenya are exported through the ‘unofficial market’. Due to the long supply chain and the multiple petty traders involved the pastoral harvesters received very little price reward; also there is little incentive for the harvesters to manage the longer term sustainability of these natural resources (Wren, 2008a,b).

2.6 Development sector and the pastoral plight

Horowitz (1979) suggests that it is an orthodox belief of those governing national states that the pastoral principle is irrational and is the cause of secular environmental degradation, and Western, quoted in Horowitz (1979), cautions against such assumptions based on short term observations. Even with unpredicted variables, such as rainfall, this approach can lead to erroneous conclusions. Richards (1985) indicated that it is a fundamental requirement of research and development agencies to understand the aims and methods of these deeply established livelihood practices in order to compliment and augment local trends and interests, rather than centring their approaches on prescribing solutions to perceived problems.

Many of Kenya’s community conservation programmes have a strong protected area outreach focus that seeks to increase local support from conservation and bring tangible benefits to communities through wildlife tourism (Malleret-King and Hatfield 2008).

They have created a knowledge base from which a more effective institutional framework for conservation can evolve, encouraging those engaged with conservation to continue to evolve these principles. However, Hulme and Murphree (2001) suggest that there is little understanding of developing sustainable businesses to stimulate community driven conservation in the ASAL. The same underlying issues pertain to the humanitarian aid situation. Kirkemann and Martin (2007) argues that although the humanitarian approach which starts with securing immediate food is justifiable in terms of keeping people alive, the longer term need of these populations are as importance and far less understood and assisted effectively. Safety net programmes based on food aid are being questioned as their effectiveness in seeking long term solutions (Fitzgibbon, *et al.*, 2007). The realisation that food aid will not solve the problem has led many humanitarian organisations and development agencies to explore ways of improving the livelihoods of agro/pastoral populations in a way that builds their resilience. Easterly and Levine (1997) and Twarog (2006) are typical of many researchers, whose papers conclude that increasing numbers of development agencies and national NGOs specialised in assisting rural livelihoods, are including livelihood diversification strategies within their development portfolio. They add, however, that these diversification projects frequently suffer from poor sustainability due to; the lack awareness of the aspirations of the communities themselves, the small scale making the initiatives unviable, poor production and market gearing, and lack of exposure to best practices of business and micro finance (Bavikatte, *et al.*, 2009; Easterly and Levine, 1997; Twarog, 2006). As a result there are very few businesses in bio-products that are reported to have stimulated community-driven conservation in the ASALs.

There is evidence that has been very little business support made available by government or development actors to assist communities within the ASAL to diversify their livelihoods (Ministry for Northern Kenya, 2009). Smith (1992) states that agro/pastoral communities are keen to take-up complimentary or additional enterprises and are willing to learn new skills. However, their increasing sense of impoverishment, in many cases the result of significant loss of livestock due to drought, insecurity and violence between the tribes and clans over dwindling resources, often means that these communities are more susceptible to the influence of development sector agents. Pastoral communities are becoming increasingly anxious to undertake training and receive any other kind of support to assist them to diversify their livelihood opportunities (Lind and Letei, 2011). Smith (1992) further argues that communities often do not have sufficient knowledge about non traditional livelihoods to understand the investment and commitment that is required to gain entry. Mario Aguilar (1998) further argues that the dominance of development-orientated research has overshadowed research on pastoral cultural domains, an area that can provide valuable information to development agents in how to best shape their approach to supporting livelihood improvements in these complex cultural settings. Communities are most frequently not involved in the design and establishment of development driven community enterprise / livelihood support projects. They have little or no say in setting up the projects, or to the day to day decision making needed to run the operations. Smith (1992) explains that to create complimentary income options that are feasible and can be managed alongside livestock herding, close interactions with all value-chain actors and stakeholders must be made throughout the design, inception and establishment phases.

Greater social cohesion and stability can be achieved by bringing together the interests of the different resource-users, increasing understanding amongst agro/pastoral communities, the public sector, development agencies and land owners of the tangible benefits of using bio-enterprise to improve the management of natural resources through mutually rewarding relationships (Baird, *et al.*, 2003). However, fundamentally, most pastoral communities (particularly outside of NGO focal operating areas) have no or little access to training, trade finance and capital to develop alternative, complimentary or additional livelihoods (Smith, 1992). These costs can be significant, and for the private sector to be attracted to invest in such remote regions and develop viable and sustainable business operations these risks need to be reduced factors that are fully supported by Bavikatte and Jonas (2009). Developing new enterprises, particularly community-based, means that producers need to secure necessary investment capital to fulfil the infrastructure, training and management needs of the start up phase, which is critical to developing a successful and replicable bio enterprise model (Bavikatte, *et al.*, 2009). It can, therefore, be considered imperative that rural enterprise development initiatives need to address these points throughout the value chain, particularly at the community level.

Many NGOs have increasingly supported savings and credit schemes in pastoralist communities. In the past these have started as very small loans and in a comparatively informal manner. However in more recent years the loans have increased quite substantially and informal groups have become cooperatives. NGOs can address the constraints through specialised techniques but frequently suffer from lack of sustainability because of their welfare orientation, small scale, low absorptive capacity, and lack of exposure to best practices of micro and SME finance (Gamba, 2005). For any

intervention to work, the local situation has to be well analysed to ensure that those who borrow the money are able to control its expenditure and be responsible for and are capable to ensure repayment (Bravo-Baumann, 2000). Often NGOs in particular place less emphasis on repayment than a government scheme might do, accepting a higher risk of loss. Though this might benefit some borrowers, it can also damage relations in the long term by not instilling a good sense of business or encouraging responsibility (Oxfam-GB, 2009).

2.7 Concept of incentive-led community-driven conservation

Although Africa contains seven biodiversity hotspots, there are mounting pressures from habitat destruction and degradation that cause threats to the future of this diversity across the continent (Razafimanantsoa, *et al.*, 2006). Awareness of the negative impact that ecosystem loss brings is growing and as a result the world's system of protected areas has grown exponentially over the past 25 years. Concurrently, the efforts to protect ecosystems have expanded from purely biodiversity conservation to encompassing measures to improve human welfare (Homewood, 2008). The result is a policy shift towards allowing local resource-users to benefit from sustainable use of natural resources in protected areas (Mukonyi, *et al.*, 2010). As reflected in the millennium development goals, conserving biodiversity and meeting expanding human needs is now seen as an issue of the utmost importance. Evaluation methods are being developed for economic models which incorporate site characteristics and location to predict economic returns for a variety of potential land uses (Polasky, *et al.*, 2008).

The Forest Policy of 2007 (KWS, 2007a) and the Forest Act of 2005 (KWS, 2005) encouraged communities adjacent to forests to participate in forest management by forming Community Forest Associations (CFAs). This is now a legal requirement and all forest reserves are expected to have a CFA composed of the different forest user groups. Progress in effecting the policy and Act has however been slowed by a lack of policy implementation mechanism and management capacity within the government authorities to develop the management plans. The new Kenya Forest Service (KFS) has been charged with instigating this process and providing management plans for the using and managing of each forest reserve in the country (KFS, 2010). In the Samburu Heartland the KFS has received the support of the Africa Wildlife Foundation and Laikipia Wildlife Forum in developing these plans. However, for the CFAs to be effective in governing sustainable community utilisation of the natural resources in the forest reserves and in engaging communities in forest management, the CFAs require the understanding, skills and management capacity to develop incentive led approaches that enable communities to benefit from these activities. In the Samburu Heartland, the Bio-enterprise Development Programme, a central case study of this thesis, is one example of such an initiative. The Laikipia Wildlife Forum and Africa Wildlife Foundation is promoting this approach (Malleret King and Lempoko 2009; Wren, 2008a,b). There are very few other examples within the country that provide these tangible opportunities, and although the KFS has shown willingness to support these initiatives, it is evident that governments and international donors need to collaborate more in achieving the goals of these Acts and in more effectively securing the future of Kenya's fast diminishing forest resource.

Jayantha and Herath (2009) provided a review of research contributions on natural resource management and planning using multi-criteria decision making (MCDM). They concluded that the management of tropical protected areas is a contentious issue and often leads to an unproductive polarization of viewpoints supporting either ‘protectionist’ or ‘sustainable development’ paradigms. It is argued that effective management requires a mix of private ownership, common property management, and central government involvement to maximize benefits to local people and ensure long-term protection of biodiversity (Baird, *et al.*, 2003; Schwennesen, 2005). Madagascar, Kenya and Ghana case studies provide insight into strengthening local management capacities and cooperation. They highlight the need to leverage local knowledge and to reconcile the different formal and informal rules for active and responsible involvement of concerned community members in sustainable resource management (Fritz-Vietta, *et al.*, 2009). For example, the Annual Entomology Review, ‘Forest Habitat Conservation in Africa Using Commercial Insects’ (2010), demonstrates that over-exploitation of forest resources in Kenya, driven by extreme poverty, is largely responsible for the escalating degradation.

ICIPE, over the last 10 years, has developed conservation initiatives in three forests in Kenya focused on an integrated approach to forest conservation (Raina, *et al.*, 2009). The initiative has included biodiversity assessment, management planning, habitat restoration and community driven commercial insect enterprise development. The monitoring results have indicated that resident communities have made no new demands on the forests and no illegal encroachment was reported during the project period. Illegal activities (cutting/harvesting) in the buffer zones were shown to have reduced by 50% by the final year (Gordon, 2003; Raina. *et al.*, 2009). The IFAD publication, ‘Gender and Non-

Timber Forest Products: Promoting food security and economic empowerment, 2008, states that incomes of the participating members increased by 16-20% as a result of their commercial insect enterprise activities. Such projects have also demonstrated that beekeeping and silk farming can be conducted by women and less advantaged members of communities, including those with very small land areas. Wild silk farming and traditional beekeeping can be carried out by landless and very poor community members, requiring little external resources (Gordon, 2003; Raina, *et al.*, 2009).

Work using interdisciplinary research and methodology conducted with pastoral populations in the drylands of Northern Kenya has been aimed at integrating ecosystems services and their drivers. It has brought together natural resource management, conservation and livelihoods development through natural products enterprise, as identified in Wren and Speranza (2010). These bio-enterprise models, based on beekeeping and other non-timber forest products, have shown that pastoral communities will engage in positive natural resource management when integrated with, and incentivized by, income generating activities (Malleret-King, 2009). When well planned and structured with the necessary mechanisms, such as those required for organic certification and ethical trade, bio-enterprises can lead to positive socio-economic and environmental gains (Raina, *et al.* 2009). An analysis of EU and US organic certification standards reveals that new tools have been developed such as the international FairWild Standard that provides accredited certification for sustainable wild harvesting systems. This standard provides market recognition through the product certification label. The FairWild Foundation (Duerbeck, 2009; Traffic International; 2010) expounds that compliance to these standards enables natural resource-users to better manage their

operations and, once certification is gained, to harness the opportunity to access attractive global markets (Ashley 2000; Monela, *et al.*, 2001). Natural resource management, as opposed to plant gathering, appears to be constrained by an informal process of ‘logic of practice’ (Bourdieu, 1990) derived from a culturally mediated understanding of local landscape ecology. Women harvesters, for example, do not strip a bush of seed but leave enough to sustain the plant in the following season. This is part of the traditional beliefs of man as the custodian of nature’s resources.

2.8 Gender relations and participation in income generation activities

The earlier views of pastoralist groups as economical, politically, socially and culturally male-dominated have shifted with the emergence of studies of the role of women in pastoralist groups (Chieni and Spencer, 1993; Dahl 1987; Hodgson, 2000; Monimart, 1989; Oboler, 1985; Sikana *et al.*, 1993; Talle, 1988; Waters-Bayer, 1984;). ‘Women’s status’ however, is not a useful analytical concept *per se* (Hodgson, 2000). Women’s roles emerge as diverse, differentiated, complementary and overlapping with those of men. Both men and women are capable of getting involved in income generation activities if the right conditions exist. In the past though men have dominated activities involving cash transactions, pastoral women have become known as excellent traders and money managers (Flintan, 2001). Economic diversification following a more settled existence may give women greater freedom because it offers access to more sources of income which they can control, although there may be other negative impacts. It should not be assumed that if women are involved in income generation activities that they are able to control income raised: sometimes men will take control. As Brockington (2001)

describes, although the Maasai women have control over milk the control over the income may be continually negotiated and contested. In addition, any new patterns of trade and change are to some extent, dependent on the impact on the autonomy and interdependence between men and women. However, women are largely deprived of property ownership and consequently are not able to offer the collateral required to access bank loans (Stevenson and St-Onge, 2005). If a woman is able to keep her earnings, though the income may be small, it may be the only means by which she can obtain cash that she has control over. Indeed, it is said that men are more likely to respect women if they are raising monies that form a significant part of the household income (ABRDP, 1999).

Non Timber Forest Products (NTFP) / bio-products in particular have been found to represent an important source of income and employment particularly to women, encouraging increased production and harvesting for local trade (Marshall and Streckenberg, 2002). Where women are the main processors of natural resource products, the processing technology tends to be rudimentary, returns on labour are relatively low, and the work is often conducted in or near the family residence (Fratkin, 1991). Some studies of new technology introductions reveal a pattern whereby men displace women from processing. Even where commercialisation has been targeted at products previously controlled by women, women have failed to retain or gain increased income (Neumann and Hirsch, 2000; Campbell, 1991). Sometimes women may not be as interested in the financial benefits of commercialisation as the social aspects such as meeting and working with others, social interaction and a chance for exchange of information. In many cases, if their businesses become successful, women owners face the dilemma of either handing

over the business to male relatives to prevent conflict between household and business responsibilities or to retard business growth in order to retain control (Haight, 2005). Participation in income generation activities, particularly of women, may be limited by a range of factors including level of mobility and resources, cultural and religious constraints and the type of task in the chain of activities from harvesting to marketing (Fratkin, 1991). As a result of these constraints low-income women micro-entrepreneurs tend to work in the same kind of businesses such as commodity trading or food kiosks. These businesses require low capital and are familiar therefore the risk of entering into them appears low. However, when too many women start similar businesses, the market becomes saturated and everyone's income suffers.

A high percentage of low-income women lack the skills, ideas or ability to innovate and to respond to threats in the marketplace. When one business folds they often begin another that requires similar inputs, but which is in a different sector (Haight, 2005). However a study in Kenya suggested that a lack of education was not a barrier to women getting involved in income generation activities (Nduma *et al.*, 2000). Exposure to new ideas, innovations, alternatives and options can open up people to different income generation alternatives. Learning visits and study tours can help people understand a situation beyond their own community and learn from the experiences of others. For example Desta *et al.* (2006) describe how the aspirations of communities in Borana had been raised by exposure of the Ethiopians to the success of well organised pastoral women's groups from northern Kenya. Training is often given during the setting up of income generation support to improve men and women's business skills, introduce them to different income generation activities and improve their capacity to handle credit

(Hodgson, 2000). Restrictions and barriers may still exist, however, as the majority of trainers tend to be men and many husbands object to their wives being exposed to this environment. In some cases, women have to obtain their husband's permission to travel, which can represent another barrier to their participation in training. Most rural women require training delivered in their local language and the use of non-literate training methodologies is an important consideration when designing effective training programmes for dryland communities (Stevenson and St-Onge, 2005).

2.9 Potential for bio-enterprise development to drive positive socio-economic and environmental change

Despite the limited availability of research literature that explores the impact of bio-enterprise development initiatives in the ASALs of Kenya and identified factors for their failure and measurement of the achieved success levels, there are a number of attempts made by private and development sector operators to develop bio-enterprise that can contribute to increased incomes and sustainable management of natural resources (Wren and Speranza, 2010). Many papers and reports produced by government and development agencies (such as FAO, World Bank, USAID-CARE, Save the Children, FARM-Africa, SOS Sahel - Ethiopia, Oxfam GB, African Wildlife Foundation, Laikipia Wildlife Forum, a number of ministry department reports, Arid Lands Resources Unit, Ministry for Northern Kenya and the ASAL) have been carefully explored and evaluated as a core component of this research study. The rationale and justifications vary, in some cases considerably, but they share very similar experiences concerning the problems that inhibit the diversification potential of dryland communities. These agencies have gained a common understanding on the core set of factors that must be addressed for successful bio-

enterprise to be achieved (Oxfam-GB, 2010). These include; financial/investment capital, ownership, commercial partnerships, skills and continuous training in all technical and institutional areas, organisational and financial management skill building, the development of formal (often certification) systems to ensure traceability and transparency is maintained, market awareness and reliable up-to-date market data, value addition technologies that are suitable for women participation, methods of increasing group involvement in progressing businesses, access to credit facility and micro-banking (Wren, 2008a,b).

Recent studies in the region show marked changes in diversification strategies that increasingly engage the market, even in areas considered to be very remote (Holtzman, 1996; Kituyi, 1990; Little, 1992; Little *et al.*, 1999; Straight, 1997). Aklilu and Wekesa (2002) emphasise that to assess the benefits and costs of these changes, the relationship between income diversification and pastoral risk management should be examined. For example, whether, and to what degree, diversification has allowed herders to cope better with economic, political, and ecological risks (Little, *et al.*, 2000). Little, *et al.* (2000) propose that ‘what has hampered comparative studies of pastoral diversification is the absence of good longitudinal data; an agreed upon definition of what constitutes diversification among African herders; and the lack of conceptual frameworks to distil theory from the region’s excellent descriptive, ethnographic materials’. These constraints have resulted in numerous contradictory statements about the potential role(s) of diversification in minimizing risk among pastoral herders. For example, cultivation is seen by some as a viable risk management strategy (Campbell, 1984; Smith, 1998), while others view it as an unsustainable (even destructive) option (Hogg, 1986, 1988). Similar

inconsistencies are revealed in debates about market-oriented diversification in pastoral areas, with some condemning and others applauding the practice (Fratkin, 1991; Hogg, 1986; Holtzman, 1996; Little, 1992).

Few papers and reports have so far managed to thoroughly outline the main drivers and motivations that stimulate pastoral communities to take-up bio-enterprise initiatives and what their own expectations and perception of the reward they received from these income diversification and/or livelihood security activities. From assessing and evaluating the design, instigation, and implementation of bio-enterprise initiatives in Laikipia and Lower Samburu over the three year period, 2009 to 2011, this research study attempts to provide this information.

2.10 Conclusion. Main research gaps that shape this study

This review has shown that pastoralists are increasingly looking beyond livestock to other means of generating income in order to diversify their livelihoods and spread risk beyond a reliance on livestock, whether as wealthy pastoralists, as a strategy of accumulation or investment; or for the impoverished as a matter of survival. However, pastoralists are faced with many challenges when attempting diversification strategies, from lack of skills, resources, infrastructure to poor access to markets and affordable finance.

It is clear from the considerable research findings that diversification strategies are often a forced response to the dwindling opportunities for pastoral livelihoods. For a very large number of evicted, displaced and refugee former pastoralists there is little likelihood of

re-entering the pastoral production system (Ellis, 2000). As well as those driven by necessity, relatively well-off pastoral households may also diversify away from livestock-based activities as a mechanism for managing risk. These may include rural-urban enterprises that develop with town based branches of the family who are better positioned to exploit commercial business and trade opportunities (Nassef, *et al.*, 2009). For the very well-off, diversification is common-place, and some level of engagement with pastoral production is maintained, usually as absentee herd owners, as part of the wider portfolio of investments (Homewood, 2008).

From a wide search of literature on income diversification among East African pastoralists, it appears that there is significant amount of material that provides identification of these diversification types but there is very little investigative work documented that captures the comparative advantage of one diversification strategy over another and in relation to presiding conditions. This is especially notable when compared with the substantial analytical work on diversification conducted in agrarian regions of Africa (Reardon, 1997; Reardon *et al.*, 1994). Additionally, there are very few research papers that discuss the conditions for successful alternative or complimentary partial livelihood options, such as bio-enterprise development support. Research information is needed on a range of salient factors, such as; the application of business skills and acumen to development sector livelihood initiatives, the relevance and application of internationally recognised best practice and certification methodologies, the use of commercial partnerships in providing momentum, business acumen and value chain development skills to community based enterprises. While some of the literature reviewed shows that diversification into bio-enterprises can increase rural incomes, and

provide incentives for sustainable management of natural resources, more empirical studies are needed to provide further insights on the synergies and trade-offs between the various factors of business development based on natural plant products and sustainable natural resource management.

Chapter 3: Research Methods

3.1 Introduction

This Chapter explains the research concepts and approaches relevant to this study, defines their application to the research tasks required to address the objectives of the study, presents the methodological framework on which the fieldwork is to be based and introduces the informants. Techniques and analytical tools are described in the relevant sections.

3.2 Research concepts and approaches

3.2.1 The characteristics of quantitative and qualitative research methodologies

Quantitative research is used to develop and employ mathematical models, theories and/or hypotheses pertaining to phenomena. The process of measurement is central to quantitative research because it provides the fundamental connection between empirical observation and mathematical expression of quantitative relationships (Hopkins, 2000).

Quantitative research used in social sciences relates to empirical methods. Quantitative methods are research techniques that are used to gather quantitative data - information dealing with numbers and anything that is measurable. Statistics, tables and graphs are used to present results of these methods. Quantitative methods can include:

- Models, theories and hypotheses
- Methods for measurement
- Experimental control and manipulation of variables

- Collection of empirical data
- Modelling and analysis of data
- Evaluation of results

In social sciences qualitative research is a method of enquiry used to gather an in-depth understanding of human behaviour and the reasons that govern such behaviour (Hunter and Leahey, 2008). The qualitative method investigates the why and how of decision making, not just the what, where, and when. Hence, smaller but focused samples are more often needed, rather than large samples. Qualitative methods produce information only on the particular cases studied, and any more general conclusions are only hypotheses or informative guesses (Baxter and Jack, 2008). Quantitative methods can be used to verify which of such hypotheses are true. A focus group is a research term used where a group of people are asked about their perceptions, opinions, beliefs and attitudes. Questions are asked in an interactive group setting where participants are free to talk with other group members. This method has proved to be highly effective in this study.

To identify which approach is more relevant when designing research methodologies, it is useful to understand that qualitative methods are used for exploratory (i.e. hypothesis-generating) purposes or explaining puzzling quantitative results, while quantitative methods are used to test hypotheses – using precise measurement tools and applied mathematics (Slocum, *et al.*, 1995). By contrast, qualitative data is usually difficult to graph or display in mathematical terms. To this end both techniques need to be engaged in a research study of this kind, where the information is based on both the perception of

the sample groups and on physical data collection. Due to the timeframe of the research study a greater proportion of the results are based on qualitative data.

3.2.2 Case study approach

A case study is a research methodology common used in social science. Case study methods involve an in-depth, longitudinal examination of a single instance or event: a case. They provide a systematic way of looking at events, collecting data, analyzing information, and reporting the results. As a result the researcher may gain a sharpened understanding of why the instance happened as it did, and what might become important to look at more extensively in future research (George and Bennett, 2005). Case studies lend themselves to both generating and testing hypotheses. Case studies can be defined as a 'research strategy, an empirical inquiry that investigates a phenomenon within its real-life context' (Dul and Hak, 2008). Case study research means single and multiple case studies, can include quantitative evidence and relies on multiple sources of evidence and benefits from the prior development of theoretical propositions (Eisenhardt,1989). Case studies are based on a mixture of quantitative and qualitative evidence, as used in this study. Single-subject research provides the statistical framework for making inferences from quantitative case-study data (George and Bennett, 2005).

When selecting a case for a case study, researchers often use information-oriented sampling, as opposed to random sampling. This is because an average case is often not the richest in information. Extreme or atypical cases reveal more information because they activate more basic mechanisms and more actors in the situation studied. In addition, from both an understanding-oriented and an action-oriented perspective, it is often more

important to clarify the deeper causes behind a given problem and its consequences than to describe the symptoms of the problem and how frequently they occur (Baxter and Jack, 2008). For this research project the case study of the Bio-enterprise Development Programme located in the Samburu Heartland of Kenya is a central component for all the reasons cited above.

3.2.3 Participatory research methodologies

Participatory methods are ‘people centred’ approaches (Thomas-Slyter, 1995), they are interactive, iterative and open-ended (Guba and Lincoln, 1985). They allow people to establish their own analytical framework and to challenge top-down development strategies (Mukherjee, 1995). By recognizing that local people have knowledge and opinions, these methods were designed to enable people to express their needs and concerns (Chambers, 1992; Thomas-Slyter, 1995; Norton, 1998).

These approaches appeared in the 1970’s at a time when the balance sheet of 30 years of development did not seem to have had the expected results (Nelson and Wright, 1995; Thomas-Slyter, 1995). It was realised that top-down industrialization based development focusing on infrastructure and transfer of technology was often maladapted to local realities and to the cultures on which they were imposed (Nelson and Wright, 1995; Thomas-Slyter, 1995). Furthermore, ‘structural adjustment’ policies promoted by the ‘international agencies’ often result in the poor becoming poorer (Nelson and Wright, 1995). Questioning development policies invariably led to reconsiderations of conventional research on which decisions were based. For Chambers (1992), participatory methods emerged to replace what he refers to as ‘rural tourism’ where

researchers impose their worldview to respondents through questionnaire surveys, treating respondents as passive receptors and mostly getting distorted results.

It was also realised that, in order for development to be sustainable, projects had to target the right people (i.e. including women) and had to be owned by the communities (Chambers, 1997; Leach *et al.*, 1997; Thomas-Slayter, 1995). For that, communities and particular groups within these communities need to be empowered (Borrini-Feyerabend, 1998; Chambers, 1997; Nelson and Wright, 1995; Thomas-Slayter, 1995). These approaches emphasise the benefits of informal relationships, open-ended questions and visual tools (Chambers, 1992, 1998; Norton, 1998). They target specific groups: e.g, ethnic or religious minorities, the poor, women (Thoman-Slayter, 1995) and also provide quicker and more cost effective methods (Chambers, 1992).

Participatory methods acknowledge that communications are heterogeneous; they focus on and seek the differences relevant to the study group (Welbourn, 1991). In order to understand the complexities and the diversity within communities, purposive sampling is used to determine the purpose for which the informants are selected (Dunn and McMillan, 1991). However, it is argued that participatory methods were developed as an alternative to conversational approaches and their trustworthiness is sometimes questioned (Gill, 1991). The traditional criteria for testing the robustness of positivist research results are internal and external validity, reliability and objectivity (Bernard, 1995; Shoomaker Freudenberger, 1998) but for Pretty (1993) results of participatory methods should be tested according to alternative criteria. These could be credibility (for

internal validity), transferability (external validity), dependability (reliability) and conformability (objectivity) (Pretty, 1993).

Checking the validity of the results is an important part of participatory approaches and techniques such as cross-checking, triangulation, overlapping methods and replication are used (Chambers, 1992; Mikkelsen, 2005). Researchers and development agents are careful to document their activities and choices extensively, as usually it is participatory methods which have to prove their utility to policy matters rather than the conventional methods (Shoomaker Freudenberger, 1998). During fieldwork with participatory groups it is not uncommon to have the feeling that the information being delivered by the participants are what the participants presumed that the researcher would want to hear rather than describing the actual picture. However, the credibility of participatory methods is increasingly accepted. It has been shown that a scoring exercise purposely sampled can be more statistically robust than a simple random sample, a mapping exercise can represent 100% of the community and that monitoring through participatory methods is often both more cost-effective and more popular (Shoomaker Freudenberger, 1998). Moreover, the comparison of results collected by well-conducted questionnaire surveys and by participatory techniques showed that the latter were “more valid, less costly, more timely and more useful” (Chambers, 1992: 142).

The strengths of participatory approaches lie in “their qualitative explanatory powers” and it might be inappropriate to force these methods to fit the conventional positive model (Shoomaker Freudenberger, 1998). Good participatory methods require time and enthusiasm, which is difficult to sustain over large replication. The aim is to understand

the issues rather than extrapolate/aggregate/standardize. It has been recommended that more researchers should be open and flexible so as to choose a blend of the ‘most appropriate’ approaches (Mikkelsen, 2005). In this research study, participatory methods are used extensively in order to associate the explanatory powers and richness of people’s knowledge to the quantitative information collected.

3.3 Selecting the research strategy

3.3.1 Orientation and approach

The literature review supported the view that in order to support agro/pastoral communities to develop and improve their livelihoods the design of management and delivery systems must be supportive of the communities’ own visions and aspirations as well as the conservation needs and their needs. It also highlighted the lack of detailed analysis of the type of behavioural patterns that pastoral/agro-pastoral communities need to evolve in order to engage in and embrace alternative, complimentary or additional enterprises that are beneficial to livelihood and the environment. One major research gap that has been highlighted is that very few empirical studies have examined the performance and impact of diversified enterprises on pastoral/agro-pastoral livelihoods and the environment in the ASAL and also that there has been little evaluation of the potential for environmentally and socio-economically supportive bio-enterprises in the chosen study area. Therefore, this study is specifically designed to capture and analyse existing diversified enterprises being conducted in agro/pastoral communities, and evaluate the success of specifically orientated development funded support schemes. In order to do this the study focuses on the BDP, as a specific case study, selecting the

operating areas and agro/pastoral community groups within Kirisia and Mukogodo areas of the Samburu Heartlands. In order to demonstrate sound and successful methodology and frameworks to achieve viable and environmentally sustainable community driven bio-enterprises, this research project has captured the main facets of developing business in the ASAL, and assesses how collaborative support (ranches, lodges, existing bio-enterprises, CBOs and NGOs operating in this region) can aid the successful adoption and implementation of commercial bio-enterprise activities. The study has reviewed opportunities to take to scale proven methodologies for enhancing pastoral/agro-pastoral livelihoods, including social organisation, access to inputs, skills development and market access.

To collect the necessary data a combination of analytical methods was necessary to assess the impact of diversified 'bio-enterprise' on the livelihoods and overall socio-economic status of the sample community groups. Participatory methods were predominantly used in order to associate the exploratory powers and richness of the local people's knowledge to the quality and quantities of information collected. The environmental impact is also assessed using participatory methods to gauge the communities' awareness, views and deeper understanding of this aspect. Basic empirical quantitative methods, which include transects, GPS markers and aerial photography historical comparisons to measure the impact of bio-enterprise on botanical health and species richness were considered, but due to the relatively short time frame of the research study these methods were not adopted as they would not have provided reliable results.

The specific research methods that have been used for this study have included the following:

(i) **Comparative investigation of the impact of five bio-enterprise initiatives** in different locations within the Kenyan ASAL that have been subject to different establishment and management conditions is the subject of Chapter 5. Qualitative data was collected through purposive sampling and was gathered through semi-structured interviews held with key informants involved in the selected bio-enterprises to examine how these initiatives have affected their livelihoods, and with project staff and advisers of selected projects.

Informal discussions were held with project directors, staff and advisers, and with representatives of selected projects and government departments. Quantitative data was gained from secondary sources; available records such as participation in training, receipt of inputs, production per producer/supplier, sale volumes and prices, and returns to producers/suppliers, among others. Additional information was gathered from secondary data directly related to these bio-enterprise initiatives, and relevant studies on livelihoods and diversification in the ASAL were reviewed.

(ii) **An evaluation of a central case study, the Bio-enterprise Development Programme**, making comparisons of the perceptions of the programme participants from the start of their interaction with the programme with their perceptions after one year (see 3.3.3). The impact of the programme, presented in Chapter 6, was determined by comparing the results of the baseline study conducted with purposively selected groups in Kirisia and Mukogodo in November 2009 with the information gained from a follow-up

survey conducted in December 2010. The information collected for Chapter 7, to research the perceptions of the community members of the increased pressure on natural resources, and for Chapter 8 to research the major factors that have affected the selection and adoption of bio-enterprise by communities was gained from the baseline survey, focusing on five selected producer groups located in Kirisia. The data collection for Chapters 6, 7 and 8 was conducted using the same methods of focus group discussion, key informant interviews and household surveys. Quantitative data was gained from the BDP records such as participation in training, receipt of inputs, production per producer/supplier, sale volumes and prices, and returns to producers/suppliers, among others.

(iii) **Secondary data from three formal studies** conducted by the World Wildlife Fund-UK (WWF-UK), AWF and A. Powys for the BDP was sourced for Chapter 7 to provide comparative quantitative information on the increased pressure on natural resources to the qualitative information from the perceptions of the informants within the 5 selected groups in Kirisia,.

(iv) **Perception of the representatives of commercial, development and government sectors** operating in the target areas of the main case study was gained through informal interviews to provide additional qualitative data for Chapter 8 about their awareness of and views towards using bio-enterprise as a development tool.

3.3.2 Examination of the wider study setting to effectively and scientifically address the objectives and corresponding research questions raised in Chapter 1, this study

evaluates and examines the activities and methods of a diversity of livelihood approaches that have been adapted in the target region and assesses the level of their effectiveness in bringing about improvement in the livelihoods of the participating agro/pastoral communities.

A review of existing research was conducted in this and other relevant geographical areas in the ASAL. This study draws upon primary and secondary source information from livelihood initiatives in the Samburu Heartland, and from other similar initiatives relevant to this study that have been implemented within the Horn and East Africa region. This involved extensive research of existing data held within the development sector, by CBOs and by independent operators, mapping exercises and field studies. Information, evidence and experiences were gathered from the activities of the Bio-enterprise Development Programme, and from similar initiatives of other stakeholders/agencies engaged in pastoralism development support in this and other ASAL regions in Kenya.

Data collection involved:

- Meetings with key staff of the selected development agencies to discuss aspects of their livelihood development approaches
- Wide and intense literature review of livelihood and marketing studies from across the region
- Mapping of livelihoods activities in the region
- Criteria to identify the selection of economic activities that have positive livelihood and conservation impact and greatest potential for scale-up
- Detailed analysis of commercial and development stimulated economic activities

- Field visits to undertake analysis. The communities for this study have been determined by a baseline study conducted at the onset of the study.

This information has enriched the study in identifying the probable factors that influence the up-take and endurance of diversified livelihoods and the major influences to achieving positive social and environmental change resulting from diversified livelihoods.

3.3.3 Central case study - BDP

The focus of this study is to explore the impact of the Bio-enterprise Development Programme, operating in Samburu and Laikipia, which is designed to assist agro/pastoral communities to develop enterprises in plant-based natural products. This research framework has been designed to track the bio-enterprise impact on livelihoods and the environment. The emphasis of the study has been directed at the livelihood component and the communities' perceptions about the environment due to the lack of reliable physical environmental impact data that can be collected during the research study period (see 3.4). The sample groups selected for this study are those targeted by this programme.

The study evaluates the central assumption of the BDP; that:

- (i) A community owned bio-enterprise approach can improve the livelihoods of a large number of involved small-holder and pastoralist households within a short timeframe (less than three years);

(ii) Enabling resident and pastoral communities to access tangible incentives from enterprises, based on domestication and sustainable wild harvesting of indigenous plants encourages sustainable use of natural resources in the short to longer term;

(iii) By providing tangible incentives for communities to continue to value their natural resources and manage them into the future, these communities were in a stronger position to combat the effects of climate change and the impact of increasing human population in this region.

Specific data collection modalities were designed to gain research information on the following:

- Impact of the service provision (training, technical advice, demonstrations, extension, etc)
- Impact of the bio-enterprise activities on the social and economic status of the communities.
- Impact of the bio-enterprise activities on the natural resource status (perceptions of the informants).

3.3.4 Presentation of the results

To provide development and government sector agencies with key information about the effectiveness of this approach, as introduced in the rationale, the study collated and presented the information under two main focal areas: (i) Impact of bio-enterprise development on rural livelihoods, including food security; (ii) Ability of bio-enterprise development in providing tangible incentives for rural communities to manage their

natural resources positively for longer-term environmental gain. The dissertation comprises: the new substantiated research data gained, learning points, and evidence and reflection to assist in the elaboration of viable approaches for the development of livelihoods of communities in the ASAL areas of Africa, including operational and policy constraints. See 3.4.6 for the data entry and analysis methods that have been used.

3.3.5 Positionality and ethics

This study has been undertaken with a positivist approach, i.e., reporting what has been seen and understood, rather than a normative approach where the subject is judged as to what it should be rather than what it is. It is also assumed that any bias in reporting is spread out evenly across the sample (i.e., respondent's bias), and that the bias arising from the framing of the questions are not trivial (i.e., do not distort reality too much) and spreads out evenly across the sample.

The ethical steps used in this research study have been based on the informal consent of the participants to supply sensitive information to the study without any prejudice or fear. The objective of the study was briefed to them at the beginning of contact and consent is sought from the participants. This consent has been received by the verbal approval given to the researcher, Susan Wren, and/or to the enumerators at the start and completion of each interview. The second element is the right of the informant to withdraw at any time from the research process. The anonymity of the participations has been ensured and upheld, i.e., data cannot be traced to individuals. This was done by coding the data so that the specific participant cannot be identified by anyone else. Finally, all data collected for

this study has been kept secured and will be destroyed when no longer needed by this study.

3.4 Sampling strategy

3.4.1 Sample frame

Sample groups are located in two selected geographical areas, and are representative communities involved in bio-enterprise, such as honey and ethnobotanicals. Communities were sampled in the two target areas, Kirisia and Mukogodo. The sampling frame for communities took into consideration geographical location, rainfall, ecosystem characteristics, main livelihood activities, ethnic and socio-cultural backgrounds and land tenure. A number of these characteristics were interlinked. The aim was that the impact of the bio-enterprises was researched and evaluated in representative communities of different context (pastoralist communities and agro-pastoralists). This demonstrated the effectiveness of the bio-enterprise approaches according to the different factors taken into consideration. The monitoring process used interviews and participatory assessment to capture information about the change in social and governance power structures and relationships between the larger community and the marginalized groups. To support this approach, interviews with community support workers (employed by government, NGOs and CBOs) at the beginning and at the end of the research programme assisted the research of these parameters.

The selected areas and groups are geographically representative of communities located in the Kirisia and Mukogodo districts and of the diversity of livelihood zones identified in the area including employment/trading, agro-pastoralist and pastoralist zones. Data was

also gained from the BDP monitoring exercises, conducted through the direction of a monitoring and evaluation expert and BDP extension team. A pre-selection of the groups was made on the basis of interviews with development agents operating in the region, and specifically with the focus communities selected under this study. The committees and members of pre-selected groups were then interviewed (Table 1).

Table 3.1 List of groups selected and their location.

Group	Location
<i>Kirisia</i>	
BYRUG (Baawa Youth Resource Use Group)	Baawa
BECOG (Baawa Environmental and Conservation Group)	Baawa
Saanata	AngataNanyukie
Nkorien	Lodokejek
Nduat	Lporros/Milimani
<i>Mukogodo</i>	
Mbeke	Musul
Naiputaki	DolDol
Naisukut	Morupusi
Nadungoro/Tapapo	Lekuruki
Nkiloriti	Nkiloriti

3.4.2 Tools, sampling and validity in participatory methods

In this research, open-ended questions, informal interviews, semi-structured interviews and focus groups are the main tools used to gather information.

Non-random sampling: Non-random sampling methods were carried out, principally purposive sampling of households, where ‘typical’ households were selected following group interviews based on discussions with other households. The identification of key informants is an important part of the field work. The BDP, operating in the Samburu

Heartlands and targeting the same groups as those selected under this study, has a monitoring framework designed to track the programme's impact on livelihoods and the environment to ensure that it informs programme managers' and other stakeholders' decision making, and help create an adaptive process to the programme. The study harnessed this research opportunity by developing its research activities alongside the programme, standing apart from it and observing and assessing its impacts and outputs and utilising the data collected through the monitoring and evaluation activities for a more detailed analysis of the situation. The study needed to research communities that have diversified their livelihoods to other non-livestock enterprises in order to meet its objectives and effectively evaluate the central assumption.

Semi-structured interviews: Household surveys are designed to elicit information about the incomes and productivity and based on semi-structured interviews. There are two reasons for this: there is a need to ensure that the same underlying information is collected from each household; yet the questions needed to be sufficiently open-ended to allow informants to expand on responses if they wanted to. Households were not chosen at random because the different subgroups identified within the communities needed to be sampled (cf. Holland and Blackburn, 1998). Initially households were selected through the producer groups and representatives of the co-operatives that were present in the group interviews. Once a number of interviews had been carried out it became possible to select other households that were dependant on different sources of livelihood in order to provide a balance to the sampling. The questions used as the basis for the interviews are given in Appendix 1. The principal areas of interest were the family and the numbers of dependants, asset ownership, work, livelihood activities, and finally general questions of

socio-economic interest such as savings, education and the future security. This process also means that people's responses can be checked and triangulated to other discussions or interviews over the period of the fieldwork.

Informal and unstructured interviews took place through in-situ fieldwork as a process of building rapport and trust with the participants. Unstructured interviews were principally focused conversations during field activities when the informants are relaxed and able to discuss more freely. These sessions allowed informants to provide information that they felt necessary and helped overcome the criticism of them telling us what they thought we wanted to hear (Bernard, 1995).

Units of analysis

(i) Communities: A community is often described as a group of people who consciously share a function or moral link such as kinship, occupation, place of residence, religion and values' (Renard, 1991 cited in White *et al.*, 1994:15). The link that is used in this study to identify the communities of the study areas was the elders, community ranch councillors, co-operative leaders, government and NGO field officers. The elders represent each clan within the tribal groups and are indigenous leaders under traditional systems. Their understanding of the community functions, livelihoods and social dynamics however varies with their level of interest and the duration they have been assigned to the area.

(ii) Households: The study focuses on the socio-economic characteristics of households. The unit of analysis chosen to investigate the food security and livelihoods status of the

communities was the 'household'. It is an accessible and recognizable research unit, and is assumed to be the level at which resources are pooled and decisions are taken about consumption, production and investment (Corbett, 1988). However, the characteristics that a household can take differ in the remote pastoral communities where several families may share a household. A household is often referred to as the people living in one house in a collective manner. In Sub-Saharan Africa households often comprise extended family (Kabeer, 1991). The household is also a dynamic unit, its size can fluctuate due to migration of some of the members, putting the children in the care of more affluent relatives/families, betrothing daughters, is often used as a strategy to cope in times of crisis, such as prolonged drought (Devereux, 1993). In the study areas, therefore, it is felt appropriate to define households as 'people who live under the same roof and share food and resources'.

Selected data collection methods: Data collection methods have harnessed participatory sampling tools such as focus groups and key informant interviews as well as household surveys. Formal questionnaires have been used to produce results that can be compared between communities and analysed quantitatively. Participatory sampling tools were used as they are the quickest and the most accurate tools to build up an overall picture of the communities. The household surveys were designed on the basis of the discussions with key informants and/or focus groups in order to ensure survey questions are relevant, appropriate and effective. Both quantitative and qualitative methods are therefore used. Sampling tools included:

- Informal and unstructured interviews
- Household surveys through questionnaires

- Group interviews - focused group meetings, semi-structured interviews

Interviews were conducted with producer group representatives, community members, NGOs and government staff and commercial sector operators. Informant interview data has also been supplemented through the wide literature review conducted for this study and presented in Chapter 2. Comparative survey information was gained from the baseline survey conducted in November and December 2009 and a follow-on survey conducted in December 2010. Synergies have been sought with existing monitoring i.e. the Bio-enterprise Development Programme impact monitoring system, in which a set of relevant indicators have already been defined.

Questionnaire design: Questionnaires were used as the main tool for conducting the household survey. Cross-sectional data included the main bio-enterprise types and the major factors that affect the selection and adoption of the bio-enterprises by the communities. The information was gathered so that the relationship between the background and perceptions relevant to the research objective 2 (constraints and opportunities that affect the selection and adoption of bio-enterprise) could be made. The questionnaires (see Appendix 2.) targeted randomly selected group members (whether they were household-heads or not) and included a range of aspects including:

- General characteristics of the respondent and his/her household;
- Occupation (household level);
- Well-being using material style of life indicators (assets) and food security, based on coping strategies (household level);
- Understanding climate change and sustainability principles (individual level);

- Perception of skill level (individual level);
- Level of empowerment at the household level (individual level).

Focus group meetings: Focus group discussion was held with key informants and community leaders. Focus group discussions were gender based to ensure that women could express themselves freely. Traditionally women are not able to speak in front of men in a public setting. Although this is changing, it is appropriate to interview women separately on some of the topics to ensure that their points of view are captured in an uncompromised way.

Key informant interviews: Key informants were used to enrich the data collection process. These interviews have been held with women and traders in the case study areas and with BDP staff, as well as with representatives of selected projects, commercial sector operators, and staff members of ministries and government departments (such as the Kenya Forest Service (KFS), Kenya Wildlife Service (KWS) and district agriculture and livestock officers).

Collection of secondary data: Available secondary data has been reviewed that directly related to the geographical case study areas, the BDP activities and monitoring and evaluation data, the projects of other case studies that have been researched and presented in this thesis, and other reports with information relevant to the study. Literature (published and unpublished) on the forest and on related forest ecosystems have also been reviewed. Sources of secondary information has included; the government, NGOs operating in the target regions, research institutes, private ranches and landowners, and natural product sector companies.

Household survey: The purpose of the household survey was to complement and triangulate the information collected through more participatory methods. The household survey was used to investigate well-being as well as perception, knowledge and women's empowerment. The survey is designed on the basis of the key informant and focus group discussions to ensure that questions are appropriate and that local based criteria were used to measure well-being and empowerment.

3.4.3 Sampling and validity in environmental impact assessment methods

Socioeconomic impact assessment: To obtain information on household uses of the forest and their perspectives on its future management a survey using questionnaires was designed and completed with the main case study sample households. Meetings and interviews were used to assess what is seen by the communities as causing the pressure on natural resources in the target area and what effect it is having on their livelihoods and the environment. Data was also gathered during the interviews on the informants' perceptions of engaging in these activities and the main challenges and benefits of them to their lives and their natural environment. Collection of secondary data was conducted to evaluate what has been recorded as the main causes of increasing land-use pressure and the effects this is having on the lives of communities and the environment in the region.

3.4.4 Measuring change

Indicators to measure possible change and perception of change (of individuals and groups), e.g. how change has occurred since the start of the bio-enterprise in the different areas of impact. Change parameters are summarised in Table 3.3.

Table 3.3 Impact areas, indicators, methods of data collection and sampling used

Impact area	Indicators	Method	Sampling
Business dynamics and infrastructure	<ul style="list-style-type: none"> • Infrastructure • Access to market • Number of producers involved in production • Sales • Number of ha planted/harvested 	Key informant interviews, records of producer groups, observation	Purposive, all areas in which the bio-enterprise programme is being established
Livelihood impact community and household levels	<ul style="list-style-type: none"> • Relative income change • Occupational structure (diversity of activities) • Material style of life • Food security 	Household surveys of key informants, mapping	Random selection of households within representative communities
Social acceptability of the enterprise	Change in uptake of the bio-enterprise and reasons	Key informants	Purposive sampling of informants, all areas where BDP is active.
Specific impact on women and empowerment of marginalized groups	<ul style="list-style-type: none"> • Level of access to resources • Level of retention of resources • Level of participation in decision making at the household • Level of participation in decision making • Number of women involved • Number of other marginalized individuals 	Key informants and/or focus groups, individual interviews	Purposive sampling for key informants and focus groups,
Performance of extension services (change in social capital)	<ul style="list-style-type: none"> • Change in skills level (management) • Frequency of visit • Level of relevance, 	Key informant/focus groups	Random sampling of groups purposive for key informants in selected communities
Natural resource health	<ul style="list-style-type: none"> • Change in vegetation cover (by area) 	Aerial photos, satellite images, transects. Key informants.	Communities selected for key informants and locations for transects

3.4.5 Developing and using the questionnaires

For the evaluation of the BDP the questionnaires were developed with the input of D. Malleret-King (pers. comm.), who is a monitoring and evaluation expert and assigned to the BDP to provide this function. D. Malleret-King (pers. comm.) also guided the data collection process. A total of seven enumerators undertook the data collection following a training session and the cost of the enumeration was covered by the BDP as the information from the data collection could be utilised for the programme's monitoring and evaluation needs. The enumerators were trained in the following areas:

- Familiarise field based assistants with the programme and the purpose of the monitoring
- To incorporate their input in the questionnaires/interview guides
- To discuss interview methods and basic principles
- To discuss Samburu translations of key terms in the questionnaires and interview guides (Samburu being the most common language in the study area)
- To test the questionnaire/interview guides and amend as necessary.

More detailed data was provided by the enumerators from the purposive interviews of the groups and individuals. The household surveys were designed on the basis of the discussions with key informants and focus groups in order to ensure that the survey questions were relevant, appropriate and effective. Formal questionnaires were used to produce results that could be compared between communities and analysed quantitatively. Household surveys, focus group discussions and key informant interviews were carried out using pre-designed and pre-tested questionnaires. The interviews were conducted during the day in the informants' home or home environment, and the

enumerators filled in the questionnaires during the interview sessions. The statement of ethics was read to the informants at the start of the interviews by the enumerators and verbally confirmed and agreed at the end of the interviews between the enumerators and respondents. The interview guides for the focus group discussions and key informant interviews are presented in Appendix 2, the questionnaires for the household surveys are presented in Appendix 3, and the number of informants per method and topic is presented in Appendix 4.

3.4.6 Data analysis and statistical techniques

Data entry templates were designed and adapted as interviews were carried out. In the case of focus-group discussions and the key-informant interviews, data were entered and summarized by the facilitators. The quantitative data were analysed with Microsoft Excel for basic, descriptive statistics. Proxy indicators have been used in Chapter 5, 7 and Chapter 8 as an indirect measurement to approximate or represent a trend in the data. This has been used in the absence of a direct measurement. The statistical tests used were selected according to the questions that were to be addressed and the information that was to be achieved. Correlation analysis was used to measure the degree of relationship among two variables of interest. The parametric correlation, called Pearson's correlation has been used as the data has been derived from a population with normal distribution and equal variance. One-sample t testis used to compare the mean of one variable with a known or hypothesized value. In other words, the One-sample t test procedure tests whether the mean of a single variable differs from a specified constant. We have used the 95% or 99% confidence interval, i.e., p-value of 5% and 1%, respectively to determine the significance of the parameter.

Chapter 4. Description of the Study Area

4.1 Arid and Semi-arid Lands (ASAL)

4.1.1 General characteristics and classifications:

The ASAL or sub-humid zones are characterized by low erratic rainfall of up to 700mm per annum, periodic droughts and different associations of vegetative cover and soils.

Interannual rainfall varies from 50-100% in the arid zones of the world with averages of up to 350 mm. In the semi-arid zones, interannual rainfall varies from 20-50% with averages of up to 700 mm. Regarding livelihoods systems, in general, light pastoral use is possible in arid areas and rain-fed agriculture is usually not possible. In the semi-arid areas agricultural harvests are likely to be irregular, although grazing is satisfactory (Goodin and Northington, 1985).

In Africa, the ASAL zones located at the north of the equator, are bordered by Senegal, Upper Volta and Chad in the south; and Morocco, Algeria, Libya, and Egypt in the north. The zones extend southeast through Somalia and Northern Kenya, South of the equator the zones cover Lesotho, parts of the Cape, Northern Transvaal and Free State provinces of South Africa; Botswana; Namibia; and parts of Zimbabwe. The notion of desertification has been a contentious subject. The UNEP's Desertification Control Programme Activity Centre defined desertification as "*land degradation in arid, semi-arid and dry sub-humid areas resulting mainly from adverse human impact*", aggravated by the characteristics of dryland climates. Within the context of Agenda 21, desertification is defined as "*land degradation in arid, semi-arid and dry sub-humid*

areas resulting from climatic variations and human activities" (UNEP, 2001; UNCED, 1992). The difference between these definitions has to do with causation. In the former, human intervention is viewed as the central driving force in desertification; while the latter clearly identifies both human and climatic influences (Toulmin, 1993). Another notion linked to desertification is that of desert advance. Assertions have been made that the desert is advancing at approximately 5km a year. This has been contested by Hellden (2000) whose work in the Sudan shows no such advance. The majority of the population of the ASAL regions live at the basic subsistence level. These zones exhibit ecological constraints which set limits to nomadic pastoralism and settled agriculture, such as:

- Rainfall patterns that are inherently erratic;
- Rains which fall mostly as heavy showers and are lost to run-off;
- High rate of potential evapotranspiration;
- Scarcity of moisture reserves;
- Low organic matter levels

4.1.2 The ASAL in Eastern Africa:

The ASAL landscape in Eastern Africa is diverse, wide range of climatic and geographical features that give rise to habitats ranging from afro-montane to woodland, open savannah and aquatic. Local geological forces make this ecosystem distinctive, productive and diverse. Mountain forests discharge much of their annual rainfall to the plains below through underground aquifers that feed the many springs and swamps in the basins regions. The landscape rolls to low-lying areas of arid and semi-arid savannah. The land designations and primary land-use has diversified over the last fifty years, as indicated in Table 4.1. The increase in the area under cultivation has been facilitated by

changes in land tenure policy, both official and customary. The general trend has been towards land privatisation, and fragmentation of former communal holdings.

Table 4.1 Land Designation

Land designation	Primary land-use
<ul style="list-style-type: none"> • National Parks • Forest Reserves • Wildlife corridors • Communal lands • Agro-pastoral small private landholdings • Private ranches • Group ranches • Community Conservation Areas 	<ul style="list-style-type: none"> • Conservation/ tourism • Pastoral grazing • Small scale agriculture • Small areas of cultivation along perennial water courses and lake sides

For example, former agro-pastoralists in the lower parts of Mt. Kenya have been confined to family plots following land adjudication. This has resulted in bush clearing and a change in land use from animal grazing to cropping. Continuous cropping has led to signs of rapid soil degradation. The public land parcels set aside for grazing during adjudication are insufficient particularly during droughts (Smucker, 2002).

4.2 National setting – the ASAL of Kenya

Kenya's economy remains concentrated on a relatively narrow geographical and productive base, focused on an area which covers less than 20% of the country's land mass. The remaining 80% is known as the Arid and Semi-arid Lands, ASAL, Figure 4.1. There has been mounting pressures from the pastoral representatives and other supportive parties in the Kenyan government over the recent years concerning poor representation of this vast region at the national policy and governance levels, and this has intensified disenfranchisement of the ASAL from the prosperous highland.

MAP OF KENYA SHOWING ARID AND SEMI ARID DISTRICTS

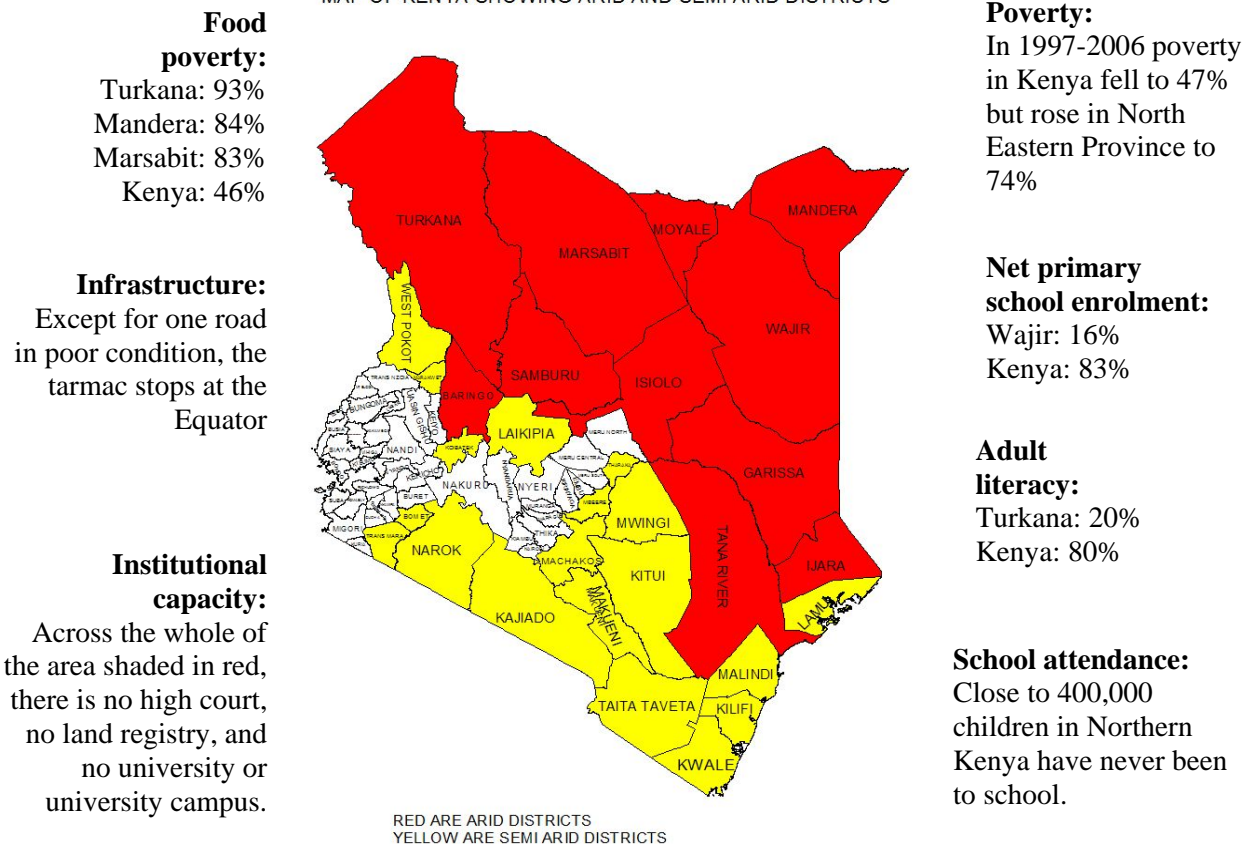


Figure 4.1 Regional inequalities in Kenya (compiled by the GoK 2007).

As Figure 4.1 clarifies, very small part of the national budget is directed to the ASAL and consequently there is a significant lack of infrastructural investment to-date and the social impacts of this neglect are clearly illustrated. Diminishing economic returns from traditional land-use practices are increasing the pressure on communities in arid lands to diversify their incomes. Growing environmental pressures are leading to the loss of biodiversity that has long sustained the livelihoods and culture of the people of these areas. The same processes are weakening their capacity to cope with and adapt to climate

change. There are currently few meaningful livelihood opportunities open to people outside nomadic pastoralism which itself can provide for only a proportion of the region's population in a sustainable way. Domestication and sustainable wild harvesting of indigenous plant products will help diversify, complement, and enhance traditional livestock-based livelihood systems (Wren and Powys, 2008; Powys and Duckworth, 2004). However, the link between producers and potential market outlets both in-country and internationally is particularly under-developed and there is a lack of well-organised commercial structures and trusted links between the various actors in the value-chain.

4.3 Description of the study region

4.3.1 Samburu Heartland

Location: The study is focused on the Samburu Heartland, a region located in the Rift Valley just north of the equator in the rain-shadow of Mt. Kenya. It encompasses parts of Mt. Kenya and Aberdare National Parks, Samburu, Buffalo Springs, and Shaba National Reserves, plus extensive ranch and communal lands in Laikipia, Samburu and parts of Isiolo district. The altitude of this vast area is between 2,500-4,000 feet (762-1,219 metres). The Samburu Heartland is just one part of Africa's ASAL. It is proposed that the findings of this study have direct and in-direct application to other ASAL regions.

Wildlife status: This is one of the very few areas in Kenya where wildlife numbers outside of protected parks have increased in recent years. The Heartland supports an important range of wildlife that includes: Kenya's second largest population of elephants; predators (lions, cheetah, hyena, wild dogs); an interesting collection of northern

savannah specialist species like reticulated giraffe and Somali ostrich; and endangered species such as Grevy's zebra and black rhino. The group ranches adjacent to the protected areas provide important seasonal grazing for the outflow of widely ranging species, and habitat for resident species.

Tourism: Together with the scenic landscape, the wildlife of the Samburu-Laikipia ecosystem is a major draw for tourists. The three key national reserves (Samburu, Buffalo Springs and Shaba) are some of the most visited protected areas in northern Kenya, representing increasingly significant financial returns to local residents as well as the local authorities. Tourism is an expanding sector, particularly in Laikipia which has become a destination in its own right; there are over 40 tourism operations active in Laikipia. Laikipia is developing as a self-drive tourism destination within private and community-owned and managed rangelands and forest reserves (Hampton and Weston, 2002). The types of facility ranges from small exclusive lodges and community-owned lodges, to tented camps, ranch houses, hotels, wild-camping, and adventure safaris. Eco-tourism has increased very steadily and to date there are three communities owned and managed lodges in the Mukogodo area. Laikipia is now host to five community-owned ecotourism enterprises (Malleret-King and Hatfield, 2009). It has been estimated that 399 households maintained a traditional pastoralist lifestyle whilst also benefiting from some eco-tourism income from private sector initiatives (Malleret-King, 2009). There are also several community owned and managed Eco-Tourist Lodges in Samburu, and a number of campsites established in the region, within Ol Maisor, Ngare Ndare Forest, Mukogodo Forest, Naibunga Conservancy, and Kaptuya Conservancy (Wren and Powys, 2008).

Principal land-uses: Principal land-uses include pastoralism, livestock ranching, tourism and sedentary agriculture. Crop destruction by elephants and conflicts with predators are a regular problem. Traditional lifestyles in many areas are adapting poorly to the influence of population pressure, government policy and changing socio-economic ambitions. Subsistence patterns of production and use are being gradually replaced by integration into the cash economy, particularly through livestock marketing, but the remoteness of the area and the lack of market linkages are key constraints to improving livestock-based livelihoods. Large ranches within the Samburu Heartland include; Suyian Ranch covers 17,753 hectares, Borana Ranch covers 14,000 hectares in the north-east adjacent to the Mukogodo forest; Lekuriki, Ethi, Arijjo, Sosian Ranch covers 9,600 hectares, Mugie Ranch covers 17,600 hectares and the Samburu Heartland Nature Conservancy covers 37,000 hectares along the Rift Valley Escarpment; and Ol Pejeta Conservancy Ol Pejeta Conservancy covers 30,000 hectares on the east the Samburu Heartland boundary (Wren and Powys, 2008). Figure 4.2.

People: The resident and transient populations of the Samburu Heartland are mainly pastoralists, with livelihoods based on cattle, sheep, goats and camels, and large private ranchers. The diverse communities include the Maasai, Kikuyu, and Meru, who live side by side with Europeans, Turkana, Samburu and Pokot, which demonstrate a rich mix of traditional culture and settler history.

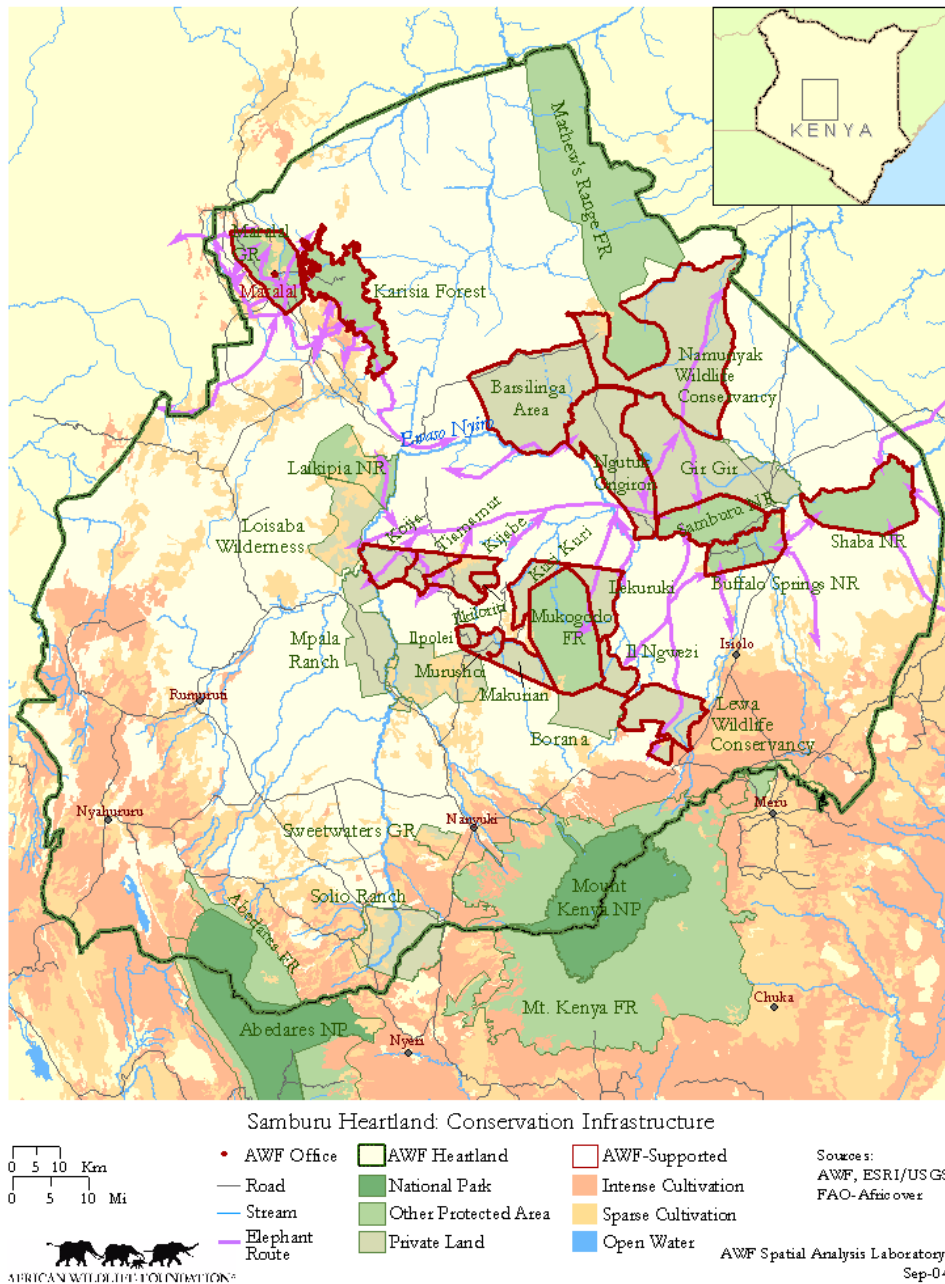


Figure 4.2 Samburu Heartland Conservation Context (compiled by AWF)

Prevailing socio-economic conditions in the Samburu Heartland: Currently an estimated 35 - 55% of the population in the Samburu Heartland live below the poverty line (0.6 USD per day) (GoK, 2005c) and 32% of the households in the target area identify food relief as a main source of food (Malleret-King and Hatfield, 2008). Due to population migration to marginal lands and the inappropriate land use practices of the growing population the demand for natural resources is increasing rapidly. The Samburu Heartland holds a diversity of land-uses and management practices, different settlement, population densities and ethnic communities. Traditional land utilisation no longer provides sufficient food and incomes for the vast majority of its resident and transitory population. Most communities do not maintain an adequate diet and living conditions in most years. It is also an important consideration that poverty is not just an issue of income, but also the denial of basic rights. Social exclusion, in the form of limited social and economic representation of women and minorities is manifested across Africa and the Samburu Heartland is no exception. As a result, one of the key aspects of private sector development is ensuring equal participation and integration of women and the minorities in economic and social development processes. There is no manufacturing industry and a very few formal commercial processing operations are active in the region. There are some small scale processing facilities for agricultural products in the towns and villages. There are a few private sector export marketing companies who are developing the supply of agricultural and natural products with small scale producers in the Samburu Heartland region. A few landowners have developed certified organic bio-enterprises which have opened up some new markets.

Property rights: Property rights are often viewed in the narrow sense of ownership – the right to completely and exclusively control a resource. However, as Meinzen-Dick *et al.*, (2005) explain, property rights are better understood as overlapping ‘bundles’ of rights, which can be grouped simply as user rights and control or decision making rights. According to most pastoral traditions wealth, land, water and pasture belong to God. As such they are available for use communally. However, today many parts of common property rights over natural resources are being replaced by individualization or privatization accompanied by strong government policies of land nationalisation and privatisation leading to the transformation of former property systems on rangelands (Kelly, 1992). All water points are communal property; all Masaai and Samburu people have access to well water after meeting the shared responsibilities and understanding with the well manager. A well owner cannot deny other clan members access to well water (Ibrahim, 2005). Rights may be conditioned by the amount, timing and other aspects of resource use and management. They are flexible and dynamic depending on factors such as social relations, the weather conditions and the resource/property concerned. There are multiple sources of property rights given by international treaties and law; state law; religious law and accepted religious practices; customary law, which can be formal written custom or living interpretations of custom. People draw upon a range of strategies for claiming and obtaining resources, depending on their knowledge and assessment of which best suit their situation (Flintan *et al.*, 2008).

The impact of national policies continue to create incentives for subdivision of community land, reflecting the limited value attached by policy makers to pastoralism, the high value attached to land ownership, and a lack of appreciation of the opportunities

for enhancing wildlife-based livelihoods as a core development strategy. Recent dialogue on policy development between review commissions and local communities has provided opportunities for community representatives to present their case for extensive land management - strengthening individual rights within the community tenure.

Critical Threats to the Samburu Heartland:

- Human-wildlife conflict
- Overgrazing (livestock)
- Loss of ecological integrity of protected areas
- Privatization/subdivision of communal land
- Sub-division of ranches
- Poaching
- Charcoal production
- Water diversions for irrigation
- Deforestation in the watershed
- Conversion to cropland

Recent conservation and development efforts: A wide array of conservation and development organizations work in the Samburu Heartlands. Conservation efforts have focused on forest conservation, rangeland rehabilitation, wildlife conservation through the establishment of conservancies/protected areas and water conservation and management. In addition to capacity building in relation to conservation and resource management, organizations have supported the development of community based

activities which create conservation incentives including: livestock marketing, beekeeping, micro finance, micro enterprise development and aloe based product development as a side benefit to aloe planting for land rehabilitation, development (Wren, 2007; Wren, 2008a,b; Wren, 2009; Wren and Powys, 2008).

The poor success of other conservation efforts, especially the establishment of micro enterprise development and commercial beekeeping are believed to be due to:

- Lack of business approach and expertise in conservation organizations
- Lack of coordination amongst conservation organizations
- Lack of governance/unity and trust among communities targeted

One of the challenges to-date has been the lack of collaboration between organizations and the way in which communities have captured opportunities from the lack of coordination. Organisations have carried out conflicting activities and duplicated each other's work. Again this created a situation where communities used this as leverage for organizations to compete against each other and feed local politics (Malleret-King, 2009). However, this situation has changed drastically in the last two years, where organizations have become increasingly transparent about their work and have this year created a sharing platform. Organisations such as the NRT, LWF and AWF work in conjunction with government departments in both Laikipia and Samburu. The organizations recognise that governance is the most important issues to tackle if land health is to be improved. The lack of long term success of some of these initiatives have been attributed to the lack of governance, unity and trust within communities and to the fact that communities in the area are used to receiving support from these organizations, with no obligations to

perform in return. This has created a situation where communities constantly look outside their communities and social environment for solutions rather than from amongst themselves (Malleret-King and Hatfield, 2008).

Bio-enterprise activity: There are several established community based initiatives in the Samburu Heartland. Some are achieving livelihood improvements and poverty alleviation to some degree. Some examples include: the Lulu Livelihoods programme which creates employment for some 36 women's groups (approximately 1,440 women in total) who harvest and press shea nuts for processing and packaging in Nanyuki using raw and semi-processed shea nut from Southern Sudan. Arbor Oils Ltd pays and Horizon Limited engage over a thousand people to collect seeds from the Cape Chestnut tree which occurs on the Abadares and Mt. Kenya's forest edges for use in bodycare products. SALTICK has organized self-help groups throughout a 12,000 km² area to sustainably harvest the gum arabic from *Acacia senegal* trees. This is sold mostly to international markets.

4.3.2 Samburu District

Study area environment: Samburu District lies between 0°40'N and 2°50' N of the equator and 36°20'E and 38°10'E of the Prime Meridian. It covers an area of 20,826km. Kirisia division covers an area of 2,446km². It lies at an altitude of 2,000m a.s.l. Before, and for a few years after, independence the area north of the equator was called the Northern Frontier District (NFD) which merges into the northern desert and slightly south of Lake Turkana in the Rift Valley Province of Kenya. Samburu district was once a large part of the NFD. Only government officials were allowed to enter and it was closed to

foreigners of both European and African descent. A special permit issued by the administration was required to enter the NFD. Even today Samburu land is still a remote area. There is also a game park in the area, Samburu National Reserve.

The soils in the region have formed as a result of volcanic activities in the formation of the Rift Valley. The erosion of lava fields has produced only a thin mantle of soil and the lava flow still remains as rough sheets with boulder sheets devoid of vegetation and useless for any imaginable agricultural activities in the future. The rainfall ranges from 500- 700 mm per annum and the driest months are January and February whilst the wettest month is April. The temperature varies with altitude from 24° –33°C. The rate of evaporation for the elevated areas such as Kirisia hills is estimated to be 1786mm (GOK, 2005a) which exceeds the average rainfall income. The Kirisia forest is on the Kirisia plateau on the Western side of Samburu district, formed as a result of lava flow. East of Suguta valley the district is characterized by repeated extensive high-level plateaus, which have been built by repeated lava-flows from the Rift Valley. The forest covering the Kirisia hills, alt. 2,000-2,200 m is of upland dry evergreen type of *Juniperus procera*, *Nuxia congesta*, *Olea europaea* ssp. *africana* and *Podocarpus falcatus* on much of the hills with *Cassipourea malosana*, *Croton megalocarpus* as co-dominant on the wetter slopes (Beentje, 1994). The understory species include *Teclea nobilis*, *Maytenus undata*, *Acokanthera schimperi* and *Mystroxyloa ethiopicum*. Most trees are clothed with epiphytic lichens, ferns and orchids on their stems and branches. Open rocky areas are dominated by variable mixtures of *Euclea divinorum*, *Carissa edulis*, *Rhus natalensis* and *Croton dichogamus* (Powys, 2009).

Land tenure: There are both gazetted and ungazetted forests in Samburu. The gazetted forests are Leroghi (92,000 ha), Mathews Range (94,000 ha), Ndoto Mountains (97,000 ha) and Mt. Nyiro (46,000 ha) (District Forest Office, Maralal). The ungazetted forests are under the group ranches where the land is held in trust by the Samburu County Council for a registered number of people who were based in the area. All land in the group ranch is shared by all registered members and a member is allowed to establish a manyatta or shamba or graze his livestock anywhere in the ranch. These ranches are managed by Group Ranch Committees which are made up of a number of elders. These committees work closely with the local Provincial Administration and other Government Departments. Kirisia Forest is located within the gazetted Leroghi Forest Reserve on the Leroghi Plateau. It was gazetted in 1936 and therefore protected by the Forest Act. It is administered through the District Forest Officer (DFO), Maralal. The day to day management of the forest is the responsibility of the resident Forester and the Forest Guards. However, most of the controls and protection is enforced through Forest Protection Committee of the group ranches.

As shown in Figure 4.3, the West, North and South sides of Kirisia forest are bordered by group ranch land with patches of individual/communal land. Commercial/public ranching areas dominate the East of the forest. The main land tenure system is communal whereby land is divided into group ranches and shared by all the registered members of the group ranch (Figure 4.3). The members can graze or establish a manyatta within the ranch. The ranches are managed by the Group Ranch Committees, which comprise of village elders and work closely with the Provincial Administration. The community relies on the forest mainly for dry season grazing and water, which makes the forest a very important part of

their daily lives. Generally the literacy level of the community is low (illustrated by the finding of the study).

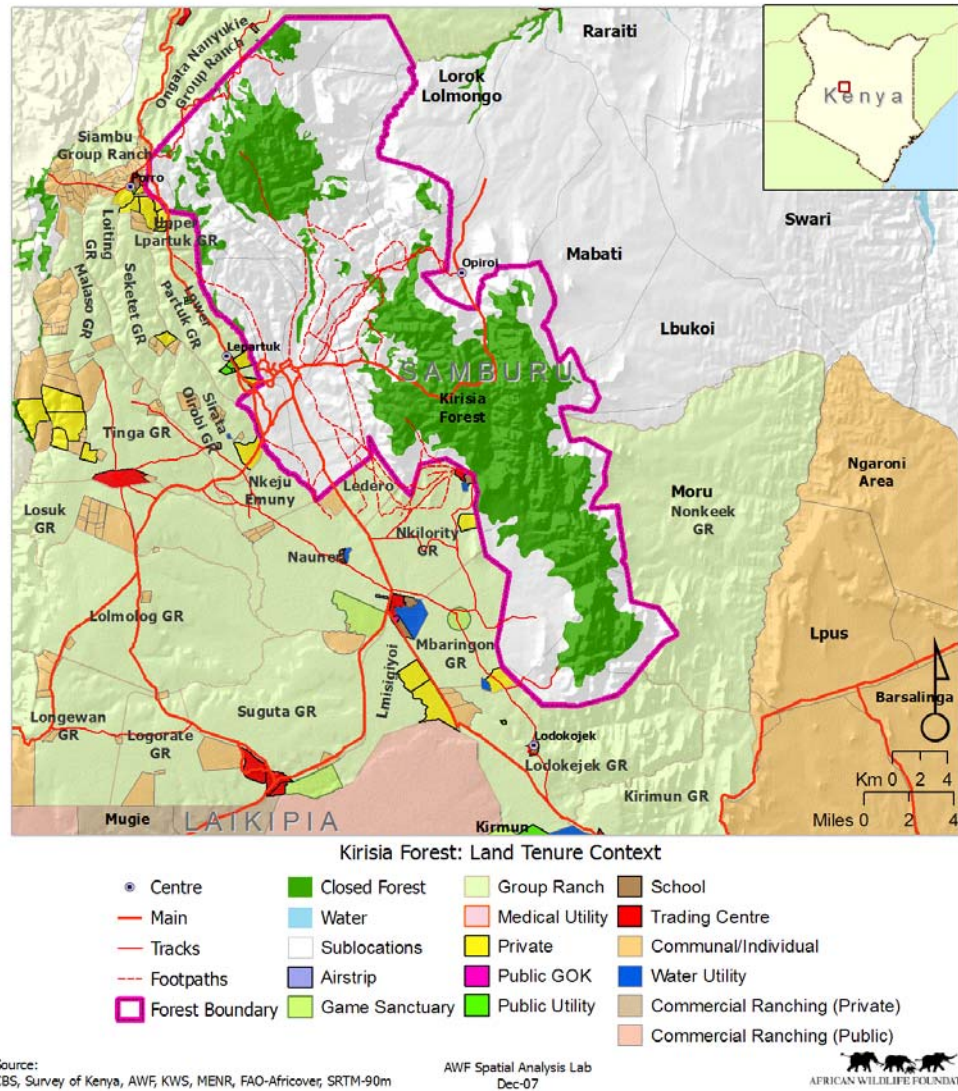


Figure 4.3 Kirisia Forest and surrounding land tenure (compiled by AWF)

Wildlife: The ecology, sparse human settlement and the Samburu culture favours wildlife which is an important feature found in several ranches neighbouring Kirisia forest. The forest and the adjacent rangelands are habitat to a wide variety of wild animals including elephant, buffalo, eland, giant forest hog, warthog, bush buck, water buck, lion, hyena, zebra, giraffe and baboons. There are also large numbers of reptiles, birds and insects including a great diversity of butterflies.

Land utilization by the local people: The area is predominantly occupied by the Samburu communities who are traditionally pastoralists. The pastoral production system operates through independent family units exploiting a common resource (grazing land, forest, water) through privately owned and managed herds. The rangelands, forest and water are viewed as communal property resources owned by defined group ranches of independent users. Thus land is owned communally but livestock individually. Of the 142,547 people in Samburu, just over 47,000 people live in Kirisia (1999 census)

Livelihood activities: Livelihood activities in the Kirisia areas are mainly livestock based. In 2005 livestock was considered as the most important source of income and farming was the most widespread second source of income (Malleret-King, 2006). Figure 4.4, produced by AWF, shows the extent of the areas around the Kirisia forest which are farmed. The GOK (2009) report states that there are 140,900 ha of arable land in the Samburu District 6,000 ha of which are cultivated (mostly in the Loroki and Kirisia Divisions targeted by the BDP). The most common crops are maize, pigeon peas, beans, potatoes, sukuma wiki (indigenous leaf vegetable). Group members also depend on employment, casual farm labour and small business to various degrees depending on

groups and areas. Although widespread beekeeping is considered as an activity of lesser importance, charcoal and wood based activities widespread in Nkorien and Mbaringon.

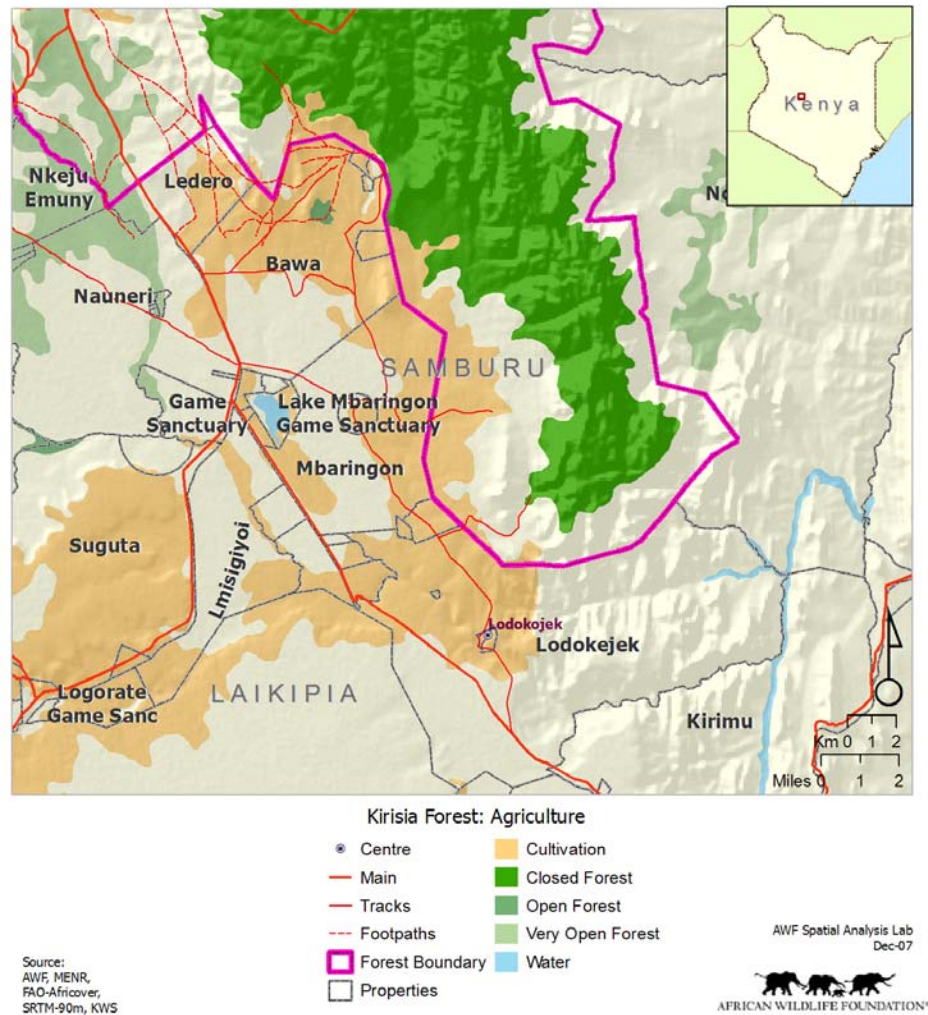


Figure 4.4 Livelihood systems around the Kirisia Forest (compiled by AWF)

Characteristics of the targeted group members: Most people around the Kirisia forest are of Samburu ethnic origin however it is estimated that the Ndorobo people account for only 1% of the population (Hendrickson, 1996). As many towns in Kenya, the town of Maralal brings people together. Samburu, Turkana and Kikuyu peoples have settled in and around Maralal seeking business or farming opportunities or have just sought safety. There is a long history of conflict in the area, including cattle rustling. Intensifying conflicts between Samburu and Pokot people in the West of the District has resulted in the migration of 25,000 people from Suguta Marmar to the outskirts of Maralal (GOK, 2009). Insecurity is increasing the pressure on natural resources and is contributing to the already high poverty rate. It was estimated 50% of people in the District of Samburu West, lived under the poverty line (GOK, 2005). The unreliable rains of 2008 to mid 2010 have contributed to increasing people's vulnerability. At the time of this assessment, households' distance to water points had increased significantly (average distance of 5 to 7 km instead of 3 to 5 km) as had food insecurity (GOK, 2009).

Samburu ethnic culture: The Samburu is an ethnic group in north central Kenya that are related to but distinct from the Maasai. The Samburu are semi-nomadic pastoralists who herd mainly cattle but also keep sheep, goats and camels. The name they use for themselves is *Lokop* or *Loikop*, a term which may have a variety of meanings which Samburu themselves do not agree on. Many assert that it refers to them as "owners of the land" ("lo" refers to ownership, "nkop" is land) though others present a very different interpretation of the term. The Samburu speak the Samburu language although they are part of the Maa-speaking people as are the Maasai. About 95% of the words of both languages are the same. The name 'Samburu' is also of Maasai origin and is derived from

the word 'Samburr' which is a leather bag used by the Samburu to carry a variety of things. Linguists have debated the distinction between the Samburu and Maasai languages for decades (www.wikipedia.org accessed 12th April 2010). It is unclear when Samburu became a distinct ethnic identity. As is common many places around the world, ethnic identities became fixed and defined at the point of colonial contact. 19th century European travellers often referred to Samburu as "Burkineji" (people of the white goats), and there are many interconnections with other neighbouring ethnic groups. Other indigenous people in the region are of Rendille, Turkana and Borana ethnicity (Pavitt, 2001). Most peoples in the Samburu are semi-nomadic pastoralists whose lives revolve around their cows, sheep, goats, and camels. Milk is their main-stay although sometimes it is mixed with blood. Meat is only eaten on special occasions. Soups made from roots and barks are most commonly eaten on a daily basis with vegetables if living in an area where they can be grown.

The Samburu developed from one of the later Nilotic migrations from the Sudan, as part of the Plains Nilotic movement. The broader grouping of the Maa-speaking people continued moving south, possibly under the pressure of the Borana expansion into their plains. Maa-speaking peoples have lived and fought from Mt. Elgon to Malindi and down the Rift Valley into Tanzania. The Samburu are in an early settlement area of the Maa group, who have retained a more purely nomadic lifestyle until recently when they have also begun farming.

Typically between five and ten families set up encampments for five weeks and then move on to new pastures. Adult men care for the grazing cattle which are the major source of livelihood. Women are in charge of maintaining the portable huts, milking cows, obtaining water and gathering firewood. Their houses are of plastered mud or hides and grass mats stretched over a frame of poles. A fence of thorns surrounds each family's cattle yard and huts. As with the Maasai, the Samburu settlement called a *nkang* or *manyatta* may consist of only one family, composed of a man and his wife/wives. Each woman has her own house, which she builds out of local materials, such as sticks, mud and cow dung. Large ritual settlements, known as *lorora* may consist of 20 or more families. One of the groups in the third Survivor was named "Samburu" in honour of the real Samburu, the other being "Boran" after Borana.

The society of the Samburu peoples has for so long been organized around cattle and warfare (for defence and for raiding others) that they find it hard to change to a more limited lifestyle. The purported benefits of modern life are often undesirable to the Samburu. They remain much more traditional in life and attitude than their Maasai cousins.

4.3.3 Mukogodo District

Study area environment: Mukogodo is a division of the Laikipia District of the Rift Valley Province. Laikipia District is a vast plateau to the north west of Mount Kenya, in Kenya's Rift Valley Province. It spans an area of over 9,500km², and forms part of the 40,000km² Ewaso ecosystem. The Laikipia plains stretch from the Great Rift Valley to the escarpments which descend into Northern Frontier District. Laikipia is highly bio-diverse and comprises 10 forests, a network of 25 rivers: the main one being the Ewaso

Nyiro River with its source on the slopes of Mount Kenya this river is the lifeline of Samburu land. The annual mean rainfall for the area is 600 mm. At the centre of the Mukogodo landscape is the Mukogodo Forest Reserve (30,189 hectares). It is located on the eastern side of the District (figure 4.5), and covers 302 km². Mukogodo forest is considered as the largest remaining and most intact dry montane forest area in Kenya (Ochieng, 1975).

The forest area was originally demarcated in 1937 by the colonial government as Crown forest and the people living inside granted rights of access. The Mukogodo Forest is one of the rare indigenous forests to have survived the process of 'civilisation' and non-coordinated 'human settlement' efforts. The forest is rich in plants and wildlife. The forest is a key dry season grazing areas of the communities in the landscape who depend for the majority mostly on livestock for their livelihoods (80% on average for Lekuruki). The forest was gazetted as a National Reserve in 1964, and has been under the responsibility of the Forest Department (now Kenya Forest Service) through the District Forest Officer. Although the Forest Act of 2005 calls for more involvement of surrounding communities in the management of forests, communities around the Mukogodo forests have cared for it for decades. The forest was informally divided into four areas and four group ranches, namely Il N'gwesi, Lekurruki, Makurian and Kuri Kuri were then established to take the responsibility for the management of each portion (Malleret-King and Hatfield, 2008). This is a unique phenomenon in Kenya (Kihara, 2003). The landscape outside of the reserve is dominated with perennial grass and shrub (*Acacia mellifera*). However large areas of land have been cleared of trees and are now eroded from overgrazing and bare

areas of ground with encroaching *Opuntia* species have expanded significantly over recent years (Malleret-King, 2009).

Land Tenure: After being annexed by the British and brought under “crown land” at the beginning of the last century, the Mukogodo area was then made the Dorobo Reserve in 1936 (Malleret-King and Hatfield, 2008). Thirty years later, in an attempt to develop the commercial potential of the area, the land was surveyed and divided into 13 group ranches. Group Ranches are currently the main land tenure type system in Mukogodo (Figure 4.5). Group Ranches are a specific land tenure system developed in Kenya’s arid and semi arid lands where nomadic pastoralists prevailed. Group Ranches comprise land held in trust on behalf of the members of the Group Ranch with formal legal basis from the Group Representative Act, Cap 287, 1968. The land belongs communally to the group of registered people as recognised by customary law. Each group selects some of its members to register as trustees of the land. These trustees can allocate portions of the land for specific uses or lease the land in the interest of the group (Wayumba, 2004). Selected people form a Group Ranch Committee. The existing land policy and land law are currently (2010-2011) undergoing a review process which may affect the Group Ranch tenure, and in turn have impacts on the initiated process.

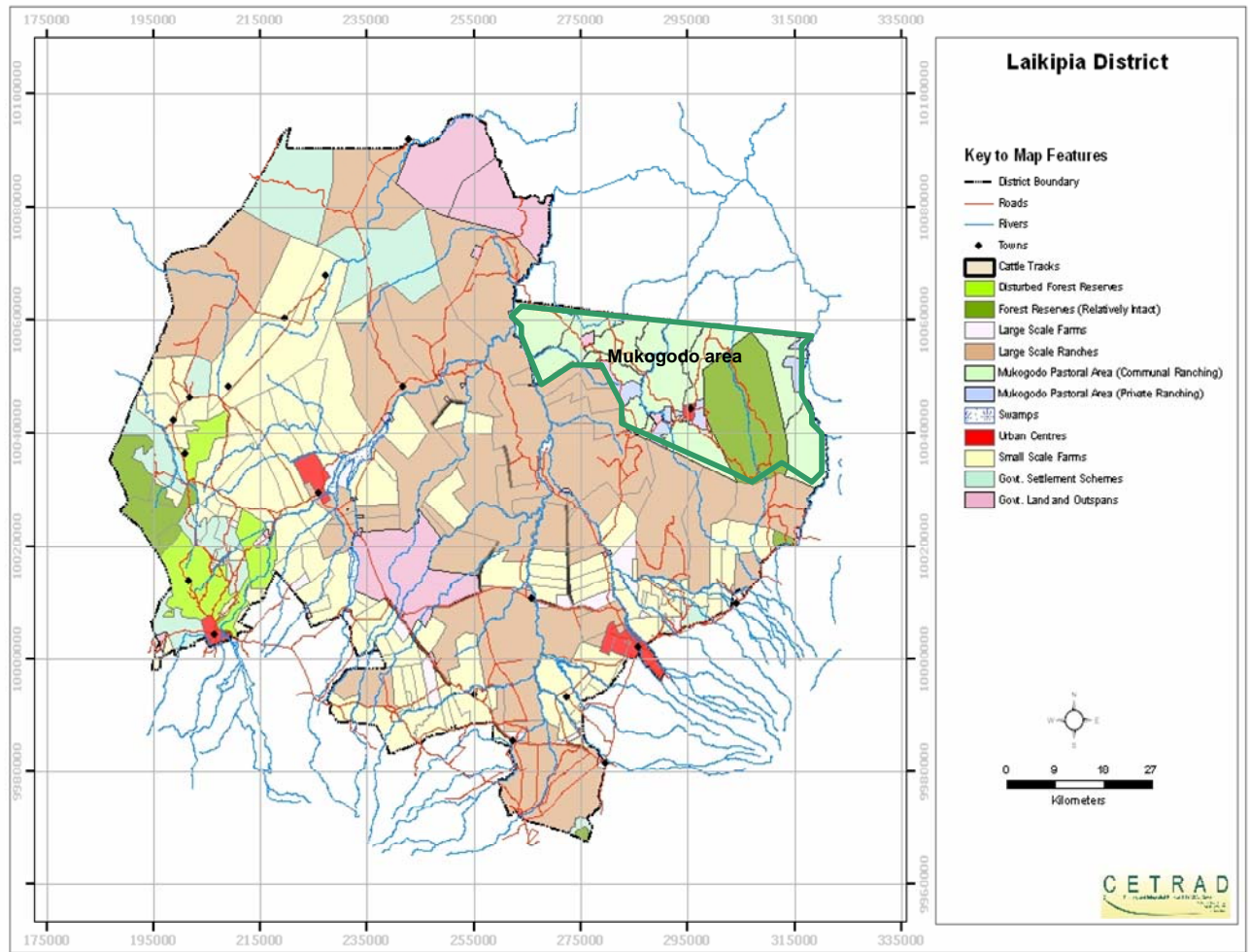


Figure 4.5 Land tenure/Land use map of Laikipia and Mukogodo area (compiled by CETRAD)

The idea behind setting up Group Ranches was to transform pastoralists into beef ranchers, with the assumption that this would be economically more profitable and improve livelihood.

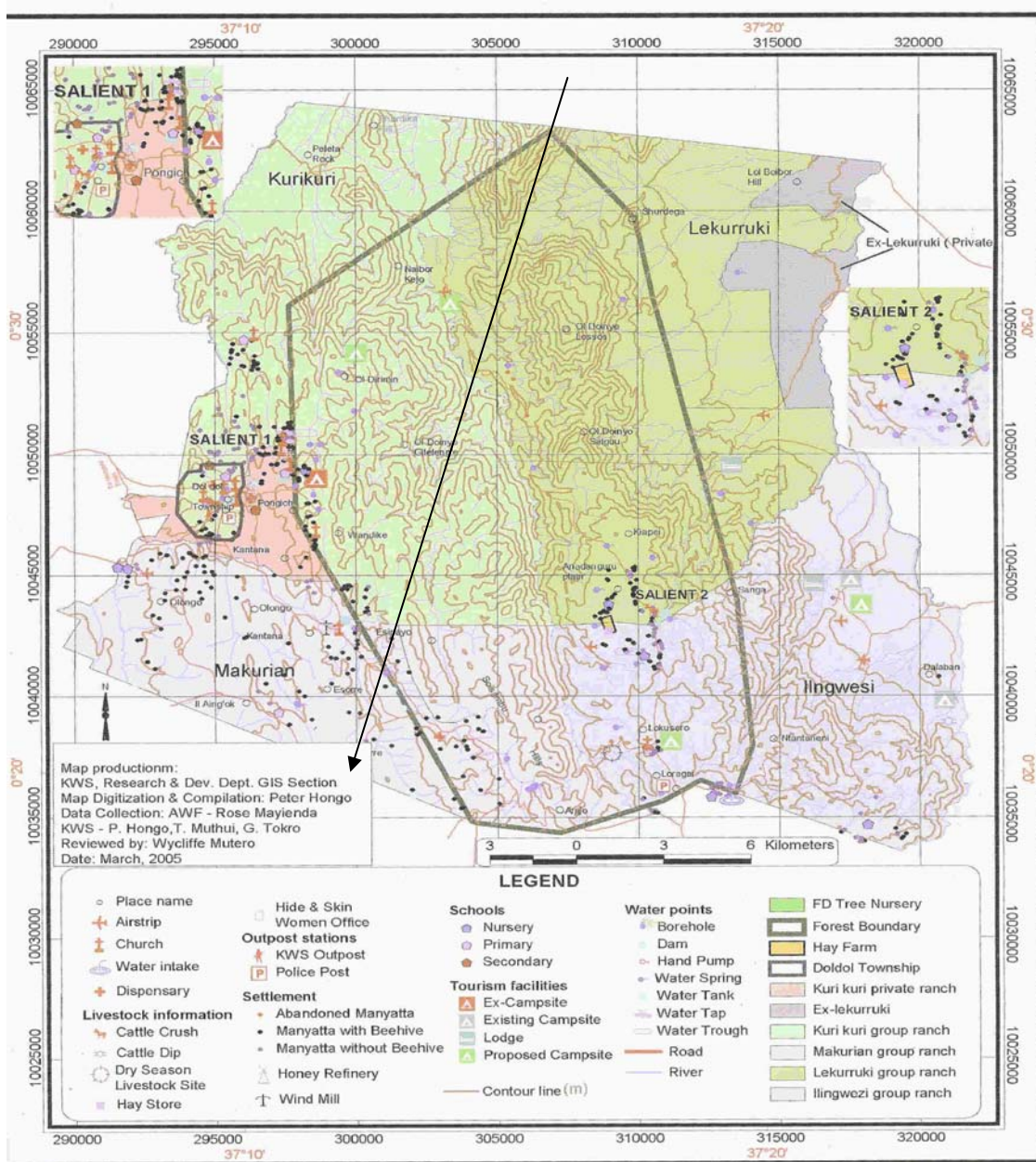


Figure 4.6 Mukogodo forest and group ranch divisions (compiled by FORREMS/KEFRI, 2006)

Individuals registered as Group Ranch members of have a claim on the land held in trust. Registries are updated regularly usually during a Group Ranch AGM. Registration rules vary from one Group Ranch to the next, but are generally similar. Individuals often qualify on the basis that they are a man of above 18, or an unmarried women.

Mukogodo is a historically insecure area where cattle rustling and wildlife poaching were both frequent. Since the development of the community conservation project, security has been greatly enhanced for both wildlife and people. Since 1996, when there was a great deal of insecurity in Lekurruki due to constant invasion by neighbouring pastoralist communities and theft of livestock, the majority of the community moved off their land and are now settled illegally in the Mukogodo forest reserve, approximately nine km from the Group Ranch. However with the inception of the conservation and tourism project in 2000, including recruitment of trained and equipped security scouts and a shared radio network, security on both group ranches has improved hugely and the conflict issues have been largely resolved. As a result, the community of Lekurruki has moved back onto their land (Malleret-King and Hatfield, 2008).

Wildlife: Mukogodo, as a district of Laikipia, within the Ewaso ecosystem, carries all of the wildlife diversity of Laikipia. Laikipia hosts the highest populations of endangered species, such as black rhino (half of Kenya's total population), Grevy's zebra (70% of the world's population), reticulated giraffe, and the only viable population of Lelwel hartebeest in the country, as well as Africa's only expanding population of wild dog. Laikipia's biodiversity is globally unique. Eco-tourism has been built over the last decade based on the beauty of the landscape and the diversity of the wildlife in the Mukogodo district.

Land utilization by the local people: The Mukogodo-Maasai have only a recent history of Pastoralism. They can be described as transhumant pastoralists or semi-sedentary pastoralists (Blench, 2001) where livestock migrates when grazing is at a low, led by a few members of the households (usually the young warriors) whilst the rest of the family

stays behind with some of the small stock (for milk and cash). Figure 4.7 presents the grazing patterns in the Mukogodo areas and shows that the movement of livestock is relatively contained. It was found that in the Mukogodo area, group ranches generally have grass available for cattle from 1 to 3 months after the rains (depending on rainfall). Grass availability is longest in Il Ngwesi where the well-enforced conservation area is used for dry-season grazing. Schools, dispensaries and the presence of religious centres have contributed to the relative sedentarisation of pastoralists. As land availability has reduced in the last decades and following the division of communal lands into group ranches in the 1970s and 1980s livestock migration has been constrained. In the dry season when no grazing remains livestock from Mukogodo migrate. Cattle are taken to the forest, abandoned land, or to small plots bought by livestock owners in areas where rainfall patterns differ from Mukogodo. Livestock owners also rent grazing from private ranches.

Livelihood activities: Apart from livestock, small-scale food production is now becoming common practice as more of the clan members take up residence in the district, and most clans have small areas set aside for this agro-pastoral activity (Malleret-King, 2006). Land degradation has expanded as pastoralists' governance systems have eroded through government policies, modernization (westernized education), change in land tenure, increased population, lack of cohesion at the group ranch level, and decreased access to land.. The pastoralist system relies on livestock movement to maintain land productivity. High population densities and change in land tenure have constrained livestock movement, and management systems have not adapted to these new challenges. As a result land has become increasingly bare, less productive and eroded.

Other livelihood activities include: subsistence farming along rivers, commercial agriculture (particularly wheat) in the group ranches, tourism, employment, alcohol brewing, beading, trade of food-stuff and hides and skins, beekeeping and charcoal burning. Charcoal burning is widespread on the western side of Mukogodo (Malleret-King and Hatfield, 2008).

Characteristics of the targeted group members: Most people around the Kirisia forest are of Samburu ethnic origin and the characteristics of the groups in the Mukogodo region are similar to those of Kirisia. All of the groups are headed by men, and all are of Maasai ethnic origin. The communities are traditional in structure and governance systems. These pastoralists rely on their livestock for their social, economic and cultural life. As land is increasingly degraded, people rely more and more on small stock (sheep and goats, rather than cattle) for their livelihoods, especially on the group ranches in the western part of the area. Beekeeping is widespread around the forest; however numerous bee projects have been established in the area with little success. The educational levels have increased over this current generation since the establishment of a school on the West of Mukogodo (Malleret-King, 2009).

Mukogodo-Maasai ethnic culture: The Mukogodo area was originally populated by Cushitic-speaking hunter-gatherers, whose culture revolved around beekeeping, forest and rock shelters (Cronk, 2002). The Yiaku (often described as *Yaaku*, or incorrectly *Mukogodo-Maasai*) is the traditional name of the people living in the Mukogodo region. Former hunter-gatherers and bee-keepers, the Yaaku had partly assimilated to the pastoralist culture of the Maasai in the first half of the twentieth century, although some

still keep bees. The reason for this transition is mostly one of social prestige. The Maasai look down upon hunter-gatherer peoples, calling them Dorobo ('the ones without cattle'), and many Yaaku for a certain time considered the Maasai culture superior to their own. In the early 20th century (1925's to 1936's) these hunter gatherers were absorbed by Maa-speaking pastoralist tribes (Cronk, 2002) through conflict, intermarriages, and as a result of the British Colonial policies. Some think that this recent history may explain some of the issues that have arisen to date in relation to lack of community cohesiveness, poor governance and land management practices (Malleret-King, 2009). The Maasai variant spoken today is called Mukogodo-Maasai, with some Yaaku words found in parts of the vocabulary (Sankan, 1971). Even today the Mukogodo-Maasai follow the Maasai age-grade customs, the moranship (warrior age-grade) and culture organised around cattle-herding and occasional raiding of their neighbours. They are more traditional than the Maasai, though like the Maasai, changing conditions are causing them to make a transition to settled living and cultivation of maize (Pavitt, 2001). Maasai practice polygamous marriage, and a man may have many wives, on average between 3 and 12. The traditional Maasai settlement is known as a *manyatta*. Settlements generally comprise two or three families and are housed in separate dwellings built in a circle surrounded by a thorn-bush fence.

Chapter 5. Costs and benefits of relevant case studies

This chapter is published in the European Journal of Development Research. Special edition, "New avenues for pastoral development in sub-Saharan Africa". (Wren and Speranza 2010).

5.1 Introduction and methodology

5.1.1 Context and scope of this chapter

As referred to in previous chapters, deepening poverty and loss of natural resources in the ASAL highlights the need not only to improve and diversify the livelihoods of their inhabitants in a way that reduces poverty in the long term but also the need to use the natural resources in a more sustainable manner. In direct response to this point and to address objective 1, this chapter examines and identifies the factors of failure and success of existing livelihood diversification initiatives in the ASALs of Kenya, and to provide insights for improving rural enterprise development initiatives. Such insights are important because of the challenging socio-economic and bio-physical conditions that generally limit diversification options remain a source of concern for development, humanitarian and environmental agencies as well as for African governments and African rural society at large (Wren, 2008a).

In order to fully understand and find reliable solutions to the multiple challenges to diversifying livelihoods in the ASALs, it is important to assess the conditions and devise pragmatic approaches that facilitate agro-pastoral/pastoral communities to engage in enterprises that are environmentally, socially and economically sustainable. This chapter

contributes to this knowledge by analysing four case studies of bio-enterprise development initiatives and their impacts. The determining factors for success or failure of the case studies and the implications of these findings for designing and implementing bio-enterprise initiatives are evaluated and explained.

This chapter signifies that despite the limited livelihood diversification options in the ASALs, bio-enterprise niches can contribute to increased incomes and sustainable management of natural resources, if certain factors are taken into consideration. Such factors for successful bio-enterprise development include financial/investment capital, ownership, commercial partnerships, skills and continuous training in all technical areas, organisational and financial management skill building and certification systems and third party involvement to ensure traceability and transparency is maintained. Other factors include market awareness and information, value addition technologies that are suitable for women's participation, methods of increasing group involvement in progressing businesses, access to credit facility and micro-banking.

The chapter also discusses the conditions necessary for successful bio-enterprise development. Agro/pastoral communities require training to acquire skills in business development, guidance in adhering to internationally recognised and accredited sustainable wild collection standards, establishment of long term trading relationships with buyers, plus active and well focused extension facilities. Notwithstanding this, development agencies, NGOs and government actors require capacity development in these areas. While this chapter shows that diversification into bio-enterprises can increase rural incomes and provide incentives for sustainable management of natural resources, more empirical studies are needed to provide further insights on the synergies and trade-

offs between the various factors of business development with sustainable natural resources management.

5.1.2 Methods of evaluating the different bio-enterprise initiatives

The data used for this chapter are derived from an extensive research and consultation exercise conducted during this research study. Data has been collected from a representative range of existing bio-enterprise initiatives, selected through purposive sampling, to evaluate their contributions to improving livelihoods among the participating pastoral and agro-pastoral communities.

The reasons for selecting these four case studies are because they: (i) have commercial orientation, (ii) are community based initiatives, (iii) are based on indigenous natural products, (iv) include different ethnic groups and geographical locations, and (v) have been established through external development sector support. The four case studies include:

Case Study 1: Mwingi Organic Beekeepers' Association, Mwingi, Kenya

Case Study 2: Rumuruti Aloe Women's Group, Laikipia, Kenya

Case Study 3: MakaaZingira Eco-Charcoal, Kilifi, Kenya

Case Study 4: Baringo Aloe Enterprise Development, Kenya.

Figure 5.1 shows the locations of the case studies.

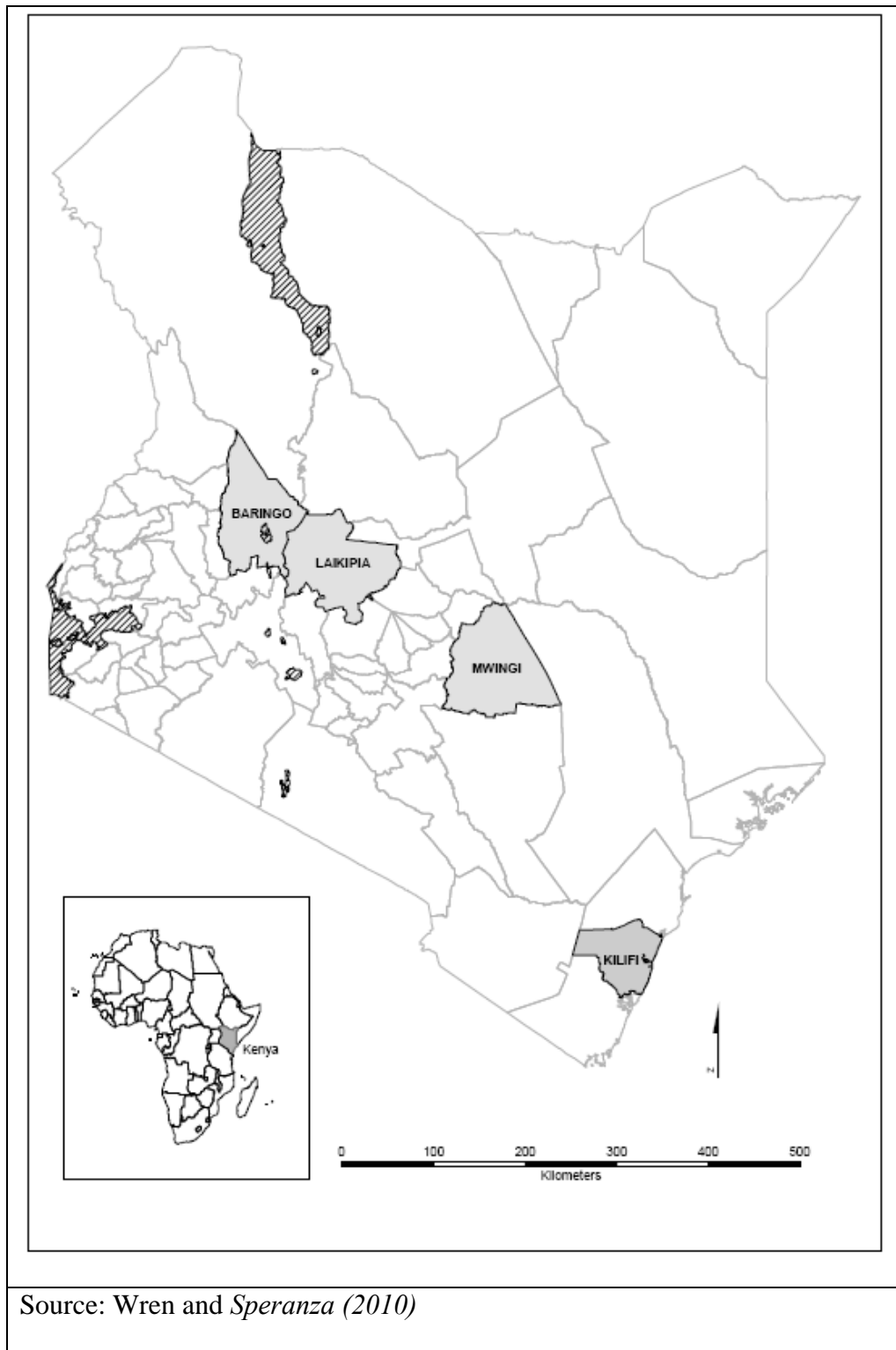


Figure 5.1 Districts in Kenya where the case studies are located

Both qualitative and quantitative data were collected through interviews, focus groups discussions and informal discussions with practitioners and researchers, and through the study of reports. Semi-structured interviews were conducted with the actors involved in the selected bio-enterprises to examine how these developments have affected their livelihoods. Focus group discussions were conducted with key informants, community members and leaders. Meetings and interviews were also held with project directors, staff and advisers, and with representatives of selected projects and government departments.

Available secondary data directly related to these bio-enterprise initiatives and relevant studies on livelihoods and diversification in the ASAL were reviewed. Quantitative data was gained from available records such as participation in training, receipt of inputs, production per producer/supplier, sale volumes and prices, and returns to producers/suppliers, among others. Records were available at group level and project actors' level.

In the following, the selected case studies of bio-enterprise initiatives are presented in terms of:

- (i) project organisation and skills development;
- (ii) investments, production and market linkages;
- (iii) incomes earned and potential trickle-down effects;
- (iv) their contribution to environmental conservation.

5.2 Case studies of the bio-enterprise initiatives in Kenya

Although the natural products sector in the ASALs is still at its infancy, a number of bio-enterprises operate in the region, but mostly at a small scale with low levels of investment. The lack of organisation of these enterprises and low operational gearing has prevented sufficient economies of scale to develop. Most producers are limited to informal sales to local traders and domestic retail within the villages. Lack of capital investment, business and technical capacity has prevented producer groups from achieving sufficient supply and quality to reach more attractive markets. Where communities are engaged in wild harvesting of indigenous products, low price returns, lack of market information and linkages mean that natural resources are worth very little in commercial terms, and provide very little incentive that promotes sustainability. Predominantly, poor quality raw materials are sold to intermediaries at considerably low prices, resulting in little social and economic benefit.

5.2.1 Case study 1: *Mwingi Organic Beekeepers Association, Mwingi, Kenya*

Project organisation and skills development: Over the past few years, the International Centre for Insect Physiology and Ecology (ICIPE) has pioneered a set of rural community livelihood support mechanisms that are based on the sustainable use of natural forest products, primarily in partnership with the Global Environmental Fund (GEF). These have demonstrated the role of commercial insect production in strengthening the management of protected areas. Tangible incentives from honey and wild silk enterprises have stimulated community collaboration in forest management. The approach has been based on close integration of investments into productive rural

infrastructure, forest resources and human and institutional capital, apiculture and sericulture. To demonstrate this approach GEF supported a series of projects. Mwingi, a semi-arid district, was selected by ICIPE as one of the initial project locations due to its rich bio-diversity and long tradition in bee-keeping by resident agro-pastoral communities. Mwingi District Joint Self Help Group was registered in 1995. With support from ICIPE, the group started the project with 6 bee-keeping groups of 180 members. Numbers have since grown; there are now 47 groups with over 2000 members.

The project approach included three major areas of interaction with targeted communities: training in biodiversity conservation and sustainable forest resource management, and establishing systems that ensure equitable benefit and cost-sharing. Just over 260 lead farmers were trained by ICIPE on apiculture and sericulture technologies, conservation of forests, tree-planting, and sustainable utilisation of locally available natural resources. The activities were fully linked to the Kenya Forest Service management plan. Stakeholder workshops enabled the communities to take part in the planning process.

Investments, production and market linkages: Fully equipped processing centres were developed to enable participating communities to value-add the raw honey comb and to reach and maintain quality standards and economies of scale required to access wider, more lucrative markets for their bee and silk products. The process of attaining organic certification of these products in Mwingi started in June 2007. This enabled the farmers to meet international organic standards and gain further competitive advantage. The *Mwingi Organic Beekeepers Association* took a year to complete organic certification compliances, which involved restructuring existing groups, detailed training of the field

officers, producer group leaders and the Association's management staff, the registration of producer groups and farmers, habitat mapping, and developing recording systems and an extension framework. To date, the organic certification scheme includes over 1,030 farmers.

Incomes earned and potential trickle-down effects: Honey sales have increased from 6 tonnes in 2007 to 15 tonnes in 2008 and price premiums of over 15% have been received by participation producers. Yearly income benefits from the honey enterprises for the Mwingi community members increased by approximately Ksh 2,800 (USD 38) per person during 2008 and by Ksh 2,900 (just over USD 39) during 2009. Members report that they have used the additional incomes to purchase/make additional hives and to improve their domestic situation (repairs to their homes, clothing). Some have used the income to purchase non-essential items such as radios and cell phones.

Through provision of equipment, training and supervision, this project enabled women to take part in beekeeping as an income-generating enterprise. Due to cultural taboos, women do not climb trees to harvest honey (required for harvesting traditional hives), thus are excluded from traditional beekeeping. As a result of the provision of Langstroth and top-bar hives more women are participating and generating incomes from beekeeping.

Contributions to environmental conservation: By improving incomes from their sustainable bee and silk enterprises ICIPE has been able to sensitize and train communities in forest conservation methods. Farmers now understand that these

practices are at the core of sustainable bee-products enterprise and can associate and link proceeds from the sale of honey and silk cocoons with forest conservation.

5.2.2 Case study 2. Rumuruti Aloe Women's Group, Laikipia, Kenya

Project organisation and skills development: The Kenya Aloe Working Group (KAWG) was formed in 2004 by KWS together with interested development and private sector representatives, to coordinate activities related to the Aloe sub-sector in Kenya. A Secretariat was established and supported by LWF to assist the KAWF and grassroots communities to develop aloe-related businesses that have positive conservation impacts. With support from LWF, community-based aloe groups were established in Laikipia. Examples include: Rumuruti Women Aloe Group (25 members), Tigithi Aloe Group (40 members), Kieni Aloe Group (300 members) and Withare Aloe Group (50 members). The groups planted indigenous aloe and have made products for sale within the local community from the crude aloe extruded. Their aim was to achieve good income from value-addition of indigenous aloes instead of the insignificant income commonly gained from the processing and sale of aloe gum. Some farmers were trained in aloe production and processing techniques, through small support from the LWF. The Ministry of Agriculture, KFS and other line ministries also provided technical assistance.

Rumuruti Women Aloe Group, the focus in this case study, was registered in 2005 with 25 women members from different ethnic backgrounds. The group has two patrons, Mr. Aden Mohammed and Maria Dodds, a local large-scale farmer.

Investments, production and market linkages: The group planted 1 hectare of *Aloe secundiflora* and *Aloe lateritia*, comprising approx 12,300 plants, and currently harvests a

small amount of sap for the products they manufacture. The sap is sieved and placed in plastic bottles for sale or storage. The group collects between 60 and 100 litres each harvest (outer leaves are removed once or twice a year depending on the size and strength of the plants) all of which is sold as semi or fully processed products. This group has received training in processing of bodycare products, sponsored by the LWF, from Mr Mohammed and Maria Dodds. They now make a range of aloe products, such as soap, body cream and lotions. In 2009, product registration was gained under Kenya Bureau of Standards. Rumuruti Women Aloe Group sell their aloe products in Nanyuki, such as Aloe soaps, herbal tea, creams and Aloe lotions, shampoo, hair conditioner and Aloe cleaning detergent, for prices between Ksh 50 (USD 0.6) to Ksh 160 (USD 2) per item.

Incomes earned and potential trickle-down effects: The members have increased their annual incomes by at least 10% through the sales of aloe products. This has provided each member an approximate average of Ksh 6,000/yr (USD 81) additional income during 2008.

During a focus group discussion with group members, held in November 2008, the members felt that the increased incomes motivated them to expand their business. They also explained that as a result of developing their own enterprise they have improved their social position within the community. Additionally, the group has provided an opportunity for women of different ethnic groups to work together. They indicated, however, that the main challenge centres on their lack of financial capacity to develop adequate processing facilities to improve and expand their product supply and range. They feel that this is critical to maintaining existing markets and expanding into new more lucrative ones and also to attract more members and expand their business.

Contributions to environmental conservation: Very little direct impact has been made in terms of environmental conservation through these commercial activities. This is due to the very low volumes of aloe used in the final processed product because of the poor extraction procedure. The cost of improved processing equipment is beyond the group's financial capacity. However, by entering into this enterprise the members, their families and the wider community have become more aware of the value of the indigenous aloe species.

5.2.3 Case study 3: MakaaZingira Eco-Charcoal, Kilifi, Kenya

Project organisation and skills development: Charcoal is the primary cooking fuel in Africa, although most production is unsustainable. Large wholesale clearing of forests has led to increased soil erosion, desertification and reduced agricultural productivity. In Kenya, charcoal is responsible for a reduction in forest cover from 12% land mass area in 1978 to 1.3% in 2008 (KFRI, 2008). Exploitative charcoal production has contributed greatly to deforestation and endangers the long term viability of this important income generator for many millions of people (KWS, 2008). Wild Living East Africa, a small NGO dedicated to assisting rural market-led enterprise development in the East Africa region, has developed an innovative, yet simple system for producing eco-charcoal briquettes from fast growing regenerative indigenous shrub species. When combined with cassava as a binder and processed through a hand operated manual press, superior burning charcoal briquettes are produced.

MakaaZingira Business Enterprise is a Community Based Organisation situated at the 60 hectares Wild Living Resources (WLR) conservancy in Kilifi District. MakaaZingira is

certified for sustainable Farm Management and Chain of Custody under the globally recognised Forest Stewardship Council (FSC) Woodmark Certification scheme for Small to Low Intensity Managed Forests. After the feasibility study on different charcoal production systems, sustainable harvesting regimes, biomass off-take quotas, packaging and efficient kilning systems for shrubs, the MaKaaZingira CBO initiative was established. So far more than 200 farmers have received full training, and the number of producers continues to increase.

Investments, production and market linkages: The Royal Netherlands Embassy, in 2007, provided a small grant for research and development. This enabled Wild Living East Africa to conduct a comprehensive program and develop a detailed business plan and strategy for implementation of the Wild Living MakaaZingira initiative.

As an example of the product flow, one group of 41 producers achieved two tonnes of charcoal bits per month, which they sell at Ksh 15/kg (USD0.2) to MakaaZingira enterprise. They are further processed into FSC-certified eco-charcoal briquettes and sold at Ksh 45/kg (USD 0.6) to retail outlets.

Incomes earned and potential trickle-down effects: Participating producers have increased their overall incomes by 15% to 20% through engaging in this enterprise. The charcoal briquettes are currently sold through six retail outlets locally and in Nairobi. As this technology is the first of its kind in East Africa, MakaaZingira enterprise is designed as a pilot project. Over the past two years, MakaaZingira has determined the key factors influencing the viability of community produced eco-charcoal briquettes and is now in a position to enable communities to develop the technology themselves. As eco-charcoal briquettes are of higher quality, easy to light and provide more energy per kg than wood

charcoal, the enterprise has continued to expand successfully. The price of MakaaZingira is competitive and the market has responded favourably. There is a consistent demand from the urban markets, as experienced from sales to six outlets. Farmers have earned approx Ksh 3,000/month (USD40.5) from taking part in this enterprise to-date.

Contributions to environmental conservation: Wild Living Resources MakaaZingira enterprise trains and builds the capacity of rural farmers to be able to produce sustainable charcoal bits from fast growing shrubs as alternative to unsustainable charcoal production. The members have become more aware of the value of indigenous vegetation, and the need to manage it sustainably so that it continues to yield income, as opposed to traditional charcoaling methods where entire shrubs/trees are cut down.

5.2.4 Case study 4: *Baringo Aloe Enterprise Development, Kenya*

Project organisation and skills development: Baringo District is one of the poorest districts in Kenya. Livestock production is the only source of livelihood for the vast majority of the resident and transient Samburu, Pokot and Turkana pastoral communities. It is commonly understood that Aloe is an important plant species with medicinal properties. The Kenya Forest Research Institute (KFRI) conducted successful research work in the area aimed at enhancing the conservation and management of Aloe species. To promote sustainable harvesting, FRI and partners implemented an aloe bio-enterprise in Baringo: the Koriema Aloe Processing project.

The organization was formed through a partnership between local communities represented by their own Community Based Organisation (CBO), a private entrepreneur

represented by Land Mawe, KWS and KFRI. Land Mawe took the lead role in the project. The processing factory was constructed by contractors, commercial partners were engaged, and approximately 290 farmers were trained by KFRI and Land Mawe and small scale plantations established. Interested community members formed into groups and were registered as the 'Baringo Aloe Bio-enterprise' in 2004. It was intended that the initiative would extend to Kerio Valley, West Pokot, Turkana, parts of Laikipia, Samburu and Koibatek.

Investments, production and market linkages: The European Union, through its Community Development Trust Fund, provided a grant amounting to approximately Euros 100,000 to construct and equip an aloe processing factory. The project was designed to directly target over 1,000 farmers and have impact on at least 5,000 farmers. Initial activities involved aloe resource mapping and quantification and an Environmental Impact Assessment. It was intended that the processing factory would allow value-addition of the raw material, and the establishment of a plantation would enhance the supply base. The project expected to achieve 50 tonnes of processed aloe annually. A further study of the records in December 2009 showed that less than 1 tonne has been processed to-date and quality standards were not developed.

The processing plant was designed to produce crude aloe gum for sale to the pharmaceutical and cosmetic industries. It was planned that value-added products would be developed over time to compete with products from South Africa. KFRI and KWS were partners in the project to provide the regulatory responsibility and carry out research. However, the factory lies dormant and the development of the stakeholder-owned company has stalled and recently collapsed. It was consistently reported that this

was due to the lack of clarity as to which party has legal ownership of the premises, leading to suspicions between the parties. A lack of clear marketing and business management strategy was also cited as a fundamental problem. As no business plan was produced, investment was misguided. For instance, the processing equipment consisted of a boiling pot, thus only achieving the same low market value crude aloe gum as traditionally traded. Government officers from the region report that there was insufficient involvement of the stakeholders throughout the planning and initiation stages. Incomes earned and potential trickle-down effects could not be realised as the project collapsed. Consequently, there has been little direct impact on environmental conservation. However it can be assumed that some measure of awareness at the community level has been raised about the value of sustainable utilization of indigenous aloes for long-term income generation.

5.3 Impacts of bio-enterprise initiatives on the livelihoods of communities

5.3.1 Impacts on rural livelihoods in terms of increased incomes

The case studies highlight the impacts of different interventions on agro/pastoral communities. Livelihood diversification implies that those involved earn better incomes than those without the diversification activity, and that they can sustain their overall livelihoods as a result of the diversification activity. While the participating communities in three cases improved their incomes, albeit at different levels, the participating communities in the Baringo Aloe initiative realised no income benefit.

5.3.2 Impact on human and organisational capacity

The benefits derived from bio-enterprise initiatives can also be in non-economic terms. The ICIPE project that supported the Mwingi Organic Beekeepers Association demonstrated the positive impact of a carefully planned and well structured community driven initiative. These communities have developed producer group operating capacity using the Internal Control System (ICS), a statutory requirement for international organic certification compliance. ICIPE involved the community at each stage of the initiative, using participatory methods to ensure their central involvement in all commercial and management decisions, and encouraged the district ministry departments to assist specific extension support and training facilitation.

In order to complete their research programme and to enable a fully sustainable model to emerge, ICIPE sourced financial support for the construction and equipping of the processing centre, bee keeping equipment, training and organic certification. Most of all, the success of this project is primarily due to the close working relationship that ICIPE established with the community for activity planning and implementation in all associated technical and business areas. Skills gap identification, designing training needs, and impact monitoring were also conducted as joint activities. The time and interest invested in the project by ICIPE project staff and the association leaders, together with the publicity given to the community's achievements from media coverage and public launches, further stimulated the communities' commitment to the ownership and direction of the enterprise. Another major factor in the project's success is that the market was guaranteed from the start of the initiative: the pricing and grading structure was made known to all members of the association. This raised members' confidence and commitment to the enterprise.

The Rumuruti Aloe Women's Group is a valuable example of a self help situation where women of mixed ethnic backgrounds work together towards a common goal of improving their livelihoods through diversified enterprise. These women took this a stage further and developed the value-addition of indigenous aloe, resulting in a range of handmade aloe products. Support provided by the local farmer, Maria Dodds, has been mostly technically based. However the constant encouragement and marketing assistance (through personal sales and transporting finished products to retail outlets) the group has received from this volunteer patronage has motivated and encouraged the group to progress and expand their bio-enterprise.

The feasibility study proved a valuable exercise for the further development of the MaKaaZingira enterprise. Further investment has been received, following the initial two-year pilot phase, to include more than 200 farmers. Further expansion is expected to cater for the strong interest from other farmers outside of the scheme. The level of interest demonstrates the local communities' perception of this initiative's ability to contribute to improving the livelihoods of those involved. The equipment is simple and cost effective, and therefore entry to this commercial venture is within the capacity of most community members. MakaaZingira enterprise intends to expand its outreach and extension service, to increase volumes and market penetration.

In the case of the Baringo Aloe Enterprise Development Project, despite the strong technical research base to the project, the process of developing a sound feasibility study and business plan for stakeholders and commercial actors was not conducted. As a result market-orientation was inappropriate and the business case was not adequately developed before the project became operational. The expectations of the partner organisations and

the community were therefore greater than the capacity of the project to deliver. As the mechanisms to develop the necessary skill base were not envisaged, there was little capacity to deliver the type of product that sufficiently rewarding markets require. The foregoing factors compromised the project from its outset. The communities were unclear of the management and ownership of the initiative, and misunderstandings developed between partner stakeholders and community members. This was mostly due to the lack of involvement, communication and correct information from the design stage. If community members had been given sufficient information, awareness and assistance to conduct their own cost – benefit analysis, and given opportunity to drive the initiative, then the outcome may have been more positive.

5.3.3 Ability of these bio-enterprises to provide incentives for communities to manage natural resources

Natural resources-based enterprises need not only to manage natural resources in such a way that their supply of raw materials is guaranteed, but also to ensure that the ecological sustainability of such resources is not jeopardised.

Mwingi Organic Beekeepers Association understood the relationship between protection of forests and the increase in honey production. The processes of organic certification and ethically endorsed trade also provided mechanisms and incentives to encourage community-led conservation. This project increased the awareness of the bio-enterprise members, the wider communities and national institutions of the ecological and economic importance of insects and their forest habitats. The project showed that clear benefits can be accrued from economically incentivised conservation activities, and illustrates how

direct impact on the ecological integrity of protected areas is achieved when community groups are directly involved in their management.

As the Rumuruti Aloe Women's Group had little access to information about the production and processing techniques, and were unable to finance the necessary processing equipment to reach the criteria required for entry into more rewarding markets, their products have been based on a very small percentage of aloe extract (due to the lack of purity preventing the formulas from stabilising at any greater inclusion). Therefore, the environmental impact of this bio-enterprise so far is minimal and, as for the Baringo case study, this factor does not provide communities sufficient incentive to positively manage indigenous aloe species. It also presents little evidence to the landowner that engaging land and other core resources in an indigenous aloe plantation is more economically rewarding than traditional crop production.

MakaaZingira Eco-Charcoal, based on an out-grower programme, is now serving a growing market in Kenya. MakaaZingira is the first Forest Stewardship Council (FSC) certified charcoal in East Africa, which has led to greater market demand from higher income consumers. The project has already shown that MakaaZingira can make cheaper and more efficient charcoal briquettes from sustainably harvesting the widely available indigenous shrub material. Because the raw materials are widely available and production relatively cheap, the project provides tangible incentives for rural populations to sustain their natural resources for income benefits as well as gaining affordable fuel for their own domestic needs. Now that the project has clearly shown the economic opportunity of sustainable charcoal production there is considerable demand from the local communities to participate in this venture. It is likely that once the communities receive attractive

returns from the sustainable utilisation of indigenous vegetation they are further stimulated to manage it in an environmentally positive manner.

The underlying concept of the Baringo Aloe Enterprise Development Project was to drive sustainable utilisation of the aloe species by creating a localised market for the plant material that has been sustainably harvested in accordance with a set of criteria. The project made significant progress in researching the location and density of indigenous aloe species in the selected districts to assess the commercial potential. Mapping and zoning of the areas was also carried out to manage a sustainable harvesting methodology. These are time and financially consuming steps of developing sustainable wild harvesting standards under internationally recognised schemes, such as the FairWild Standard (cf: FairWild Foundation www.fairwild.org). However, as the project members were unaware of the purpose of this process, the sustainable wild harvesting methodologies were not pursued further.

5.4 Identifying the determinant factors for the success or failure of these initiatives

5.4.1 Perception and experiences of the target beneficiaries

As illustrated by the success or otherwise of these bio-enterprises, those that have been set up and developed by the private-sector have sustained and are slowly growing, mainly due to the level of management that has been invested in these initiatives over an extended period. Many of the community-based enterprises set-up and developed purely as development-led projects have not progressed well, despite the initial level of

investment in training and equipment provided. Some have dwindled and collapsed, others have survived where there has been involvement of individual ‘champions’ and/or CBOs. In most cases the representatives of the producer groups talk of having little understanding or direct linkages to the marketplace and low level of ownership of the business enterprise.

Another factor mentioned by some of the groups was the lack of trust concerning the handling of the financial returns within their enterprise structures. They felt that reliable and transparent accounting systems had not been developed and/or maintained. Few women appear to be directly involved with these bio-enterprises, unless specific efforts had been made to ensure their inclusion, such as in the Mwingi and Rumuruti cases. The financial handling mechanisms were also inadequate to ensure that they receive a fair reward for their efforts. Another overriding aspect was the lack of pre-market finance, i.e. for purchasing the raw materials, and investment finance, i.e. for improving/expanding processing infrastructure and equipment. These are the most commonly requested areas for support from producer groups and the most frequently repeated problems cited during the interviews. The interviewees also indicated that they have little capacity to wait for an extended time for economic rewards from their efforts and, if not realised within a short term, the enterprise would be terminated.

As clearly expressed by the Rumuruti Aloe Women Group, with greater financial and skills capacity the bio-enterprise groups have greater chances of expanding their commercial operations, and improving their product formulations and standardization. Additional finance was reported to be also required for product licensing, improved packaging, product branding and effective promotional campaigns. It appears from this

study that if business plans and commercial partnerships were developed at an early project stage the investment of energy and effort by producer groups could be channelled more effectively to achieving market-competitive products.

5.4.2 Motivation and rationale of the initiators

All of the initiators of these projects have focused on rural enterprise development as a central tool for improving pastoral livelihoods. These agencies have used market-based approaches with a central focus on building value chains. The results of the survey suggest that the agencies with a straight forward commercial approach, rather than combined with other objectives such as a social support initiative or humanitarian aid, have created sounder structures and a more robust business culture within the target groups, for example MakaaZingira Eco-Charcoal.

It appears that if the motivation and rationale of the initiators is towards purely assisting pastoral communities to improve their livelihoods through sustainable trade then the starting position is more carefully laid, such as the use of feasibility studies and business plans, to include:

- Sub-sector mapping,
- Analysis of value chains for strengths, weaknesses, opportunities and constraints to competitiveness;
- Assisting the stakeholders to identify leverage points and decisions and to develop flexible business plans to ensure sustainable value chains

A participatory approach has also yielded better results than those projects designed and established solely by the donor agent. Engaging key stakeholders in the value chain analysis often means that they are more likely to buy into the programme design. Where development agents have encouraged participation by all members of pastoralist communities and included advocacy as well as financial and technical training, the capacity of the groups has increased more effectively than where solely technical training and no or little business advice has been given (IIRR, 2006). It may be concluded that the Baringo Aloe Enterprise Development project did not fully achieve these criteria.

5.4.3 Comparative analysis of the case study initiatives

In Table 5.1 a score is given to each case study against a set of parameters which were identified from the data collected and the discussions held. Using this method a qualitative weighting to the indicators was assigned to demonstrate the level of importance each parameter has in the overall performance of the bio-enterprises. The results show that the following basic factors are crucial for the success of community based bio-enterprises: financial/investment capital, clear ownership and sound leadership, commercial partnerships secured from the inception stage onwards, skills and continuous training resources in all technical areas, strong organisational and financial management based on traceability and transparency mechanisms, secure and known source of product supply, market awareness, access to value addition technologies suitable for women involvement and micro-credit and savings facility.

Table 5.1 Criteria for successful bio-enterprises, as per case-studies

Criteria	<i>Mwingi Organic Beekeepers</i>	<i>Rumuruti Women's Aloe Group</i>	<i>MakaaZingira Eco-charcoal</i>	<i>Baringo Aloe Enterprise Dev.</i>
Human capital (i) Capacity building (ii) Improved skills	(i) +++++ (i) +++++	(i) +++ (i) +++	(i) +++ (i) +++	(i) ++ (i) +
Service provision (i) Relevance (ii) Level of sufficiency	(i) +++++ (i) +++++	(i) +++++ (ii) ++	(i) +++++ (ii) +++	(i) +++ (ii) ++
Access to information (i) Technical (ii) Business (iii) Marketing	(i) +++++ (ii) +++ (iii) +++	(i) +++++ (ii) + (iii) +	(i) +++++ (ii) + (iii) +	(i) +++ (ii) + (iii) +
Leadership and mentoring (i) Strong group leadership (ii) Consistent mentoring of producers	(i) +++ (ii) +++++	(i) +++++ (ii) +++++	(i) +++ (ii) +++++	(i) + (ii) +
Trust and accountability (i) Within groups (ii) Producers, support agent/s	(ii) +++++ (ii) +++++	(ii) +++++ (ii) +++++	(ii) +++ (ii) +++++	(i) + (ii) +
Participation (i) Local ownership (ii) participation	(i) +++++ (ii) +++++	(i) +++++ (ii) +++	(i) ++ (ii) +++	(i) + (ii) +++++
Market (i) Guaranteed market (ii) Recognised certification	(i) +++++ (i) +++++	(i) + (ii) -	(i) +++ (ii) +++++	(i) + (ii) -
Product (i) quality and (ii) quantity	(i) +++++ (i) +++++	(i) +++ (i) +	(i) +++++ (i) ++	(i) + (i) +
Increased income	+++++	++	++	+
Improved environmental impact	+++	+	+++	-
Legend: Qualitative indicators from +++++ (very high); +++ (high); ++ (medium); + (low); - (no contribution)				

5.5 Longer term impact of the existing initiatives

Development sector reports indicate that rural enterprises, particularly community based, not only require a sound understanding of communities' needs and their involvement from the design point onwards, but also require significant investment into infrastructure, training and management, plus an active well facilitated extension service (Raina, *et al.*, 2009; Twarog, 2006; Nori *et al.*, 2008; Elias, 2008; Fitzgibbon, *et al.*, 2007; Ashley, 2000).

Evaluation of the four different bio-enterprise projects demonstrated that if all of these aspects have been fully considered and included from the design stage of the projects onwards that they would have flourished and have now sound frameworks upon which to expand their operations. Successful examples are the Mwingi Organic Beekeepers Association and MakaaZingira Eco-Charcoal.

As pastoral populations have very little capacity for raising formal loans, the provision of micro-finance and trade loans, such as in the case of Mwingi Organic Beekeepers Association, can have a significant impact on the rate of growth and how well the bio-enterprises can respond to business opportunities. As a result these projects have greater opportunity to grow and to survive into the future after development support has ceased.

5.6 Informing the design of future bio-enterprise initiatives

These case studies demonstrated that a bio-enterprise approach can improve livelihoods and highlight the critical points required for designing successful bio-enterprise initiatives in the context of agro/pastoral communities in East Africa. The main problems and basic tools to address these can be described as the lack of well-organised commercial structures and mutually beneficial trustworthy linkages between chain-actors leading to the inability of communities to reach rewarding national, regional and global markets. Greater social cohesion, stability and the sustainability of bio-enterprise initiatives can be achieved by bringing together the interests of different resource users, such as agro/pastoral communities, public sector, development agencies and land owners.

Significant capacity gaps exist in the majority of rural communities in terms of business management skills, market knowledge and exposure, sustainable production/wild-harvest methodologies and value-addition skills to meet market expectations. Bio-enterprise initiatives should provide up-to-date technical and management skills through practical training that develops strong awareness, responsibility and ownership by the communities. The role of development agencies should be to first assist group members to ascertain the enterprise type and design that is most appropriate to their own situation. This can be achieved by conducting simple business plans and formulation of community-driven management units. With such an approach it is likely that local producers are motivated to drive-forward their own enterprises, to identify problems and overcome barriers to advancing their businesses. Through this approach communities also recognise the skills gaps and tools they need for improving their enterprise, and are then in a better position to seek specific and well focussed support.

Access to services, such as extension, training, product promotion, micro-credit, trade finance and marketing, is crucial for community-driven bio-enterprises to achieve the necessary business and management capacity required to achieve economies of scale, market quality standards and ethical trade (Twarog, 2006). From wider research conducted during the study it is apparent that bio-enterprises need legally registered apex structures to attain commercial viability. These apex structures should represent the full range of actors (bio-enterprise members, producers and processors, ethical finance-providers and commercial investors), and be sufficiently managed to enable successful applications for micro-credit/trade-finance.

The assumption that available and affordable trade finance is a core requirement for sound business development was verified by the feedback from producer groups and small scale entrepreneurs. The communities already harvest and trade small quantities of honey and plant materials but have no or very little business finance for purchasing raw materials and for investing in equipment and infrastructure. They also have very little equity to obtain loans and service at the high borrowing rates that banks and finance institutions charge. Their enterprises, therefore, remain small. To realistically assist agro/pastoralists to achieve longer-term economic benefits, community-based enterprise development initiatives need to take full account of the basic business principles as well as integrating a certification-endorsed ethical trade mechanism into their value chains. This approach should be based on tightly bound partnerships, endorsed through contractual agreements between the partners. They must be substantial enough to stimulate sufficient economies of scale for viable business to operate and achieve sustainable livelihoods impact. The activity areas should therefore be designed to address the main business principles as market competition centres around price and quality. A

study by the EPOPA programme (Export Promotion of Organic Products from Africa) on the viability of value-addition for organic exports from East Africa shows that exporters and rural smallholder farmers face similar challenges from their micro- and macro-business environments, as well as internal managerial constraints of their organisations, especially for the exporters (Kairumba and Ssemwanga 2007).

To ensure the sustainable utilisation of indigenous plant materials, it is imperative that bio-enterprises follow internationally recognised and accredited sustainable wild collection standards and achieve certification. This is increasingly becoming a market requirement, a necessary entry point for some buyers, and can provide the bio-enterprise competitive advantage in the global market (Dankers, 2003).

To ensure viability of the enterprises, the fostering of long-term trading relationships is a central factor. For producers to meet market criteria and produce the consistent quality and quantity that the market requires, this is paramount. Business support, such as business assessment, feasibility studies, cost price calculations and the development of quality management systems will enable producer group managers to make informed decisions and operate efficient businesses. By providing tailored technical training, advice and information, production and primary processing, the expertise of groups will improve, together with their income generating potential. Furthermore, to increase the success-rate of bio-enterprises the interest of participating communities should be captured to ensure that they sufficiently prioritise these within their key activities.

5.7 Conclusion

The process of developing these bio-enterprises clearly shows that agro/pastoral communities are keen to take-up complimentary or additional enterprises that are understood to be economically rewarding within the short-term. In this context communities are very willing to learn new skills. However, many rural actors often do not have sufficient knowledge about non-traditional enterprises to effectively evaluate the investment and commitment required to achieve business success. Without this knowledge their expectations invariably exceed the ability of the enterprise to reward them.

Agencies and organisations that initiate community-based enterprises also need to acquire adequate knowledge on enterprise development before designing and starting their initiatives (Bavikatte, *et al.*, 2009). There are many NGOs engaged with livelihood diversification projects in the ASALs of Kenya, but many such projects are developed on poor business grounds and have failed, leaving participating communities wary and sceptical (Smith, 1992). These factors explain why bio-enterprises established by NGOs have mostly not progressed or failed, despite their expenditure in the capacity building of the community groups. Fundamentally, most pastoral communities (particularly outside of NGO focal operating areas) have no or little access to training, trade finance and capital to develop alternative/complimentary livelihoods (Smith, 1992). These costs can be significant, and for the private sector to be attracted to invest in such remote regions and develop viable and sustainable business operations these risks need to be reduced.

Developing new enterprises, particularly community-based, means that producers need to secure necessary investment capital to fulfil the infrastructure, training and management needs of the start-up phase, which is critical to developing a successful and replicable bio-enterprise model (Bavikatte *et al.*, 2009). It can, therefore, be considered imperative that rural enterprise development initiatives need to address these points throughout the value chain.

Government and NGO extension staff in the rural areas are potentially powerful agents for supporting viable agri-business development. However, the level of business skills and extension capacity is mostly inadequate to effectively assist the development of community based enterprise, particularly where products are diverse. This is exacerbated in the ASALs where extension numbers are very low.

A directly related issue raised by respondents is that communities are often not involved in the design of development sector initiated livelihood projects. They have little or no say in their establishment or in the decision making processes required to run the operations. To create complimentary income options that are feasible and manageable alongside livestock herding, close interactions with the value-chain actors and stakeholders must be made throughout the design, inception and establishment phases.

A frequent complaint voiced by the communities concerned the lack of access to rewarding markets. However, market actors see the problem as lack of reliable supply of the type and quality of product that they (the market) are seeking. However, most pastoral communities have little or no access to training, trade finance and capital to develop products to these standards. Most groups also felt that they have low organisational and business management skills; although it appears that in many cases the traditional

governance structures are intact and can be harnessed for these purposes. In this context, it is important to underline a point made by communities' elders during the research process: they feel that their traditional systems are weakening and that the youth do not respect the elders in the way that has been traditionally expected. Reduction of the cohesion within producer groups, seen as a growing problem during group interview sessions, may also be a symptom of this underlying problem. Therefore, particularly in relation to the handling of financial returns, it is necessary to develop business orientated management systems that are unifying and are operated within economically rewarding certification schemes.

Management challenges of organising producer groups and community owned micro-enterprises persist, and highlight the importance of active and well-focused extension facilities (Elias, 2008; Ashley, 2000). Associated cost can be significant. For the private-sector to be attracted to invest in bio-enterprises in remote regions, and to have potential to develop viable and sustainable business operations, these risks need to be reduced. In response to these observations, future bio-enterprise development programmes should provide key business-support services and cover some infrastructural costs necessary to kick-start the enterprises to reach a point where commercial partners can viably engage. To develop new enterprises and achieve viability, producers need to secure the necessary services and investment capital. It is therefore imperative that any future rural enterprise development initiative address these points adequately to achieve success.

The issues presented in this conclusion are further explored and discussed in Chapters 8 and 9, whilst addressing the questions posed under Objective 2 and 3 of this thesis.

Chapter 6. Central Case Study: Bio-enterprise Development Programme (BDP)

6.1 Introduction

6.1.1 Context

The evaluation of the approaches and impact of the BDP is a central part of the study. This chapter aims to provide a clear picture of the activities designed and adopted by the BDP to develop well managed viable dryland plant based enterprises as sound social and environmentally supportive commercial initiatives within Africa's ASAL region. The chapter presents the evaluation of the programme by comparing the baseline survey results with that of the follow-up survey conducted after 18 months to show the impact of the programme. The information concerning the design and approaches of the programme and its impact is used in Chapters 8, 9 and 10 as a part of the general discussion and to compare its impact with other similar initiatives operating in the ASAL

This chapter is focused on providing information for Objective 1, in terms of evaluating the approach and examining the effectiveness of activities and methodologies of initiatives designed to enable pastoral/agro-pastoral communities to achieve viable and environmentally sustainable bio-enterprises in the ASAL. Building on the information presented in Chapter 5, this chapter also provides further insight for Objective 2, in analysing the constraints and opportunities that affect the selection and adoption of bio-enterprise.

6.1.2 Methodology

6.1.2.1 Approach and purpose: The material for this chapter has been drawn from the primary and secondary sources and also information from the studies that preceded and informed the design of the BDP and from the programme documents and reports. The impact of the programme was determined by comparing the results of the baseline study conducted at the onset of this research study in November 2009 with the information gained from a follow-up survey conducted in December 2010. The overall methodology for the data collection and analysis is explained in Chapter 3.

The information is evaluated under the specific areas below:

- Uptake of the BDP activities and level of collaboration
- Extension performance
- Incomes of selected groups in Kirisia and Mukogodo from developing bee enterprise
- Up-take of payment system
- Commitment of selected groups in Kirisia (based on honey enterprise)

Additional information was sourced from a baseline survey of the five selected groups in Kirisia for the Chapter 7 and Chapter 8. The information collected for Chapter 7 focused on the perceptions of the community members of the increased pressure on natural resources. The information collected for Chapter 8 concerned the major factors that have affected the selection and adoption of bio-enterprise by communities.

6.1.2.2 Case study area and sample group selection

The surveys were conducted within two main geographical areas of the BDP operational area, Mukogodo and Kirisia. As shown in Table 6.1 the number of respondents interviewed in November 2009 were 58 from the selected groups in Kirisia; BYRUG, BECOG, Nduat, Nkorien and Saanata. This figure fell to 43 producers in December 2010 due to Nduat group dropping out of the programme during early 2010. In Mukogodo 68 respondents were interviewed, from the selected groups; Naiputaki, Naisukut, Nkiloriti, Mbeke and the combined Tapapo and Nadungoro group, which fell to 56 respondents in the follow-up survey in 2010 due to the absence of some of the group members as a result of high rainfall conditions (Tables 6.1 and 6.2).

Table 6.1 Kirisia - Number of respondents and gender 2009 and 2010

Groups	Number of Respondents		% of group members interviewed		Number of women interviewed		% of groups women interviewed	
	2009	2010	2009	2010	2009	2010	2009	2010
BYRUG	12	10	37.5%	31.2%	5.0	4	50.0%	40%
BECOG	12	11	46.2%	44%	6.0	6	86%	86%
Nduat	7	0	63.6%	0	7.0	0	64%	0%
Saanata	15	14	50.0%	43.7%	3.0	2	50%	33%
Nkorien	12	8	37.5%	28.6%	5.0	3	31%	19%
Total	58	43	44.3%	36.7%	26	15	52%	35%

Table 6.2 Mukogodo - Number of respondents and gender 2009 and 2010

Groups	Number of Respondents		% of group members interviewed		Number of women interviewed		% of groups women interviewed	
	2009	2010	2009	2010	2009	2010	2009	2010

Mbeke	12	9	46%	38%	6	7	54%	58
Naiputaki	15	11	35%	32%	6	7	43%	51
Naisukut	15	10	39%	31%	7	6	58%	52%
Nadungoro/Tapapo	9	12	39%	35%	0	3	0%	12%
Nkiloriti	17	14	33%	26%	15	8	30%	14%
Total	68	56	37.5%	33.2%	34	31	39%	37%

6.1.2.3 Data collection and sampling: The data collection for this impact assessment component of this chapter was conducted in Kirisia and Mukogodo. The first round of data collection was conducted in November 2009 to December 2009 as an extension to the BDP baseline study. The second round of data collection was conducted in Kirisia between March and June 2011. The second round of data collection in Mukogodo was only partially completed due to heavy rain and lack of access to the selected groups.

To gain evidence and experience of the activities of the BDP, purposive interviews were held with the key staff and representatives of the partner organisations during 2010. By exploring purchase and sales records, a detailed analysis of the economic activities of the BDP to assist pastoral and agro-pastoral communities to develop enterprises in plant based natural products in Kirisia and Mukogodo was conducted.

The questionnaires were developed with the input of D. Malleret-King (pers. comm.). A total of seven enumerators undertook the data collection following a training session. Formal questionnaires were used to produce results that could be compared between communities and analysed quantitatively. Household surveys, focus group discussions and key informant interviews were carried out using pre-designed and pre-tested

questionnaires. Interview guides for the focus group discussions and key informant interviews are presented in Appendix 2. The questionnaires for the household surveys are presented in Appendix 3.

The method and sampling technique used for each impact area and indicator investigated are shown in Table 6.3. This information plus the number of informants per method and topic is delegated to Appendix 4. The justification for the research instruments used is explained in details in the overall methodology in Chapter 3.

Table 6.3 Method and sampling technique used for each impact area and indicator investigated

Impact area	Women 2009	Men 2009	Women 2010	Men 2010	Sampling
Incomes from developing bee enterprise	58	66	43	53	Purposive, all areas in which the bio enterprise programme is being established
Uptake of the BDP activities and level of collaboration	60	63	41	50	Key informants purposive sampling of representative sample of producer groups.
Level of commitment	48	57	46	48	Purposive sampling of informants, all areas in which the programme is being established
Performance of extension services	54	55	39	44	Representative sample of producer groups. Purposive interviews with key informants
Up-take of payment system	37	64	15	53	Representative sample of producer groups. Purposive interviews with key informants
Total interviewed	60	66	46	53	Interviewed in 2009 – 106 Interviewed in 2010 - 99

Justification of research method used: Key informants were selected purposively on the basis of their knowledge of their community, of the activities discussed, and of the group members. Key informants were used to enrich the data collection process. Focus group discussions were gender based to ensure that women could express themselves freely. Traditionally women are not able to speak in front of men in a public setting. Although this is changing, it is appropriate to interview women separately on some of the topics to ensure that their points of view are captured in an uncompromised way. The data was analysed with Microsoft Excel for basic and descriptive statistics.

6.1.3 Background

The BDP is a collaborative initiative that has arisen from the need to establish commercially viable community owned plant based enterprises in the Samburu Heartlands, focusing in the counties of Laikipia and Kirisia. For a number of years, conservation organisations including LWF and the AWF have supported producer groups to develop plant based micro enterprise as a way of creating conservation incentives. However, despite high investment in these enterprises, there have been little or no positive impacts on the environmental health or producers' economic status (Malleret-King, 2006). The reasons for this has been explored in a series of feasibility studies which suggested that the plant based enterprises could be commercially viable if the lack of infrastructure, skills and economies of scale are addressed (Wren and Powys, 2008).

The partners, LWF and AWF, have embarked on the development of environmentally supportive bio-enterprises in the ASAL regions to address important millennium

development goals. During 2007, 2008 and 2009 a series of research studies were conducted to assess the opportunities for NTFP / bio enterprises in the Samburu Heartlands (Wren, 2007; Wren 2008 b; Wren and Powys, 2008). As a result of these studies, it was established that the domestication and sustainable wild harvest of indigenous plant products can provide tangible incentives for communities to continue to value their natural resource and manage them into the future (Duerbeck, 2008). It was also evaluated that high value cropping using organic practices in the lands adjacent to watercourses can provide vital buffers to mitigate drought impacts, and that bio-enterprise can contribute to mitigating human-wildlife conflict in some areas (Malleret-King and Hatfield, 2008).

By establishing BDP as a tool to support the bio-enterprise sector, the partners seek to deliver positive environmental, economic and social impacts that reverse poverty and land degradation trends in the target areas, and thus increase the landscape's (including its people) resilience to climate change. The purpose of the BDP was therefore defined by the LWF as 'creating the conditions for a business driven natural products sector to develop in Laikipia and Kirisia in Lower Samburu and for long term engagement of ethical private sector companies with these enterprises to achieve environmental, social and economic sustainability' (Wren, 2008b: 14).

*Photograph 1.
Domestication of
indigenous aloe
in Laikipia county*



The BDP has been designed to operate over a 2 year establishment phase, starting from June 2009 and to June 2011, followed by a 5 year expansion phase, making a total programme period of 7 years. The geographical target area of the programme is Laikipia and Kirisia, both falls within the area named by AWF as the ‘Samburu Heartlands’. These areas are divided according to predominant livelihood systems, ethnic characteristics and land tenure system. The bio-enterprises that were identified in the target areas as being the most feasible and economically and environmentally viable to support the development of include; bee products, ethnobotanicals, gums and resins, essential oils, aloe-based products.

6.2 Issues and assumptions that formed the programme’s design principles

6.2.1 Main issues perceived as hindering expansion of bio-enterprises in the Samburu Heartland

The main factor voiced by rural community representatives during the initial feasibility study process is that they have little understanding of the market, no/limited linkages, low level of business ownership, and lack of post-market finance for purchasing the raw materials, to invest in equipment, infrastructure etc, in the first few years of operation (Wren and Powys, 2008). These factors provide clear indicators for the approach that needs to be developed to ensure that the dryland plant product enterprises succeed on a business basis and have a positive impact on livelihoods and the environment. Wider issues presented by the BDP are indicated in Table 6.4.

Table 6.4 Analysis of the barriers, assets to progress and the sector opportunities

BARRIERS TO PROGRESS	ASSETS TO PROGRESS	SECTOR OPPORTUNITIES
Lack of expertise.	Availability of land.	Large national and regional market demand
Strong national and regional price and under-supply leading to marketing of poor quality products	Wide climatic and environmental diversity - excellent growing conditions	Export potential for natural and high value products
Product adulteration	Strong traditional organisational structures	Value adding plant materials to increase product returns. Strong local/national markets with lower quality standards than for export.
Relative high transport costs	Established agri-sector export operations	Export of dry products - long shelf life and easy to transport.
Lack of business information.	Rural-based internet centres are increasing.	High local and national market demand for natural products.
Lack of access to specialist equipment and advice. Lack of infrastructure	Small level livelihood support provided by development agencies and government.	High local and national market demand for natural products in raw and semi-processed form as well as for fully processed, retail packed.
Lack of market intelligence	If for export, high value sustainably harvested materials, certified, with already established markets	As above. Expansion in the national and regional markets for products that are well formulated and presented.
Weak middle sector industry to provide processing, packaging facilities.	Sound economies of scale in some product sectors	Utilise duty free status for imported materials and export processing zones for export products
Droughts/water shortage for cultivation and processing	Commercialised indigenous plant species are largely drought tolerant / require less water.	Adopt organic farming and processing practices, and take up certification schemes for competitive market advantage.

6.2.3 Producer group structures and business operating capacity

The management challenges of organising producer groups and community owned micro-enterprises that were identified demonstrated the need for active and well supported extension facilities (Wren and Powys, 2008). The bio-enterprises need to provide low risk and sufficiently attractive returns for the participating communities within a relatively short term from inception; and low capital cost to equip and operate. At the same time many value-addition activities involving harvesting and processing

provide opportunities for direct participation of women and marginal groups whose participation in traditional commercial activities are often limited within their social and cultural context. The major challenge is for these communities to produce consistently good quality products in sufficient quantity.



Photograph 2. Honey harvesting equipment and protective clothing provided by the BDP

It was clear from the studies that most producers and operators in rural community have limited experience of business, enterprises and market development, have only local community level organisational skill, and have not operated supply chain orientated recordings systems and have not had to meet protocols and compliance requirements that are externally audited. Therefore assistance and training is required to enable the producers to operate efficiently, sustainably and viably to achieve market entry and sustain their businesses (Wren and Powys, 2008).

In order to develop a supply chain which will enable the community owned business operation to develop and to meet certified requirements for group certification, the small scale producers and wild harvesters need to operate within a strong organisation structure, with transparent financial handling systems, sound and sufficiently skilled management and with effective recording systems in place. To address these central issues the BDP was designed to provide training and extension services to build producers' skills to satisfy market requirements, develop formal linkages between buyers and producers and to establish basic and appropriate infrastructure (Malleret-King, 2009).

6.2.4 Bio-enterprises development based on sound business principles

According to the BDP programme design documents held by LWF, if producers are involved with the business planning from the onset, the capital investment and break-even points is understood and the level of capital and risk involved is identified. Further assumptions were made concerning the commitment of the producers to the enterprise initiative; that if producers are encouraged to take a lead in the design of the initiative then it is more likely that they will fully own and drive the enterprise, accept the responsibility of the investment and commit further resources to it.

Business plans: Before establishing any support to existing or new bio-enterprises, the BDP conducts a basic feasibility study and a business plan. The BDP believes that the effort of producing a business plan is well rewarded and exert a the positive effect on good business decisions and investment plans and that it is a practical and invaluable exercise which needs to be carried out as soon as all the necessary information has been

gathered. As a tool to management, the BDP used the business plans to assess the viability of the operation and re-assessed it as it moved through its development phases. Therefore the BDP updated the marketing and the business plans as a fundamental part of its management practice.

Multiplier potential - vertical: The BDP believes that for its business support operation to be successful and achieve a solid platform on which to expand, the following are critical steps:

Achieving sufficient economies of scale to maintain at least minimum orders and to ensure equipment is efficiently utilised and down time is minimised, and investment cost of this developing business is covered by adequate turnover and profit within an acceptable period.

Certification systems, such as for meeting organic and fairtrade standards, which specifically includes the development of an ICS required for organic producer group certification is an excellent supply chain development tool, a central management mechanism, as well as an entry requirement for most premium markets.

Commercial partnerships. Fostering of long term trading relationships based on ethical principles provides greater security to all members in the chain, particularly at the top and bottom where risk handling is at its highest and directly effects viability of the enterprise (i.e., investment into the product and the costs recovery over successive seasons; and annual profit made over the variable costs incurred). Contractual agreements should be

established between the parties at the beginning of the project to clarify and bond the relationships.

Multiplier development: The opportunities for diversification of supply, product and the marketplace are high in the case of bee products and in direct terms of the market. For example:

Supply diversification as a progressive expansion of a commercial bio-products initiative, for sourcing the product should widen to include different geographical areas. This provides some security of supply to the market; for example, if one area became badly affected by drought and supply in this location is lost, other areas may be less affected.

Product diversification is the key component of expanding commercial initiative; for example; beekeeper associations marketing honey and wax could also be trained for the production of propolis and pollen, which are high demand nutraceutical food products in the retail market.

Market diversification is a factor of the natural expansion of nature products businesses. As well as the market segment, the market spread can also be diversified from small to medium scale retail outlets to range from supermarket to delicatessen.

Marketing plan: An initial feasibility study conducted for the partners (AWF and LWF) assessed the prospects of developing bio-enterprises with the dryland communities and it was proposed that a proper marketing strategy for plant products targeting the

international market should include Good Agricultural Practice¹, organic certification and CITES regulations in the case of wild harvested materials. Marketing strategies of course must be adapted to the national regulations as well as those for the importing country such as the EU regulations COM 2002/1 for herbal medicinal products.

6.2.5 Ensuring environmental sustainability

Sustainable wild harvesting: The development of sustainable wild harvest standards is imperative where products are sourced from indigenous resources. Sustainable wild harvest standards are devised to ensure that wild production comes from a clearly defined area and uses methods that meet international certification standards (Duerbeck, 2008; Wren, 2008a,b; Mukonyi, *et al.*, 2010).

The International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP) has been developed by the Medicinal Plant Specialist Group (MPSG) of the Species Survival Commission (SSC), The International Conservation Union (IUCN), on behalf of a Steering Group consisting of the MPSG, Bundesamt für Naturschutz (BfN), WWF-Germany, and TRAFFIC. An international Advisory Group of more than 150 experts from diverse backgrounds has provided guidance in drafting the ISSC-MAP. The FairWild Foundation was endorsed by these four founding institutions (TRAFFIC, WWF-Germany, IUCN and BfN) as the official international body responsible for the management and global implementation of the ISSC-MAP standard and the FairWild standard (www.fairwild.org). Under the auspices of the FairWild

¹ Good Agricultural Practice (GAP) provides guidelines for cultivation, harvest, processing, packaging, and storage.

Foundation, the International Standard for Sustainable Wild Collection is jointly implemented to assure buyers that products are produced in a socially and ecologically sound manner (Dürbeck, 2008). Initial and successive annual inspections are conducted by the accredited inspection body, IMO, a Swizz certification company accredited to provide inspection to the EU-ISO 65 Organic Standards and the FairWild Standard. The Eastern Africa IMO office is located in Nairobi; imo-tanzania@tanzania-organics.com

Domestication: For scaling up dryland plant product enterprises based on wild harvested plant products, the domestication of these indigenous species should be encouraged where possible (Wren and Powys, 2008). This is particularly important for species that cannot be readily wild harvested at sustainable levels and for medicinal extracts that are derived from bark, wood and roots (Schippmann, *et al.*, 2006)

6.2.6 Initial scoping exercise and feasibility study that informed the programme design

Selection of the geographical area for the BDP: The target region comprises the counties of Laikipia and Kirisia. Laikipia has a great concentration of organised producer groups, small scale community based enterprises and supportive NGOs and CBOs and therefore a greater emphasis of the BDP budget has been directed at this county.

Selection of the target beneficiaries of the BDP: The first step for the BDP to operate in an area is to identify the groups with which it is to start working. The objective is to select the most motivated, performing and cohesive groups. The reason for this is to

create a network of strong groups which act as hubs and champions of bio-enterprise that can be joined over time by other groups or individual producers. Selection criteria were developed to investigate group leadership, history, records and membership. A pre-selection was done on the basis of interviews with the LWF and AWF field teams. The committees and members of pre-selected groups were then interviewed by BDP extension officers. Factors which helped to decide which groups were suitable for the BDP to work with included:

- Track record, good governance
- Potential for production, processing and marketing
- Level of capital investment existing and required
- Economies of scale can be achieved in a viable time-span
- Organisational ability to develop and manage a supply chain to reliably serve the target market/s
- Experience in value addition and product quality management.
- Processing facilities and capacity to develop adequate value addition to buyer specifications

Selection of the target bio-products for the BDP: The link between producers and potential market outlets both in-country and overseas is under-developed in the natural products sector, particularly for indigenous plant based products. However, natural products, that include the dryland indigenous plant products, are globally in demand (Wren, 2007; Wren 2008 a,b; Wren and Powys, 2008).). Despite alternative sourcing strategies by cultivation, the global industry is still dependent on wild collected plants as raw materials for food, medicine and cosmetics (over 90% of commercially used plant

species are sourced from wild collection, this is over 70% of material trade). Only 500 plant species are commercially cultivated today (Traffic International, 2010). Whereas about 15,000 wild collected plant species are threatened in at least part of their natural habitats (Schippmann *et al.*, 2006).

In the studies it was identified that there is a growing potential for natural products in the national and regional as well as the international markets. From the studies conducted for a range of development agencies (Oxfam GB, Save the Children US/CARE, AWF, LWF, Northern Rangelands Trust, etc.), (Wren, 2007; Wren 2008 b; Wren and Powys, 2008) the dryland plant-product selected as having greatest potential for viable bio-enterprises in the ASAL include;

(i) Bee-products: Traditional (log) hive production exists right across the ASAL. It predominates in certain areas where traditional bee keepers have maintained their activities at domestic levels with some at commercial levels. There are some organised bee-keeping enterprises which provide immediate potential for increasing the supply and the quality of both honey and wax. Marketing of comb honey, well packaged and presented as a branded product to the national market was assessed as the first rung in the commercial development of this product. Diversification to pollen, propolis, and royal jelly is important as a second step to maximising the returns from this sub-sector.

(ii) Medicinals/Nutraceuticals: There is wide natural abundance of medicinal plant materials in the ASAL and a long tradition for its use for the majority of ailments and disorders. There are a number of indigenous plant species that have commercialisation

potential for the international and national markets. There is good potential for a small range of natural products for use at herbal supplements, such as *Warburgia unguandensis*, *Prunus africanus*, and *Hypoxis rooperi*, already exported to global markets. For the local and national market, the development of a range of herbal remedies and supplements was identified as a strong enterprise option, particularly for women who traditionally prepare ethnobotanical medicines for their families. Species include; *Plectranthus pseudo marrubioides*, *Euclea divinorum*, *Withania somnifera*, *Asparagus africanus*, *Spilanthes acmella* and *Centella asiatica*. There is good market potential for sale through community based pharmacies (Wren and Powys, 2008; Powys and Duckworth, 2004).

(iii) Indigenous essential oil: There are a range of indigenous plant oils that are already recognised in the European fragrance markets such as the wild sages; *Ocimum americanum*, *Ocimum gratissimum*, *Ocimum kilimanjaracom*, the gums and resins; *Boswellia neglecta*, *Acacia kirkii*, *Zizphus mauritiana*, and others such as *Tagette minutes*, *Lantana camera*, *Lippia kituiensis*, *Lippia javanica*, *Saturea abyssinica* (Wren and Powys, 2008). Before focusing on the export markets it was intended that these oils can be sold as retail products as bodycare and herbal supplements for national and regional markets. Essential oils enterprises are relatively low risk as there are no hygiene criteria and quality parameters are easily met if the correct genotype is distilled and equipment is well calibrated and correct distillation techniques are followed.

(iv) Cold pressed oils: There are several viable indigenous tree seed oils, such as *Calodendrum capense* and *Croton megalogarpus* that are found abundantly within the ASAL and have international markets. Carrier oils, such as *Calodendrum capense*, are

also excellent for developing bodycare products for national, markets (Wren and Powys, 2008). There appears to be viable opportunity for developing sustainable wild harvest operations with rural communities for these tree seeds. Furthermore processing is simple and inexpensive.

(v) **Bodycare products:** The African market for bodycare products is immense, being a fundamental part of the culture and traditional practices. The national and regional demand is high for high quality natural ingredients based well formulated bodycare products. There are already successful bodycare product enterprises operating in the ASAL region, one of which is now exporting a limited range of products (soaps, body cream and massage oils). There are also community owned enterprises producing aloe based bodycare products for the local market.

A combination of sustainable wild harvested products, such as bee products, gums and resins, and crop production requiring low inputs could be viable diversification for pastoral and agro-pastoral communities. The bio-products selected by the BDP are those that were assessed as being suitable for domestication or can be sustainably wild harvested. Another important factor for this selection was the potential of the bio-product to provide opportunities for direct participation of women and landless families/communities.

The factors used to assess the suitability of the short listed bio-product types are demonstrated in Table 6.5. Based on a more complex assessment, each of the factors were weighted against each for the short-listed plant based products, in terms of their suitability, using a simplified method of weighting, as follows: **** = very highly

suitable; *** = high suitability; ** = medium suitability; * = low suitability; - = not suitable.

Table 6.5 Factors that were used to assess the suitability for selection of bio-products

Bio-enterprise product	Feasibility +	Business viability+	Market volume / demand +++	Involvement of women and youth	Positive environmental impact	Positive livelihood impact
Bee-products	****	****	****	***	****	***
Ethnobotanicals	***	***	***	****	***	***
Cold pressed indigenous tree seed oils	**	**	***	****	****	**
Indigenous essential oils	**	**	**	****	****	**
Bodycare products	****	****	***	****	**	***
Legend: Qualitative indicators from **** (very high); *** (high); ** (medium); * (low); - (not suitable)						

+ Feasibility includes suitability to physical conditions, economies of scale, processing requirements, incorporate traditional activities, can be fitted into the daily activities.

++ Business viability includes gross and net margin, and value added market return.

+++ Market volume and demand includes national, regional, international.

6.2.7 Central design focus of the BDP

As a result of the initial feasibility study and business assessments, it was concluded by the partners (AWF and LWF) that the central focus of the BDP is to facilitate, co-ordinate and promote the development of bio-enterprises that are both environmentally and socio-economically supportive and sustainable with rural residents and pastoral communities in the Samburu Heartlands of Kenya. The programme is designed to give rise to tangible and viable businesses, managed and owned by the communities through ethical

partnerships with commercial entrepreneurs, research and development agents. The development of community driven bio-enterprise that have positive social and environmental impact falls directly in line with the policy directions and aspirations of the national government in the ASAL region (Wren and Powys, 2008)

The programme goal and objectives were defined as the following:

BDP goal: Reversing environmental degradation in the Samburu Heartlands through market driven community based indigenous bio-enterprise, creating an increase in the incomes of approx 5,400 households and value chain actors which the programme intends to achieve over its operating period (seven years, from June 2009) through producing, processing and selling diverse natural products into rewarding markets. The aim is that this will result in improved business management skill, product quality, supply, and the equitable participation of women and the less advantaged.

BDP Objectives: The overall objectives of the programme are to:

- Improve access to fair and sustainable markets for the pastoral communities and other residents of the target areas and increase their income.
- Increase active participation of and fair reward to women and disadvantaged members of communities in these income generating activities.
- Increase tangible incentives for participating communities to sustainably utilise and manage their living environment, retain integrity of their culture and contribute positively to reducing the impact of climate change.

6.2.8 Developing business operating and trading structure, the “Desert Edge” (DE)

To develop commercially strong multiple bio-enterprises which are environmentally and socio-economically sound in the long term, a not for profit company has been established to operate in collaboration with the development and conservation organisations, private partners and resource users. This commercial entity has been registered as the Desert Edge Bio-Trading Company (DE); a company limited by shareholding. The registered brand name is *Desert Edge*. In addition to its commercial marketing and trading functions, this structure was set up to provide a pivotal role in the development of viable commercial bio-enterprise in the region and operates a service providing facility (extension, training, promotion and marketing) to support the interests of these bio-enterprises. DE uses its financial capital asset to build the businesses of its members, the individual bio-enterprises and its producers. DE has established operating criteria that accords with internationally accepted ethical trade principles. There are legally bound MOUs between the company and the implementing NGOs, and between the BDP and the DE that incorporates these principles.

The typical flow of business activities are explained below

- (i) DE acts as a buyer and wholesale trader, mostly bulking, marketing and selling the semi-processed products to premium markets, supported by its promotional, marketing and branding efforts.
- (ii) DE buys the semi-processed products from the bio-enterprises and then fully process and bulk/retail pack and dispatches the products to retail outlets nationally or to export markets by using freight/transport. The central processing facilities are developed to fully process to finished retail packed products, as well as bulking, packing and selling the

semi-processed products. Where suitable and possible these products are certified organic and/or fairtrade (thus attracting market advantage and price premiums).

(iii) Payment is made directly by DE to the producers in cash on delivery at the depot centres, based on weight and grade. This is conducted by the purchasing manager under a well governed and transparent system.

(iv) Profit sharing: A percentage (10%) of the profits is returned to the producers after the sale has been made by DE of the value added raw materials. The payment is directed to the individual bank account of the producers-suppliers through a micro-credit and savings facility developed with its institutional banking partner. Additional profit accumulation allows DE to consistently provide competitive price returns to the supplying producers for the semi-processed products over successive seasons.

6.2.9 Infrastructure and product development

Common to all of the above is the need for depot/collection centres or satellite workshops, and an adequate and efficiently operated central processing facility for final processing, packaging and distribution of the bio-products. A central facility allows consistent product quality (grading), formulation, design, packaging and presentation to be achieved.

Primary processing and collection centres: The BDP has constructed or renovated seven depot centres to serve the bio-enterprises (i.e. bee products, indigenous aloe stabilisation and semi-processing, tree-seed collection, crafts and medicinal plant products) within Kirisia and Laikipia counties. For raw material products, such as comb honey, tree seeds, essential oil and medicinal plant materials, the depot centres are used for collection,

grading, payment and primary processing (initial cleaning such as sieving) and bulking. The materials are transported weekly to the central processing centre. The depot centres comprise of a receiving room, semi-processing room, handling and storage facility.

Bio-enterprise central processing: The central processing facility has been designed as a key component of the programme towards achieving consistent marketable quality product. The depots ensure economies of scale and enable the bio enterprises to share overheads. The central processing facility also enables consistent final grading, high level maintenance of quality and hygiene standards, appropriate packaging and storage conditions. It provides the producers with the opportunity to consolidate consignments.

Producers access to fair markets: The major challenge in accessing fair markets for these communities is to consistently produce good quality products in sufficient quantity. To address this central issue the BDP provides the bio-enterprises with training to improve producers' skills to satisfy market requirements, monitors quality standards and protocols, develops formal linkages between buyers and producers, establish collection and processing infrastructure, conducts product branding and promotion (through exhibitions and trade fairs) and to conduct marketing trials. Commercial partnerships are arranged through transparent and equitable agreements and partnerships with relevant NGOs and government departments continue to be important.

Bio-enterprises from indigenous plant based product can be successfully diversified provided that:

- The product is already widely known and accepted in the market;

- There is sufficient and sustainable supply
- Products are processed and packed to statutory regulations of the market and to buyers' non-statutory standards.

Exporting plant materials that are already established in the international market can be competitive but penetration into apex markets can only be achieved if the plant products are endorsed as sustainably wild harvested, 'organic' and/or fair-trade certified. Whilst providing competitive advantage, certified harvesting/ production and management systems can provide sound mechanisms to develop the bio-enterprises on good business grounds, whilst incentivising producers to drive community-led conservation of the natural environment.

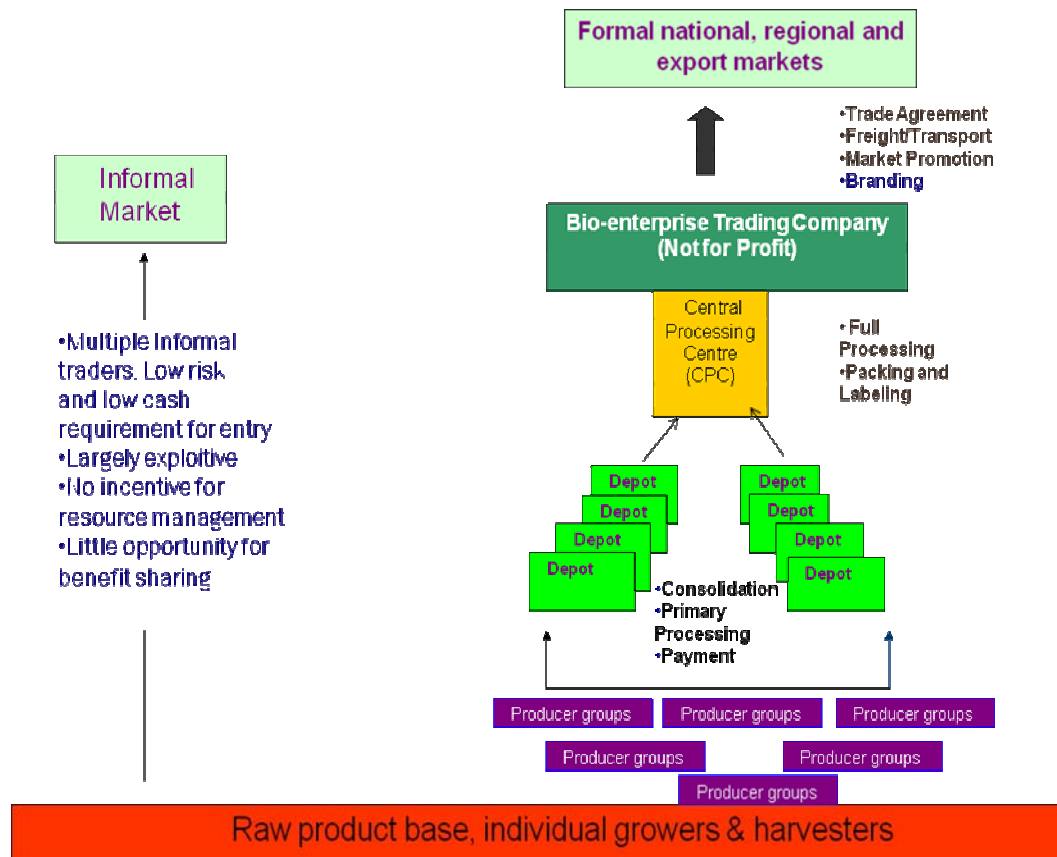


Figure 6.1. BDP Business flow

6.3 Baseline survey of the selected research groups targeted by the BDP

6.3.1 Group history, governance and composition

The BDP expects to have an impact on group governance and structure as the groups' capacity grows. Good governance is seen by the BDP as being critical for effective implementation of sustainability and traceability protocols that have to be put in place to ensure that production achieves desired market standards and conservation impact.

Before the establishment of the programme information was gathered on the groups which included:

- Group history (how the group was formed and why)
- Group governance (transparency, elections, etc)
- Gender equity – proportion of women (in mixed group)
- Business operations – activities, sources of income, sources of expenditures, account status etc.

As an example, Table 6.6 provides a summary of selected groups in the Mukogodo region.

Table 6.6 Example summary on governance and business status of the groups

Group	Membership, activity and benefit sharing	Governance	Gender	Business status
Mbeke (Musul)	Registration: 2003 and Updated Records: Constitution, mission, meeting minutes, accounts Bank account: active Support: received support from a number of NGOs Members: 27 members (11 women)	AGM: Annually Meetings: once a month Committee: functioning and established Elections: every end of year Records and information sharing: records are kept by the treasurer and shared with the members.	Mixed	Source of income: sale of honey from the group hive, otherwise sale of individual honey is for own. Livestock trading is also an activity explored by the group but does not exist for the moment.
Naitabaya Women (Musul)	Registration: 2005. Updated yearly. Records: Constitution, mission, meeting minutes, account Bank account: active Support: received support from a number of NGOs and LWF Activities: was set up informally and expanded activities to rangeland rehabilitation, aloe (2006), hay, livestock trading. Members: 63 members, 50 active members.	AGM: Annual Committee: 3 members, functioning Election: annual at the date decided in the AGM Records and information sharing: financial records up to date. Meetings: monthly Group ranch set up: the group has a formal agreement with the Group ranch to grant the group the right to a 50 acre plot. Agreed on a consensus basis at the group ranch level.	100% women	Sources of income: Sale of aloe soaps. Each member buys a soap others are sold locally. Livestock trading Main costs: materials to soap making, bank fees, livestock purchase and maintenance Income to members: support to school fees. In 2008 the group distributed 500 ksh per member from the soaps. Assets: 40,000 Ksh (grant received), 5 cows.
Naisukut Beekeepers (Morupusi)	Registration: 2006. Updated yearly. Records: Constitution, mission, meeting minutes, account Bank account: active Activities: Beekeeping Members: 38 but 25 active (10 women)	AGM: held as per constitution Committee: established and functioning. Inform and pay group members (honey sales), ensure that rules are followed. Records and information sharing: through meetings, phone. Expenditures are approved by the members in meetings. Financial records are shared with members at meetings when operations are planned. Meetings: members meet bi monthly and committee weekly.	Mixed	Sources of income: monthly contributions, honey sales Income to the members: through dividends (annual). Main costs: facilitation of members who go to the bank, motorbike hire to carry honey. Assets: Ksh.13,000.

<p>Naiputaki (Dol Dol)</p>	<p>Registration:2002 as an enterprise (no need for renewal) Records: Constitution, mission, meeting minutes, accounts (not up to date) Bank account: Closed (had 2 but inactive and then closed). Activities: Beekeeping Members: 33 (14 women) Support: Received hives and a honey depot/ processing centre (from AWF) but not used.</p>	<p>AGM: Committee: 7 members Elections: Every two years. Records and information sharing: through phone, letters and meetings. No process for budget planning. Financial records were shared with members during the meetings Meetings: every two months. Meetings have not been held for 2 years. The group is an umbrella for 5 sub groups which are located far from each other, making it dysfunctional.</p>	<p>Mixed</p>	<p>Source of income: honey sales (but none for a long time) Income to members: in the form of loans to be repaid with interest (none for the last 2 years). Assets: no money is account. Hives. Depot/processing centre</p>
<p>Nkiloriti Women (Nkiloriti)</p>	<p>Registration: 2007 Records: Constitution, meeting minutes, accounts Bank account: active Activities: Poultry, now beekeeping Members: 51 (49 women) Support: AWF</p>	<p>AGM: held as per constitution. Committee: formed and functioning Elections: Held as per constitution Records and information sharing: Communication is by word of mouth. Expenses are planned and records are shared during meetings. Meetings: 3 x month and minuted.</p>	<p>100% women</p>	<p>Source of income: Poultry sales Costs: is registration and poultry food Assets: Poultry house, chickens and 8,000 Ksh in account.</p>
<p>Tapapo (Lekuruki)</p>	<p>Registration: In process Bank account: None as yet Records: None as yet Activities: Beekeeping Members: 12 (2 women)</p>	<p>Committee: acting chairman and executive committee in place (temporary) Meetings: on a needs basis, attendance not consistent at this stage.</p>		<p>No income yet as a group.</p>

6.3.2 Summary of the baseline information of producer groups targeted by the BDP

In addition to the surveys conducted for this research study, the BDP conducted a baseline survey in all its targeted areas in November 2009 using participatory methods. 36 key informants were interviewed and 68 group members were surveyed as representative of their households and as individuals in their own right. Results are thus representative of the groups targeted by the BDP rather than the wider communities to which they belong. The baseline information of the BDP selected groups within the operational area of the full programme is listed below:

Beekeeping: Beekeeping is genuinely traditional in the target areas. A quarter of the sampled group members thought that beekeeping is an important source of livelihood for their household. The majority are confident in their beekeeping skills.

Diversified activities and entrepreneurship: Most households depend on livestock for their livelihood at some level as well as on an array of non-livestock based activities. People are relatively integrated in the monetary economy, resourceful and entrepreneurial which should provide a good basis on which to develop the bio-enterprise approach. Most members sampled were confident in their business skills.

Traditional plant use: Plant knowledge is widespread and traditional medicines are commonly used by most of the population. Specific knowledge exists in relation to midwifery and the use of herbal (indigenous plant) medicines. Rules in relation to harvesting of medicinal herbs are very simple and were found to be loosely enforced. However the forest is still in good health and there is little evidence of trade in

ethnobotanicals and other indigenous plant materials. However, people are keen to derive more economic benefits from traditional knowledge and medicinal plants.

Women involvement: Women were well represented in the targeted groups. They are keen to be more involved within the groups and the bio-enterprise development activities.

Poor governance: Most of the groups have some form of governance already in place. However, the effectiveness of the governance is questionable. This was demonstrated through the recent severe drought periods where the group members were not always willing to adhere to group rules. For example, group grazing management systems are becoming weak and ineffective due to the interests and actions of individuals to compete with each other for grazing and other resources. Most organisations which have worked in Laikipia consider that the main constraints to achieving sustainable resource-use, or assisting communities to improve their livelihoods is poor governance at all levels, coupled with a lack of unity and interference from local politics (Malleret-King, 2009).

Land tenure: The domestication of plants in communal lands is effectively “privatising” parts of the land. Although there seems to be a will of people to farm where possible there needs to be a clear strategy on how to promote the domestication of indigenous plants to relieve pressure on wild stocks in the context of Group Ranches (government designated communally owned and managed land). Areas exist which have been effectively “privatised” by groups in the group ranches through the establishment of demonstration plots. A formal agreement is usually developed by the Group Ranch for an

established period of time; however issues of poor governance at the Group Ranch levels can jeopardize these agreements.

Education, training and knowledge: Overall the education level of group members was found to be low (70% had not received formal education), and this was more acute for the women. This affects the capacity of the members to take up new knowledge. Women were found to have had less access to training than men. Empowerment, assertiveness and skills levels were found to be lower in the sample of women interviewed.

Transport and beekeeping: Very few members have access to transport, even bicycles. Hives are located far from the homesteads. Logistical issues concerning the transport of harvested honey have provided the justification to the BDP to construct and equip collection and semi-processing depots at suitable locations in the operating areas.

Unsustainable resource use and lack of control: Charcoal burning is widespread, especially in the Western side of Mukogodo and in the Kirisia forest reserve where most efforts may have to be concentrated in relation to linking natural resources and income derived from the resources/value.

Bank account ownership: Few members own bank account, especially women.

Sustainability principles and climate change: Although there seemed to be a good understanding of some ecological processes – for example the link between vegetation

cover and water availability, a large proportion of people did not make the link between their activities and water availability.

6.4 Impact of the BDP after 18 months of implementation (Nov 2009 – June 2011)

6.4.1 Uptake of the BDP activities and level of collaboration

From the investigation of the BDP records it was found that over the 18 month period the programme had fully engaged 18 groups in Laikipia and 7 in Kirisia in its programme activities. At the end of this period BDP was targeting 366 producers in Laikipia (51% women), thus altogether the programme was working directly with 539 producers (including 273 women); as well as 3 private operators. In addition to this, the BDP works indirectly with the Oreteti beekeeping enterprise, which is a group ranch enterprise set up to serve 1,350 households. The monitoring process conducted by the BDP shows that practical-based and on-site training sessions are more effective than formal class room style training. This also has been found to enable greater involvement of women who find it easier and culturally more acceptable to participate in trainings sessions held within their location of their homes and communities. The result of the extension services has been an immediate raise in the hive colonisation (i.e., 300% increase in the Mukogodo area over the 18 month period). The hive catchment has increased due to the increased number of beekeeping groups trading. The overall hive catchment of the programme has increased by 679 hives (a 28% increase) with an average colonization rate of 40%.

The information gathered for this study from the informants in the selected groups in Kirisia and Mukogodo demonstrated that the importance of beekeeping at the household level had increased. In November 2009 51% of the surveyed producers mentioned beekeeping as part of the 5 main activities carried out by the household, compared to 70% in the survey conducted in June 2011. The number of producers with their own bank accounts has more than doubled since 2009 as a result of the programme facilitating process. This increased producers' capacity to save. An increase in perceived skills was detected (skill score) especially in relation to beekeeping. Results also show that the gap between women and men's skills level has narrowed. This positive change may reflect a change in women's confidence in their ability to be involved in honey productions, which was picked up in focus group discussions. It was found that producers who had received training were more likely to have acknowledged increased production and income, which suggests that increased in income and production is linked to the BDP efforts in capacity building. From interviews held with the BDP team members based in Kirisia there is no doubt that the honey harvested has increased in quality since the start of the BDP activities in these areas.

6.4.2 Extension performance

Increased skills, improved quality honey and increased perceived skills all suggest that the extension service has been effective in relation to beekeeping. The role of the extension officers is also very clear for the respondents. In order of frequency, the services provided by the extension officers are understood to be the following:

- Buy honey/collect honey (32%)
- Follow up and advise (28%)

- Inspect hives (19%)
- Supervise producers' activities (19%)
- Train producers (19%)
- Pass information (14%)
- Other (7%)

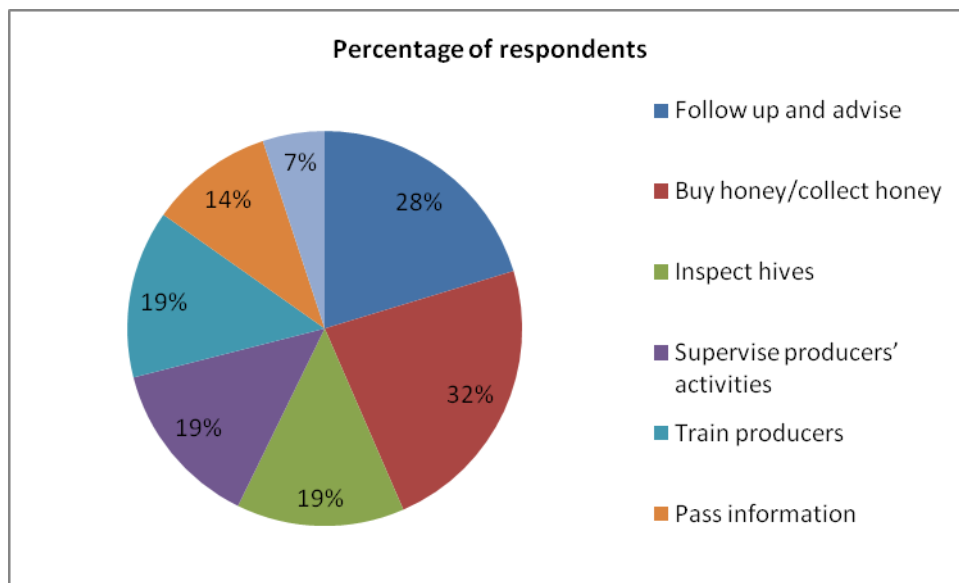


Figure 6.2 Perceived roles of extension officers (%)

Most of the respondents found the services provided useful (Figure 6.2). None of the respondents felt that the service was of no value. Although this question was likely to attract positive answers (in the attempt to please), differences were detected, as seen below from the Kirisia follow-on survey (Dec 2010). This may relate to the circumstances of the respondents in terms of their readiness to take up and benefit from the services. For example, the high scoring of the Saanata group may be due to the amount of honey purchased from the group by the BDP through the extension staff over

the last 1 year. The other groups have fewer products (honey and ethnobotanicals) ready to sell to the BDP.

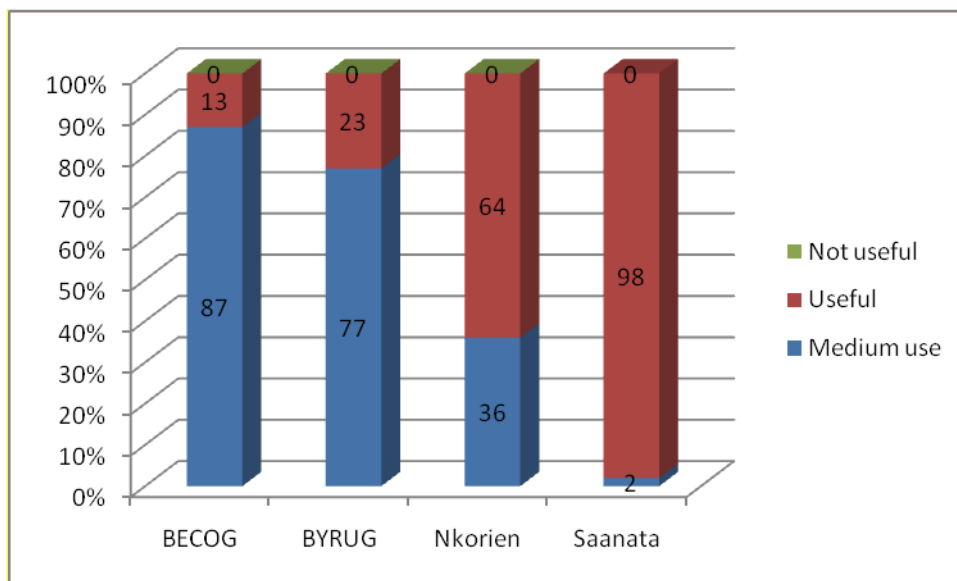


Figure 6.3 How useful is the service provided by the extension officers?

The reason for which most of the respondents rated the service useful is due to the new skills provided by the extension officers, or reviving skills which had been forgotten. The reasons invoked for rating the service medium include low frequency of the visits. When asked about how the service could be improved, responses included:

- Providing equipment (especially hives) for 54%
- Increasing visits and more training 49%
- Increasing the price of honey (26%)
- Provide planting materials for herb production, depot (7% each, 3 respondents)
- Help sort out the pest issues
- Other

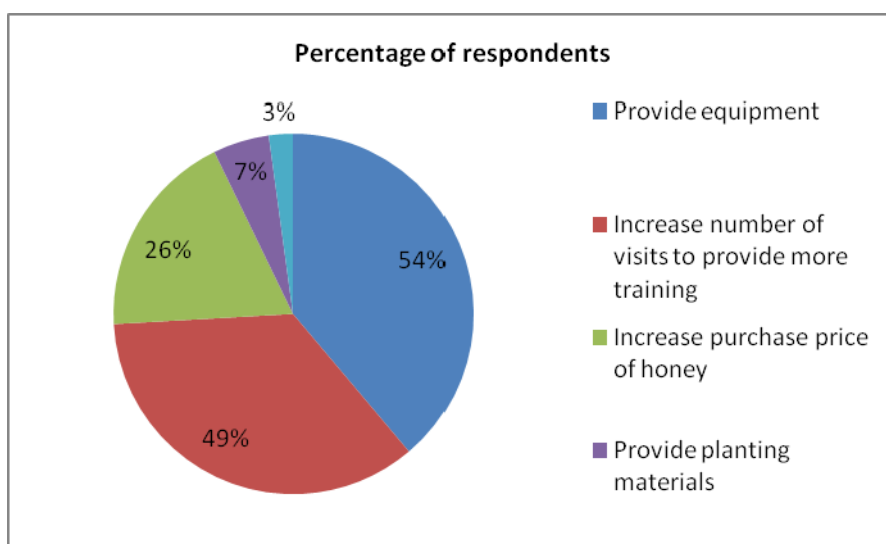


Figure 6.4 How can the service be improved?

The strongest response to the question as to how the service can be improved was for an increase in the provision of equipment. It is most likely that this response is due to the recent history of donors who have developed short term initiatives in the region (2 to 3 year terms), providing training and equipment such as bee hives to producers. However, it is evident the low level of production and the number of vacant or abandoned hives that this strategy is ineffective. The expectation however remains in the communities that development initiatives represent an opportunity to gain free equipment. Almost half of the respondents felt that increased training and mentoring is the most important improvement of the existing service. This indicates that the respondents value the services and can see their purpose in improving their opportunities to increase their incomes (this is demonstrated in Table 8.4 in Chapter 8). Due to the long drought period between 2009 and 2011 (referred to in detail in Chapter 8) there is a shortage of honey in the entire country. This has increased the purchase price and has caused greater pressure from intermediate traders who are able to buy small quantities of honey for high prices.

This has increased the price expectation of the suppliers and the assumption is that large quantities can also be purchased for the same inflated price. The BDP has conducted quarterly surveys of honey comb purchase price and the retail price fluctuations nationally in order to ensure that it is offering its suppliers, the community members, a fair and competitive price. This suggests that the extension team need to continue to raise the capacity of the producers to develop their bee-keeping bio-enterprises on sound and sustainable business grounds.

6.4.3 Incomes from developing the bee enterprise

More than half of the producers interviewed think that their involvement in the programme has contributed to increasing their income in the last year due to the guaranteed market and increased skills. An investigation of the BDP records between October 2010 and June 2011 showed that DE (for the BDP) purchased 4.6 tonnes of honey for Ksh 518,890.

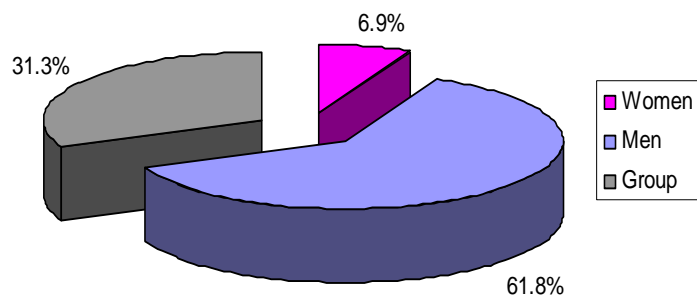


Figure 6.5: Honey supplies according to gender

The majority of the honey was supplied by men (almost 62%). Women supplied less than 7% of the total supply dependently, although women contributed a higher percentage of the total through the producers groups (Figure 6.5).

The records also show that in Kirisia DE purchased 3.1 tonnes within a 9 month period, between October 2010 and June 2011, compared to 4 tonnes bought by the Samburu Beekeepers Co-operative from the same groups prior to the start of the BDP over a three year period from 2007-2009. This increase in honey volumes can be attributed to a positive change recorded in business attitude of the producers, the increased extension services, improved pricing, improved production efficiency and implementation of Internal Control Systems. These are positive results that can be attributed to the impact of the BDP.

The perceived changes in income, production and investment as a result of engaging in bio-enterprises promoted by the BDP are presented in Chapter 8, figure 8.4. Over half of the producers interviewed felt that by adopting bio-enterprises their incomes have increased, just under half of the respondents felt that their production had increased, and as a result they have expanded their investment in beekeeping activities.

6.4.4 Up-take of payment system

BDP is developing its payment system to the producers by using the cell-phone based banking system, *Mpesa*. This is made possible by the expansion of cell-phone network coverage over most of the country, including the larger ASAL settlements and commercial centres, such as Maralal in Kirisia and DoIDol in Mukogodo. The producers

targeted by the BDP visit these commercial centres regularly (at least monthly) for household provisions and trading purposes. Payment is made by the BDP directly to individual producer accounts, facilitated by the bank, against the payment schedule provided by the BDP. As money is transferred to their accounts the producer receives a message on the cell phone from the bank confirming that payment has been made to the producer's account from the BDP. Producers can then withdraw, or transfer money by *Mpesa*. To achieve this BDP has facilitated producers to obtain individual bank accounts through Equity Bank. This enables direct payment to individuals, through their accounts. This system encouraged savings and also facilitates women to have more control over their income. This has had a noticeable effect, as shown in Figure 6.7.

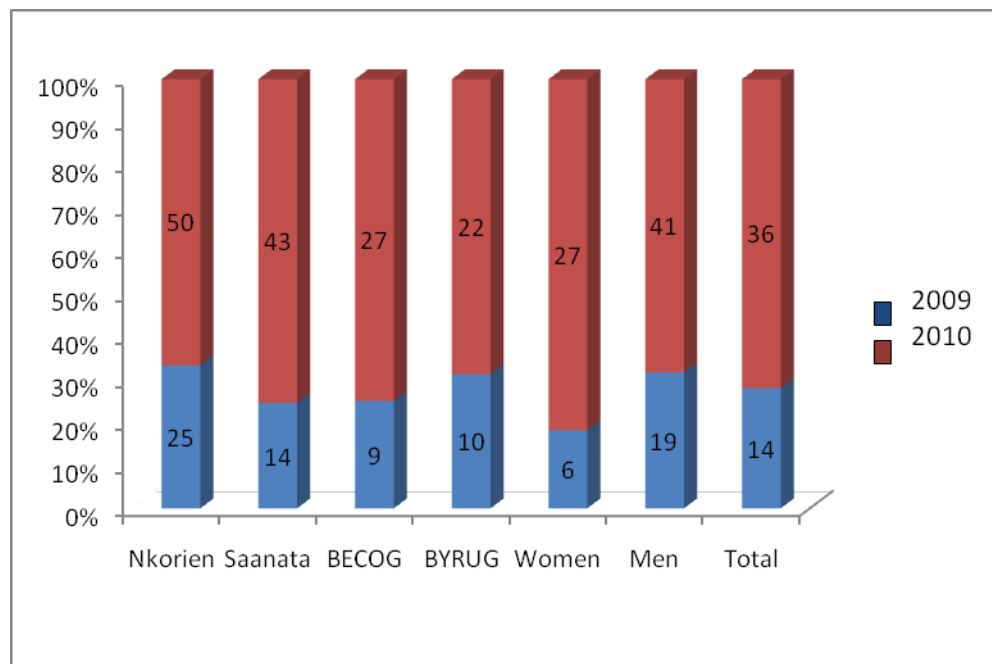


Figure 6.6 Proportion of respondents with individual bank accounts (%)

When exploring the change in account ownership according to gender, results show that 27% of the women interviewed had a bank account in 2010 (against 6% in 2009) and

40% of men respondents had a bank account compared to 18% in 2009. Although the proportion of women producers is still lower than that of men, the proportion of women with accounts has tripled since 2010.

6.4.5 Commitment of selected groups in Kirisia (based on honey enterprise)

The survey then focused on exploring whether producers understand and are committed to the bio-enterprises. As shown in Table 6.7, the large majority of respondents, 95%, think that they know how to produce good quality honey, 77% consider they produce good quality honey, 95% think it is worth producing good quality honey and 100% say they are committed to investing time and effort in the production of good quality honey.

Table 6.7 Commitment to production of good quality honey (%)

Opinion	% No	% Yes
Do you know how to produce good honey?	5	95
Are you producing good quality honey?	22	77
Is it worth it?	5	95
Are you prepared to invest in beekeeping (time and effort)?	0	100

From the survey the reasons for producers being committed to producing good quality honey suggest that they may have seen a difference in the financial value of good quality honey in comparison to low quality honey. When questioned on this point, the respondents indicated that:

- Because a higher price is received for good quality honey. BDP pays a 25% premium for table grade quality the price for honey that falls below this standard (34% of respondents).
- Because good quality honey is sold easily (56% of respondents).

- Other reasons included, it is; healthier, good food, quick income, matter of pride (10% of respondents).

The fact that good quality honey sells easily and thus brings more income/quicker is one of the main reasons why producers are think it is worth producing.

6.4.6 Key impacts

From the evaluation of the BDP, the key impacts of the programme after the first eighteen months of activities are identified as follows:

- Greater understanding of the participating communities of the potential rewards that bio-enterprise can bring as a result increased incomes
- Greater understanding of the value of the natural environment.
- Increased women's confidence to participate in beekeeping activities; it is felt that beekeeping is a family activity rather than a man's-only business.
- Increased skills of the producers and harvesters
- Pride; women feel proud that they are the only women in their area who are involved in beekeeping, that have bank accounts and have developed their own small businesses.
- Increased capacity to save their income and the greater potential to trade using their individual bank accounts.
- For women, the increased income enables them to pay for school fees and has improved the overall household food security.

The information also has shown that the outputs of the BDP service-providing activities and the ethical trade facilities provided by DE have created positive change, as identified

in the key impact areas above. The information gained from the two surveys and the secondary data held in the BDP records contributes to the focus of Chapter 8 of this study, to identify the probable factors that influence the up-take of diversified livelihoods by pastoral communities and for highlighting the major factors that affect the ability for bio-enterprises to create positive social and environmental change.

Chapter 7. Perceptions of Increased Pressure on Natural Resources

7.1 Introduction

This Chapter focuses on, within the context of the research study area, the much debated subject of the causes and effects of increased pressure on natural resources by user groups in the Kenyan ASAL. At the heart of this discussion are the inexorable and often polarised perceptions of pastoralism by government and the development sector. In further addressing Objective 3 of this study, this chapter presents the perceptions of resource users on the increasing resource pressure, its causes and effects, and compares these with the findings from recently published and non-published research studies.

Development approaches to stimulate alternative or complimentary pastoral livelihoods are primarily based on the assumption that pastoralist understand that they need to change their traditional livelihoods and are willing to drive these changes. More so, development agencies assume that it is possible to instigate this change in a manner that meets their conservation and livelihood objectives. These objectives may differ from those of the pastoralists themselves whose prioritises are generally focused on immediate concerns of livestock grazing and income generation (Homewood, 2008). From the experiences of the BDP and other development initiatives interviewed and evaluated in this research study, it was evident that these assumptions may be a major cause for fundamental misunderstandings between the parties.

The case study within this chapter provides fresh information about pastoralists' understanding of their environment and the concept of environmental 'sustainability'. Information was also captured about their perceptions of climate change and its impact on their livelihoods and environment. Informants were asked about their coping strategies and their interest in bio-enterprises, such as bee keeping, that can potentially buffer their livelihoods against these severe climatic effects. By evaluating the communities' perception of these issues, this chapter seeks to present insights as to the relationship communities have with the natural environment, and whether and to what degree they require incentivisation in order to actively engage in conservation management. It was felt that once this is understood by government departments and conservation bodies they will be better positioned to pro-actively address the effects of human impact on these resources before further and more considerable damage was reported. It was also intended that this information will help these actors to detect the underlying causes for the poor communication that currently exists between the development and government sectors and the pastoralist communities, and will assist the KFS and the CFAs to develop effective community lead forest management methodologies.

The chapter concludes with a discussion on the comparative qualitative findings revealed by the interviews conducted for this study with those of the quantitative research studies conducted by the World Wildlife Fund-UK (WWF-UK), AWF and A. Powys for the BDP.

7.2 Methodology for the case study

7.2.1 Design

A case study was designed for this research to gain information about the understanding of the pastoralist communities, who live in the proximity of the Kirisia forest, about the value of the natural environment, and how they view the concept of sustainability, the impacts of climate change and the need for diversification, such as the bio-enterprises discussed in Chapter 6. Data collection conducted for this chapter was undertaken as a part of the follow-up survey conducted for the Chapter 6, using the same methodology as previously described. Field research data was collected through purposive interviews to evaluate awareness and perception of the pastoral communities. The findings from the interviews on each of the topic areas are presented as in section 7.4. The data scores are given in Appendix 5 together with the number of informants per methods and topic investigated. The overall methodology for the data collection and analysis is explained in detail in Chapter 3; whilst the specific methodology for this chapter is given below.

A separate study conducted by A. Powys (pers. comm.) for the BDP provides background information about the awareness of the resource users of the increasing pressure on natural resource use in the Kirisia Forest. This is presented as contextual background information in section 7.3.

7.2.2 Case study area and sample group selection

Despite being in good condition, the Kirisia forest was considered as a highly endangered critical ecosystem for the area. The main threats to the forest are population increase

thereby putting pressure on the resources (timber for building, fuelwood, ethnobotanicals and charcoal) as well as the loss of traditional forest management systems. As seen from this case study, the forest provides essential services and goods to the communities around it.

Table 7.1 List of group selected and their location

Group	Location
BYRUG (Baawa Youth Resource Use Group)	Baawa
BECOG (Baawa Environmental and Conservation Group)	Baawa
Saanata	AngataNanyukie
Nkorien	Lodokejek
Nduat	Lporros/Milimani

Since 2009, the BDP has established activities in the Kirisia area to improve the socio-economic and conservation status in this region by assisting communities to establish and build enterprises based on the sustainable harvesting or production of indigenous plant based products. The five groups selected for this survey are those targeted by the BDP, as indicated in Table 7.1. The people within these pastoral communities depend mostly on livestock and farming for their livelihood (more than 80% of the group members interviewed). Group members also depend on employment, casual farm labour and small business to various degrees depending on groups and areas. Although widespread (50% of the group members mentioned depending at least partly on beekeeping for their living), beekeeping was considered as an activity of lesser importance. These groups have been formally registered as community groups in the last two to five years. Their purpose is mainly ‘poverty reduction’ and activities involve beekeeping and farming. They meet regularly and maintain records of their meeting. It is interesting to note, however, that

only one of the groups had proper records of their sales and production thus their current level of income could not be identified.

7.2.3 Data collection and sampling

A series of household surveys, focus group discussions and key informant interviews were carried out using pre-designed and pre-tested questionnaires. The committees and group members were then interviewed. Household survey methodology was used to complement the information collected through more participatory methods, conducted as focus group discussions. Household surveys and key informant interviews were also used when more sensitive topics were explored, such as women's perceived level of assertiveness and decision making opportunities. Interview guides for the focus group discussions and key informant interviews are included in Appendix 2. The questionnaires for the household surveys are given in Appendix 3. The methods used for each indicator investigated and the number of informants per method and topic is given in Appendix 4. Using the household survey method 58 people were interviewed; 26 women and 32 men. A maximum of 15 members were interviewed within each group, representing a minimum of 37% of the group members (Table 7.2).

Table 7.2. Number of respondents surveyed per group

Groups	Number of Respondents	% of group members interviewed	Number of women interviewed	% of groups women members
BYRUG	12	37.5%	5.0	50.0%
BECOG	12	46.2%	6.0	85.7%
Nduat	7	63.6%	7.0	63.6%
Saanata	15	50.0%	3.0	50.0%
Nkorien	12	37.5%	5.0	31.3%
Total	58	44.3%	26	52.0%

The sampling techniques used for each topic area are indicated in Table 7.3.

Table 7.3 Sampling technique used for each impact area and indicator investigated.

Impact area	Respondents (2010)	Sampling technique
Awareness of the components of a healthy environment	58	Representative sample of producer groups Household surveys, focus group discussion and key informant interviews
Perceived importance of bees	58	Representative sample of producer groups Household surveys, focus group discussion and key informant interviews
Understanding of ecosystem and sustainability according to education level	58	Representative sample of producer groups Household surveys, focus group discussion and key informant interviews
Perception of changing climatic conditions and effects of food security	58	Representative sample of producer groups Household surveys, focus group discussion and key informant interviews
Attitudes towards future	58	Representative sample of producer groups Household surveys, focus group discussion and key informant interviews
Perceived Skill level	58	Representative sample of producer groups Household surveys, focus group discussion and key informant interviews
Total interviewed	58	Interviewed in 2010

Household survey: The household survey was used to investigate well-being as well as perception, knowledge, and women’s empowerment. The survey was designed through key informant interviews and focus group discussions to ensure that questions were appropriate and that local based criteria were used to measure well-being and empowerment. The focal aspects included:

- General characteristics of the respondent’s household
- Food security (based on coping strategies)
- Understanding of climate change and sustainability principles

- Perception of skill level
- Level of empowerment at the household level

The household units selected for this monitoring process are called the “*Enkang*” in Maa, and this classification is recognised within the Samburu culture, and includes a husband and all his wives. This term is used for both male and female headed households, although women headed households are often referred to as “*Enkaji*”. Although not all resources are pooled together, well-being is relatively homogeneous at the *Enkang* level.

Key informants: Key informants were selected purposively on the basis of their knowledge of their community, of the activities discussed, and of the group members.

Key informants were used to enrich the data collection process. The 16 informants included 5 women and 11 men, and were one of the following:

- Group committee members
- Plant collectors
- Group ranch chairman or committee
- Beekeepers
- Group members

Focus group discussions: Focus group discussions were gender based to ensure that women could express themselves freely. Although this is changing, it is appropriate to interview women separately on some of the topics to ensure that their points of view are captured in an uncompromised way. Of the 35 respondents, 18 were women and 17 were men.

Justification of research method used: As stated in Chapter 6 (6.1.2.3)

7.2.4 Scoring

The respondents were asked about their level of agreement with a list of statements. The interview data was evaluated and a score calculated by adding the scores for each item on the list (1 for agreement/disagreement, 2 for strong agreement/disagreement when the respondent showed understanding, and -1 and -2 scored was allocated to reverse statements – “wrong” answers in other words). Statements related to the perceptions of the interviewees on the state of and the increasing pressure on the natural resources, including soil, water and the forest. The scale used to illustrate the distribution of answers overall where -2 corresponds to very little understanding and 2 to high understanding (strong agreement on positive statement and strong disagreement on negative statements such as statements a, c, d, g). The Likert scale is used at the means of analysis. Is it necessary to note that there is no direct translation of the word ‘*sustainability*’; the word was explained as “to use resources in a way that they will last”. Statements c, f and g relate to whether people see a link between different ecosystem processes (water, mineral cycles, energy flow and biodiversity).

7.3 Background and past research findings

7.3.1 Environmental, socio-economic and administration status of Kirisia Hills

Samburu District has always been pastoral land, with the Kirisia Hills forming an important dry season refuge for livestock. With the growing population in Maralal town and the surrounding group ranches that border the reserve, there was a noticeable increase

in the use of forest products and charcoal production especially was on the increase. The Kirisia Hills are surrounded by two main groups of people the Samburu make up the majority ethnic group whilst there are small populations of hunter gatherers (Ndorobo) who are the oldest inhabitants of the Kirisia forest. The area of the Leroghi Forest Reserve, comprising the remaining Kirisia forest, has been traditionally used for dry season grazing, honey collecting, herbal medicine, firewood and building material.

In the early 1980s, logging of the indigenous tree species was prohibited by presidential decree. In March 2000, a nation-wide general ban on logging and forest exploitation came into force. Kirisia forest reserve falls under the protection of the KFS and activity concerning forest utilization requires permission from the District Forest Officer (DFO). The regulations for Kirisia Forest do not allow for the collection of firewood since it is an indigenous forest and collecting of firewood is therefore illegal. The DFO also controls permits for the transport of charcoal, assuming that it is produced on private land since the production of charcoal is prohibited in forest reserves. Grazing in the forest is allowed during dry months of the year. The Forest Bill encourages community participation in the joint management of forests. The CFA was recently founded; so far it has not begun to fulfil its mandate. AWF has worked for more than 5 years with some of the communities in developing Natural Resource Plans and raising awareness on the importance of forest conservation. It continues to provide some governance support to the CFA in order to build its capacity to oversee the conservation welfare of the forest reserve.

The Leroghi Forest Reserve spans 91,452 hectares and lies on the northern end of the Laikipia plateau in Northern Kenya. The reserve boundary encompasses 70,000 hectares

of dry cedar/olive forest on the Kirisia hills and approximately 20,000 hectares of semi-arid and arid bush land with an altitudinal range of 1,273m – 2,625m. The forest was gazetted in 1933. The forest is critical as a water catchment area and in maintaining other environmental services, as well as in the pastoral economy of the 13 group Samburu community group ranches surrounding it. The topography of the hills is made up of metamorphic rock in the form of granitoid gneiss at an altitude of 1,273 to 2,625 m. The North facing side of the hills form steep slopes with sheer granitic bare rock faces and deep seasonal river valleys these form important water channels to underground water catchments in the seasonal loggers in the areas between Kirisia and the Mathews range.

7.3.2 Research findings of the increasing pressure on natural resources in the Leroghi Forest Reserve, 2004-2010. World Wildlife Foundation (WWF-UK) 2005

In response to logging alerts in Leroghi Forest, the WWF-UK, organized and funded a ground survey in 2004, followed by an aerial survey in 2005. The aerial survey was conducted in March by Christian Lambrechts of UNEP, Bongo Woodley of KWF and Michael Gachanja of Kenya Forest Working Group (KFWG). Set transects were followed from the air, with the position of the aircraft recorded on a GPS every 10 seconds. Each observation of forest disturbance was recorded and supported by photography.

The findings indicated that:

- No evidence of external, large-scale commercial drivers of forest destruction
- Logging was scattered and selective
- Three factors, (i) logging, (ii) manyatta settlement and (iii) fire were concluded as causing the most damage, as evident from the aerial photographs.
- There were 620 manyattas counted as present in the forest
- There were 96 burnt areas / fires recorded, 27 burnt trees / small fires recorded

- There was evidence of 318 indigenous trees logged

In response to the findings, WWF-UK Vice-Chair Toby Aykroyd then attended follow-up meetings with KFWG, KWS, the Green Belt Movement, UNEP, WWF and Leroghi communities. KFWG agreed to address manyatta settlement in the forest, a very sensitive issue. The 2005 aerial survey revealed 96 fires in the forest over 2 days, many started by honey collectors' smoking devices. These aerial findings supported the 2004 WWF-UK ground survey results.

7.3.3 Kirisia Forest Survey and Assessment Report, AWF. 2008

Of the NGOs, CBO and community groups that are active in the area, the AWF is the largest organisation involved in conservation in the Kirisia Forest reserve and locality. The inspection of the habitat recorded in ground surveys conducted by AWF and KFS during 2008 to 2009 demonstrated that the Kirisia Forest Reserve has been seriously damaged over recent years. The aim of the survey was to provide a baseline for developing a framework for participatory management of Kirisia Forest. The framework would enhance the opportunities for conservation and sustainable utilization of biodiversity through equitable access and benefit sharing with communities adjacent to the Forest. A participatory approach was chosen as the methodology for the survey. The survey was conducted using various participatory methods including: group discussions, transect walks/drives, demonstrations, observations and excursions to selected areas. The methodology used proved to be satisfactory in the prevailing circumstances.

The data presented from the ecological component of the AWF Kirisia Forest Assessment Report demonstrated that forest disturbance levels from both wild game and anthropogenic sources are high and should be addressed through sustainable management strategies for the forest resources. It stated that a high proportion of trees are in poor health (15 - 28 % of trees \geq 10 cm diameter at breast height (dbh)). The three most frequent damages on trees were pollarding (19 - 60 %), tree debarking (8 - 31%), naturally dead standing trees (13 – 15%), heart rot i.e. over-mature trees (up to 19 %), diseased trees (up to 13 %). This survey revealed that key threats to good forest health targeted a few species. The three most affected species were *Olea europaea ssp africana* (pollarding), *Juniperus procera* (die-back disease, heart-rot and debarking), *Croton megalocarpus* (debarking and honey-harvesting related injury); *Euclea schimberi* (pollarding and heart rot), *Mystroxyloa ethiopicum* (dying); *Podocarpus* sp. (debarking). The findings indicated that unsustainable wild honey harvesting techniques has been destructive to huge trees. Charcoal making in Kirisia was confined to areas near the township. Uncontrolled forest fires have also destroyed several thousands of hectares during the last 10 years. Trampling through permanent and semi-permanent footpaths and animal trails averaged 1.4% of the forest area. Trees were pollarded mainly for fodder particularly during dry seasons. Debarking is both man-caused, for construction materials or for carrying harvested wild honey, and game-caused such as debarking by elephants and buffalos. Heart-rot attacked mostly over mature trees and most dead and diseased trees (die-back) were those sensitive to fire damage. The dieback phenomenon was observed in extensively fire-damaged areas.

The socio-economic study component of the AWF Kirisia Forest Assessment targeted the household heads as the main respondents in thirteen group ranches that are adjacent to the Kirisia forest in a 5 km radius from the forest edge. Data were collected on the cultural, economic and social benefits that rural communities derive from the forest and the contribution of these benefits to the household economy. The survey showed that literacy level of the community, largely Samburu, is low with 85% of the respondents having not acquired any formal education. The survey also showed that the major economic activity is livestock keeping and the main land tenure system is communal for members of a given group ranch. The Samburu community relies on the forest mainly for dry season grazing and water. Currently, crop production and off farm employment is fast becoming a primary occupation. The community's household economy is therefore mainly based on land-use (crop cultivation and livestock keeping). Information from the study also showed that change in land tenure is taking place from group ranch ownership to some households searching for title deeds on the land they occupy so as to make permanent investments. Private land ownership is increasing. Some people still reside within the public forest, although this is now only a small percentage as a result of greater government enforcements.

As the land is no longer enough to support traditional pastoralism, some communities have started to develop long term settlements in some areas. The socio-economic survey revealed that Kirisia forest provides a diversity of benefits to local community as also evidenced in the ecological survey; firewood as a source of domestic energy, and water and dry season grazing emerged as the most important products from the forest. Other products included building posts and medicinal herbs. The main constraints to the access

and use of forest resources found by the AWF survey was reported as being permits, policing and human-wildlife conflicts. Most of the forest products are harvested for household consumption and less as a direct source of income. It was also reported that the Kirisia Forest Reserve is the major source of firewood with the balance coming from group ranches and an important source of honey. Herbal medicine is widely used in Kirisia area by the local community and the forest is the main source as revealed by the ecological survey. The AWF study showed that medicinal herbs are mainly collected for domestic uses. A small percentage of people practice herbal medicine for commercial purposes.

7.3.4 Ecological Survey of Kirisia Forest. BDP, 2009

An ecological survey of Kirisia Forest Reserve was commissioned by the BDP in 2009 and was conducted by A. Powys (pers. comms.) who is an ethno-botanical consultant (Powys 2009). The survey included the Kirisia Forest Reserve and the group ranches: Mbaringon, Nkiloriti, Angata Nanyokie. The survey was carried out between October and December 2009. The survey revealed escalating forest destruction. The main threats identified included tree cutting for cattle fodder in the dry season, charcoal burning, illegal timber extraction and honey collecting of wild hives where whole trees are felled the most affected species were found to be *Juniperus procera* (cedar) and *Olea europaea ssp. cuspidatus* (wild olive) and *Olea capensis ssp. macrocarpa*. From the survey it was assessed by the consultant that the current rate of destruction will lead to the disappearance of the Kirisia Forest within the next ten to fifteen years. Powys concluded in her report that judging by the prevailing circumstances it does not seem effective to

manage the forest resources through the enforcement of existing regulations. The rate of population growth in the Maralal and Kirisia environs has significantly influenced the rate of forest cover change. Changes in forest cover in Kirisia between 1986 and 2000 were assessed from aerial photographs (1:50,000, 1:10,000 and 1:12,000), spot imagery (1:250,000), and base maps of the study area (1:50,000). Using the Leroghi Forest Aerial Survey from the WWF-UK study, a comparison can be made between forest cover in 1986 and 2000. Powys reports that even though the two comparison satellite images do not show a significant change in the forested area (although the differences are more obvious on the forest edge where encroachment has occurred) it is a very different scenario when the forest is inspected on foot.

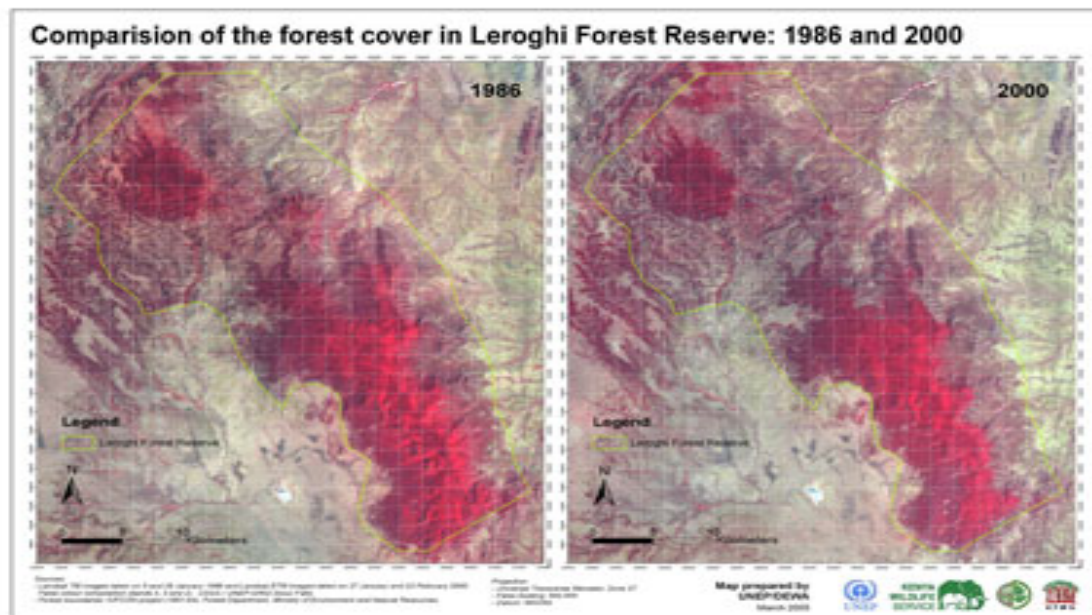


Figure 7.1 Comparison of the forest cover in Leroghi Forest Reserve: 1986 and 2000.

Powys recorded serious logging, charcoal burning and cutting of *Olea capensis* trees and that the health of the forest in the areas closest to Maralal and main roads is poor due to frequent harvesting of branches from mature trees and felling. During the drought beginning in 2008 and intensifying in 2009 the Kirisia hills received some rain in (March/April 2009) but the surrounding low country became very dry. The only water available for livestock and human use was in the hills. Neighbouring pastoralists from the surrounding country moved into the forest with their livestock. It was reported that whole trees were cut down to feed cattle and mature cedar and olive trees were felled to extract honey from wild hives. Traditionally the elders would only cut branches for livestock knowing that the tree would produce more the following year. The practice of harvesting wild honey was discussed with the elders, they impressed that in the past honey was carried out sustainably and there were very few incidences of fires as a result of these methods.

The main points from the 2009 ecological survey were:

- Kirisia forest is the main water catchment for the surrounding area
- All communities living adjacent to the forest rely on water coming down from the hills. Communities to the East in Meibae, Seiya, Sware, Operoi, Barsalo, Suyian rely on the groundwater that comes down from the Kirisia Forest.
- Damage to reserve, this important water catchment, is increasing annually
- The people living in and around these hills depend on the forest

7.3.5 Survey of community awareness of the conservation status of the Forest Reserve

The rapid survey of community awareness of the conservation status Kirisia Hill, Leroghi Forest Reserve was conducted in Kirisia during 2009, commission by the BDP and conducted by Powys. This survey was carried out in conjunction with the ecological survey of Kirisia Forest Reserve also commission by the BDP in the same year (7.4.3). The summary of the survey, presented below, provides relevant background and an important setting to the case study (7.5).

The aim of the survey was to collect the perception of local communities of the state of the forest and its resources. Information was collected through group discussion held in and around the forest and series of informal interviews with the local people living along the forest edges. This survey was conducted with some of the groups that were later selected for the case study conducted for this research project, as set out in section 7.6; it included youth group around Baawa, Lpartuk and Sanataa. Interviews were also held with administration officers, Kenya Forest Department (now the KFS, since 2010) and KWS personnel. Summary of the sources of information:

- Participatory interviews with stakeholders and ‘Friends of Kirisia Forest Reserve’
- Field visits and purposive interviews with local people
- Maps and data from the WF-UK 2005 Leroghi Forest Aerial Survey

In brief, the overall impression for the field research was that community members, especially those living near the forest, are aware that without the intervention, the forest will be gone in the near future. Some are concerned by this and expressed their interest in

conserving the forest, while others are indifferent or simply lack insight as to the importance of Kirisia Forest to their lives and to future generations. KFS was found to be supportive of the involvement of communities in the management of the forest resource through the Community Forest association (CFA), although the formalization of the CFA had not yet been completed at the time of this survey (2009). It was found that generally the local leaders have a positive attitude towards the conservation of the forest and involvement of the surrounding communities.

A summary of the results and findings of the aforementioned research studies are given in Table 7.3:

Table 7.3. Summary of findings from the former research studies of Kirisia Forest

Research survey	Date	Main results	Findings
Research findings of the increasing pressure on natural resources in the Leroghi Forest Reserve. WWF-UK	2005	Set transects were followed from the air using GPS. Observations of forest disturbance were recorded using photography. Survey revealed 96 fires in the forest, many started by honey collectors' smoking devices. The aerial findings supported the 2004 WWF ground survey results.	No evidence of external, large-scale commercial drivers of forest destruction. Logging was scattered Three factors, (i) logging, (ii) manyatta settlement and (iii) fire were concluded as causing the most damage, as evident from the aerial photographs. There were 620 manyattas counted in the forest There were 96 burnt areas / fires recorded, 27 burnt trees / small fires recorded. Evidence of 318 indigenous trees logged
Kirisia Forest Survey and Assessment Report, AWF	2008	Environmental survey provided baseline information for developing a framework for participatory management of Kirisia Forest. The socio-economic study in thirteen group ranches provided information on the cultural, economic and social benefits that rural communities derive from	Major economic activity is livestock keeping. Main land tenure system is communal for members of a given group ranch. Private land ownership is increasing. Samburu community relies on the forest mainly for dry season grazing and water. Currently, crop production and off farm employment is becoming a primary occupation As the land is no longer enough to support traditional pastoralism, some communities have started to develop

		the forest and the contribution of these benefits to the household economy.	long term settlements. Constraints to the access and use of forest included; permits, policing, wildlife conflicts. Unsustainable wild honey harvesting techniques has been destructive to huge trees. Charcoal making in areas near towns. Uncontrolled forest fires have destroyed several thousands of hectares during the last 10 years. Trampling through footpaths and animal trails averaged 1.4% of the forest area. Trees pollarded for dry season fodder. Literacy levels are predominantly low. Communities have received little education.
Ecological Survey of Kirisia Forest Reserve. BDP	2009	Main result was the demonstration of escalating forest destruction. Main threats identified included tree cutting for cattle fodder in the dry season, charcoal burning, illegal timber extraction and honey collecting of wild hives where whole trees are felled.	Kirisia forest is the main water catchment for the surrounding area All communities living adjacent to the forest rely on water coming down from the hills. Communities to the East in Meibae, Seiya, Sware, Operoi, Barsalo, Suyian rely on the groundwater that comes down from the Forest. Damage to reserve is increasing annually People living in the vicinity depend on the forest
Rapid survey of community awareness of the conservation status of the Forest Reserve.	2009	The perception of local communities of the state of the forest and its resources. Interviews were also held with administration officers, Kenya Forest Department (now the Kenya Forest Service, KFS).	Communities are aware that without intervention the forest will be gone in the near future. Some members expressed their interest in conserving the forest, while others are indifferent Local leaders have a positive attitude towards the conservation of the forest and involvement of the surrounding communities in conservation activities. The KFS is supportive of the involvement of communities in the management of forest resource through the CFA.

7.4 Perceptions of pastoral communities and users groups of the value and status of the natural resources within the Kirisia Hills region. Case study findings

7.4.1 Perception of the ecosystem, its value and sustainability

Using the household survey technique, 58 respondents were selected. They were asked to state the extent to which they agreed with a series of statements. The questions were designed to gain people's perception of a healthy environment. To achieve this, a set of statements were posed to the respondent to encourage them to indicate the way in which they valued resources, to demonstrate their level of their understanding of the ecosystem and of the linkages between the ecosystem processes and human activities.

The list of statements is the following:

- a) It does not matter what people do on their land, water will still be available
- b) It does not matter how much or how I collect medicinal plants/herbs, there will always be enough to satisfy my needs
- c) Soil condition cannot be improved
- d) If I increase vegetation on my land I will increase water available and the productivity of my land
- e) Even if the forest disappears, it will make no change to my life or my land

The results of the 58 respondents, according to their agreement with a series of statements, are presented in the Figures 7.2.

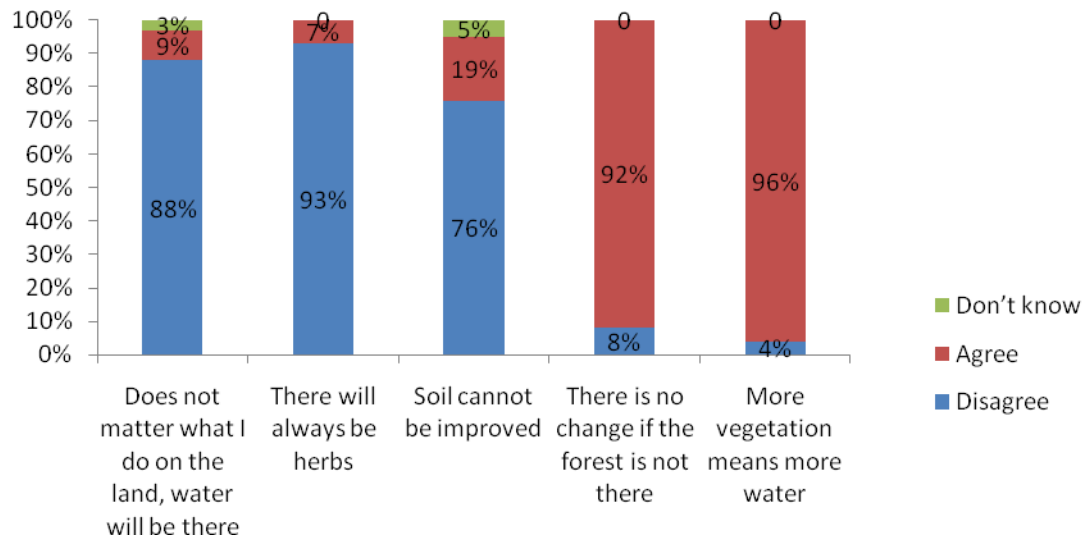


Figure 7.2. Distribution of answers for each statement

As shown by Figure 7.2 the majority of the respondents had some understanding of ecosystem processes and of the link with activities on the land. Nearly all respondents disagreed with the idea that no change would occur if the forest disappeared.

As illustrated in Figure 7.3 for most of the respondents a healthy environment is characterised by plenty of water, plenty of vegetation (trees) and fertile soils.

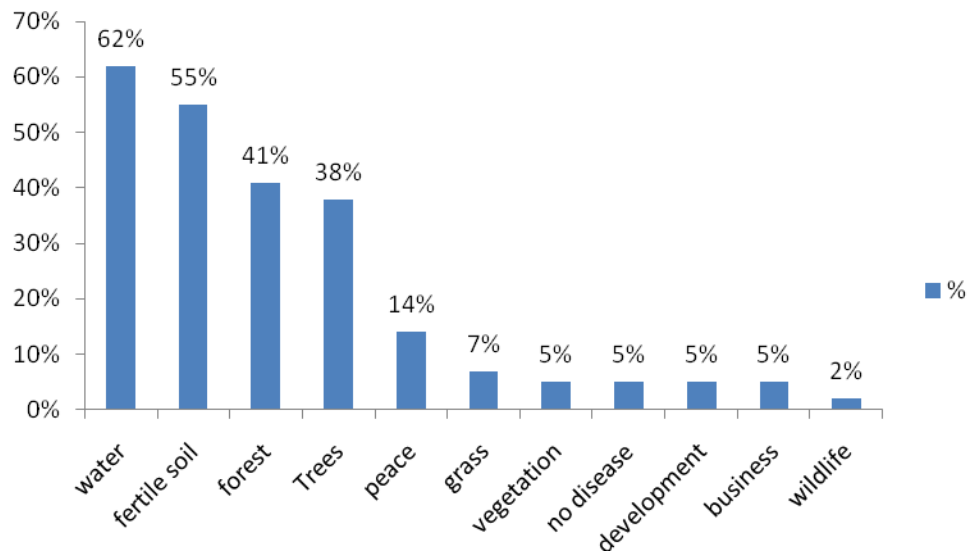


Figure 7.3. Components of a healthy environment (%)

The group members sampled were asked to list the main reasons for which they thought the forest should be maintained. As shown in Figure 7.4 the most commonly mentioned reasons why the forest is important was for grazing, wood and for attracting rain.

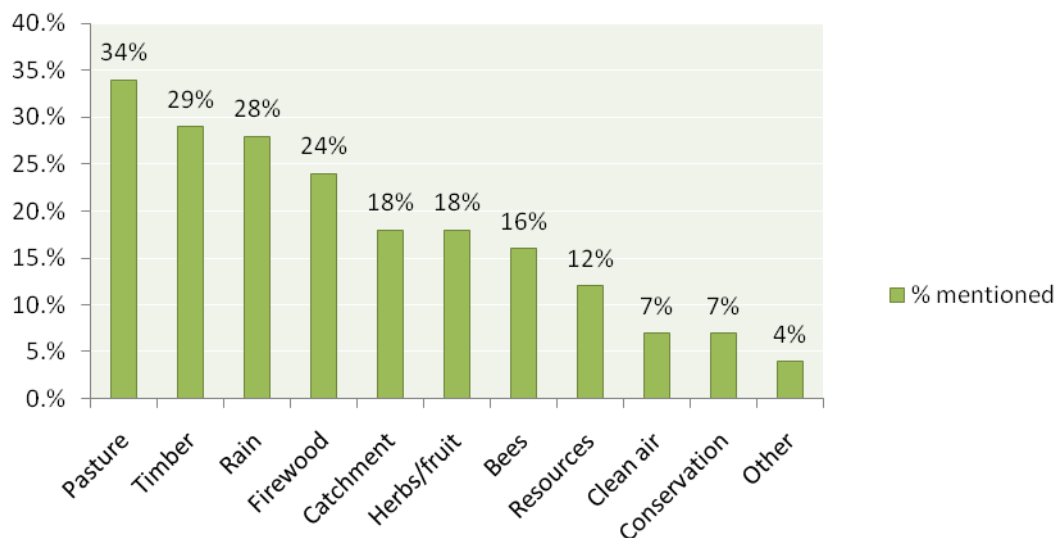


Figure 7.4. Reasons for the forest to be maintained healthy

Figure 7.3 and 7.4 show that there is a widespread understanding of the importance of the forest and that vegetation cover is very important to the productivity of the land (all respondents agreed strongly with this). Interestingly however, a fifth of these respondents did not see the link between what they do on their land and water availability (statement a), thus the link between what is done on the land and resulting vegetation cover and thus water availability is not understood by 20% of the group members.

The lack of connection between healthy ecosystem and animal life is emphasised by the lack of mention of the role of bees as pollinators when the investigation was made of the informants' perception of the importance of bees (Figure 7.5). All group members interviewed think that it is important to have a healthy land to achieve good honey. The reason mentioned is that bees need flowers and water to make honey. They therefore need a healthy system to make honey. However, the respondents do not seem to perceive

that a healthy ecosystem needs bees. It can be seen as necessary that development agencies first focus on raising awareness about the interconnectedness of all elements of the ecosystem when promoting conservation objectives.

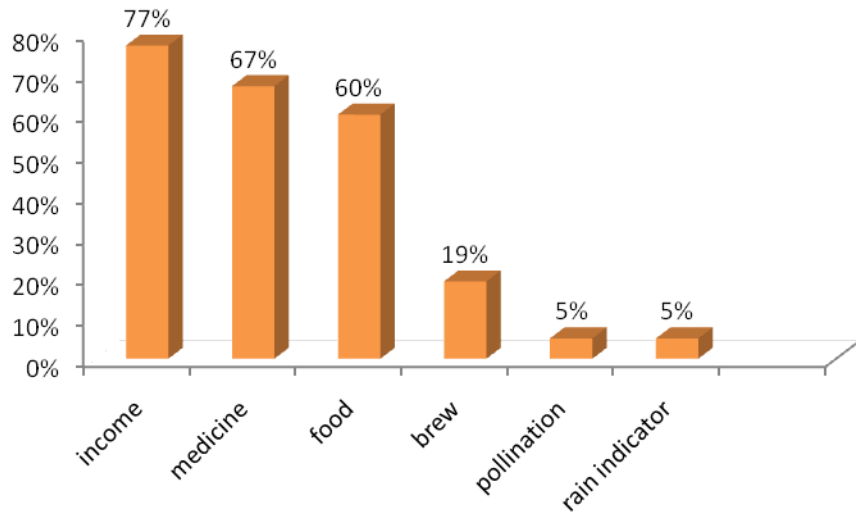


Figure 7.5 Perceived importance of bees (%)

As illustrated in Figure 7.5, the reasons for which bees are important to producers are:

- They bring income (77%)
- They make honey which is medicinal (67%)
- They make honey which is a source of food (60%)
- They make honey which we can use to make alcohol (19%)
- Bees are useful for pollination (5%)
- Bees are indicators of rain (5%)

These responses show that producers strongly value bees; they also have a good idea of how to ensure that bees survive. Although, as mentioned above, they are unaware of the role of bees in maintaining an environment in which they can farm and live.

The majority of the respondents had some understanding of ecosystem processes and of the link with activities on the land.

No statistically significant differences were found according to gender education or groups, although a significant correlation was detected between the education level and understanding of the ecosystem and sustainability. Predictably, the higher the education the better the understanding (Figure 7.6):

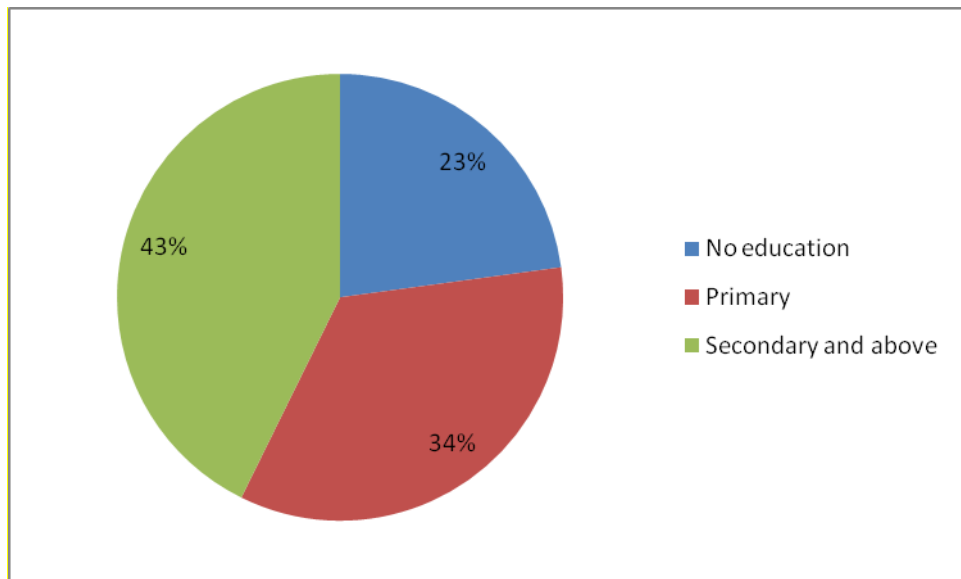


Figure 7.6 Awareness of ecosystems and sustainability according to education level (%).

7.4.2 Perception of changing climatic conditions

General projections show that climate change in arid and semi arid areas in Kenya will trigger increasingly erratic weather patterns. Resilience to climate change represents a

system's (in this case, the household) capacity to adapt to change triggered by climate variability. Households' capacity to adapt climate change (Marshall, 2007) depends on its:

- Exposure to climate change (the level of change likely to affect the resources in the area where the household is located)
- Sensitivity to climate change (e.g how dependent is the households on the natural resources that are affected by climate change)
- Adaptive capacity (skill level of household members to be able to diversity, awareness level of climate change and its impact, the capacity to plan and willingness to diversity, poverty level).

The assessment presented here focused on measuring people's awareness of climate change impacts and their willingness to plan and diversify.

Firstly, each of the 58 respondents was asked whether they felt that the climate is changing in their area, and what changes they are observing.

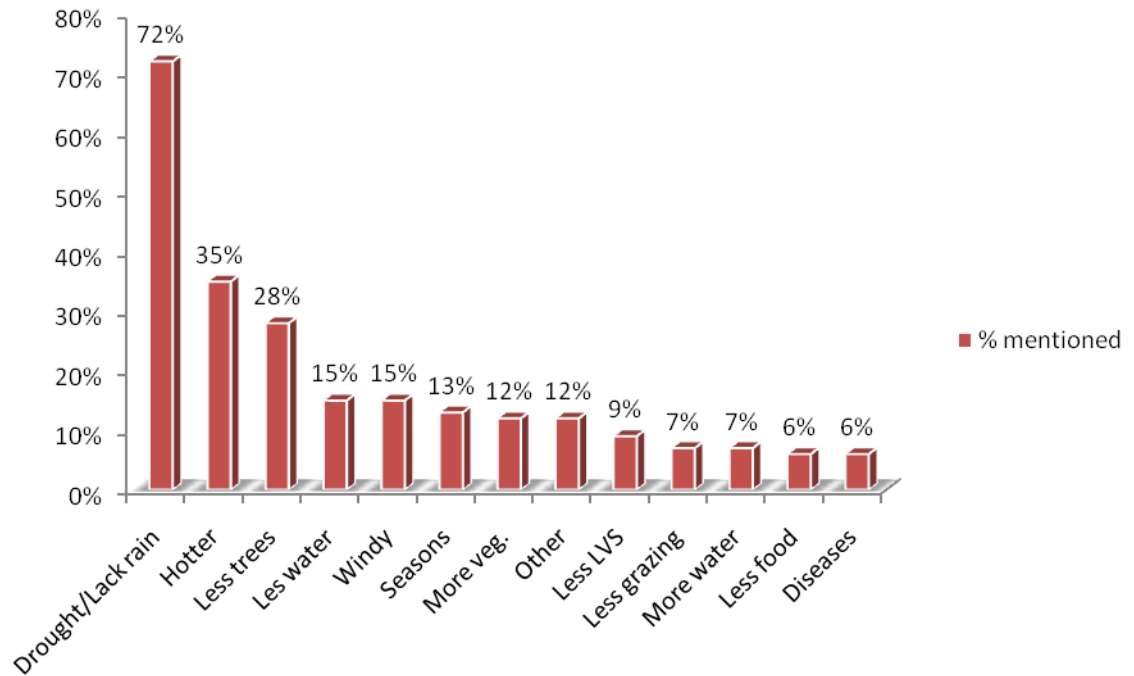


Figure 7.7. Changes due to climate (%)

The survey results in Figure 7.8 showed that all of the respondents think that there the climate is changing. The results showed that the changes observed by the respondents are:

- More droughts and lack of rain (72%)
- Higher temperatures (35%)
- Less trees - deforestation (28%)
- Other effects mentioned include, less farm productivity, diseases, changes in seasons, less access to water (between 6 and 15% of the respondents)

The respondents were then further questioned as to and how these changes are impacting on their households so far (Figure 7.9):

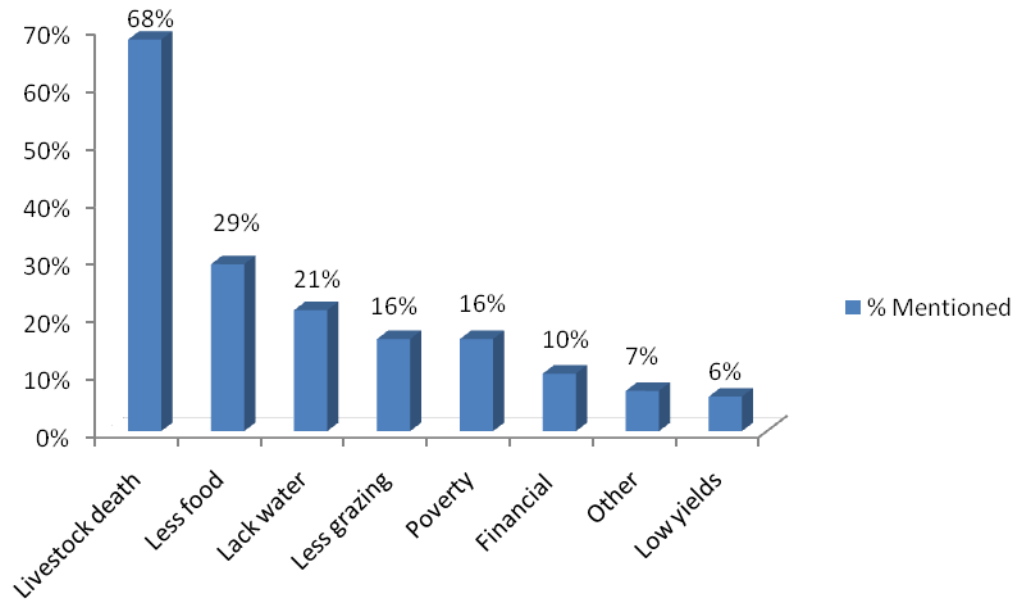


Figure 7.8. Detected effects on the household (%)

As shown in Figure 7.9, the most commonly detected effects so far are:

- Death of livestock through droughts (68%)
- Less food available (29%)
- Lack of water and grazing (approximately 21%)

The major changes attributed by the respondents to climate change were increasing drought, lack of rain, reduction in pasture availability, deforestation, from which result poverty through death of livestock and lack of water.

When investigating whether respondents feel they can do something to mitigate climate change, the respondents were divided. As indicated in Figure 7.10, more than a third thought that nothing can be done about climate change (36%). The proportion is particularly high in the Nkorien group (58%) that believe that nothing can be done.

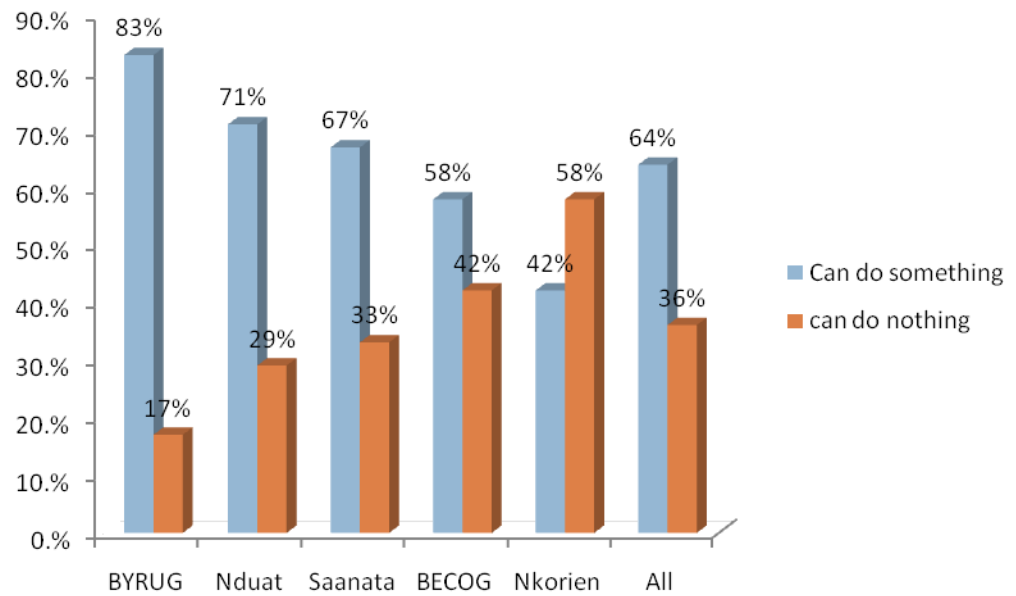


Figure 7.9 Proportion of group members who think something can be done about climate change

Relationships of the scores between education level and understanding of sustainability shown in Figure 7.7 suggests that attitudes towards climate change may vary with education level (the higher the education the higher percentage of people who feel there are ways of mitigating climate change). This may lead to the assumption that increased skills and education increases people’s awareness and capacity to adapt to change.

The respondents were asked what they were individually doing to mitigate the impacts of climate change. As shown in Figure 7.11 the most preferred strategies to reduce climate change impacts and indirectly to increase household resilience are:

- Planting trees (48%)
- Diversifying activities (21%)
- Increasing food production (12%)

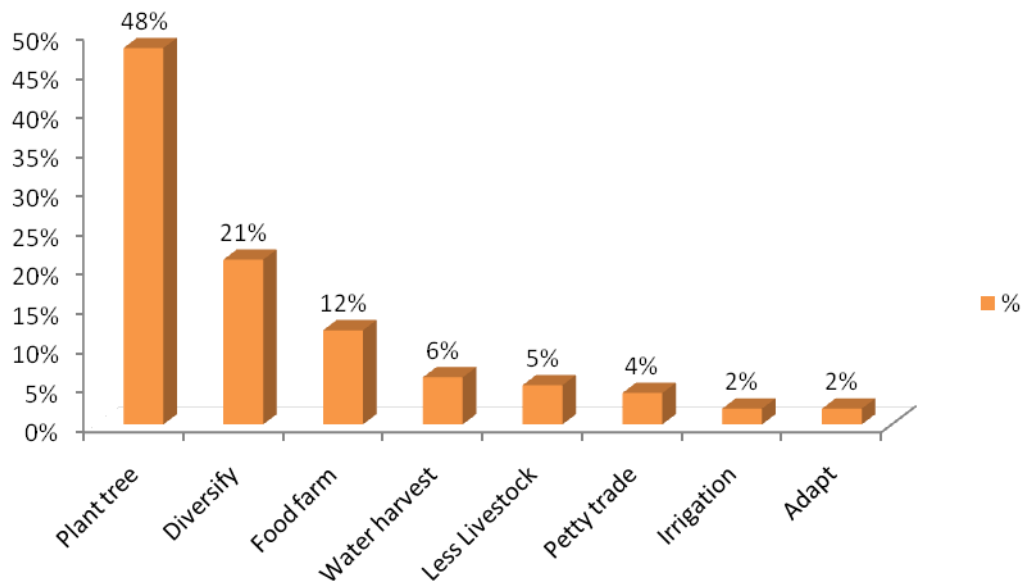


Figure 7.10 What are group members doing to mitigate climate change impacts?(%)

The high score received for planting a tree as a mitigation measure is probably strongly influenced by the work of a the regional NGO, Africa Wildlife Foundation who has worked with these communities on forest conservation for over 5 years. Most of these groups have small tree plantations as a result. However, it is evident that very little tree planting is actually taking place voluntarily by the vast majority of the people in the same communities. It may be more significant, in terms of reliable indications of what communities are doing as mitigation measures, that 21% of the 58 respondents have seen the need to diversify their activities. The need to place more emphasis on food farming (12%), petty trade (4%) and water harvesting activities (6%) could be included as adaptive diversification measures. However, only 5% of the respondents felt that they should place less time and emphasis on livestock enterprise.

7.4.3 Food security and coping strategies

The household survey method was also used to assess the level of household food security. This refers to the households' capacity to access sufficient quantity and quality food. Proxy indicators were used in order to measure food security. The indicators concentrated on the households' short term response to lack of food in the dry season, the severity of the strategies and the frequency of the strategies investigated. In some cases, if used regularly these short term strategies may increase vulnerability in the longer term, such as in the case of borrowing money. The food security index, shown in Table 7.5, was developed on the basis of a scale established by key informant from most insecure (1) to least insecure (4) in this dry season. The scale reflects the severity of the short term coping strategies households use in times of stress.

Table 7.5 Food security - severity and frequency scales

Insecurity indicator	Severity scale	Frequency	Frequency scale
Reduce food quality	9	Never	4
Reduce food amount	8	Rarely	3
Not eat for one day	7	Sometimes	2
Borrow from relatives	6	Often	1
Get in debt	5	The maximum score possible for each season was: 180	
Eat wild foods	4		
Relief	3		
Sell livestock at low price	2		
Slaughter	1		

The scales were developed on the basis of key informant interviews. The list of coping strategies were read to the 58 respondents and asked the frequency in which they used each strategy. In order to avoid bias in relation to this extended dry season, they were asked to recall the last dry season.

The information in Figure 7.12 shows that a large proportion of the households used most of the strategies in the last long dry season, except the use of wild foods. Eating less-preferred foods, reducing food intake, borrowing from relatives (‘paran’), take loans on purchases from shops and selling livestock were used frequently by a wide number of households. The respondents understood that selling livestock at a low price and getting into debt with shops are strategies that negatively affect households’ resilience in the longer term. Using a number of coping strategies at once was regularly used by a much smaller proportion of households and selling livestock at low price or slaughtering livestock was only carried by very few households. These may be the most vulnerable households in the sampled population.

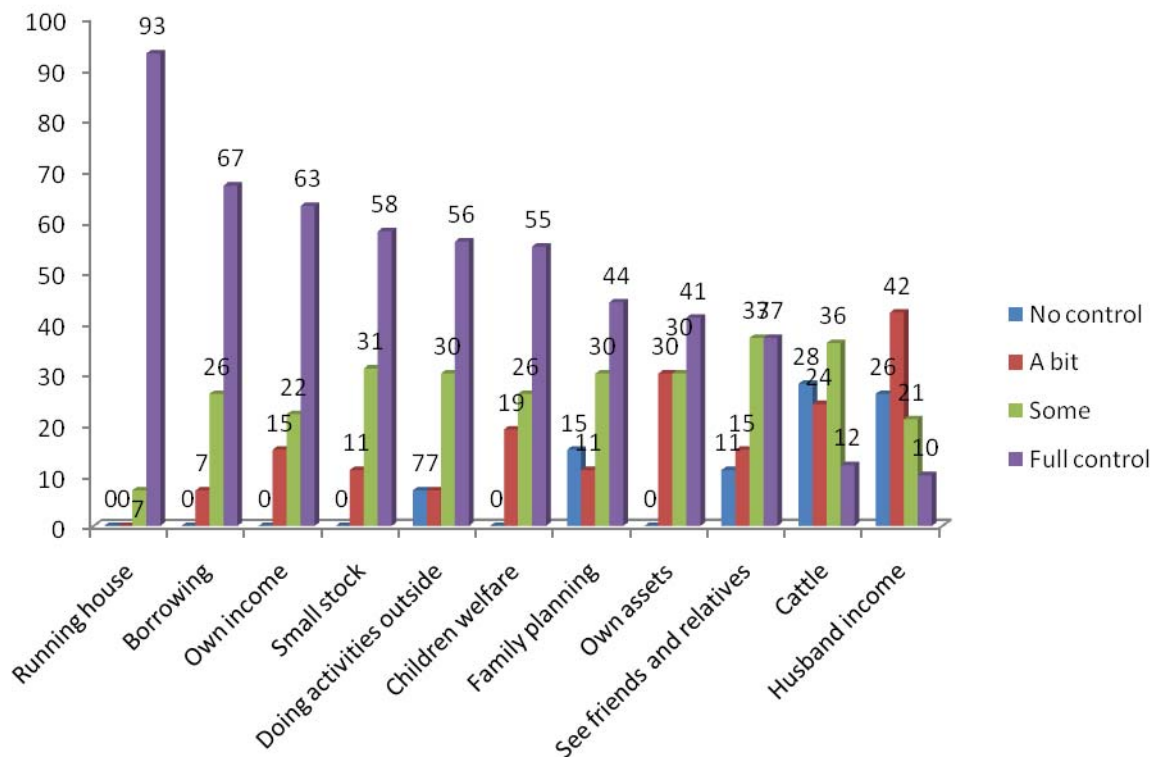


Figure 7.11 Short term food coping strategies / frequency used in last two dry seasons %

The informal and fluctuating uptake of diversification approaches is endorsed by Homewood, in her book, “Ecology of African Pastoralist Societies” (Homewood, 2008); she states that pastoral families can manage risk and secure a buffer against fluctuations by diversifying their livelihood activities, so that not all household income streams are affected by the same potential shocks, such as drought, disease or conflict.

7.4.4 Attitudes towards the future

The attitude towards the future was assessed using both the Focus Group Discussions with 35 respondents (18 women and 17 men) and the Household Survey method with 58 respondents (26 women and 32 men). In order to assess producer groups’ members’ attitude to change two statements were listed and individuals were asked to express their level of disagreement / agreement: (a) The future will look after itself; and (b) I want to learn new skills.

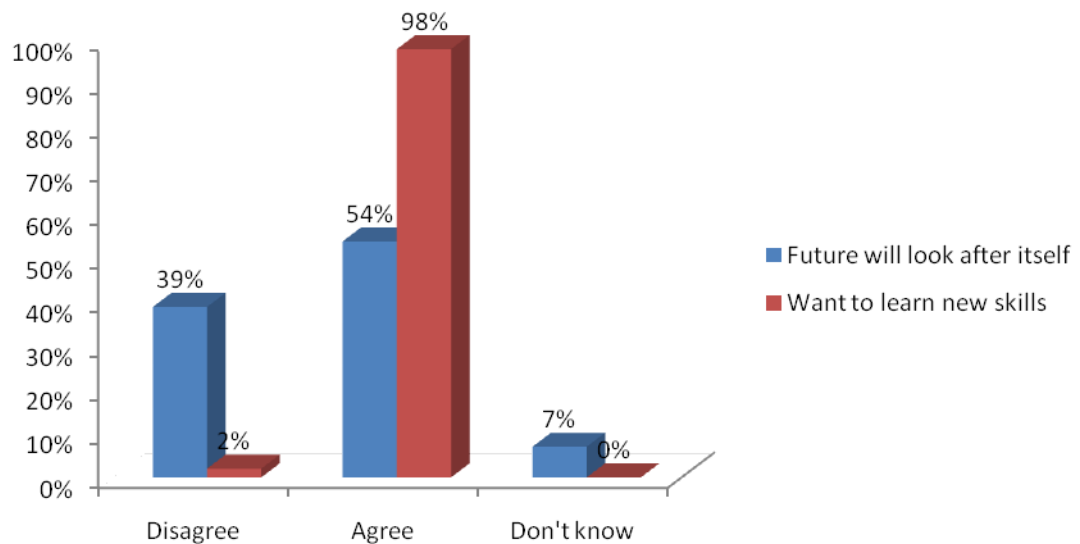


Figure 7.12 Proportion of respondent who agreed/disagreed with the statements.

As shown in Figure 7.13 above, all respondents are keen to learn new skills. More than half (54%) of the members interviewed however, have a fatalistic approach to life and believe that the future will look after itself. Believing that the future will look after itself is a way for individuals to refuse consequences of their actions. It can also illustrate a general feeling of powerlessness. The lack of moral which was also detected by the LWF study of the Il Ngwesi group ranch, when evaluating the level of the group ranch's uptake of the Rangeland Programme's activities (Malleret-King and Hatfield, 2008).

7.4.5 Perceived Skills level

Questions concerning perceived skills levels, as for those concerning attitudes towards the future, were assessed using both the Focus Group Discussions with 35 respondents (18 women and 17 men) and the Household Survey method with 58 respondents (26 women and 32 men). In order to assess the existing skill levels, the respondents in the five groups were asked to rate from 1 to 4 (very weak to very strong) their perceived skills in a series of aspects of producing honey and plants. A skill score was established by adding each item's score.

In Figure 7.14 it can be seen that harvesting and storing honey, sustainable harvesting of plants and book keeping are the areas in which the highest number of individual felt unsure about their skills. Skills most widely spread in relation to hive maintenance, honey storage and running a business.

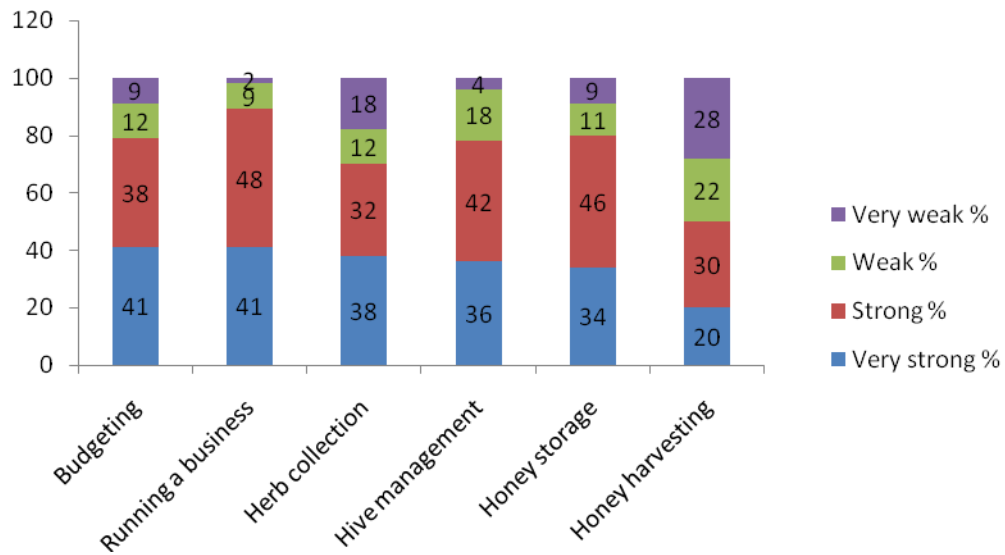


Figure 7.13 Skill level according to production aspects (%)

7.5 Comparison of the observations between this case study and previous research studies

7.5.1 Quantitative findings

The quantitative research findings of the AWF and WWF studies show that there is increasing destruction of the environment and ecology within the Kirisia Hills Forest Reserve and the surrounding area. The findings are endorsed by Powys (Powys, 2009) which indicates that the drought that started in 2008 and continued into early 2010 intensified the situation by increasing the escalation of the damage caused by the multiple coping methods used by the surrounding pastoral communities. It is interesting to see that the satellite images do not demonstrate significant changes in forest cover between 1986 and 2000. The comparison between the 2000 images and those taken in 2011 may reveal far greater change.

The research studies make reference to the reserve as a critical resource for human and livestock water, food and other livelihood resources. The studies have shown that whole trees have been felled to feed cattle whereas traditionally the elders would only cut branches, and trees have been cut down to harvest honey instead of the climbed. The conclusions of the reports not only indicated that the forest reserve is under increasing threat of destruction, but that the principals and values of sustainable natural resource utilisation is no longer up-held by current resource users. Powys also referred to the decreasing indigenous knowledge amongst the youth as being a contributory factor, as most malpractices were recorded as being made by the youth within the communities (Powys 2009).

The increasing practices of charcoal burning on the west side of the forest, observed by the enumerators, may be a result of population increase in the areas surrounding Maralal town, further stimulated by the improvements made to the main Maralal artery road. But, as indicated in both the report by Powys and by AWF, the increase in charcoaling activity may be due to the reduction in forest stewardship by the resident communities due to insecurity in the area (tribal clashes with the Pokot). As the drought intensified these clashes due to increased competition over grazing, the prevalence of firearms, and increase wildlife poaching has also been recorded (Malleret-King and Hatfield, 2008)

Both the AWF survey and the one conducted by Powys (2009) indicate that these illegal practices are not adequately controlled by the authorities, and support to the governance and management capacity of the fledgling Community Forest Associations is urgently required in order that they attracts the participation of and directly involve the communities in the policing and conservation management of the reserve.

7.5.2 Qualitative findings - Perceptions of the communities'

The research finding presented in section 7.3 agree that although the forest is generally in good condition, there are widespread signs of increasing degradation. The socio-economic study component of the AWF Kirisia Forest Assessment showed that the Samburu community relies on the forest mainly for dry season grazing and water, as a major source of firewood and forest products such as honey.

The key informants interviewed during this assessment showed that the communities perceive the forest as having declined in the recent years due to intensive human activities including tree felling, charcoal burning and firewood collection. The household survey results validated key informant interviews. Group members sampled were asked to list the main reasons for which they thought the forest should be maintained. As shown in Figure 7.8 and in concurrence with the AWF study, the most commonly mentioned reasons were the importance of the forest in attracting rain, grazing, wood, food, and source of water pollen/honey. More than 80% of the group members disagreed strongly with the statement "nothing would change for my household if the forest disappeared". This information substantiate the earlier survey conducted by Powys in 2009 which shown that the communities living in and around the Forest Reserve have a good understanding of the importance of the forest in terms of their welfare and future livelihoods. The case study shows that most respondents understand that vegetation cover is central to land productivity and that the forest should be maintained grazing resource, timber and firewood, to attract and catch rain, for wild herbs, fruit and honey.

7.5.3 Community empowerment to effect change

Despite the perceptions of the local communities of the importance of the forest to their livelihoods and future welfare, the information from the key informant interviews demonstrates that there is little understanding of the need to take action against the increasing practices of tree cutting, felling and charcoal burning. This indicates that although there are established traditional practices (IISD/IUCN/SEI, 2003) for natural resource management, there is low community awareness that forest stewardship is important. This case study shows that although the communities are aware of the signs of climate change that has mostly resulted from the recent patterns of severe drought, lack of rain, diminishing pasture, deforestation, most people feel that the future will look after itself. Despite the resulting poverty from these severe climatic conditions, through death of livestock and lack of water availability, the predominant feeling recorded in the interviews is that nothing can be done to control or better manage the use of the natural resources, and to develop strategies to mitigate the effects of climate change. The indications of powerlessness over what happens and the lack of awareness of the need to take action to reduce the impacts, contrast with the respondents' highly positive response to the question about their interest in learning new skill. This suggests that building awareness of the range of opportunities can be the first step to assisting pastoralists to understand ways to mitigate the impact of climate change. Practical and well applied methods of education, demonstration, training and visits to effective commercial models, could tangibly enabling pastorals to take practical steps to diversify their livelihoods in a way that will buffer and improve their food security, and stimulating their long term management of natural resources.

7.5.4 Effectiveness of the BDP approach and the role of the CFAs

As a result of the research studies prior to 2009 and from additional studies conducted for LWF and AWF (Wren, 2007; Wren 2008 b; Wren and Powys, 2008), the Bio-enterprise Development Programme (BDP) was designed to assist pastoral communities to diversify their income through developing enterprises in indigenous plant products, such as sustainably wild harvested ethnobotanicals and honey. The overall aim was to improve communities' resilience to climate change and to incentivising communities to positively manage the natural resources. The BDP works to increase the skill base of producers to supply the quality required by the market through training, extension and mentoring, as well as providing guaranteed markets, trade finance and profit sharing. The surveys have shown that the communities are keen to learn new skills, such as those provided by the BDP, and are open to diversifying their livelihoods. The BDP is based on the assumption that by improving the skills and business awareness of the producers that the potential for livelihoods reliance and community driven conservation will increase. The indication from the respondents' that the future will look after itself, and the feeling that nothing can be done to mitigate climate change, are two perceptions that reinforce each other. The indications that the community members lack vision for the future and feel powerlessness over what happens may be significant reasons why the BDP has reported that it is difficult to find and work with cohesive and progressive communities groups in the Kirisia region.

The Forest Policy of 2007 (Kenya, 2007a) and the Forest Act of 2005 (Kenya, 2005) encouraged communities adjacent to forests to participate in forest management by forming CFAs. The KFS has been charged with instigating this process and provide

management plans for the using and managing of each forest reserve in the country. This is now a legal requirement and all forest reserves are expected to have a CFA composed of the different forest user groups. It is reported by McDermott and Schreckenberg in the International Forest Review, 2009, (McDermott and Schreckenberg, 2009) 'that the progress in effecting the policy and Act has however been slowed by a lack of policy implementation mechanism and management capacity within the government authorities to develop the management plans. In the Samburu Heartland the KFS has received the support of AWF and LWF to develop these plans. However, for the CFAs to be effective in governing sustainable community utilisation of the natural resources in the forest reserves and in engaging communities in forest management the Associations require the awareness, skills and management capacity to develop incentive lead approaches that enables communities to benefit from these activities. The BDP is one example of such an initiative. In the Samburu Heartland LWF and AWF are promoting this approach and are encouraging the CFAs to integrate the BDP activities with their own activity programmes. There are very few other examples within the country that provide tangible opportunities. Although the KFS has shown willingness to support the CFAs to more effectively secure the future of Kenya's fast diminishing forest resource through developing conservation positive enterprise from forest products, they have little expertise and financial capacity to be effective in this task (as indicated in the research conducted for this study presented in Chapter 8). The onus is therefore, on the governments and donor sectors to develop greater awareness of the impact of and potential for initiatives such as the BDP, and collaborate more in providing targeted support that will effectively address the opportunity cost of developing conservation positive enterprise in the ASAL. This assertion is supported by many published studies of

similar situations in Kenya (Hesse and MacGregor, 2006; Little, *et al.*, 2000; Scoones, 1995). They expound the need for more effective policy and legal environments that will allow greater incentives to the CFAs to utilise NTFP enterprises to stimulate greater natural resource conservation

In terms of motivating community based conservation, the survey reported here detected important relationships between education levels and understanding and could indicate that the uptake of sustainable practices might increase if training and extension support over is consistently provided over a long period of time (i.e, over 5-7 years). Although the KFS and several donor agencies have shown willingness to support the development of community based enterprises that provide incentives to positive natural resource management, there is a chronic lack of knowledge and skills within the Authority and the development sectors to enact this. These aspects are further discussed in Chapter 8.



Photograph 3: Illegal charcoal production in Mukogodo Forest Reserve.

Chapter 8. Major factors that have affected the adoption of bio-enterprises

8.1 Introduction

8.1.1 Context

There is increasing interest in rural development circles in promoting alternative livelihoods opportunities for agro/pastoral communities. After a series of severe droughts in the drylands, pastoral communities are increasingly seeking diversified means of gaining income from sources other than livestock. However, there is very little research conducted to date that have explored and identified the major factors that - (i) affect the selection and adoption of the bio-enterprises by the communities, (ii) affect the livelihood development approaches adopted by the development and government sectors, and (iii) attract the engagement of the commercial sector. As such this chapter addresses the questions raised under Objectives 2 and 3 of this thesis.

It is critically important to understand the factors and the relationship between the perceptions of the resource users and approaches of the central actors, where the objective is to enhance and encourage wider up-take of diversified livelihood strategies. Examples of such strategies are the types of bio-enterprises discussed in this thesis, such as: Mwingi Organic Beekeepers Association in Mwingi, MakaaZingira Eco-Charcoal in Kilifi and the Bio-enterprise Development Programme in Laikipia and Lower Samburu. Once these factors and relationships are understood the information can then help to

inform key actors and stakeholders about the orientation and characteristics of effective diversification approaches in the drylands, as referred to in questions under Objective 4. This chapter presents the results of interviews with communities and with development and government sector actors involved in livelihood development in the ASAL of Kenya, and evaluates the findings. The chapter concludes with a discussion about the relationship between the perceptions of the communities and actors and how these can be enhanced to encourage up-take of the complimentary or alterative bio-enterprises.

8.1.2 Methodology

8.1.2.1 Methodology used to analyse the major factors that have affected the selection and adoption of bio-enterprise by the communities

Approach and purpose: To understand the levels of awareness, and the attitudes and views of agro/pastoral communities about the possibilities and opportunities of diversification through bio-enterprise development, interviews were held as participatory group discussions with selected groups in the Samburu Heartlands. The groups and individuals surveyed for the topics discussed in this chapter and in Chapters 6 and 7 in December 2010 were the same as those interviewed in the baseline survey used in Chapter 7. See 7.2 for a full description of the methodology used. Interview guides for the focus group discussions and key informant interviews are included in Appendix 2. The questionnaires for the household surveys are given in Appendix 3. The methods used for each indicator investigated and the number of informants per method and topic is given in tabular form in Appendix 4.

Case study area and sample group selection: The surveys were conducted in Kirisia, one of the BDP operational areas. The five groups selected for the baseline survey were the Baawa youth Resources Use Group (BYRUG) and Baawa Environmental and Conservation Group (BECOG) in Baawa Group Ranch, Nkorien in Lodokejek Group Ranch, Saanata in Angata Nanyukie Group Ranch and Nduat Farmers women groups from Lporros area. These same groups, questionnaire and method were also used in the survey conducted for Chapter 7. As indicated in Table 8.2, 4 groups, comprising 43 respondents, were interviewed in December 2010, as one group (Nduat Farmers Group) had been dropped from the programme but more than a third of the current group members were interviewed, comprising a good proportion of women. The sample sizes for each of the groups, the numbers interviewed in 2010 and the gender ratio are presented in Table 8.1.

Table 8.1 Number and percentage of respondents and gender in 2010

Groups	Number of Respondents	% of group members interviewed	Number of women interviewed	% of groups women interviewed
	2010	2010	2010	2010
BYRUG	10	31%	4	40%
BECOG	11	44%	6	85%
Nduat	0	0	0	
Saanata	14	44%	2	33%
Nkorien	8	29%	3	19%
Total	43	37%	15	35%

Data collection and sampling: The first round of data collection was conducted in November - to December 2009. The second round of data collection was conducted in Kirisia between March and June 2011. Different techniques were used that included household surveys, focus group discussions and key informant interviews. The household

survey method was used for more sensitive topics such as the perception of women's assertiveness, level of empowerment at the household level. Gender based focus group discussions were also used where necessary to ensure that women could express themselves freely without the presence of the male members of family or group. The sampling techniques used for each topic area are given in Table 8.2.

Table 8.2 Sampling technique used for each impact area and indicator investigated

Impact area	Respondents (2010)	Sampling technique
Livelihood diversification factors	43	Representative sample of producer groups Purposive, focus group discussion and key informant interviews
Perception of the BDP after one year and members' role	43	Representative sample of producer groups Purposive key informant interviews
Change in income, production and investment	43	Representative sample of producer groups Purposive key informant interviews
Challenges for increasing business potential	39	Representative sample of producer groups Purposive key informant interviews
Link between training and income change	42	Representative sample of producer groups Purposive key informant interviews
Women level of decision power	15	Representative sample of producer groups. Household surveys and purposive interviews with key informants
Women assertiveness and confidence	15	Representative sample of producer groups. Household surveys and purposive interviews with key informants
Total interviewed	43	Interviewed in 2010

Justification of research method used: See Chapter 6 (6.1.2.3)

8.1.2.2 Methodology used to research the major factors that have affected the selection of approaches by the development agents

To gain an understanding of the awareness and impressions of the development sector actors, a series of purposive interviews were held with key informants. The key informants comprised; senior management representative of international level NGOs national level NGOs and CBOs. All selected organisations are involved with pastoral livelihoods development. The selected international level NGOs comprised; Oxfam-GB, CARE, World Vision, Comic Relief and Cordaid. The national level NGOs selected were: SOS Sahel-Ethiopia, LWF and AWF-Kenya. The two CBOs were the Rumuruti Aloe Women Group and ILMAMUSI (a combined abbreviation of the community names; Iingwesi, Makurian, Mukogodo, Sieku).

The topic areas and questions were based on the approach and orientation of the organisation, and were specifically targeted at how the bio-enterprise development approach accords with the objectives and activities of the organisations they represent. The respondents were also asked whether they felt that their organisation had the management capacity and skills to support the bio-enterprise approach effectively, whether the organisation would choose to support agro/pastoral communities to develop bio-enterprises and, if so, how. The information concerning awareness, impressions and views of the government sector were gained through a similar process. Purposive key informant interviews were held with the Ministry of Livestock, the KWS, the KFS and the Kenya Bureau of Standards (KBS). Questions put to the representatives of the development and government sectors were based within three broad topic areas:

- Approach and Orientation
- Awareness of using bio-enterprise as a development tool

- Experience and skills of the management and field staff

In order to gain an insight as to the commercial sectors' awareness of community based bio-enterprises, and their views on the potentials and risks of interacting with these bio-enterprises as trading partners, representatives of two Laikipia based companies and two national level companies were interviewed.

The questions are presented under each of the three broad topic areas in Tables 8.5, 8.6, 8.7 and 8.8. The respondents' level of agreement or disagreement to the series of declarative statements is captured. Proxy indicators are weighted to record the predominant views of the respondents to the questions. The weighting are as follows: **** = very high; *** = high; ** = medium; * = low; - = no contribution. The scores are multiplied by the number of respondents to achieve representative comparative total scores to each of the statements.

The scores can then be compared with (i) the total score given to each statement against the highest possible score for each statement that can be granted, (ii) the respondent groups' views on each statement, and (iii) the respondent groups' views of one statement against another. To achieve the total score using the LTS the number of respondents under each sector were multiplied by the predominant response per subject:

Development sector: 7 respondents

Government sector: 4 respondents

Commercial sector: 2 respondents

Community sector: 2 respondents.

8.1.3 Background

As social-ecological factors such as climate variability, population pressure and competition for land continue to decrease the viability of traditional agro/pastoral livelihoods so complementary or alternative pathways are sought to enhance the resilience of agro/pastoralists. As defined in previous chapters, the development objective of bio-enterprise development is to create greater economic incentives for participating communities/farmers/ pastoralists to conserve biodiversity whilst increasing household income and gaining additional coping strategies. However, the bio-enterprise sector in Kenya, as for other Eastern African countries, is not well developed. In particular, such enterprises developed through the support of NGOs have achieved no or little growth as compared to those developed under the private management or by the commercial sector (see Chapter 5). This is also the case for many of those managed by the CBOs. This poor performance has been attributed to the neglect of basing such activities on sound business principles and the general lack of business knowledge of the initiators.

Two of the most prominent factors affecting the success of bio-enterprises, as highlighted in Chapter 5, are; (i) the poor level of understanding by the government, commercial and development sector actors of the aspirations and priorities of the communities themselves toward diversification, and, (ii) the low level of community involvement in the design and orientation of the bio-enterprise initiatives. As referred to in Chapter 6 and further discussed in this chapter, these factors can significantly affect how well the initiatives are adopted by the communities.

Further factors affecting the adoption of bio-enterprise opportunities concern group dynamics, for example to poor cooperation and cohesion within groups lead to poor economies of scale, lack of trading capacity and negotiation powers, fragmented marketing and poor linkages between chain actors.

As the conditions that surround pastoral livelihoods are changing however, pastoralists are continuously adjusting their livelihoods to these shifts in their resource base, and the political and economic conditions. Therefore, both out of necessity and opportunity, there is a level of continuous innovation within the communities of the ASAL, particularly in severe conditions such as the drought years. Furthermore, these challenging periods increase the rate of change and innovation, as observed during the severe drought period, between 2008 and 2010 (Lind and Letai, 2011). However, developing new short and longer term coping strategies depends on having a certain amount of wealth and influence. Increasingly, this is sourced from external support, such as from the more affluent (often absent) clan members, the development and government agencies or from commercial partnerships.



Photograph 4. Maasai elders discussing the opportunities of working with the BDP

8.2 Major factors that have affected the selection and adoption of bio-enterprises by the communities

8.2.1 Awareness

Changing livelihood conditions: During this second round of data collection in December 2010 the information gained from the interviews with the 43 informants from the selected groups targeted by the BDP displayed that the communities' have awareness and acceptance of the changing livelihood conditions. In very many cases this awareness has led to action. The factors that have led to pastoral communities' adapting their livelihood systems were reported by the informants as the following:

- Increasing unreliability and riskiness of solely relying on livestock due to not being able to cope with droughts;
- Improvement in education, including literacy;
- Provision of training from government and NGOs; and
- Provision of financial assistance from government and NGOs

Table 8.3. Livelihood diversification factors

Livelihood diversification factors	Increasing riskiness of relying on livestock due to droughts;	Provision of training from government and NGOs	Improvement in education, including literacy	Financial assistance from government and NGOs	Total
Numbers of respondents	23	11	5	4	43
Percentage of respondents	53%	25.6%	11.6%	9.3%	100%

However the awareness of the potential for livelihoods diversification was very limited in all groups interviewed (Table 8.3); as observed during the baseline data collection. This changed dramatically once the group members were exposed to the opportunities of developing bio-enterprises, through sensitisation, business training provided by the BDP. As a result they had selected and invested their time into certain bio-enterprises (predominantly bee-keeping). This awareness change was demonstrated in the second round of data collection from the same groups and individuals (Chapter 7) after approximately twelve months of their engagement in these activities:

Providers of bio-enterprise development support: The provider of these services, the BDP, is explained in detail in Chapter 6. To gain perceptions about the purpose of the BDP from the group members who have received these services, the respondents were asked to describe this. As shown in Figure 8.1, most of the respondents felt that the purpose of the BDP is to provide a market for honey and ethno-botanicals (herbs), and most of the respondents (71%) reported that the main purpose of the BDP was to supply training on beekeeping, ethno-botanical plant (herb) production and conservation, and for 26% of the people the programme is also about providing equipment (hives, buckets and bee suits). This shows that there is a fairly good understanding of these services, although the BDP does not provide beekeepers with hives and the harvesting buckets and bee suits remain the property of the depots. See Figure 6.1 in Chapter 6.

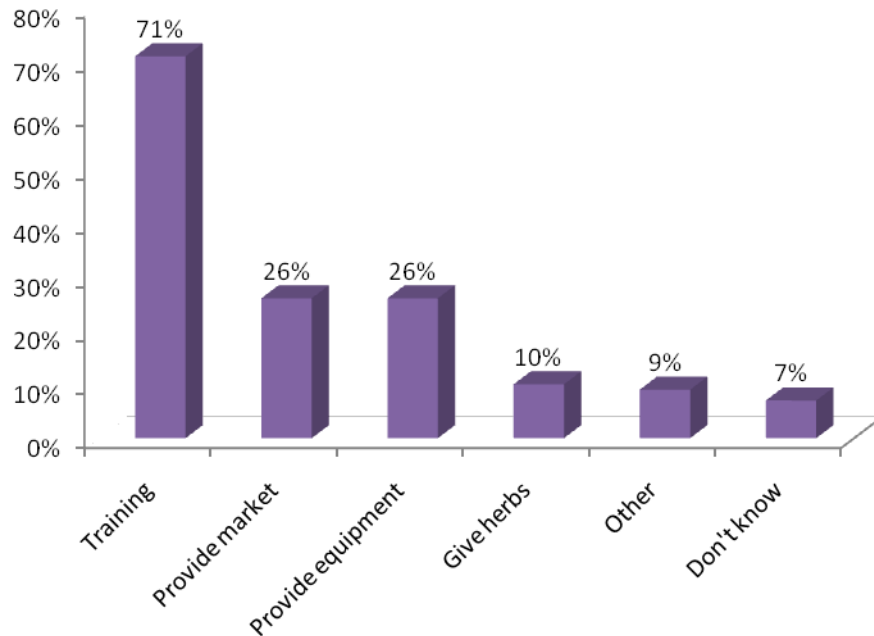


Figure 8.1 Perception of the BDP after one year

As indicated in Chapter 6, the need for mentoring is high in the producer groups, and this factor is well recognized. The wish for equipment has been recorded strongly. This is a result of the past donor approaches in this region, which were more of grant-based contributions to producers of items, such as processing equipments and hives. The BDP is trying to break the cycle by encouraging groups to invest (where it is realistic). However, gifting communities' equipment has not yielded the business results that were expected. For example, in a rapid survey conducted by the BDP, it was observed that a large number of bee hives have been gifted to communities in Kirisia and Laikipia, and that the vast majority (+/-80%) of these hives are either abandoned or misused.

A question was asked of producers working with the BDP as to what they felt their role to be in terms of developing bio-enterprises. Responses were varied, the most frequent

ones were: selling products, participate in training, and planting herbs (Figure 8.2). None of the respondents mentioned being business partners or conservation.

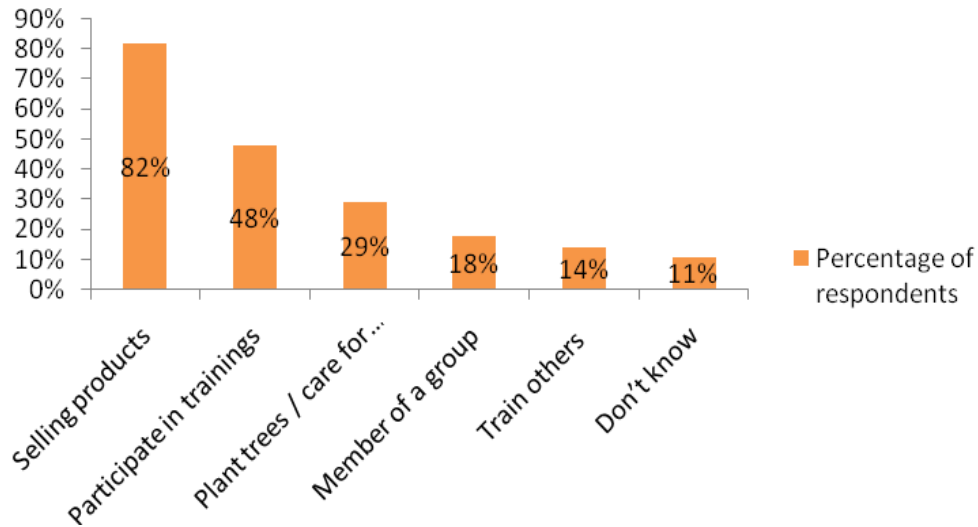


Figure 8.2 Group members' role (%)

Overall, as indicated in Figure 8.2, the results show that the understanding of the purpose of the BDP in assisting communities to develop bio-enterprise is good but there is still a wish for the BDP to have a donor-based approach rather than a business one. As referred to in Chapter 6, over the one year period from its instigation, the number of groups and producers collaborating with the BDP has expanded, and (Table 6.7) all of the producers say they are committed to investing time and effort in the production of good quality honey. . This suggest that there has been an expansion in the uptake of this bio-enterprise.

Income, production and will to invest: Perceived changes in income, production and investment as a result of engaging in bio-enterprises were investigated. Further attitudes that were explored included whether producers thought it is worth investing in these bio-

enterprise sectors and whether they were prepared to do so. Figure 8.3 shows that more than half the producers interviewed (52%) think that by adopting bio-enterprises their incomes have increased, 44% think that their production has increased and 44% say their investment in beekeeping activities has increased. Increased investment and production and income may also have contributed to beekeeping increasing its importance as a source of livelihood. A small proportion of the respondents feel income (11%) and production (6%) have reduced. 16% have reduced their investment in beekeeping.

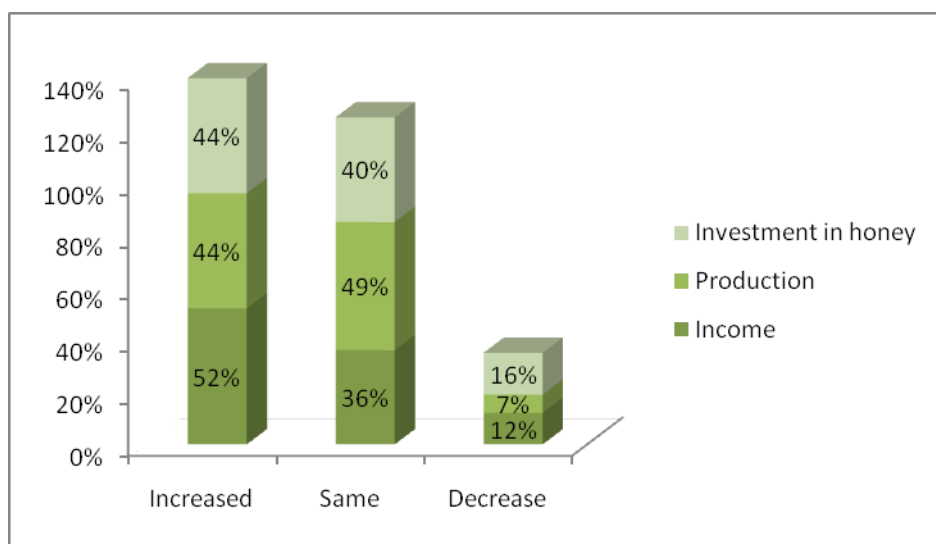


Figure 8.3 Perceived change in income, production and investment from beekeeping (%)

The reasons provided by most of the producers who perceive their production as having increased (16 producers) relate it to improved knowledge (from hive maintenance to harvesting). The reasons for investment to have increased, in order to importance, include:

- Increased skills (50% producers)
- Hives are now producing more honey, so worth investing (35% producers)
- Increased income (15% producers)

This demonstrated that there is tangible interest in bio-enterprises as a business and diversification strategy. It also suggests that by providing on-going practical training (as further illustrated in Figure 8.5), extension and mentoring to each of the individual producers and by providing a guaranteed market for the honey, the confidence of the community members to invest in alternative or complimentary livelihoods is raised. It is noticeable that most of the respondents are able to clearly articulate their business position, and this factor may be attributed to the business planning support provided by the BDP to the producer groups.

The reasons mentioned by the respondents for negative change included pests and low or no harvest (income). This may reflect the two years of drought experienced in the region (from mid-2008, throughout 2009 and into 2010) that resulted in poor honey yields. This has been particularly experienced by those with hives located outside of the forest reserve.

In most case it was felt that the groups needed more capital to increase their business potential. However, when questioned through focus group discussions, their major perceived challenges, illustrated in Figure 8.4, were reported as being:

- Shortage of capital;
- Difficult weather conditions, such as drought; and Conflict (see 2.4)

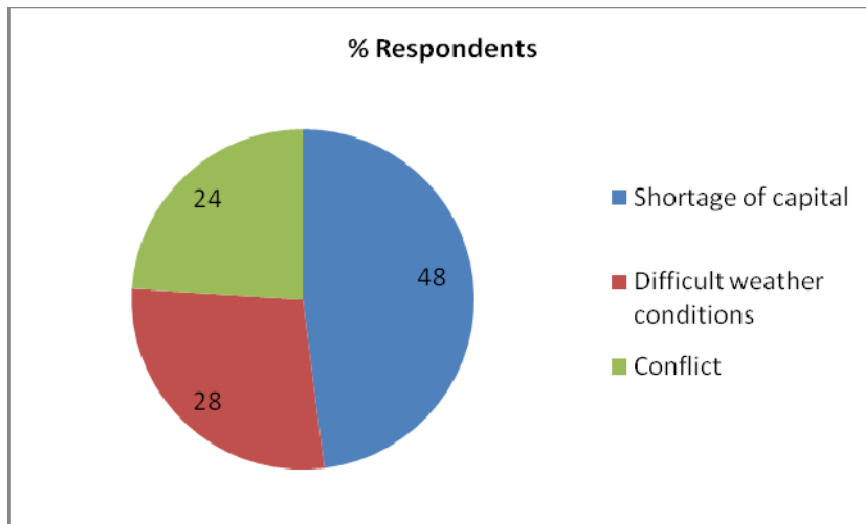


Figure 8.4 Top scoring challenges for increasing their business potential (%)

Education and skills: The lack of the necessary technical and management skills and inadequate extension service are clearly seen as by the respondents of the groups as being impediments for bio-enterprise diversification. The extension team members of the BDP expressed that the low level of illiteracy, the attitudes towards learning new approaches and the lack of awareness of the skills required for developing bio-enterprises are major factors inhibiting the skills capacity and adaptation ability of the individuals and groups.

In the second interview round (undertaken after 8 months of the groups' involvement in the BDP) the informants indicated that their skills have increased and also their incomes (Figure 8.5). The informants linked the increase of their skills with the increase of incomes from the diversified bio-enterprise activities (mostly bee-keeping) and have encouraged the individuals to prioritise more of their time to their diversification activities.

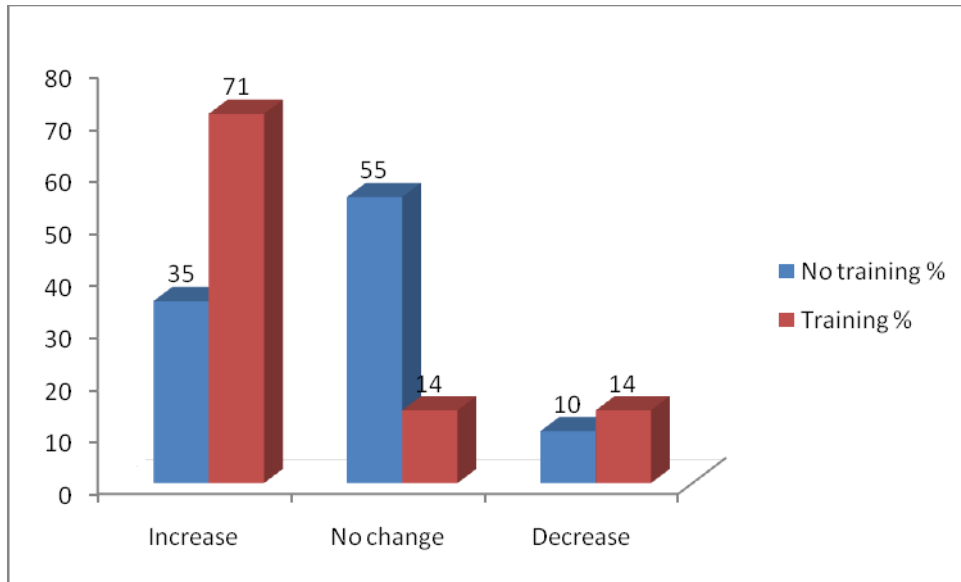


Figure 8.5 Link between training and income change (%)

A similar result was recorded from the members of the Mwingi Beekeepers Association following three to five years of training and awareness-raising provided by ICIPE under a Global Environmental Fund (GEF) supported project (Raina, *et al.*, 2009). (See Chapter 5). The project provided local people with expertise in institutional governance, group management and organisation as well as in the technical skills for enterprise development in sericulture and apiculture. As a result these communities have gained increases in their incomes of approx 20-25% as a result of these bio-enterprises.

Perception of risk and insecurity: The issues of risk and insecurity were vividly demonstrated during the last drought in the Kenyan ASAL. Inter-clan disputes and inter-tribal conflict caused widespread loss of livestock (theft) and human life. This situation was exacerbated by the ready access to guns, exploited particularly by younger members of the clans. Conflict and insecurity has caused more concern to the clan elders interviewed during the 2010 data collection and in the 2011 pastoral livelihoods

workshop (*Livestock, land and the changing political economy of pastoralism in Laikipia: pathways to strengthen pastoralist livelihoods*, hosted by IDS and DE), than any other single factor concerning the impact of the drought. During this workshop participant pastoral elders from Samburu talked of ‘negative peace’. In using this phrase the elders referred to the lack of motivation that their clans have in finding solutions to the increasing incidences of conflict and violence in their areas (Samburu and Pokot inter-wars). They expressed that there are no options available to them in resolving the disputes, and that the competition over access and use of resources is unregulated and unpoliced. They are not aware of any national-level authority over or interest in the protection of these lands. They feel disenfranchised from the governmental administration, and that their voices are unheard. These same elders also referred to ‘negative diversification’ that has resulted from the lack of governance and control over the natural resources in their areas and examples included charcoal production. The elders talked of the new rainfall patterns that are creating competition over better lands. They referred to the weakening of the traditional grazing management systems and the lack of control over the utilisation of these lands by other tribes. Their main concern is centred on their inability to defend and manage these grazing areas and it is to this that they attributed the rapid pace of the land degradation in these areas.

8.2.2 Attitudes

The group dynamic: Baland and Platteau (2002) have extensively researched and reviewed information on the behaviour of individuals within a group, and have shown that the attitude of an individual within a poor community is most commonly guided by

the group, and that the group dynamic is the most influential factor on the decision making processes of each of the individual members. This is a common characteristic of pastoral communities. The behaviour of the group in decision making processes is predominantly governed by its experiences and attitudes. The attitudes are often formed by their experience, although this is more vulnerable to prejudices and historical bias. As well as being the most pervading force in the rural decision making processes, the strength of the group is essential for the success of rural enterprise. This is particularly the case when it comes to input and output cost sharing, reaching viable economies of scale and serving markets.

Understanding the attitudes and overall characteristics at group level is vital in assessing its potential to engage with bio-enterprise initiatives. With respect to this Lin and Nugent (1995), based on premise laid down in Olson's static game (i.e. group size, homogeneity, membership period, physical proximity, level of goal differentiation and inequality in wealth or power among participants), elaborate further on the theoretical variables affecting collective action. They indicate that the time group members spent together and 'geographical or sectoral concentration' affects the level of group dynamic and adherence of the members to group decisions. The level of social capital created horizontally or vertically, through determining social relationships, can facilitate or constrain decision making and the subsequent actions (Meinzen-Dick, et al, 2004). In the view of Lin and Nugent (1995) the environmental circumstances in which members find themselves, availability of 'political entrepreneurship', success or failure of other similar groups and knowledge of technology of collective action on the part of the group members and leaders influence the success of collective action. The attitudes shown by the groups

interviewed during the research of the case studies demonstrated that they were happy with their main livelihood activities (livestock and small scale farming) and felt that if their groups continue to get stronger their bio-enterprises will become stronger.

Attitudes of the community towards diversification: From the interviews held during the data collection, the lack of skills, investment capital and reliable market were cited as the main reasons holding the respondents back from putting more commitment and available resources in to diversified enterprises. Theft of honey and insecurity were mentioned as two other predominant reasons for the low level of diversification.

During the workshop described above (*Livestock, land and the changing political economy of pastoralism in Laikipia: pathways to strengthen pastoralist livelihoods*), the elders identified these factors as dominant reasons for low diversification within their communities. They also mentioned that activities such as bee keeping are second place to any traditional activity concerning cattle and even sheep and goats. It was suggested that once pastoral communities can see good and reliable income arising from diversified activities it is very likely that they will play a strong role in pastoral livelihoods. They felt, however, that it would take time for these enterprises to proliferate as the trust and commitment of their communities must first be gained, particularly in terms of market reliability.

Attitudes of women towards taking part in diversified enterprise: The data collection of the BDP groups was conducted in 2010 through focus group discussion (for the all women groups), which involved 18 women informants, and household survey (for the

mixed gender groups), involving 26 women informants. The data collection methodology was designed to allow women to respond openly within a safe environment, and not be inhibited by the presence of men.

The results, in Figure 8.6, showed that most of the women feel to be in control of their choices to do business. This suggests that as group members (despite not being heads of households) they are able to commit to the group's activities. The interviews revealed that, of the 44 respondents, the large majority of women have some, or total, control over their own income (40% consider having full control over their own income). For this information it may be assumed that if women received direct payment for their products it is likely that they will be able to decide what they spend their income on. However, the survey showed that approximately half of the women have little control over livestock transactions. This is fairly predictable, as livestock marketing is traditionally a male dominated domain.

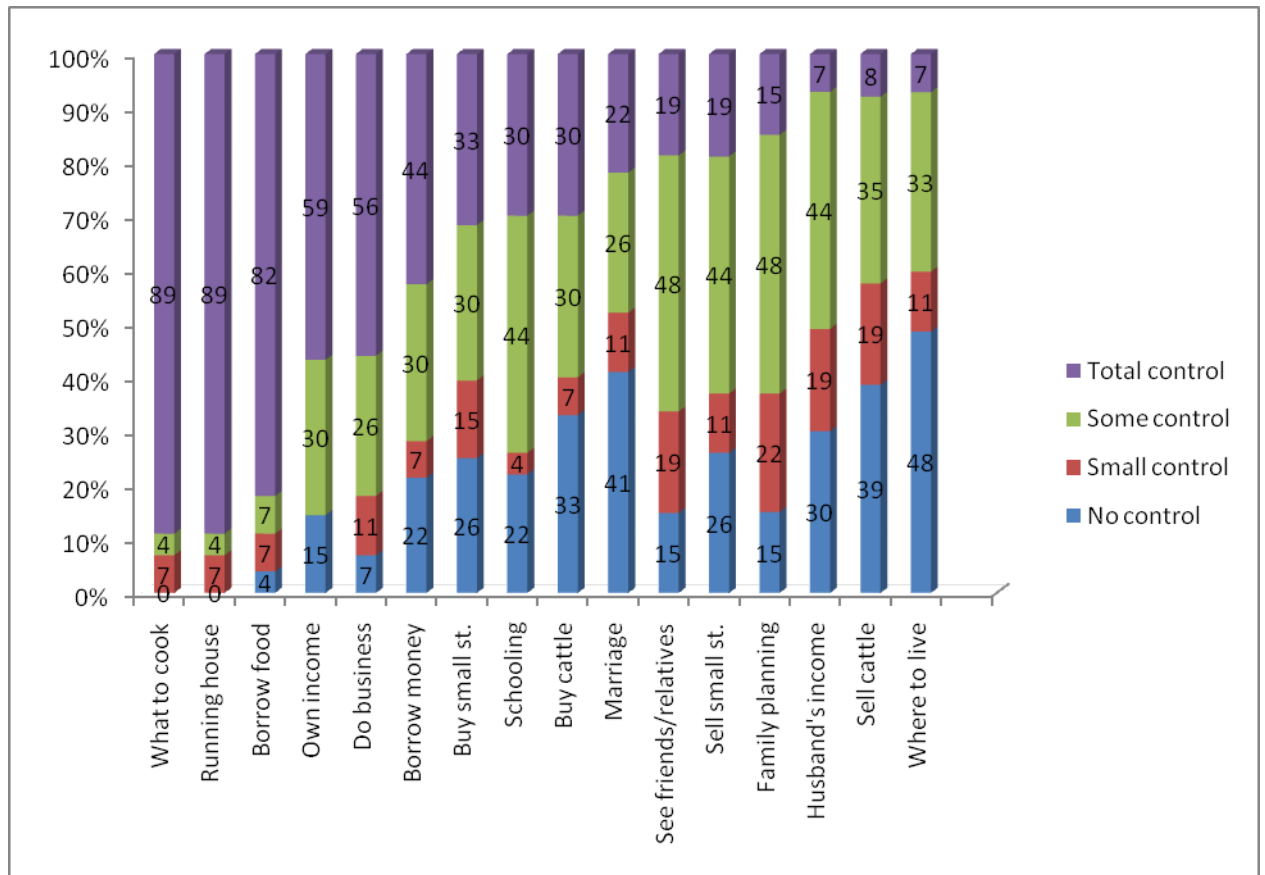


Figure 8.6 Level of decision power (% women)

As presented in Figure 8.6, findings suggest that women of the interviewed groups are relatively assertive. During the questioning on the subject of assertiveness, women said that they are confident in their capacity to control their lives and plan and participate in group activities and lead (50% to 70% feel strongly that they have the capacity) whilst 20% feel that they have no capacity to lead (Figure 8.7). Not only do they feel that they have this capacity but they also have the will to be in control, to plan to participate and to lead. Not all women want to lead, but overall there is a strong will to be in control (40 to 70%). This suggests that bio-enterprise activities can be taken up by women and the benefits controlled by women.

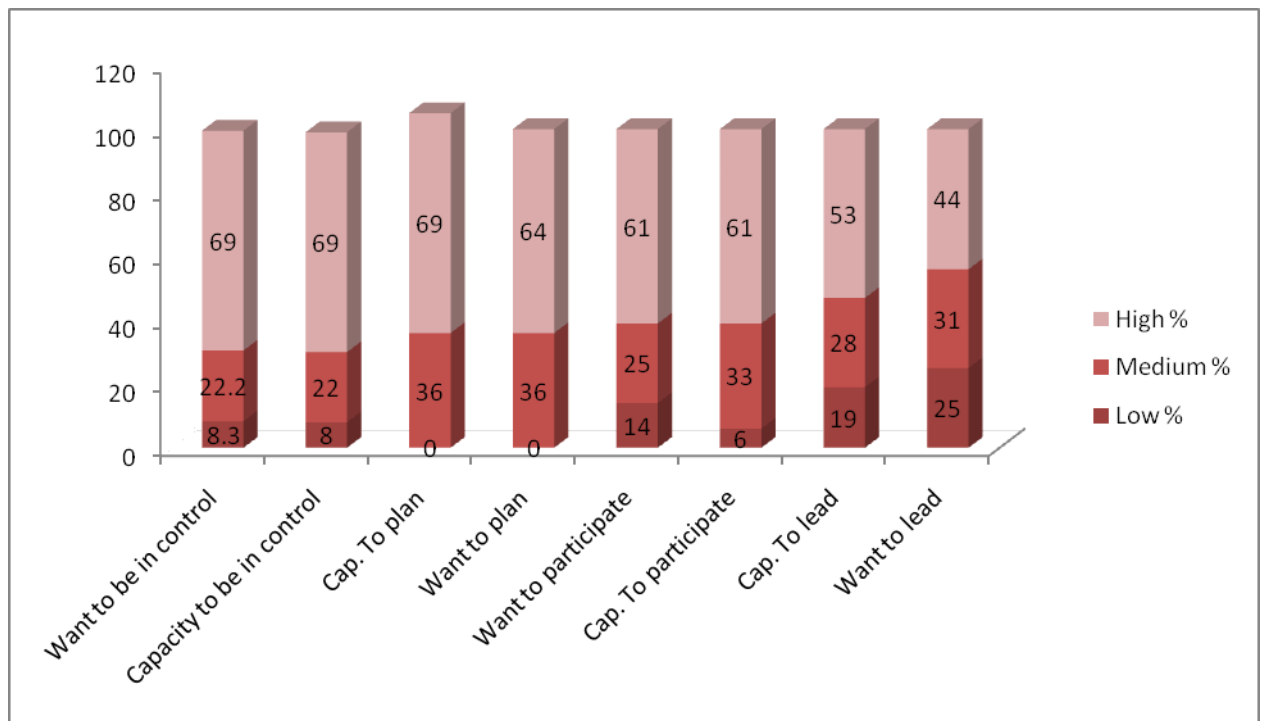


Figure 8.7 Distribution of answers about women assertiveness and confidence levels (%).



Photograph 5. Samburu women harvesting honey from log hive during practical training

8.3 Major factors that have affected the selection of approaches by the development agents

8.3.1 Approach and orientation of the organisation

Due to the nature and terms of the majority of the development finances, most NGOs are tied to short to medium term funding. Therefore, the objectives of their initiatives, although often being far-reaching, are attached to the targets that have to be achieved within a relatively short three to five year time frame. Many projects and programmes take a full year to develop their administration systems and establish other management logistics, cutting further the operative time of these relatively short term initiatives. The activities are therefore limited in their impact in assisting rural communities to develop new livelihoods approaches that have the potential to stimulate incentive-led community-driven environmental management. One of the major strengths of the longer term initiatives, such as the BDP operating within the not-for-profit 'Desert Edge Bio-trading Company', is that the instigators and partners have sufficient time to evaluate the impact, re-assess assumptions and design perceptions and thereby understand the needs and dynamics of the target communities and evolve and refocus their activities as necessary and as demanded by their communities.

There is much evidence to suggest (Fratkin, 1991; Smith, 1992; Behnke, 1993, etc) that the development approach of providing immediate solutions to the deepening poverty in the ASAL, such as providing food, shelter and finances directly to the affected populations who then decide what to do with the assistance, have only served to make the populations more dependent on NGO hand-outs. As a result communities can become

less willing to make their own endeavours to improve their livelihoods (Smith, 1992).

This has especially been the case in northern Kenya, which has been the base for hundreds of NGOs over the past twenty years. For this reason, some international NGOs are now starting to assist communities to initiate entrepreneurial ventures as a route out of daily poverty (Malleret-King and Hatfield, 2008; Wren, 2008a,b; Fratkin and Mearns, 2003)

A series of questions were put to the key informant representatives (senior managers) of the development sector involved with pastoral livelihoods development and are summarised in Table 8.3. The organisations and their focus areas and activities are set out in Table 8.4.

All of the representatives confirmed that the bio-enterprise approach does accord with the objectives of their organisations, and that their organisation's support to agro/pastoral communities is orientated to diversifying their income base, sensitisation and increasing their skills. The international level NGOs all provide, or support to some degree, training and extension services through their country programmes, and all four organisations (Oxfam-GB, CARE, World Vision, Cordaid) are willing to assist communities to develop environmentally sustainable enterprises. When questioned about relevant tangible support areas, such as whether the organisation provides or supports the cost of equipment or infrastructure, provide business / enterprise management training, and can assist communities to develop strong value chains and link them to the market, the answers were "yes in principle".

Table 8.4 Organisational orientation of the selected international and national NGO and CBO respondents

Operational level	Organisation	Area and activity focus
International	Oxfam GB	International humanitarian organisation with focus on livelihoods improvement as well as emergence support to communities in the ASAL.
International	CARE	As above
International	World Vision	As above
International	Cordaid	As above
National	SOS Sahel	Ethiopia. National NGO focusing on natural resource management and rural livelihoods improvement.
Regional	Africa Wildlife Foundation	Eastern and Central Africa. Regionally focused, US registered NGO. Wildlife and environmental conservation focus with a strong community livelihoods component based on conservation enterprise development.
National/Local	Laikipia Wildlife Forum	Laikipia focus but operative at national level. Representative membership organisation with multiple initiatives to support wildlife and environmental conservation and integrated resource management. Components include holistic rangeland management, bio-enterprise development, regulation of forest/natural resource use - community forest associations, water catchment and users management, eco-tourism etc..
Local	Rumuruti Aloe Women Group	Laikipia. Local CBO that co-ordinates, promotes, and attempts to bring skills development and market opportunities to its members. Members include Kikuyu settler and pastoralists
Local	ILMAMUSI	Laikipia. As above. Members include resident pastoralists.

The respondents felt that the level and type of support is entirely tied to their own development budgets that reflect the approach and interests of their own national governments, and the design of those programmes that they have agreed to fund.

The national level NGOs (SOS Sahel-Ethiopia, LWF and AWF-Kenya) also provide training and extension services through their different programmes, and are focused on assisting communities to develop environmentally sustainable enterprises. They already provide and support the cost of equipment and infrastructure, business / enterprise management training, aimed at assisting communities to develop strong value chains and link them to the market. They also contract in expert services, either from consultants or by working in partnership with another more specialised organisation.

The CBOs (Rumuruti Aloe Women Group and ILMAMUSI) do not have the capacity themselves to provide on-going training and extension services to their members, and wish to gain these services from partnering with national level NGOs. They do, however, assist their communities to develop environmentally sustainable enterprises by forming themselves into self-help groups and providing their members with co-ordination, governance, stimulating skills-sharing, and by promoting the group's activities. They do not have the resources to purchase, or support their members to purchase equipment and infrastructure. They request business and management training, trade finance and access to markets.

8.3.2 Awareness of the opportunities and methodologies of using bio-enterprise as a development tool

To assess the awareness of the organisations about the opportunities and methodologies of using bio-enterprise as a development tool, the first two questions that were put to the key informant representatives were based on qualitative statements; whether the organisation see that ‘supporting rural livelihoods involves the development of sustainable businesses operating within sound value chains’, and that ‘sustainable enterprise development in non -timber forest products (NTFP)/bio-products can be a tangible tool for improving communities’ livelihoods and incentivising positive community management of natural resources’.

The representatives of the selected international level NGOs agreed with both statements. Further to this, the organisations do see sustainable bio-enterprise development as an opportunity for assisting communities to improve their livelihoods and their resilience to climate change. Although these organisations see this approach as a compliment to their core objectives, the response to the question: “what are the opportunities and risks of using the bio-enterprise approach” was variable. Each of the organisations has supported community-based enterprise development in pastoral areas, although mostly concerning livestock and petty trading (sugar, maize), Oxfam-GB has some experience with enterprises concerning bio- products, such as bio-charcoal in Turkana, vegetable gardens and craft products in north-east Tanzania, Cordaid works with Gum and Resin producers in northern Kenya to support improvements into the value chain and market potential.

The representatives of the international level development organisations agree that their organisations work widely and more effectively in terms of implementation, through partnerships with national level NGOs, and have supported bio-enterprise initiatives through these partnerships. For example, Oxfam has been working in the ASAL with pastoral communities for a long period (i.e. in Turkana since the early 1960s). After making a literature review of Oxfam's livelihoods programmes in the ASAL, it can be seen that up to 1998 the work has been mostly focused on humanitarian relief, and since 1998 Oxfam has taken an approach orientated to solving poverty through improving the livelihoods and rights of the pastoralist communities.

The growing need for livelihoods initiatives culminated in a more pastoral development approach which began in 2005 with the Turkana Integrated Pastoral Programme (TIPP), the Somali Regional Pastoral Community Development Project and the Ngorongoro Pastoralist Programme. As seen in Table 8.5, Oxfam is directly implementing the programmes in some countries through national NGO partners and through implementing national NGO partners in other countries. World Vision has established a partnership with the BDP in Laikipia to support their target communities to develop bio-enterprises. CARE in Ethiopia has considered partnering with SOS Sahel and Save the Children in instigating a similar programme to the BDP.

Table 8.5 Example of Oxfam-GB implementing partners

Country	Area	Main implementer and implementing partners
Ethiopia	Hashin Afar Borana	Implementer: Oxfam-GB Ethiopia Implementer: Afar Pastoral Development Association (APDA) Implementer: Action for Development (AFD). Partner: Ethiopian Pastoral Forum (PFE)nd Partner: Ethiopian Pastoral Research and Development Association (EPaRDA)
Tanzania	Loliondo- Ngorongoro	Implementer: Oxfam GB-Loliondo, Oxfam GB-Tanzania Partner:
Kenya	Turkana	Implementer: Oxfam GB-Turkana
Somalia		Implementer: Oxfam GB-Ethiopia Partners: Hope for the Horn -HFH and the United Society for Development – UNISOD)
Uganda		Implementer: Oxfam GB-Uganda Partners
Sudan		Implementer: Oxfam GB-Sudan Partners
Red Sea		Programme/project not yet established

The representatives cited a range of risks that they perceive as being associated with using this approach, the most common risks mentioned were; (i) problems in identifying and linking with a reliable market, and (ii) ensuring that the communities can stand on their own feet after their support period has ended.

The representatives of the selected national level NGOs (SOS Sahel-Ethiopia, LWF and AWF) also agree with the two statements, indicated above. More so, they have embraced ‘sustainable enterprise development in bio-products as tangible tool for improving communities’ livelihoods and incentivising positive community management of natural

resources' within their specific programme. The value-chain approach is embedded within this. The representatives of these organisations each feel that they are pioneering a process that has not been thoroughly tested and effectively tried. They are keen to expand these approaches to existing and new programmes as funding permits. The risks they perceive as being associated with using this approach concern mostly the factor mentioned by the international NGO representatives: ensuring that the communities can stand on their own feet after their support period has ended. The representatives of LWF and SOS Sahel were both clear however, that if their efforts ensure that the value-chains are sound and strong, and the community-based businesses are operating efficiently and linked to markets, and the necessary skills capacity has been achieved, then these groups should continue to grow after the support period has ended.

The representative of the CBOs (Rumuruti Aloe Women Group and ILMAMUSI) understood and agreed with the two statements. They felt that they reflected the core objective of their organisations. Their main challenge was to gain sufficient capital to invest in the approach, gain the necessary skills to achieve viable bio-enterprises inside strong value chains and good markets for their products.

All representatives interviewed from the national and community based organisations accorded that in their opinion, overall, that the costs and benefits of using the bio-enterprise development approach is positive. The international organisations also agreed that the approach could be positive but were wary of providing a positive response due to the lack of their own direct experience or knowledge of successful bio-enterprises.

8.3.3 Experience and skills of the management and field staff

The respondents were also asked whether they felt that the organisation they represent had the management and skills capacity to support the bio-enterprise approach effectively. The international NGOs were confident that they had the management skills, were aware that they would need to bring in specialist skills for specific enterprise types but felt that the skills levels of the field staff of their programme was limited and would require training in all the relevant areas to support communities to develop new diversified enterprises. The selected national level NGOs representatives were aware that their organisations have already developed the skills capacity at the field and management levels to effectively assist communities to develop bio-enterprises, but felt that specialist advice is required for new enterprise types that they have not yet gained experience in. Each of the national level NGOs had extensively used consultants to develop their skills and management capacities in the areas of bio-enterprise development. The expansion of their pastoral diversification – bio-enterprise support activities have been primarily bound by funding availability, and, as such, gaining the interest and commitment of international donors in these projects and programme. LWF and SOS Sahel are particularly aware of the time and effort they have invested in raising funding for these projects and programmes, and to the relatively short-term nature of their funding. They continue to press donors to understand the need for their longer-term commitment to these initiatives.

The CBOs feel that they lack experience and skills to expand their bio-enterprises, although they do agree that they have developed an important set of skills that can be applied to new enterprise types. For example, the Rumuruti Women Aloe Group

representative believes that they have achieved sufficient technical and business skills to expand their businesses, although they have insufficient investment capital to do so. The representative of the ILMAMUSI has asked for skill development support from BDP, which has been agreed. The area that they are also concerned about is the illiteracy levels of their community members. The representative sees the need for adult business literacy classes to help individuals to improve their business opportunities.

8.4 Major factors that have affected the selection of approaches of bio-enterprises by the Government.

8.4.1 Approach and orientation

There are a range of interlinked national legislations, policies and Acts that have been developed by the Kenyan government to support conservation, rural development and rural enterprises. Kenya's Development Plan, "*Vision 2030*", also promotes rural community enterprise development and sustainable utilization of natural resources. Kenya's "*National Economic Recovery Strategy for Wealth and Employment Creation (2003-2007)*" aims to improve the government involvement in and responsibility for the long term development matters concerning governance, poverty alleviation and arid lands management. This gave rise to the Ministry of Northern Kenya in 2008. The "*Economic Recovery Strategy for Wealth and Employment creation 2003 – 2007 (ERSWEC) for Kenya*" states that non-timber forest products also play a major role for local villages especially for women. Some of the commercial non-timber forest products include aloe gum, gums and resins, indigenous fruits, like *Tamarind usindica* and herbal medicines. The "*National Biodiversity Strategy Action Plan 2002*", the "*Draft National Biodiversity*

Action Plan 2007” and the “*National Wildlife Action Plan 2002*” call for the utilization of traditional knowledge in management plans. There are also international policies relating to the wild harvesting of indigenous plant materials to consider. CITES, managed the national wildlife services, provided the legal framework for all CITES listed endangered plants, and for these species there is limited opportunity for commercialisation. In the case of indigenous CITES listed species approved for sustainable utilization and commercialisation, CITES requirements include proof of exploitation from sustainable source. Further Kenyan government policies regarding forestry and wildlife management under the new chapter of the “*Wildlife Conservation and Management Act*” (Section 67 Cap376) attempts to increase economic benefits of wildlife to the local people while empowering them. The main points of the regulation are centred on the domestication (‘artificial propagation’) and exportation of indigenous plant materials/extracts.

The purposive interviews with the representatives from the Ministry of Livestock, the KWS, KFS and Kenya Bureau of Standards (KEBS) were structured in the same way as for the development sector organisations. Questions concerning the approach and orientation of the ministries and their departments were based on the same parameters and used for interviewing the respondents from other sectors, therefore enabling a direct comparison, as illustrated in Table 8.6. The responses to the question of how the bio-enterprise development approach accords with the objectives of the ministries and departments that they represent, confirmed that each of these ministries and departments are supportive to the approach. Furthermore, the representatives of the KWS and KFS explained that they are already interacting with the BDP in developing bio-enterprises

(honey, cape chestnut and ethno-botanicals) in the Forest Reserves in Laikipia, Mukogodo and Kirisia within the Samburu Heartlands.

The representatives confirmed that their departments and ministries are willing to assist communities to develop environmentally sustainable enterprises, although they have no financial capacity to provide equipment or infrastructure to communities. Project support of this kind has been provided in the past by the Ministries of Livestock Development and Ministry of the Environment through the direct support of donors such as GTZ and SIDA.

8.4.2 Awareness

The respondents from the selected Ministry and Departments responded positively to the qualitative statements designed to assess their awareness about the opportunities and methodologies of using bio-enterprise as a development and conservation tool ('supporting rural livelihoods involves the development of sustainable businesses operating within sound value chains', and that 'sustainable enterprise development in NTFP / bio-products can be a tangible tool for improving communities' livelihoods and positive community management of natural resources').

As for the responses from the representative of the National Development Agencies, the respondents from the ministries and departments see sustainable bio-enterprise development as an opportunity for assisting communities to improve their livelihoods and improving their climate change resilience, and they see this approach as a compliment to their core objectives.

The opportunities and risks were discussed with the representatives from the Ministry of Livestock, the KWS, KFS and KEBS. Their understanding of these reflected the approach and remits of their departments. For example, KEBS were keen to assist communities to develop their products to the required standards to meet the national KEBS legislation and promote greater interaction with fledgling businesses in order to reduce the risk of non-compliance of their products at a point where investment might be wasted. KWS and KFS wishes to assist communities to develop NTFP (bio) enterprises in order to incentivise conservation management, and mandates and promotes the Community Forest Associations (CFAs) with specific tasks to support community led conservation of the reserves in hand with sustainable enterprise development. KWS is also keen to develop national level sustainable wild harvesting protocols and standards to accord with the international FairWild standard, and has gained greater awareness of the management and technical requirements for meeting the international standard through interaction with the BDP during 2010. The Ministry of Northern Kenya has also developed an awareness of the opportunities of the bio-enterprise approach, and requested detailed information and consultation with the senior management staff of the BDP over 2010 in view of designing the future services of the Arid Lands Resources Unit.

8.4.3 Experience and skills

When asked about the skills capacity to provide effective support to the communities attempting to develop bio-enterprises, the respondents from the KFS and Ministry of Livestock felt that the ministries look to partner organisations, such as the BDP and ICIPE, to provide specialist skills and targeted training to assist communities to develop

environmentally sustainable enterprises. All respondents expressed a wish to increase their own skills in this area, but also felt that they have the complementary skills that can assist the specialist organisations to work with the communities in developing bio-products. The representatives of the KWS and KFS both indicated that they have worked with the BDP in developing non-timber forest product (bio) enterprises in and around Mount Kenya, Abadares, Kirisia and Mukogodo forest reserves. For example, KSF has arranged for the training of volunteer scouts of the Community Forest Associations (CFAs) in order that they are able to provide extension support to their communities in bee keeping and sustainable wild harvesting of cape chestnut seed and the indigenous Africa nettle (*Urtica dioica*), and have provided permits and practical support to the communities to achieve organic certificate of these bio-products (honey and cape chestnut seed), arranged by the BDP. The surveys conducted for this study have also revealed that the Ministry of Livestock staff in Laikipia have also worked with the BDP to increase the training and extension impact in Laikipia and Kirisia, and with ICIPE in Mwingi in the provision of long term support to communities to develop bee keeping and indigenous silk production.

8.5 Major Factors that have affected the selection of approaches of bio-enterprises by the commercial sector

8.5.1 Orientation and awareness

The government has held consultative meetings with selected Business Development Service providers, such as IFC, TechnoServe and also with businesses (Small and Medium size Enterprises - SMEs) in Northern Kenya interested in investing in the region.

These meetings have provided a good opportunity to raise awareness of Northern Kenya needs within the financial sector. Work is on-going to develop a Northern Kenya Investment Fund (NKIF) Framework and has generated considerable interest among financial sector stakeholders. During phase II of the project, a market assessment was conducted by CARE Kenya to support the Ministry for Northern Kenya to establish a Northern Kenya investment fund. The consultants carried out a quick survey of the entrepreneurial situation and outlined key investment opportunities (CARE, 2008). A total of 17 companies were interviewed on the following subject areas; organisation, technology, innovation and growth, finance and capacity. Entrepreneurs identified access to finance, project development support, municipal business regulation and security/infrastructure as priority areas for government intervention. These views are reflected in the smaller survey conducted for this study. To gain an insight as to the commercial sector's views on the benefits and risks of interacting with community based bio-enterprises, respondents from two Laikipia based companies and two national level companies were interviewed. The companies all purchase bio-products, such as aloe extract, cape chestnut seed oil, shea nut butter, essential oils, gums and resins and either manufacture them into wholesale or retail products or semi-process and bulk trade the products. The representatives of the companies accorded in their response to the question as to whether community based bio-enterprises development met their own company objectives. Four out of the four respondents used their interaction and trade partnerships with rural communities as a marketing angle, and perceived this interaction as providing socio-economic support to communities. The company representatives see this as yielding market advantage in terms of product branding and recognition. Three companies provide advice regarding the production/harvesting, handling and storage

protocols in order that they can better ensure the quality and value of the products. The one company that does not buy direct from the communities is still interested in providing product and handling advice, and ethical trade terms to community suppliers.

All four company representatives were aware of the ethical trade principles and terms and of the advantages of certification. Two out of the four companies wanted to ensure that all product supply from the communities were endorsed with organic certification, and sustainable wild harvest certification (under the IMO organic and Wild or the Fair Wild certification) when buying wild harvested materials, such as the cape chestnut seed.

The representatives confirmed that their companies are willing to provide some level of training to the communities but do not have the financial capacity to provide consistent on-going training and extension support. The respondents confirmed that the effect of working with community based bio-enterprises can be greatly enhanced by partnering with an appropriate NGO that can provide suitable training and extension support.

Likewise, all four respondents felt that their companies could not economically afford to provide equipment and infrastructure to communities to assist them to develop their products. Two of the respondents said that this is one of the main areas they expect development agencies to assist with, alongside the provision of training and extension to the communities producing the bio-products.

8.5.2 Experience and skills

When the four respondents were questioned about the level of experience and skills of the companies in bio-enterprise development, all felt that they have a good understanding of

the overall principles. The four respondents also confirmed that they have adequate experience and skills to develop their own products and markets. Two of the respondents felt that their companies have limited skills in terms of interacting with communities, the other two respondents felt that their experience and knowledge of dealing with the communities that supply their products is one of the economic advantages (i.e. there are not dependant on middle-men/traders to obtain the product material and they have better knowledge of the traceability of the product).

8.6 Relationship between perceptions of the central actors towards bio-enterprises and how can these be enhanced to encourage wider up-take

The survey of the communities, the development, government and commercial sectors about their attitudes, awareness and perceptions of the potential for and opportunities of developing community based bio-enterprises has provided valuable information towards understanding how to enhanced the development of bio-enterprises with agro/pastoral communities, and how to encourage wider up-take. The survey has indicated important areas that are necessary to include in the design of effective bio-enterprise support programmes and in developing effective and long lasting partnerships in improving livelihoods and conservation in the drylands. The findings are used as empirical background for further discussion made in Chapters 9 and 10. Tables 8.5, 8.6, 8.7 and 8.8, illustrate the relationships and the level of importance that each of the respondents placed on the questions concerning the approach and orientation of their groups/organisations/ministries and departments/companies. The use of the Likert-type

scale (LTS) provides a more accurate picture of the comparative responses per sector to each of the statements, and the responses between the sectors and statements.

8.6.1 Approach and orientation of the organisation

In summarising the score results, Table 8.6, shows that all respondents feel that the approach and orientation of their organisations enables them to support the development of community based bio-enterprises and that their organisations and companies accord with the objectives and understand the potential of the approach. This may not be surprising as the organisations and government ministries and departments are already engaged with community livelihood development and conservation, and some have already engaged with projects to assist communities to develop diversified enterprises from non-timber forest products (bio-products). Chapter 5 provides a greater insight as to the impact of some of these initiatives, and Table 8.6 provides further information for this discussion. Although all respondents agreed with the objectives and the need for supporting the activities, there was a difference in response concerning whether their organisations and companies could currently provide support to the cost of equipment, infrastructure, extension and training. Development representatives were mostly confident that their organisations could provide this support, whereas government representatives were mostly unsure. Company representatives felt that their companies would be willing to make some provision, but only if directly linked to product supply, and restricted to a level that was within the viability of the business. The company representatives felt that their companies would not provide speculative input due to the immediate financial risk implication.

Table 8.6 Approach and orientation of the organisation

Question	Developm ent (7)	Governm ent (4)	Commerc ial (2)	Total LTS score	Highest possible score
Agrees with the objectives	****	****	***	50	52
Provide support to bio- enterprises	****	***	**	50	52
Provision of training and extension services to assist communities to develop environmentally sustainable enterprises	***	***	**	37	52
Provision of support the cost of equipment or infrastructure	***	*	*	27	52
Provision of business / enterprise management training	***	**	**	30	52
Provision of assistance to communities to develop strong value chains and link them to the market?	***	*	***	31	52
Total scoring	140	56	26	225	312

Legend: Qualitative indicators from **** (very high); *** (high); ** (medium); * (low);
- (no contribution).

8.6.2 Awareness of using bio-enterprise as a development tool

In order to support livelihoods while maintaining the quality of the environment, development actors assisting rural community livelihoods need to understand the inter-linkages between this activity and the potential for using community driven ethical businesses to incentivise and drive sustainable resource use and resource conservation. This understanding is based on the BDP model (discussed and evaluated in Chapter 7) which promotes the concept that by using the bio-enterprise approach, communities will give greater value to and use natural resources in a more sustainable manner.

Table 8.7 Awareness of using bio-enterprise as a development tool

Question	Community (2)	Development (7)	Government (4)	Commercial (2)	Total LTS score	Highest possible score
Agree with statement: Supporting rural livelihoods involved in the development of sustainable businesses within sound value chains’.	***	****	****	***	56	60
Agree with statement: Sustainable bio-enterprise development can be a tangible tool for improving communities’ livelihoods and incentivising community management of natural resources’.	***	****	****	***	52	60
Would you use bio-enterprise development as a tool for improving your livelihoods?	***	***	***	***	45	60
Do you see bio-enterprise development as a route to assisting communities to improve climate change resilience?	**	****	****	****	56	60
Can you / your organisation practically use the bio-enterprise approach?	***	***	***	****	47	60
Do you feel that the Costs and benefit of the approach is in favour of using this approach?	***	***	****	***	49	60
Would you / your organisation consider trialling the approach or visiting such initiatives to learn more?	***	***	****	**	47	60
Total scoring	40	168	104	44	352	420

Legend: Qualitative indicators from **** (very high); *** (high); ** (medium); * (low);
- (no contribution)

Table 8.7 summarises the responses of the interviewed representatives of the development, government, commercial sector organisations and the communities.

The views of the communities are included in this Table 8.7 as respondents were asked these questions, however, these communities are already interacting with the BDP and therefore it can be assumed that their awareness is higher as a result, and not representative of other communities who have not experienced this or similar initiatives.

The overall scores are high for the awareness of using bio-enterprise as a development tool, and the results show that all respondents have an understanding and an awareness of the bio-enterprise approach and its potential. As indicated in section 8.6.1, this result could be expected as the organisations and government ministries and departments are, to varying extents, already engaged with projects to assist communities to develop diversified enterprises from non-timber forest products (bio-products).

8.6.3 Relevant experience and skills of the management and field staff

In each of the bio-enterprises studied in Chapter 5, external actors (NGOs, government officers, researchers) played a key role either as initiators, facilitators or mentors. Where external actors did not initiate the bio-enterprises, they still played a key role either in facilitating local producers access to know-how and skills, to finances, or to markets. Table 8.8 provides a picture of what skills and experience this highly relevant cross section of development and government organisations are able to and are willing to

provide, and the level of input commercial companies are willing to provide to source suitable products for their own businesses.

When summarising the scores from the responses gained from the purposive interviews, as indicated in Table 8.8 it is useful to see that both development organisations and government agencies and, and to a similar extent commercial companies, are very willing to form partnerships with more specialised organisations to develop bio-enterprises support programmes. The representatives of the development and the commercial sectors have good skills levels, and the government agencies have some skills, but all representatives also see the need for and are willing to bring in, external assistance in the more specialised areas. In general, the scores are fairly similar between the different sectors.

Concerning the financing of the activities, the scores are much lower and none of the sector representatives have indicated that their organisations/companies have funded all the activities mentioned, although the development sector representatives felt that their organisations have financed a good number of the activities mentioned (Table 8.9). The representatives of the commercial sector did not feel that it was their responsibility or in their direct interest to raise funding for these activities, although they are happy to work with funded initiatives and to provide some skills support and provide a market for the bio-products (providing they meet the market standards). They express that they would be willing to provide more support if their costs were financially covered, or as

consultant advisors. This demonstrated that these companies are willing to provide a stronger role if financially assisted to do so.

Table 8.8 Experience and Skills

Question	Development (7)	Government (4)	Commercial (2)	Total LTS score	Highest possible score
Does your organisation have the experience and technical skills (business, technical, management, organisational) to develop this approach at the field staff level?	***	**	**	33	52
Does your organisation have the experience and skills to develop this approach at the management level (including feasibility and business planning, marketing)?	***	**	***	35	52
Would your organisation wish to train its staff in the technical and management areas?	***	**	*	31	52
If not would your organisation consider bringing in these skills, via consultants, or by partnering with an organisation that has these capacities.	****	****	***	50	52
Total scoring	91	40	18	149	208

Legend: Qualitative indicators from **** (very high); *** (high); ** (medium); * (low); - (no contribution)

Both the development and government organisation representatives were keen to express that their organisations would pledge to provide long term support to community based bio-enterprise development if adequate funding was made available. This indicates that the organisations would have the will to provide tailored and specialised support to communities to develop bio-enterprises, by enhancing their own or bringing in the skills and experience, if sufficient funding was made available.

Table 8.9 Capacity and commitment to financing the activities

Question	Development (7)	Government (4)	Commercial (2)	Total LTS score	Highest possible score
Does/would your organisation budget and raise finance to cover the cost of the activities above?	***	*	*	27	52
From experience to date (i.e last 5 year), has your organisation financed some activities, above?	***	**	*	31	52
From experience to date has your organisation financed all of the activities, above?	-	-	-	Zero	52
Would your organisation, if funding was available, pledge to provide long term support to community based bio-enterprise development?	****	****	**	48	52
Total scoring	70	28	8	106	208

Legend: Qualitative indicators from **** (very high); *** (high); ** (medium); * (low); - (no contribution).

8.7 Supporting innovation

Following on these interviews, a literature search was made of the selected development organisations represented in the survey. The focus of the literature search was to identify if these organisations have made tangible advancements in supporting pastoral innovation.

The search revealed that CARE has called for a renewed focus on ecosystem management that can utilize the goods and services from this system and which will be able to provide various livelihood options (Malleret-King and Hatfield, 2008). It promotes that development direction in pastoral areas should move from the conventional focus to restore traditional pastoralism, focused on livestock, to an approach that includes the management of the ecosystem for multiple goods and services, that includes rangeland products (such as bee and aloe products, gums and resins). Furthermore, CARE aims to assisting communities to develop sound and viable value chains for traditional as well as diversified products. At a meeting in Nairobi during 2010 the CARE Country Director clearly stated that CARE aims to enhance positive diversification among pastoralists to achieve greater upward income mobility, which will involve non-pastoral activities.

Oxfam-GB has been providing direct financial support for restocking, making market linkages and developing veterinary services. Oxfam has also provided credit to groups of livestock farmers and to women groups to establish micro and small-scale enterprises, assisted communities to develop crop cultivation for household consumption, small scale food manufacturing and wholesale trade.

Cordaid aims to support the adaptive capacity of pastoralists. They stress that the impact of the interventions on natural resources and the inputs and outputs from market are important. They are currently broadening their livelihoods support in the ASAL to address the increasing trend of pastoralists dropping out of the pastoral system, which either leads to destitution or gives rise to alternative diversified enterprises, often with more social and conservation negative impacts than positive ones, such as prostitution, charcoal production and petty theft.

SOS Sahel-Ethiopia in Borana and LWF and AWF in the Samburu Heartland are pioneering new pastoral innovations. All three organisations indicate in their programme reports the on-going learning process that needs sufficient time to work through and properly inform future bio-enterprise programmes. These programmes are well documented and monitored and it is hoped that these models will provide strong examples for government and development sectors, as well as communities, to encourage greater utilisation of sustainable community based enterprises to enable pastoralists to adjust their livelihood strategies and to incentivise greater community involvement in conserving the environmental they rely on.

8.8 Conclusion

In concluding this chapter the first observation that comes to the fore is the level of interest shown by the development and government sectors in the concept of community based bio-enterprise. During the interview process the representatives were keen to understand the business foundation of the approach, such as the value addition, financial

handling and marketing activities. Both the development and government sector agencies interviewed were open and interested in this overall research study. Major factors that affected the adoption of bio-enterprises appear to be mostly related to funding. It was pointed out that existing funding committed to established programmes, and the programmes have their specific niches. When each of the respondents were asked about their views on the main factor that affects their organisation adopting the bio-enterprise model, the most voiced response, particularly from the development sector representatives, was about lack of information and evidence showing that this approach is effective and replicable. This is an important corroboration of viewpoints, which further mandates the objective of this study.

The commercial sector representatives showed openness and interest in their approach, particularly concerning the opportunities that might benefit their own businesses. They indicated that they are prepared to provide input in terms of technical support and advice, if remunerated, and are interested in developing ethical trade relationships with producer groups that can provide them the type and quality of products that require. As such, the commercial sector can provide a significant resource in rural community enterprise development. In carrying forward this point, this thesis proposes that the opportunities of partnerships between development, government and the commercial sectors deserve far greater recognition and investment, by both development and government sectors.

The strongest underlying factor influencing the movement of communities towards diversified activities, illuminated through this survey, is the perception of increasing unreliability of livestock in serving the majority of livelihood needs. The climatic

extremes, mostly droughts, have resulted in intensifying shortages of grazing and water, exacerbating inter-clan friction and inter-tribal conflict, cattle theft and loss of human life (Kratli and Swift, 1999; Markakis, 1997; Mkutu, 2002; Kahl, 1998; Unruh, 2005). The conflict in turn has increased the vulnerability (Eriksen and Lind, 2009). The survey of the communities confirmed that diversification helps to spread their options and increase their resilience. However, in the workshop held in September 2011 by DE and IDE, elders explained that they were keen to learn about and harness new diversification routes that were not risky (referring to their own risk bearing capacities), but that they also intend to continue to maintain their livestock herds. In discussion, it was further articulated that the introduction and up-take of diversified enterprises may not reduce livestock numbers and the underlying pressure on natural resources.

In summary, this chapter has presented the survey findings and attempted to associate the factors and the relationship between the awareness and perceptions of the resource users and the awareness and approaches of central livelihood and conservation development actors. The main points that have arisen from this process that can inform organisations to enhance and encourage wider up-take of diversified livelihood strategies are:

(i) Communities are aware of the some diversification opportunities and are willing to learn new skills. Women feel sufficiently empowered to develop their own diversified businesses and have control over the financial rewards.

(ii) Development organisations involved in livelihoods and conservation are interested and willing to trial the bio-enterprise approach, although they are tied to operational obligations of their donors or national government and the scope of their funding focus.

(iii) Commercial sector operators are willing to provide services and develop ethical trade relationships with communities where there is business interest and where there is development support to the communities in assisting them to meet quality standards.

(iv) Government ministries and departments are willing to co-operate with development and commercial sector partners, they are keen to assist the development of the bio-enterprise approach within their operational capacities, and wish to be involved in training and extension activities.

(v) All parties need more information and evidence of successful bio-enterprise approaches that are relevant and replicable to their owned remits, in order to promote and focus future funding and other resources towards this approach.

In further addressing the questions set out in Chapter 1 under Objective 4, the discussion in Chapters 9 and 10 will provide greater clarity about the existing and potential relationship between the communities and support actors, and how these can be enhanced to encourage the up-take of complimentary or alternative livelihood approaches, such as the bio-enterprises evaluated in Chapters 5 and 6.

Chapter 9. General Discussion

Whilst there is a significant amount of material in the literature that discusses pastoral diversification strategies and approaches, there is very little investigation that demonstrates the comparative advantage of one diversification strategy over another. Additionally, there is no published information that explores the conditions and requirements for the successful development of livelihood diversification in the ASAL. While there is some published research that indicates that diversification can increase rural incomes, there is an urgent need for empirical studies that enable the stakeholders and support actors to understand the synergies and trade-offs between the various factors of business development based on natural resource management.

The specific aim of this study was to analyse whether and how bio-enterprise development in the ASAL as an example of natural resource management, can be implemented in a manner that improves both agro/pastoral livelihoods and the management of natural resources, and to assess what socio-economic and community-related structures were necessary for this to be achieved. The preceding chapters were designed to build a picture of this subject, to present research findings, analysis, discussion and evaluation to achieve the aim. It is intended that the information presented will stimulate greater understanding within development, government and commercial sectors of the nature of the challenges and the effective approaches to assist communities to successfully adapt their livelihoods and improve resilience to climate change in the ASAL of East Africa. The structure of the research study laid in the thesis is illustrated by the flow diagram in Figure 1.1

9.1 Comparative analysis of the case studies.

9.1.1 Assisting livelihoods change in the ASAL through the Bio-enterprise approach

Agro/pastoral communities are keen to take-up complimentary or additional enterprises. There are many NGOs engaged with livelihood diversification projects in the ASALs of Kenya, but many such projects are developed on poor business grounds and have failed leaving participating communities wary and sceptical. Government and NGO extension staff are potentially powerful agents for supporting viable agri-business development however, the level of business skills and extension capacity is generally inadequate to effectively assist the development of community based enterprises. Communities feel that they are often not involved in the design of the development sector initiated livelihood projects and they often have little or no say in the decision making processes required to run the operations. To create complimentary income options that are feasible and manageable alongside the traditional livestock herding, close interactions with the value-chain actors and stakeholders must be made throughout the design, inception and establishment phases of new opportunities. Management challenges of organising producer groups and community owned micro-enterprises persist and highlight the importance of active and well-focused extension facilities. Reduction of the cohesion within producer groups, seen as a growing problem, may also be a symptom of this underlying problem. Therefore, it is necessary to develop business orientated management systems that are unifying and are operated within economically rewarding schemes. To develop viable enterprises producers need to secure the necessary services and investment capital. It is imperative that any future rural enterprise development initiative addresses these points adequately to achieve success.

The Bio-enterprise Development Programme: The evaluation of the BDP service-providing activities (chapter 6) and the ethical trade facilities provided by DE has shown that positive changes occurred in key impact areas after the first eighteen months of activities. These include: (i) a greater understanding of the participating communities of the potential rewards that bio-enterprise can bring as a result of increased incomes and value of the natural environment; (ii) an increased confidence to participate in beekeeping activities; (iii) increased skills; (iv) an increased income and capacity to save thus improving overall household food security.

Perceptions of increased pressure on natural resources: The research findings in Chapter 7 showed that the communities perceive the forest as having declined in the recent years due to intensive human activities including tree felling, charcoal burning and firewood collection. The case study showed that communities living in and around the Forest Reserve have a good understanding of the importance of the forest in terms of their welfare and future livelihoods but despite this the local communities showed little understanding of the need to take action against the increasing practices of tree cutting, felling and charcoal burning. This indicates that there is low community awareness that forest stewardship is important. This shows that although the communities are aware of the signs of climate change that have mostly resulted from the recent patterns of severe drought, lack of rain, diminishing pasture, and deforestation, most people feel that the future will look after itself. The surveys have shown that communities are keen to learn new skills, such as those provided by the BDP, and are open to diversifying their livelihoods. The indications that the community members lack vision for the future and feel powerlessness over what happens may be significant reasons why the BDP has

reported that it is difficult to find and work with cohesive and progressive community groups in the Kirisia region. The findings of these studies clarify and promote the view that the CFAs require external support to achieve effective governance and conservation management, and that they need to assist their communities to develop conservation-positive enterprises that can better ensure the long term welfare of these fragile natural resources than current pastoral livelihood practices. This study suggests that this should begin with heightening the perceptions of the communities of their own empowerment to bring about change.

Major factors that have affected the adoption of bio-enterprises: The survey reported in Chapter 8 attempted to correlate the factors and the relationship between the awareness and perceptions of the resource users and the awareness and approaches of central livelihood and conservation development actors. The main points that have arisen from this process that can inform organisations to enhance and encourage wider up-take of diversified livelihood strategies are: (i) that the communities are aware of some diversification opportunities and are willing to learn new skills; ii) the development organisations involved in livelihoods and conservation are interested and willing to trial the bio-enterprise approach, within the scope of their funding capacity; (iii) the commercial sector operators are willing to provide services and develop ethical trade with communities where communities can be assisted to meet quality standards; (iv) the government ministries and departments are willing to co-operate with development and commercial sector partners, they are keen to assist the development of the bio-enterprise approach within their operational capacities; and (v) all parties need more information

and evidence of successful bio-enterprise approaches that are relevant and replicable in order to promote and focus future funding towards this approach.

9.1.2 Causes of poverty and famine in the pastoral regions of Africa

Although globally there is a vast body of research focused on determining the main underlying factors behind the escalation of poverty in Africa and other developing countries, very few studies provide detailed recommendations on how to tangibly assist communities to gain equitable and sustainable livelihood improvements. Homewood (2008), in her book, “*Ecology of African Pastoralist Societies*”, articulates clearly that socio-economics, poverty, food insecurities, inadequate infrastructure and services constrain the benefits accruing from diversification. This research study has provided some important indicators as to how the development, the government and the commercial sectors can assist communities to build diversified enterprises sustainably that will contribute to the long term resilience, as well as improvement, of the livelihoods of agro/pastoral communities. Chapter 6 evaluated the impact on communities in Laikipia and Lower Samburu after one year of receiving the technical skills development and extension services provided by the BDP and the guaranteed market provided by DE for certain selected and promoted indigenous plant products (such as honey and ethno-botanicals). This study has shown that communities will adapt and diversify readily into new, or expand existing, livelihood diversification strategies if the framework exists to support this.

The development of more resilient livelihood strategies is becoming a widely acknowledged factor by development and government sectors. As explained in the paper

by Ogallo (1994), biophysically, low rainfall amounts, high rainfall variability, high temperatures, degraded soils and droughts characterise the ASAL and furthermore climate change is expected to intensify the features of the ASAL climate (Schreck and Semazzi, 2004; Oba, G, 2001; Christensen, 2007). The survey of the community groups in Kirisia, discussed in Chapter 7, showed that all of the 58 respondents think that the climate is changing, and the observations were of increased droughts and lack of rain (72%), higher temperatures (30%) and other effects such as, deforestation, diseases, changes in seasons, less access to water (10 and 12%), (Figure 7.8). Respondents were asked as to how these changes are impacting on their households so far and the most commonly detected effects were; death of livestock through droughts (67%), less pasture available (30%) and lack of water and grazing (approximately 20%)(Figure 7.9). The result is seen as increased poverty through death of livestock and lack of water. Several authors have highlighted the point that the opportunities for alternative livelihoods are limited due to rainfall variability, recurrent droughts, harsh climatic and environmental conditions (Berger, 2003; Ame, 2006 and Pkalya *et al.*, 2003).

Homewood (2008) adds to this discussion by suggesting that besides bio-physical considerations the social and political forces have a powerful affect on pastoral decision making processes. From the interviews conducted for Chapter 8 it is clear that the government departments working in the ASAL regions are not only mandated to promote the development of conservation enterprise but aspire to actively engage with its development. However, it was also made clear by the representatives, during the interview process, that due to their lack of skills and financial capacity they are limited as to the level and extent they can roll out their support in a practical manner (8.4.3), and are

pleased to have the opportunity of working with development sector agents and programmes, such as the BDP, in order to harness these resources.

As indicated in a number of publications, the severe drought in Kenya that started in 2008 and lasted until well into 2010 has resulted in significant human as well as considerable livestock loss (GoK, 2009). Lind and Letei (2011) have examined pastoral responses to the drought crisis of 2009. At the workshop held in Nanyuki in September 2011, organised by the Future Agricultures Consortium and DE (DE, 2011), the participants explored ‘new pathways to strengthen pastoralist livelihoods’, and discussed research findings and future options and opportunities following the 2008-2010 drought in the region. All pastoral representatives indicated losses of over 60% of their total livestock number during this period and the situation was exacerbated by lack of access to grazing areas traditionally used by pastoralists in drought conditions due to increasing private land ownership of these areas. Also discussed was the increased prevalence of illegal grazing (i.e., night grazing of private ranches and occupation of forest reserves) that gave rise to informal and formal temporary grazing agreements, and the movement of women and youths to casual short term employment to provide sufficient food to the families. The interviews conducted for Chapter 7 showed that a large proportion of the households used a mixture of the strategies in the last long dry season, such as eating less preferred foods, reducing food intake, borrowing from relatives, taking loans on purchases from shops and selling livestock (Figure 7.12). The respondents understood that selling livestock at a low price and getting into debt with shops are strategies that negatively affect households’ resilience in the longer term. Using a number of coping strategies at once was regularly used by a much smaller proportion of households and selling

livestock at low price or slaughtering livestock was only undertaken by very few households. The informal and fluctuating uptake of diversification approaches is endorsed by Homewood who states that pastoral families “can manage risk and secure a buffer against fluctuations by diversifying, so that not all income streams on which a household depends are affected by the same potential shocks or drought or disease or conflict, and so that they can better cope with those shocks” (Homewood, 2008: 241).

When referring to the impact of the previous drought (1999 to 2001), Aklilu and Wekesa (2001) cautioned about the difficulties of providing humanitarian assistance to pastoral communities and creating dependency and distortions to existing livelihood dynamics. They argued that external assistance should not be freely provided but rather focused on assisting pastoralists to improving their livelihood base through awareness raising and through increasing their confidence to create change. This theme relates to one of the more significant findings of this research study, the attitude of pastoral community members towards the future. Using both focus group discussions (35 respondents) and household survey (58 respondents) the respondents indicated that their attitudes towards the future are largely fatalistic; the majority believe that the future will look after itself (Figure 7.13). This could be interpreted as a general feeling of powerlessness and possibly a refusal of the communities to accept the consequences of their actions. The lack of morale which was also detected by the LWF study of the Il Ngwesi group ranch, when evaluating the level of the group ranch’s up-take of the Rangeland Programme’s activities (Malleret-King and Hatfield, 2008).

9.1.3 Drivers of diversification and challenges

The Ministry for Northern Kenya and the ASAL (2009) further asserts that due to the extreme natural conditions, lack of transport and infrastructure and poor communications, the challenges of developing commercial business with producer groups and communities in the ASAL regions is insurmountable. Socio-economics, poverty, food insecurity, inadequate infrastructure and services constrains the benefits accruing from diversification. Of the papers published in recent years in this research area, those that discussed pastoral livelihoods conditions and characteristics (Ridgewell, *et al.*, 2007; Ridgewell and Flintan, 2007; Fratkin and Mearns, 2003; Rutten, 1992; Galaty, 1994; Igoe and Brockington, 1999; Thompson and Homewood, 2002; Homewood, 2005; Grandin and Lembuya, 1987; Western, 1993; Berger, 1993; Homewood *et al.*, 2001, 2004; Chinogwenya and Hobsen, 2009) reinforce these views. Lind and Letei (2011), on exploring the effects of the 2008-2010 drought, propose that crisis is an opportune moment for critical reflection and suggest that it has “unmasked vulnerability as well as wealth, time-old coping strategies as well as innovation, conflict as well as cooperation” (page v. 2.2). They add that crises have also led to innovation and cooperation. As researched and presented in Chapters 5, 6, 7 and 8, these pastoral communities are increasingly seeking diversified means of gaining income from sources other than livestock. This demonstrates the strengthening interest in rural development circles in promoting alternative livelihoods opportunities for agro/pastoral communities, but, the uptake is slow. The results of interviews with communities and with development and government sector actors involved in livelihoods development in the ASAL of Kenya (presented in Chapter 8) show that the lack of necessary technical and business skills and knowledge to identify and enable the take-up of alternative income generation activities

and access to appropriate technology and affordable credit are central causes. These views accord with the assertions of Aklilu and Wekesa (2002); Hogg, (1986); Stevenson and St-Onge, (2005) and Xu *et al.*, (2005). These authors also concur that the impact of these factors is further deepened by the unfavourable legal and regulatory environment that has so far retarded the prospects of developing enterprise of any sort in the ASAL. In this study (as discussed in Chapter 8) the lack of government capacity to support pastoral communities both in terms of skills and infrastructure is evident. Insecurity was also mentioned as the predominant reason for the low level of diversification. This concurs with the assertions of Kratli and Swift (1999); Eriksen and Lind (2009); Markakis (1997), Mkutu (2002) and Kahl (1998) that all conflicts are ultimately over resources, particularly in the ASAL due to their scarcity, and that the conflict in turn, increases vulnerability and constraint to human and animal development in these pastoral areas.

In pastoralist areas the most commonly voiced constraint to enterprise development is a lack of access to markets often due to the isolated nature of pastoral groups and homesteads. Fitzgibbon, *et al*, (2007); Hill and Farkas (2006); Little (2001) and Smith (1992) have highlighted the issue of unfair markets and illustrate the very small reward that pastoral communities receive from local traders from gathering and selling wild products. This study shows that this situation is worsened by the lack of commercial orientation and business acumen, a view promoted by Little (2001) and Monela, *et al.*, (2001). The findings of this study (Chapter 8) expand on this theme and demonstrate that these necessary skills are also not found to an adequate degree within the development and government sectors who are focused on community livelihoods and conservation enterprise development, and who are involved in instigating and providing support to

community-based enterprise initiatives in the ASAL (Table 8.6). During the recent workshop co-hosted by the BDP (*“Livestock, land the changing political economy of pastoralism in Laikipia: pathways to strengthen pastoralist livelihoods”*, September 2011), the elders identified the factors mentioned above, as the dominant reason for low diversification within their communities. They also mentioned that the activities such as bee keeping are second place to any traditional activity concerning cattle and even sheep and goats. It was suggested that once pastoral communities can see good, reliable incomes arising from diversified activities it is very likely that they will play a strong role in pastoral livelihoods. They felt, however, that it would take time for these enterprises to proliferate as the trust and commitment of their communities must first be gained, particularly in terms of market reliability. In Chapter 6 (6.4.7) the commitment to the development of bio-enterprise of selected groups in Kirisia (based on honey enterprise) was assessed. Table 6.5 showed that as a result of their experience with selling honey to DE, 95% of people think it is worth producing good quality honey and 100% say they are committed to investing time and effort in the production of good quality honey because they can be sure of gaining additional income. This may demonstrate that once the communities are assured of a guaranteed market and acquire the basic skills and business support, they will invest their time and other resources into a diversified enterprise, as shown by the findings presented in Chapter 7 (Figure 7.14).

Chapter 8 presented the responses to questions concerning perceived skills levels. The lack of the necessary technical and management skills and inadequate extension service are clearly seen by the respondents of the groups as being impediments for bio-enterprise diversification (Table 8.2). The extension team members of the BDP expressed that the

low level of literacy, the attitudes towards learning new approaches and the lack of awareness of the skills required for developing bio-enterprises are major factors inhibiting the skills capacity and adaptation ability of the individuals and groups. In the second interview round, undertaken after 8 months of the groups' involvement in the BDP, it was felt by the informants that the skills development activities have increased together with the income of the members in the diversified bio-enterprise activities (mostly bee-keeping). This has led to the individuals giving more time priority to their diversification activities (Figure 8.4). A similar result has been recorded with members of the Mwingi Beekeepers Association following three to five years of training and awareness-raising provided by ICIPE under a Global Environmental Fund (GEF) supported project (Chapter 5).

As shown in Chapter 6, the need for on-going training support and mentoring is high in the producer groups interviewed during the survey (Figures 6.2 and 6.3). Baland and Platteau (2002) have extensively researched and reviewed the information on behaviour of individuals within a group, and have shown that the attitude of an individual is most commonly guided by the group, and that the group dynamic is the most influential factor on the decision making processes of each of the individual members. In demonstrating the relationship between the perceptions of the communities and actors, and how these can be enhanced to encourage the up-take of complimentary or alternative bio-enterprises, these chapters have shown that where success from diversified enterprises can be demonstrated and where communities are exposed to tangible and guaranteed markets for diversified products the engagement is faster and more widespread. This can be attributed to the group dynamic as explained by Baland and Platteau, and by Lin and Nugent

(1995), where the environmental circumstances in which members find themselves, such as the availability of ‘political entrepreneurship’, success or failure of other similar groups and knowledge of technology of collective action on the part of the group members and leaders influence the success of collective action. In Chapter 5, the attitudes shown by the groups interviewed, during the research of the case studies, demonstrated that for successful enterprise the group members felt that if their groups continue to get stronger their bio-enterprises will become stronger (5.4.1).

9.1.4 Is pastoralism a major cause of environmental degradation?

Both Barany *et al.* (2001) and Malleret-King (2000) indicated in their research that the wide concern of international environmental agencies is that increasing land pressure from expanding resident and transitory populations, exacerbated by growing trade demand, is causing unsustainable utilisation of indigenous resources in Kenya. Recent reports produced by the NGOs operating in the study area suggest that natural resource loss is increasing and that there is a direct relationship between growing residents and pastoral populations, and the increasing demands on natural resource use and environmental loss (Malleret-King and Hatfield, 2008; Malleret King and King, 2005; Powys, 2009). Moore (2008), Mazer and Stakhanov (2005), Smith (1992) and Oba (2001) maintain that there is strong evidence that the increasing population and loss of communal lands to settlers and industry have caused measurable loss of natural resources. Perrings, *et al.* (1997) maintains that the effects include loss of genetic material and collapse of ecosystem resilience; the reports from the AWF and the LWF indicated that this situation will worsen unless communities are sensitized and assisted to engage in more rewarding livelihood alternatives that promote positive management of

the natural resources (Raina, *et al.*, 2010; Wren and Speranza, 2010; Wren, 2007; Wren 2008 a,b). However, as shown in Figure 7.2, the pastoral community in Kirisia do understand that there is increasing damage to and loss of the natural resources, and that this depletion has a negative effect on livelihoods and food security (Figure 7.6). The survey also indicated that the majority of the respondents understood to some degree that their activities on the land have an impact on the quality of these natural resources. Nearly all respondents disagreed with the idea that no change to their livelihoods would occur if the forest disappeared. This shows that pastoralists understand the importance of the natural environment, and they are aware of the characteristics that mark a healthy environment. The most commonly mentioned reasons for why the forest is important were for grazing, wood and for attracting rain (Figure 7.4). For most of the respondents a healthy environment is characterised by plenty of water, plenty of vegetation and fertile soils (Figure 7.3).

The most significant findings that have a direct bearing on how pastoral communities respond to diminishing natural resources, concern their fatalistic attitude which results in little pro-activity and feeling of personal responsibility towards the future of these critically important resources (section 7.4.3). This is despite the fact that they understand the impact of the loss of the natural resource base on their livelihoods and future.

Several authors support conservation strategies for protected natural habitats through the direct involvement of local communities (Scherr, *et al.*, 2003; Schmid, *et al.*, 2005; Taylor, 2005). These studies have provided key information that demonstrates that reversing forest degradation is possible through the provision of incentives to the local

community through commercial insect products (Snodgrass,1993). The examples shown in Chapter 5 (Mwingi Organic Beekeepers Association, MakaaZingira Eco-Charcoal and Rumuruti Aloe Women’s Group) and in Chapter 6 (BDP–DE) demonstrate that this is possible, and that communities can be encouraged to take a proactive role in environmental conservation if they are achieving a good and reliable income directly from the natural resource itself.

The Annual Entomology Review, ‘Forest Habitat Conservation in Africa Using Commercial Insects’ (2010), discussed the relationship between the education and sensitisation of the forest communities located in close to forest reserves and the future welfare of the forests. It promotes that when communities are sensitised, educated and enabled to engage in more rewarding livelihoods alternatives based on indigenous natural resources that they are then more likely to positively engage with the longer term conservation of the natural resource. As demonstrated in Chapter 8, the survey has shown significant association between education level and understanding of the ecosystem and sustainability (Figures 7.7, 7.10 and 7.13). Relationships of the scores between education level and understanding of sustainability suggest that the attitudes towards climate change vary: that is, higher education level raises awareness of the people on the various ways to mitigate climate change. This may lead to the assumption that increased skills and education increases people’s awareness and their capacity to adapt to change.

When the communities were asked what they are doing as mitigation measures, most of the respondents showed that they were aware that they need to diversify their activities and regularly use this strategy in dry seasons. However, only 5% of the respondents felt

that they should place less time and emphasis on livestock enterprise (Figure 7.11). This accords with the findings of Smith (1992) who states that agro/pastoral communities are keen to take-up complimentary or additional enterprises and are willing to learn new skills, although livestock will remain the most important and culturally endorsed mainstay of pastoral livelihoods.

9.1.5 Development sector and the pastoral's plight

There are many papers that conclude that increasing numbers of development agencies and national NGOs specialised in assisting rural livelihoods, and humanitarian and conservation organisation are adding this to their development portfolio, as indicated in Chapter 8 and as found during the survey (Tables 8.4 and 8.5). Kirkemann and Martin (2007), Hulme and Murphree (2001), Easterly and Levine (1997), Bavikatte, *et al.* (2009) and Twarog (2006) suggest, however, that the majority of development sector agencies have little understanding of developing sustainable businesses to stimulate community driven conservation in the ASAL and to ensure that the longer term need of these populations are effectively addressed. They add that these projects frequently suffer from lack of sustainability because of the lack of understanding of the peoples' own aspirations, the small scale of the enterprise, poor production and market gearing, and lack of exposure to best practices of business and micro finance. As a result there are very few sustainable businesses in natural products that have been reported to have stimulated community driven conservation in the ASALs. Chapter 8 focuses on this topic and the reasons for these assertions. The scores from the responses gained from the purposive interviews (Table 8.6) showed that the development organisations and government agencies and, to a similar extent the commercial companies, are very willing

to form partnerships with more specialised organisations to develop bio-enterprises support programme. This study suggests that this should begin with heightening the perceptions of the communities of their own empowerment to bring about change. Several publications have challenged development agencies (Little, *et al.*, 2000; Smith, 2006) to re-think their roles in community-based conservation and livelihoods. This study confirms that this process needs to start with a change in the communities' own perception that this is achievable. This view is further supported by AWF, who have concluded in their report (AWF, 2008) that for community-based conservation to develop and become self-sustaining, it is important that the development and government agents shift their focus from short-term goal-orientated activities to understanding and designing combinations of incentives that will motivate local stewardship of resources over the long term.

The experience gained from the study of the BDP has been valuable in that it shows that by providing guaranteed markets for indigenous plant products based on ethical trade terms, profit sharing, together with training, extension and equipment provision, communities will adapt and modify their livelihood approaches. One of the fundamental principles of the DE approach is that in order to develop viable and sustainable business operations the business risks need to be reduced. This is in full agreement with the assertion of Bavikatte and Jonas (2009) who point out that developing new enterprises, particularly community based, means that producers need to secure necessary investment capital to fulfil the infrastructure, training and management needs and that this requires the longer term commitment of development agencies that are prepared to make this investment. This theme is continued in the further publication by Bavikatte, *et al.* (2009)

where the authors state that the long term development approach is critical to developing a successful and replicable bio-enterprise model. The results of the BDP impact over twelve to eighteen months, (Chapter 6 section 6.4), verify this statement.

9.1.6 Concept of incentive-led community-driven conservation

The Forest Policy of 2007 (Kenya, 2007a) and the *Forest Act of 2005* (Kenya, 2005) encouraged communities adjacent to forests to participate in forest management by forming Community Forest Associations (CFAs). This study suggests that the success of the CFAs should begin with heightening the perceptions of the communities of their own empowerment to bring about change. This approach is supported by many published studies in Kenya (Hesse and MacGregor, 2006; Little, *et al.*, 2000; Scoones, 1995). These expound the need for more effective policy and legal environments that will allow greater incentives to the CFAs to utilise NTFP enterprises to stimulate greater natural resource conservation. Several publications have challenged development agencies (Smith, 2006; Little, *et al.*, 2000) to re-think their roles in community-based conservation and to assist communities to build the capacity of local institutions to effectively engage in community-based conservation. The current study confirms that this process needs to start with a change in the communities own perception that this is achievable (Chapter 8 Table 8.2).

The BDP has been designed on this basis and, by providing guaranteed markets for indigenous plant products based on ethical trade terms, profit sharing, together with training, extension and equipment provision, it seeks to create long term incentives to community based conservation of these natural resources. However, the survey (section

7.8) demonstrated that despite addressing the needs promoted by the communities themselves, their engagement with the activities and up-take of the bio-enterprises is still relatively low (Figure 8.1).

Baird, *et al.* (2003) and Jayantha and Herath (2009) argued that effective management requires a mix of private ownership, common property management, and central government involvement to maximize benefits to local people and ensure long-term protection of biodiversity. As found in the study presented in both Chapters 7 and 8, although the KFS and several donor agencies have shown willingness to support the development of community based enterprises that provide incentives to positive natural resource management, there is a chronic lack of knowledge and skills within the Authority and the development sectors to enact (Table 8.6).

The study conducted for Chapter 5 showed that the success of the initiative developed by ICIPE with the Mwingi Organic Bee Keepers Association has been due to its integrated approach to forest conservation (Raina, *et al.*, 2009). The initiative has included biodiversity assessment, management planning, habitat restoration and community driven commercial insect enterprise development. As Gordon, (2003) and Raina, *et al.* (2009) point out, enterprises based on indigenous knowledge that have well established local markets are relatively low risk and require less development support. They propose that by creating incomes from the forests the communities are more motivated to manage the forest over the long term. The study of the BDP approach has shown how important it is that these initiatives are developed on firm business grounds and with the guarantee of markets for the bio-products, such as honey. The feedback from the respondents has

shown that motivation is very quickly established once they receive reward for their enterprise efforts, and that this motivation is also quickly dispelled if conditions are not conducive or confidence in the market drops and the experiences of AWF in the Kirisia region emphasises this point. Where the producers had been trained and given bee keeping equipment in the past by AWF but not yet market assurance for their products, only 4 tonnes were produced over 3 years (2007-2009). After the working relationships had been established with the BDP-DE, 4.6 tonnes were achieved within 8 months (October 2010 to June 2011) from the same groups. This increase in honey volumes can be attributed to a positive change recorded in business attitude of the producers, increased extension services, improved pricing, improved production efficiency and implementation of Internal Control Systems that have resulted from the input of the BDP.

To become a success Raina, *et al.* (2009) state that it is necessary that the conservation enterprises must be well planned and structured with the necessary mechanisms, such as those required for organic certification and ethical trade, and bio-enterprises. Ashley (2000); Monela, *et al.* (2001) add to this assertion by indicating that such certifications can lead to positive socio-economic and environmental gains by assisting natural resource users to better manage their operations and to harness the opportunity for accessing attractive global markets. This study has not been able to measure the physical environmental impact of the uncertified and the organic certified bio-enterprise development initiatives but has laid down the monitoring mechanisms in order that the environmental impact of this study can be measured over a longer time period (i.e transects measured over 5 yearly periods).

9.1.7 Gender relations and participation in income generation activities

In accordance with the assertions of Brockington (2001) and Ridgewell and Flintan (2007), the finding of the data collection (section 8.2.2) illustrated that women prefer and are able to, within the cultural system, develop small scale diversified activities that can add to the family's food security. Importantly, the data collection further showed that most women feel in control of their choices to do business and how to use the revenue that was raised. Marshall and Streckenberg (2002) have found that the collection and sale of indigenous plant products represent an important source of income and employment particularly to women. The interviews conducted for Chapter 8 revealed that the large majority of women have some, or total, control over their own income (40% consider having full control over their own income, Figure 8.5). From this information it may be assumed that if women received direct payment for their products it is likely that they will be able to decide what they spend their income on. Not only do they feel they have the capacity but they also have the will to be in control, to plan to participate and to lead (see Figure 8.6).

The level of collaboration with the BDP was explored in Chapter 6 (section 6.4.2) and over an 18 month period, the BDP has been working with 366 producers in Laikipia (51% women) and 169 in Kirisia (51% women) and it is interesting to see that over 50% of the participants are women. An additional 12 women's groups in Daiga area and 14 groups, mostly women, were also joining the programme by mid 2011. The number of women producers with their own bank accounts has more than doubled since 2009 as a result of the programme facilitating the process.

Some studies of new technology introductions however, reveal a pattern whereby men displace women from processing. If their businesses become successful, women owners face the dilemma of either handing over the business to male relatives to prevent conflict between household and business responsibilities or to retard business growth in order to retain control (Haight 2005). This was not evident in the case studies accessed in this study. The study conducted by Nduma *et al.* (2000) in Kenya suggested that a lack of education was not a barrier to women getting involved in income generation activities. The research survey presented in Chapter 6 shows that practical-based and on-site trainings are more effective than formal class room style training courses, and enable better involvement of women, an approach referred to by Stevenson and St-Onge (2005). In response to the training and extension support provided by the BDP, a significant increase in perceived skills was detected, especially in relation to bee-keeping and results also showed that the gap between women's and men's skills level has narrowed. This positive change has reflected a change in women's confidence in their ability to be involved in honey production, which was picked up in focus group discussions. This, to some degree, does not entirely accord with the findings of Nduma *et al.* (2000) who suggests that a lack of education was not a barrier to women getting involved in income generation activities. The earlier views of pastoralist groups as economical, politically, socially and culturally male-dominated have shifted with the emergence of studies of the role of women in pastoralist groups (Chieni and Spencer, 1993; Dahl 1987; Hodgson, 2000; Monimart, 1989; Oboler, 1985; Talle, 1988; Sikana *et al.*, 1993; Waters-Bayer, 1984). In line with this new body of work, the evidence from this research study shows that education increases the confidence of women to develop alternative enterprises and assert themselves in a business environment.

9.1.8 Potential for bio-enterprise development to drive positive socio-economic and environmental change

Little *et al.* (2000) propose that what has hampered comparative studies of pastoral diversification is the absence of good longitudinal data. As captured in the literature review, these constraints have resulted in numerous contradictory statements about the potential role(s) of diversification in minimizing risk among pastoral herders. The perception most perpetuated by the development and government actors that pastoralists are resistant to change is challenged by I. Scoones of the Institute of Development Studies in the UK. He is adamant that there is a huge amount of innovation within pastoral communities, but it is not recorded and often not shared (Scoones, 2010). Chapters 5 and 6 show that despite the limited availability of research literature that explores the impact of bio-enterprise development initiatives in the ASALs of Kenya and identified factors for their failure and success, there are a number of attempts made by private and development sector operators to develop bio-enterprises that do contribute to increased incomes and sustainable management of natural resources. The common theme between these initiatives is the business footing that these operations are established on and the secure market conditions that they are able to grow within, as discussed in 5.4.3 ‘Comparative analysis of the case study initiatives’, illustrated in Table 5.1 and further contextualised in section 8.2. This point is reinforced by recent studies in the region such as by Holtzman (1996), Kituyi (1990), Little (1992), Little *et al.* (1999) and Straight (1997), that show marked changes in diversification strategies that increasingly engage the market, even in areas considered to be very remote. Aklilu and Wekesa (2002) emphasise that to assess the benefits and costs of these changes, the relationship between income diversification and pastoral risk management should be examined. As presented

in Chapter 6, the BDP fully recognises and has been specifically designed to address the high business risk in development enterprise in the ASAL. This study has explored how effective the BDP is in addressing these risks and the resulting response of the producers. From the data collection conducted at the beginning of the study it was clear that although communities were aware of the changing livelihood conditions (as summarised in Table 8.2), the awareness of the potential for livelihoods diversification was very limited in all groups interviewed. As shown by the second round of data collection from the same groups and individuals conducted twelve months later (Chapter 7), this changed dramatically once the group members were exposed to the opportunities of developing bio-enterprises, through sensitisation, business training sessions provided by the BDP. As a result they had selected and invested their time into certain bio-enterprises (predominantly bee-keeping). The perceived changes in income, production and investment as a result of engaging in bio-enterprises promoted by the BDP are presented in Chapter 6 (section 6.4, Figure 6.5) and in Chapter 8 (Figure 8.4). Over half of the producers interviewed felt that by adopting bio-enterprises their incomes have increased, and just under half of the respondents felt that their production has increased and as a result they have expanded their investment in beekeeping activities. The survey also showed that there is a fairly good understanding of the services provided by the BDP (Figure 6.1).

It was found that there are very few papers and reports that have so far managed to adequately outline the main drivers and motivations that stimulate pastoral communities to take up bio-enterprise initiatives and what were their own expectations and perception of the reward they received from these income diversification and/or livelihood security

activities. From assessing and evaluating the approach and impact of the BDP, and other similar bio-enterprise development initiatives, this research study attempts to provide this information. As shown in Chapters 5 and 6, the need for training and mentoring is high for all the different groups and organisations interviewed. The demand for infrastructure and equipment has also featured strongly in the groups interviewed within the four different bio-enterprises discussed in Chapter 5 (Table 5.1), and in the groups working with the BDP, as shown in Chapter 6 (Table 6.5). Discussion with the BDP management staff highlighted this issue and that the long established history of donors gifting equipment to the communities has not yielded the business results that were expected. When the respondents were asked what producers thought their role was in terms of developing bio-enterprises and their interaction with the BDP, responses were varied. They included: selling products, participating in training and trading plant herbs (Figure 6.2). It was notable that none of the respondents mentioned being business partners or conservation. However, during this second round of data collection in December 2010 the information gained from the 43 informants displayed that the awareness and acceptance of the communities had changed and had led to action (Figure 8.2). The factors that have led pastoral communities to adapt their livelihood systems were reported as being: to reduce unreliability and riskiness of solely relying on livestock; improve education, including literacy; receive training and improve their chances of receiving financial assistance from government and NGOs. As proposed by Scoones, (2010), this study has demonstrated that agro/pastoral communities have tangible interest in bio-enterprises and understand it as a business and diversification strategy. It also suggests that by providing on-going practical training, as suggested by Homewood (2008) and further illustrated in Figure 8.5, extension and mentoring to each of the individual producer, and by providing

a guaranteed market for the honey, the confidence of the community members to invest in alternative or complimentary livelihoods is raised. It is noticeable that most of the respondents are able to clearly articulate their business position, and this factor may be attributed to the business planning support provided by the BDP to the producer groups. In most cases it was felt that the groups needed more capital to increase their business potential (Figure 8.3). Homewood (2008) points out that traditionally capital investment would be sourced within the communities themselves as part of the wider portfolio of investments commonly owned by the clan (Homewood, 2008; Nassef, *et al.*, 2009). However, as traditional clan structures are breaking down (Ellis, 2000) and there are more external influences creating divergent interests within the clan the individual producers are more inclined to seek financial capital outside of the clan structure. This poses significant problems as banks loan rates are comparatively high and banks do not usually class livestock as adequate asset to secure a loan; pastoralists often do not own land, property, infrastructure, or equipment normally recognised as acceptable assets by the banks. The survey has shown that the BDP initiative that has enabled producers to open individual bank accounts has been well received. This enables direct payment to individuals, through their accounts. This system encouraged savings and also facilitates women to have more control over their income (Figure 6.6). This development agrees with the findings of Flintan (2001), and goes beyond the work conducted by Stevenson and St-Onge, 2005 who state that women are largely deprived of property ownership and consequently are not able to offer the collateral required to secure financial loans from formal lending institutions.

9.2 Summary of the comparative observations

The comparison of this study's findings with those presented in the relevant literature has clarified the specific areas of the research gap identified at the beginning of the research study in 2009 that formed the basis for the objectives and the central research questions. In Chapter 10 the findings will be presented and discussed in terms as to how they respond to the objectives of this study and address the central research questions. The main areas that have emerged from the comparison of the study findings with those discussed in the literature review are summarised under several main themes (Figures 9.1, 9.2, 9.3, 9.4, 9.5, 9.6 and 9.7):

Table 9.1 Comparative observations: Causes of poverty and famine

Theme: Causes of poverty and famine in the pastoral regions of Africa	
Argument	Conclusions
Socio-economics, poverty, food insecurities, inadequate infrastructure and services constrain the benefits accruing from diversification	Communities will adapt and diversify readily into new or expand existing livelihood diversification strategies if the framework exists to support this.
Climate change is expected to intensify the features of the ASAL climate	The survey of the community groups in Kirisia, discussed in Chapter 7, showed that 100% of respondents think that there the climate is changing,
Pastoralist mobility and resource use decisions are always powerful and frequently overwhelming social and political forces affecting those decisions.	Government departments are mandates to promote the development of conservation enterprise and aspire to actively engage with its. But due to their lack of skills and financial capacity they are limited in how they can support community-based livelihood initiatives.
Pastoral families manage risk and secure a buffer against fluctuations by diversifying to reduce potential shocks or drought or disease or conflict.	A large proportion of the households used a mixture of the strategies in the last long dry season, such as eating less, borrowing from relatives, taking loans on purchases from shops and selling livestock
Opportunities for alternative livelihoods are limited due to rainfall variability, harsh climatic and environmental conditions. Pastoral communities are also often resistant to change.	Respondents indicated that their attitudes towards the future are largely fatalistic; the majority believe that the future will look after itself. This could be interpreted as a general feeling of powerlessness and possibly a refusal of the communities to accept the consequences of their actions.

Table 9.2 Comparative observations: Drivers of diversification and challenges

Theme: Drivers of diversification and challenges	
Argument	Conclusions
Crises have led to increased innovation and cooperation in the drylands of Kenya	Pastoralists are increasingly seeking diversified means of gaining income from sources other than livestock due to the threat of significant losses from drought and due to increasing conflict over grazing lands.
Strengthening interest in rural development circles in promoting alternative livelihoods opportunities for agro/pastoral communities	Interviews with communities, development and government sector actors involved in livelihoods development in the ASAL, show that there is a lack of necessary technical and business skills and knowledge to identify and take-up diversified bio-enterprises
Conflicts are ultimately over resources due to their scarcity, this increases vulnerability and brings constraint to human development in the ASAL.	Insecurity was mentioned as the predominant reason for the low level of diversification in the target study areas.
Constraint to enterprise development is a lack of access to markets, very small reward receive from local traders	This study confirms these constraints and shows that this situation is worsened by the lack of commercial orientation and business acumen; these necessary skills are also not found to an adequate degree within the development and government sectors.
The attitude of an individual is most commonly guided by the group, and that the group dynamic is the most influential factor on the decision making processes of each of the individual members.	Where success can be demonstrated and communities are exposed to guaranteed markets the engagement is faster and more widespread. The case studies demonstrated that for the successful enterprise the group members felt that if their groups continue to get stronger their own bio-enterprises will become stronger

Table 9.3 Comparative observations: Is Pastoralism a cause of environmental degradation

Theme: Is Pastoralism a major cause of environmental degradation	
Argument	Final conclusions
Increasing population and loss of communal lands to settlers and industry have caused measurable loss of natural resources.	Pastoral communities understand that there is increasing natural resource loss, and that this has a negative effect on their livelihoods and food security; they understand the importance of the environment and are aware of the characteristics that indicate its health.
This will only change if pastoralists are educated in the value of the natural environment. Pastoral communities are keen to diversify and are willing to learn new skills.	The communities have a fatalistic attitude that results in little pro-activity and feeling of personal responsibility towards the future of the environment, despite the fact that they understand the impact on their livelihoods of the loss of the natural resource base. It was also found that increased skills and education increases people's awareness and capacity to adapt to change.
Conservation strategies for protected natural habitats should be carried out through the direct involvement of local communities.	It was demonstrate that communities can be encouraged to take a proactive role in environmental conservation if they are achieving a good and reliable income directly from the natural resource itself.

Table 9.4 Comparative observations: Development sector and the pastoral's plight

Theme: Development sector and the pastoral's plight	
Argument	Final conclusions
Increasingly development agencies are seeking to assist ASAL communities to diversify their livelihoods. The majority have little understanding of developing sustainable community driven businesses	Skills and experience in bio-enterprises development is low in development and government sectors but both sectors and to some extent commercial companies are very willing to form partnerships with more specialised organisations to develop bio-enterprises support programme.
This should begin with heightening the perceptions of the communities of their own empowerment to lead change.	This study confirms that this process needs to start with a change in the communities own perception that this is achievable.
Development and government agents must shift their focus from short-term goal-orientated activities to understanding the long term needs of communities.	The study of the BDP has shown that to raise the capacity, confidence and interest of agro/pastoral communities a sustained period of training, business development, successful trade and on-going mentoring is required.

Table 9.5 Comparative observations: Incentive-led community-driven conservation

Theme: Concept of incentive-led community-driven conservation	
Argument	Final conclusions
Development agencies should assist communities to build the capacity of local institutions to effectively engage in community-based conservation.	Although the KFS and donor agencies show willingness to support the community-based enterprises that provide incentives to positive natural resource management, they have a chronic lack of knowledge to enact this
Bio-enterprises based on indigenous knowledge that have well established local markets are relatively low risk and require less development support..	Motivation is very quickly established once producers receive reward for their enterprise efforts, and that this motivation is also quickly dispelled if conditions are not conducive or confidence in the market drops.
Conservation enterprises must be well planned and structured with the necessary mechanisms to ensure long term environmental gains are achieved.	This study has not been able to measure the physical environmental impact of the BDP but has laid down the monitoring mechanisms so that environmental impact of this study can be measures over a longer time period

Table 9.6 Comparative observations: Gender relations and participation

Theme: Gender relations and participation in income generation activities	
Argument	Final conclusions
Women are culturally able to develop small scale diversified activities that can add to the family's food security	The data collection showed that most women feel in control of their choices to do business and how to use the revenue they have raised.
If their businesses become successful, women owners face the dilemma of either handing the business to male relatives to prevent conflict or to retard business growth in order to retain control.	Most women have some or total control over their own income. If women received direct payment for their products they can decide what they spend their income on. Not only do they feel they have the capacity but they also have the will to be in control, to plan to participate and to lead
The earlier views of pastoralist groups as economical, politically, socially and culturally male-dominated have shifted with the emergence of studies of the role of women in pastoralist groups.	In response to the training and extension support women felt that they had increased their skills and that the gap between women and men's skills level has narrowed. This positive change was also reflected in the change in women's confidence in their ability to take up enterprise activities.

Table 9.7 Comparative observations: Potential to drive positive change

Theme: Potential for bio-enterprise development to drive positive socio-economic and environmental change	
Argument	Final conclusions
Recent studies show marked changes in diversification strategies that increasingly engage the market, even in areas considered to be very remote	Attempts by private and development sector operators to use the bio-enterprise model to increase incomes and management of natural resources are successful where there is sound business footing and secure markets
Agro/pastoral communities have a keen interest in new diversification strategies	Factors that have led pastoral communities' adapting their livelihood systems include: reduce unreliability and riskiness of solely relying on livestock; improve education, including literacy; receive training and improve their chances of receiving financial assistance from government and NGOs.
Very few research documents adequately outline the main drivers and motivations that stimulate pastoral communities to take up bio-enterprise initiatives	Communities are aware of the changing livelihood conditions, but that potential for livelihoods diversification is very limited. This perception changed once members were exposed to the opportunities of developing bio-enterprises they invested more time and found that production and incomes had increased.
Traditionally capital investment was sourced within the communities as part of the clan's investments. As traditional clan structures are breaking-down producers often seek financial capital outside of the clan. This is met with difficulty mostly due to their low borrowing status.	In most case it was felt that the groups needed more capital to increase their business potential. The survey has shown that the BDP initiative that has enabled producers to open individual bank accounts has been well received. This enables direct payment to individuals, through their accounts. This system encouraged savings and also facilitates women to have more control over their income

Chapter 10. Conclusions and policy implications

10.1 The Argument

In response to the existing research gaps, this research study has attempted to contribute new knowledge to assist in the process of improving the socio-economic status and livelihoods of agro/pastoral communities in the ASAL regions of Kenya. This is focused on improving the knowledge of stakeholders and actors of the potential of the bio-enterprise approach in providing sustainable livelihood diversification opportunities and in stimulating and incentivising positive community management of natural resources in the ASAL. The purpose of this study is to provide resident communities, NGOs, CBOs and government departments substantive research information that can be used to expand global knowledge of successful approaches, and highlights the types of skills and other inputs required to develop climate resilient, environmentally and economically sustainable enterprises. This study has been evoked and shaped by the following interwoven challenges:

Development dilemma: The UN impact assessment of the 2008-2010 drought experienced throughout the drylands of East Africa, estimated that eight million people were forced to depend on food-aid due to the lack of adequate resources to sustain their lives. This recent crisis has stimulated a number of research initiatives, undertaken mostly by European and US institutes supported by international development organisations, to look at why traditional pastoral coping mechanisms are failing and to influence policy

changes that recognise the needs of pastoral communities. Safety-net programme based on food-aid are being questioned as to their effectiveness in seeking long term solutions (Fitzgibbon, *et al.*, 2007). Although, increasingly there is more development emphasis on assisting pastoral communities to adopt new approaches in dealing with water and grazing management, conflict resolution and land fragmentation, the fact remains that at the national government level pastoralism is maligned as a backward production system and is grossly under-valued and under-supported (Fratkin, 1997). Raising awareness of the value and potential of pastoralism can potentially alter political and economic marginalization. It is evident that pastoralism contributes significantly to the national economy (see section 3.7), but further to this there is significant potential for pastoralism to be recognized and utilised effectively as an integral climate-adaptive resource and land management tool (Eriksen and Lind, 2009). Pastoralism itself is a response to increasingly arid conditions; if more research emphasis is applied to evaluating the opportunities of existing and emerging sustainable livelihood diversification approaches, pastoralism may be more accurately recognised as a highly tuned and evolved method of managing the fragile drylands. Assisting pastoral communities to understand these issues and adapt their livelihood methods innovatively could yield more effective solutions in this regard. In researching the ‘Socio-economic and livelihood impacts of environmentally supportive bio-enterprise development for the agro/pastoral communities in Samburu Heartland, Kenya’ this research study has made important inroads in contributing to this pool of critical information. The study has shown that the bio-enterprise approach can tangibly incentivise positive conservation management, and is a realistic and robust option to assist pastoralists to adapt to the changing climatic and socio-economic conditions.

10.2 Research analysis used and results

10.2.1 Specific research analysis used

Although quantitative research methods have been a fundamental and integral component of the framework of this study, qualitative research using participatory methodologies have provided the main structure of the investigation. Due to the relatively short term (less than five years) of the surveys and the lack of relevant historical data, the impacts need to be assessed and evaluated largely on the perceptions of the resource-users, the stakeholders, and of the relevant implementing and support organisations, the “actors”, than on physical impact results of the interventions. More specifically, in terms of the socio-economic impact, it has been found by many organisations involved with livelihood development that it takes a number of years before communities are willing to fully adopt new approaches and interventions. This is more significant in pastoral communities where the majority of resources are limited and fragile, compared to those of agrarian and peri-urban communities. Monitoring and Evaluation (M&E) methods commonly adapted by these organisations are quantitative and therefore the impact trends are often not visible within the short time periods of these initiatives. Qualitative methods can provide a richer and more reliable picture of an intervention and also enable greater feedback from the targeted communities in terms of the perceived impacts during and after its lifetime. They can also provide the actors the opportunity to assess the appropriateness of the design and orientation of the livelihood initiative concerned. This can lead to more subtly attuned development approaches that are in-line with the communities’ own aspirations and needs and, therefore, have a greater potential for success. As it is intended that this research study can provide useful and relevant

information to the stakeholders and actors in the ASAL regions of Kenya it was, therefore, necessary that qualitative methods were used. Quantitative research methods are used to compare and evaluate perceptions of the informants, to measure the number of participants engaged with the bio-enterprise initiatives, the number of training sessions and other capacity building resources that they have received, the level of increase in production, sales and incomes as a result of their bio-enterprise activities.

For the environmental impact component of this study physical measurements using transects and quadrats are fundamental analytical tools for measuring the impact of activities on the health and robustness of natural resources, such as vegetation cover, plant vigour, signs of destructive utilisation and of good conservation management practices. However, within the period of this research study there is little environmental impact information that can be gained from using these methods alone. Furthermore during the study period this situation was exacerbated by extreme weather conditions due to the prolonged drought (2008 to 2009/2010) followed by an uncommonly wet and cold year (2010/2011). These weather conditions within a five year time period can have more overall impact on a transect site than natural resource-use trends resulting from the new bio-enterprise activities. For example, severe weather conditions can alter historical trends in vegetation vigour and health and also the natural resource demands of the pastoral communities as they attempt to keep livestock alive and secure the welfare of their families. In this regard, qualitative methodologies have enabled this study within a short-term to capture the impressions of the communities regarding the health of their environment and perceptions of the impact of current resource-use in the target study areas. The results have enabled this study to compare these impressions and perceptions

with qualitative research data drawn from recent research conducted by conservation organisations within the same geographical region.

10.2.2 Specific results

The complementarities of the qualitative and quantitative methods (Maxwell and Frankenberger, 1992) are illustrated by the data collection methodologies used in this study. Qualitative information provides an invaluable in-depth knowledge and an understanding of the variables at the local level, while quantitative methods can measure the spread of the problem and compare situations. The specific results that have arisen from the utilisation of these survey methods and analysis are explained below, according to each of the study objectives:

Objective 1. *Effectiveness of commercial and development sector initiatives designed to assist agro/pastoral communities to achieve viable and environmentally sustainable bio-enterprises in the ASAL.* To achieve this objective, a cross-sectional cohort study of sampled groups with similar livelihood diversification experiences was conducted with four diversified enterprises in different parts of the Kenya ASAL. Impact levels were explored using qualitative investigation, harnessing key informant focus interviews. The aim of these discussions was to gather background information on the initiatives and to gain sufficient information based on specific parameters to present a cost/benefit analysis of the different approaches. The results of those discussions gave rise to a clear understanding that agro/pastoral communities are keen to take-up diversified enterprises that are understood to be economically rewarding within the short-term and to gain new skills. However, the discussions with the producers showed that they do not have

sufficient knowledge to achieve business success. Interviews held with the development actors engaged with these projects were effective in gaining an idea of the type and level of investment made into the development of these bio-enterprises and enabled a wider consideration for the cost/benefit analysis exercise.

Objective 2. *The constraints and opportunities that affect the selection and adoption of bio-enterprise by agro/pastoralists in the ASAL:* The in-depth study of the BDP using participatory methods was conducted to assess whether, and to what degree, the bio-enterprise approach is adopted by pastoralists and to gain the perceptions of the people involved as to its impact, both socio-economic and environmental. This longitudinal study tracked the same people over eighteen months to distinguish short-term from long-term phenomena, and allowed the author to observe differences in those people that can be attributed to the effect of their interaction with the BDP. Much background information was gathered through these interviews about the perception of the communities of the potential rewards that bio-enterprise can bring in terms of increased incomes and improved management of their natural environment, increased confidence in women to participate, and improved skills and capacity to save part of their incomes. The qualitative surveys of the communities, development, government and commercial sectors also provided important information about the probable factors that affect their ability to promote and support bio-enterprise development in the drylands. The key informant interviews were open and unsolicited. The results of those discussions showed that the level of understanding about community-based business development in the drylands and the skills capacity to assist communities to develop bio-enterprises were

largely inadequate to achieve successful diversification strategies with agro/pastoral communities.

Objective 3. *The type and scale of resource-use pressure through the current practices and the perceived challenge of the increasing pressure on natural resources, the type of coping strategies they are adopting, and challenges and benefits they observe from engaging in sustainable bio-enterprises.* The information gained from the two surveys and the secondary data held in the BDP records aided this study to identify the relationship between the type of coping strategies being adopting by these communities, and the challenges and benefits they observe from engaging in sustainable bio-enterprises. Quantitative methods used to compare perceptions of resource-users with the increasing resource pressure revealed that although the forest is generally in good condition, there are widespread signs of increasing degradation. Communities perceived that the forest has declined in the recent years due to intensive human activities and were aware of the signs of climate change. However surprisingly, the key informant interviews demonstrate that they did not feel the need to take action against the increasingly destructive practices and most people felt that the future will look after itself. Perceptions gained from the participants at the workshop organised in Nanyuki, in September 2011, provided further useful qualitative information that also strengthened the results of the research surveys by highlighting the communities urge to develop diversification strategies that buffer them from severe climatic conditions. It was interesting to observe that reducing livestock numbers was not a consideration.

Objective 4. *Lessons learned from the Samburu Heartland case study can inform similar debates on pastoral livelihoods and conservation/environmental management in other localities.* The surveys showed that the communities have a very positive interest in learning new skills and are eager to learn new diversification strategies that can buffer their livelihoods against increasing environmental and socio-economic challenges. It suggests that building awareness of the range of opportunities can be the first step to assisting pastoralists to understand ways to improve their livelihoods and mitigate the impact of climate change. The study has shown that practical and well applied methods of education, demonstration, training and visits to effective commercial models, could tangibly enable pastorals to take practical steps to diversify their livelihoods in a way that will buffer and improve their food security, and stimulate their long term management of natural resources. The key implications for all sectors (government, development, civil and commercial) and policy implications from the lessons learnt from the case studies are found in 10.5 and 10.6.

10.3 What were the assumptions?

In terms of the objectives of this study the main assumptions are founded on the study's ability to evaluate the effectiveness of commercial and development sector initiatives designed to enable agro/pastoral communities to achieve viable and environmentally sustainable bio-enterprises in the ASAL. The assumption of using four case studies of bio-enterprises that have been recently developed the ASAL of Kenya is that they are sufficiently representative to provide a reliable picture of the comparative impact and the cost/benefit of the different approaches.

To analyse the factors affecting the selection and adoption of bio-enterprise by pastoralists and agro/pastoralists in the ASAL, an analysis has been made of the impact of the BDP operating with pastoral and agro/pastoral communities in the Samburu Heartlands. This assumes that the communities and the selected geographical areas are representative of agro/pastoralists within the Kenya and that the BDP is relevant to this study as an example of a new development-driven initiative that is attempting to establish viable and environmentally sustainable bio-enterprises in the ASAL.

It has been assumed that the use of participatory methodologies to capture the resource-users' and community members' perceptions of their engagement in new bio-enterprise development activities is a reliable and appropriate analysis tool to evaluate impact. It has also been assumed that this approach is valuable in gaining relevant impressions of the communities' attitudes and awareness of their environment, livelihoods and social and economic conditions and the challenges and benefits from engaging in sustainable bio-enterprise activities. Assumptions have also been made regarding the appropriateness of the selected informants from the development, government and commercial sectors, both in terms of the relevance of the organisations themselves and the level of representation provided by the selected informants of their organisation's capacities and approaches. As an overall condition required for successful implementation and replication, this research study has also embraced the main assumption promoted by the BDP, that 'support to reducing the opportunity cost of developing business in this high-risk business environment is a fundamental to assisting ASAL communities develop diversified and climatically resilient enterprises, that also incentivise community driven conservation'.

10.4 Key conclusions

This study has shown that communities will adapt and diversify readily into new or expand existing livelihood diversification strategies if they are confident that there is a reliable market for the products and if they can readily access the necessary technical and business knowledge. Pastoral communities are realising that access to cash can assist households to cope with drought-related disaster. The study has shown that if the enterprise activities are conducted using conservation practices, bio-enterprise development is also an effective conservation and drought management tool.

The perception of the respondents captured by the participatory surveys demonstrate that pastoralists understand the impact of the loss of the natural resource-base on the future of their livelihoods but they have a largely fatalistic attitude towards the future, resulting in little responsibility or pro-activity towards its short to long-term management. The literature review and the studies conducted by the BDP and other successful bio-enterprise initiatives in Kenya (such as the Mwingi Organic Bee-keepers Association) have shown that communities can be encouraged to take a proactive role in environmental conservation if they are achieving a good and reliable income directly from the natural resource itself. These surveys also show that the communities do not commonly possess the necessary skills and business acumen to diversify from their traditional activities and that many development-sector-led livelihood diversification initiatives have failed due to their lack of business orientation and because of their short term focus. It has been demonstrated in the review of existing research studies and from the research conducted for this study that for agro/pastoral communities to harness and

develop new livelihood approaches the initiatives need to be aligned with the needs and aspirations of the communities and have a long term approach. Infrastructure, equipment, extension and training is only effective in supporting this change if the initiatives are designed with the input of the target communities and are accompanied by long term business mentoring and commercial partnerships. It is concluded that these are the most salient conditions required to achieve successful implementation and sound replication of sustainable livelihood diversification approaches with agro/pastoral communities in the ASAL regions of Kenya.

From the interviews held with key informants in the government sectors it is evident that, although mandated to increase the development of conservation/nature-based enterprises in the ASAL, the government also lacks the necessary skills to provide effective support. By contrast, the interviews have shown that the commercial sector has strong transferable skills, business acumen and market knowledge that could greatly benefit the development of community-based bio-enterprises. This emphasises the importance of the integrated approach where rural enterprise initiatives involve commercial sector partners.

This study has illustrated that women play a greater role in diversified enterprises than commonly assumed. The data has shown that they are able to develop and have control over small scale diversified activities that can add to the family's food security and choose how to use the revenue they have raised. In reference to the overall assumption cited in section 10.3, the study results have demonstrated that a development approach that provides 'support to reducing the opportunity cost of developing business in this high risk business environment' is effective in assisting ASAL communities to develop

diversified and climatically resilient enterprises and to incentivising community-driven conservation.

10.5 Key implications for all sectors

A central objective (Objective 4) of this study is that these results and learning points can be used by development and government sector agencies in assessing effective approaches to assist agro/pastoral communities to develop adaptive livelihoods that incentivise positive management of natural resources and improve their resilience to climate change. It is also intended that these results have relevance to commercial investors, government agencies and development and civil organisations operating in other parts of the African ASAL, as well as the agro-pastoral communities themselves. To this effect the key implications from the conclusions of this study are set out below.

10.5.1 Impact of bio-enterprise development on rural livelihoods and food security

The perception most perpetuated by development and government actors, that pastoralists are resistant to change, is challenged by I. Scoones of the IDS in the UK. He is adamant that “there is a huge amount of innovation going on, but it is not recorded and often not shared” (Scoones, 2007: 1). Indeed, the experiences of the BDP illuminate the characteristic strengths of pastoralist communities in quickly assessing new opportunities and utilising their relatively strong social co-operation in taking collective action. In evaluating the experiences of the BDP, however, this study shows that these communities who survive on limited resources are deeply conservative when investing their own time and finances into new initiatives. This is understandable when considering the

opportunity cost of exploring different livelihood and coping methods in harsh conditions of the ASAL, but it also highlights the need for the government and development agencies to work closely with these communities, to gain sufficient understanding of their wisdom and concerns, their perceptions and attitudes, in shaping the design and implementation processes of new sustainable resource-use and livelihood strategies. It also demonstrated the need to give due consideration to the time-scale in developing these critically important collaborative pastoral approaches. As indicated in Chapter 9, the study provides valuable information that can assist in the elaboration of viable approaches for the development of pastoral livelihoods in the ASAL. It provides an evaluation of the opportunities to take to scale proven methodologies for enhancing agro/pastoral livelihoods, including social organisation, access to inputs, skills development and market access.

J. Davies, Eastern and Southern Africa regional Drylands Co-ordinator for the International Union for Conservation of Nature in Nairobi, succinctly reports that “The trouble has always been that administrators and service providers don't like mobility, and in many cases neither do neighbouring communities, so everything possible has been tried to settle pastoralists”. “This restricts the opportunistic strategy of pastoralism and undermines its viability, leading to the images that sometimes appear on TV” (ILRI News, 11 August 2011). Pastoralism itself is a response to increasingly arid conditions. If more research emphasis is applied, pastoralism may be more accurately recognised as a highly tuned and evolved method of managing fragile drylands. This research study has shown that the bio-enterprise approach can tangibly incentivise positive conservation management as a realistic and robust option to assist pastoralists to adapt to the changing

climatic and socio-economic conditions. Assisting pastoral communities to understand these issues and adapt their livelihood methods innovatively could yield more effective solutions, such as to achieve greater carbon sequestration in the drylands.

10.5.2 Ability of bio-enterprises to provide tangible incentives for rural communities to manage natural resources positively for longer-term environmental gain

Several publications have challenged development agencies to re-think their roles in community-based conservation and to assist communities to build the capacity of local institutions to effectively engage in community-based conservation (Smith, 2006; Little, *et al.*, 2000). This study confirms that this process needs to start with a change in the communities' own perception, and that this is achievable. This view is further supported by AWF (2008), who concluded that for the community-based conservation to develop and become self-sustaining, it is important that the development and government agencies shift their focus from short-term goal-orientated activities to understanding and designing combinations of incentives that will motivate local stewardship of natural resources over the long term. The BDP has been designed on this basis and, by providing guaranteed markets for indigenous plant products based on ethical trade terms and profit sharing, together with training, extension and equipment provision, it seeks to create long term incentives to community-based conservation of these natural resources. However, despite addressing the needs promoted by the communities themselves, their engagement with the activities and up-take of the bio-enterprises is still relatively low.

The survey detected important relationships between education levels and awareness: the higher the education, the higher the awareness of ecosystem/sustainability processes. This

could indicate that the uptake of sustainable practices might increase if training and extension support is consistently provided over a long period of time (i.e., over 5-7 years). It would suggest that the conservation impact might then be more significant.

Although the KFS and several donor agencies have shown willingness to support the development of community-based enterprises that provide incentives to positive natural resource management, there is a chronic lack of knowledge and skills within the authority and the development sectors to enact this. There is urgent need for the governments and international donors to better understand how to tangibly achieve the goals and objectives of the forest policies and Acts and effectively secure the future of Kenya's fast-diminishing forests, and to be better equipped with knowledge, skills and other tangible resources to adequately affect this. The findings of these studies clarify and promote the view that the CFAs require external support to achieve effective governance and conservation management, and that they need to assist their communities to develop conservation-positive enterprises that can better ensure the long term welfare of these fragile natural resources than current pastoral livelihood practices. This study suggests that this should begin with heightening the perceptions of the communities of their own empowerment to bring about change.

10.6 Main policy implications

Although, increasingly, there is more government and development emphasis on assisting agro/pastoralists to adopt new approaches in dealing with the presiding issues (drought, grazing and natural resource management, livestock enterprise development and conflict

mitigation, the worsening food crisis, resource conflict and vulnerability to extreme climatic conditions) this study has illuminated the need for more effective policy and developmental strategies in the drylands. As verified by the findings of this study together with those presented in the literature review, pastoralists are increasingly looking beyond livestock to other means of generating income in order to diversify their livelihoods and spread risk beyond a reliance on livestock. In addition to the output of this study, more research is required that capture these innovations and recommend supportive policy changes and development approaches. The main elements that this study has shown in terms of policy implications are as follows:

- ✚ Agro/pastoralists are realising that access to cash can assist households to cope with drought-related disaster and improve their own prospects and those of their children, such as education and health care. Communities will adapt and diversify readily into new or expand existing livelihood diversification strategies if the risk is not perceived as being high and the reward is sufficient. In this regard the BDP has shown that bee-keeping and commercial utilisation and value-addition of specific indigenous plants that are sustainably harvested or cultivated are acceptable and potentially successful enterprise-types.

- ✚ Pastoral communities can improve their resilience, food security and increase their incomes by developing enterprises based on indigenous plants, even in severe climatic conditions and with very little infrastructure and equipment. If the enterprise activities are conducted using conservation practices, bio-enterprise development is an effective conservation and drought management tool.

✚ Many drought mitigation activities have been tried over the years in northern Kenya, beginning in the colonial era when destocking of vulnerable livestock took place on a large scale. More recently this approach has been replaced by smaller piecemeal responses, often by the NGOs who have attempted to mitigate the impact of drought by assisting communities to improve their marketing, access to water and veterinary services. In some cases this has given rise to small-scale diversified enterprises; however, due to the lack of market knowledge, business acumen and skills these development instigated initiatives have been mostly failures.

✚ Communities can be encouraged to take a pro-active role in environmental conservation if they are achieving a good and reliable income directly from the natural resource itself. However, the communities do not possess the necessary skills and business acumen to diversify from traditional activities. Although mandated to increase the development of conservation/nature-based enterprises in the ASAL, the government also lacks necessary skills to effectively support it. In contrast, the commercial sector has strong transferable skills, the business acumen and the market knowledge that could greatly benefit the development of community based bio-enterprises. This study has shown that where government, development and the private sector work in synergy the projects are socially, environmentally and economically successful. Policy implications of these findings made in this point and the point above are that the government departments are required to take more proactive approaches to including development and commercial sector partners in all its community-based activities. One approach could involve creation of local and area

management units/forums for rural enterprise development with representatives from the communities, government, commercial and development sectors.

- ✚ The vast majority of products sourced from the drylands of Kenya continue to be traded on the ‘unofficial market’ through the long supply chains and pastoral harvesters received very little price reward or incentive to manage these natural resources sustainably. As there is an international standard for sustainable harvesting of indigenous plant materials it is therefore necessary for the government to adopt and apply the international standards, such as the FairWild standard, that will effectively assist communities to manage their natural resource utilization and to enable harvesters to gain a recognized standard that they can use to market their products more competitively to national and international buyers.

- ✚ The issue of unfair markets and the very small reward commonly received by pastoralist is cited as a dominant reason for low diversification within their communities. However, as verified from the surveys, once agro/pastoralists can see good and reliable incomes arising from diversified activities these activities will play an increasing role in pastoral livelihoods. Policies that will mandate local and regional government departments to support the development of rural business centres, using the same community-development-commercial sector partnerships, will bring market information and interaction to these remote communities.

- ✚ Kenya’s National Economic Recovery Strategy for Wealth and Employment Creation (2003-2007) state that NTFP play a major role for local villages especially women.

From the evaluation of the BDP activities, women groups are the most successful and energetic in terms of developing diversified enterprises. Women have shown that they are able to develop and have control over small-scale diversified activities that can add to the family's food-security and they are able, within the cultural system, to choose how to use the revenue they have raised. This suggests that if the Kenyan government creates the conditions for pastoral women to take-part in government and council development meetings, and encourages financial institutions to provide more accessible micro-saving/loan opportunities for women, growth of community based diversification in the drylands may be accelerated.

- ✚ Agro/pastoral group members respond highly to the success of collective action, and in this respect policy makers can expect a wide ripple-effect from small but well targeted areas of support. Critical areas of support that reduce the 'opportunity cost of developing business in a high risk business environment' includes: mentoring of rural community-based businesses, capacity building the skills and experience of trainers and extension officers, increasing access to affordable trade finance and capital, development of market opportunities and effective value-chain mechanisms, and value-addition facilities/equipment compliant with international market standards. Policy that mandates government agencies with existing networks of field officers through-out the rural regions to work more closely with development initiatives that support these critical areas will enable greater replicability and sustainability of the impact involving wider geographical area and time-spans.

10.7 Limitations and further research

10.7.1 Limitations of the research

Many of the limits of the research have been discussed in the relevant chapters. However, the following points need to be reiterated.

Weather conditions: During the term of this study, Kenya suffered extreme weather conditions. Prolonged drought, starting in 2008 and ending in mid-2010 meant that pastoral communities were stressed, undertook more risk-coping strategies, including illegal-grazing in forest reserves and on private land, and were eager to grasp new diversification opportunities that brought financial rewards quickly. Although this impact on the communities encouraged them to consider investing more time into bio-enterprise activities, their interests were sharpest in activities that provided quick returns such as petty-trading food commodities and casual labour. The period between mid-2010 to the end of 2011 was one of cool temperatures and heavy rainfall making many roads impassable and visits to the groups difficult. These three years have also affected bee activity and honey production: very little honey has been harvested throughout this period in the study areas. However, as climate conditions are in flux and extremes are becoming more frequent, this may not be an unrepresentative picture for the drylands of Kenya. Weather conditions have also affected the ability to collect environmental impact data within the short period of the study as within this time the transect sites have been more affected by weather conditions than by normal human activity.

Duration of the environmental impact assessment: The time period of the study is sufficient to set up transect sites, to conduct a baseline environmental assessment and to conduct a qualitative survey of the perception of the communities about their environment. Within this timeframe and due to the weather conditions referred to above, the study cannot provide reliable environmental impact data. However, it has provided a baseline for future and on-going environmental impact monitoring in the study area and could provide useful longer-term research data if maintained over a longer period of time.

Duration of the socio-economic impact assessment: Longitudinal studies involve repeated observations of the same variables over long periods of time. In order to obtain stronger data on the socio-economic/livelihoods impact of bio-enterprise activities on the study communities, a longer monitoring period is required. It is suggested that monitoring should be conducted over these same groups for at least a further 5-7 years. From the case studies it can be seen that the development of bio-enterprise can take several years before they become viable due to the time it takes to develop the necessary skills and experience, product quality and market (supply-demand-pricing) stability.

10.7.2 Suggestions for further research in the study areas

Most of the following suggestions are linked to the limits of the research mentioned above. The subject and focus of this study has stimulated the interest of many development and government-sector agencies. It is therefore important that a longer-term research study is undertaken of the same study sites and communities and of other bio-enterprise operations in the drylands of Kenya to provide on-going reliable data that provides greater evidence of the longer term impact of using the bio-enterprise approach

to increase food security, climate change resilience and community-driven natural resource management. The information should be shaped for effective use by development, government-and commercial sectors and particularly for the agro/pastoral communities themselves.

The cases from which the above factors are derived are still few. Therefore more empirical studies of bio-enterprises in agro/pastoral areas are needed to test how important these factors are and to identify the contexts within which certain factor-constellations play out to shape the success and failure of bio-enterprises. As the name hints, bio-enterprise does not aim solely to make profit from natural products but aims to do so in a way that accounts for the sustainable management of natural resources. More studies are therefore required to assess the competition or complementarity between conservation and economic gains from the utilisation of natural resources.

10.8 Relevance to other situations

Study topic: This study has provided new learning points and values concerning the performance and impact of diversified enterprises on agro/pastoral livelihoods and the environment, relevant to all locations and communities within the African ASAL. The study provides information about how to effectively support such initiatives and evidence of the potential for environmentally and socio-economically supportive bio-enterprises and of the behavioural patterns that ASAL communities need to evolve in order to successfully engage in these diversified economic activities. Results show that diversification into bio-enterprises requires a greater understanding by the stakeholders

and the support-actors, of business development approaches. This research study can assist agro/pastoral communities, NGOs, CBOs and government departments in all the ASAL regions in Africa and other parts of the globe to understand the skills and resources required to develop climate-resilient, environmentally and economically sustainable enterprises. As the approach is based on business principles and encompassing of agro/pastoral cultural and traditional social and economic dynamics there is a high degree of replicability of the models to other situations across the ASAL.

Research methodologies: It has been argued that the results from studies based on participatory methods are not easily transferable. However, although the indices used in the research are based on local realities and local perceptions, the methods can be adapted to any location. The quantitative results as such would not be suitable for direct comparison, but the trends and the patterns detected could be compared to other situations. The above points highlight the importance of many factors for bio-enterprise development. However, no single factor provides sufficient basis for bio-enterprise development. Rather, specific constellations of these factors are important in specific areas and, as such, need to be tailored to different contexts among agro/pastoral communities and areas. A mix of critical design and planning factors with the involvement of the target communities and the commercial sector will be required when replicating this research and the overall bio-enterprise approach in other ASAL areas.

Appendix Section

Appendix 1. Selection criteria interview guide

1.1 Screening table

GROUPS NAME→	Score (High-Medium-Low or Don't know).	Provide general opinion on each group.
Capacity to work as a group		
Objective/activities/businesses involved in		
Business performance and Consistency of performance		
Capacity to learn and uptake information and new technique		
Level of organisation, record keeping/registration etc		
Transparency, governance		
Location (access to resources, access to land for potential cultivation of medicinal plants)		
Communication capacity, recording capacity (literacy, English/Swahili)		
Understanding of importance of environmental sustainability (and practice of sustainability principles)		
Responsibility/Initiative/willingness to take future of a business in their own hands		
Working record with NGOs		
GENERAL COMMENTS. challenges, opportunities		

1.2. Direct assessment of groups with potential.

Interview group members. Ensure that members of group committee are present.

Criteria	Example of question for groups	Documents to ask
Working together and willingness to work together in the future/objectives	When and why was the group formed? What are the characteristics of the members (age, gender, interest)? How many members are there currently? How many were there when the group was formed? Are the founding members still there? Challenges of working together? What are their plans for the group for the future?	Membership list over the years Constitution
Activities/Objectives/Performance	What has the group achieved so far? What activities/business has the group been doing? If they have been trading, what? (have they been trading consistently) How much? Have they got records?	Trading records, do they exist, are they up to date
Capacity/willingness to take up and learn new techniques	Have they changed how they do things since they started their activities? In what way? Why? What kind of training have they undergone, how did that impact what they were doing?	
Governance, level of organisation	Is the group registered? Has the group got an active bank account? Is there a group committee? How frequently does the committee change (when last) What is the process for rotating committee members? How frequently do members/committee meet? How does committee disseminate information to members?	Registration certificate, meeting minutes?
Record keeping, transparency	How does the group get income to run its operations? What is the process to plan/approve expenditures? Are there records of income and expenditures? How are the accounts shared with the members? When (last time)?	Account book, are accounts up to date, Minutes of meetings
Working with NGOs or government	Which organisations has the grouped worked with (if any)? Doing what?	
Location, access to resources and access to land	What products are harvested in the area? How far? What is cultivated? Have members access to land? Process to access land to cultivate? Process to access resources to harvest?	
English Speaker/Literate Secretary		
The group is willing to put conservation and business together	What steps are they taking/ or planning to take to improve business and to make the business/activity sustainable?	
The group is willing to take responsibility for their own business		

1.3 Summary for each group

Criteria/Group Name:	Opinion
Working together and willingness to work together in the future/objectives	
Activities/Business/Objectives/Performance	
Capacity/willingness to take up and learn new techniques	
Governance, level of organisation	
Record keeping, transparency	
Working with NGOs or government	
Location, access to resources and access to land	
English Speaker/Literate Secretary	
The group is willing to put conservation and business together	
The group is willing to take responsibility for their own business	
GENERAL OPINION/RECOMMENDATION	

Appendix 2. Focus group and key informant interview guides

BEEKEEPERS/HONEY HARVESTERS

Focus group discussion (groups that have not been done already- interview beekeepers from the group, at least been harvesting honey for more than 2 years and be from the area). Screening questions if a group exists

(Characteristics of the participants, gender, age, main occupation, area)

- What kind of business are people of your group involved in? For how long? How successful have the businesses been?
- Who is involved in these businesses (women, men, age, ethnic groups)?
- What are your groups' main source of income? (Then ranking)/What is the group ranch/community main source of income?
- When are the honey seasons
- How long have people of your group been involved in honey harvesting?
- What kinds of hives are used?
- How many hives do people own/harvest from on average?
- What is harvested from the hives generally? (kind of honey, other bee products, specify)
- What kind of harvesting methods are used?
- How many mtungi/relevant quantity of honey do people harvest each season on average per hive? How much they sell on average? How much do you produce as a group?
- How much honey have you sold last year? Where did you sell it?
- How do you store the honey harvested?
- Where do people sell their honey? What price? Has the price changed in recent years, in what way, why?
- What proportion of honey producers know about the refinery, what is their feeling about it?
- What are the challenges that you face with honey production?

- What are the challenges that you face in selling your honey?
- In what way is the forest important to your community/people? Why? How do you think honey production is linked with the health of the forest?
- How do you ensure that your activities will last a long time?
- How have you participated in the conservation of the forest? In which way?
- Has the forest condition improved in your area, remained same or declined over the last five years? Why?
- Has vegetation cover declined in your area, remained the same or declined over the years? Why?

Map of hive locations (rough)

Additional questions for groups already interviewed and screened:

- How much honey did the group sell last year (and other years if available)?
- Where/to whom they sell and why? Proportion sold to refinery?
- How is group chairman selected/chairwoman

Map hives rough location

Summary tables

Group source of income/business	Who involved	Performance	Ranking for income

Community source of income/business	Who involved	Ranking for income

Honey	Group/Community
Seasons	
Honey history	
Hive types	
Number of hives/harvested by season per person	
What is harvested	
How much is harvested	
Harvesting methods	
Proportion sold and where/to whom and why	
Price	
Change in prices and why	
Honey storage	
Proportion of honey harvesters/beekeepers who know about the refinery	
Feeling about the refinery	
Challenges in honey production	
Challenges in selling honey	

Forest/Sustainability	Groups
Importance of forest for people	
Link forest and honey	
How do you ensure that activities, bee production is going to last a long time and other services the forest provides	
Forest conservation activities	
Forest condition change and why	
Vegetation cover change and why	

WEALTH RANKING

Wealth ranking interview – Key informant in the groups (people who know very well people in the group/area)

- How would you describe a very poor household in your community?
- How would you describe a poor household in your community (not very poor, but medium poor)?
- What strategy to people use to cope in hard times? Scale.
- How would you describe a very rich household in your community?
- How would you describe a rich (medium) household in your community?
- What do people do spend their money on when they have surplus? Scale

(take the members list and ask the key informants to allocate each member's household in a wealth category, -very poor, medium poor, medium wealthy, very wealthy- and indicate what they main occupation is).

Summary table

Household name (member of group)	Wealth rank	Main occupation

This will be complemented by a survey at a later stage looking at material style of life as an indicator of well being. The wealth ranking will give a good basis on which to build.

WOMEN EMPOWERMENT (Background information)

Key informant interview – (2 to 3 women in 3 areas who know the area well have been living in the area and are part of the group targeted)

- What is the role of women in your area?
- What is the role of women in the Group?
- Role at household level?
- In what way are women involved in the community decisions? (are they on the committee, are they consulted, are their decisions taken into consideration?) which decisions are they not involved in at the group ranch/community level? How has this changed in recent years?
- In what way are they involved in the group's decisions? (are they on the committee, are they consulted, are their decisions taken into consideration?) Which decisions are they not involved in at the group level? How has this changed in recent years? Why?
- Usually at the household level, which decisions are women responsible for?
- Which decisions are they not involved in?
- Who decides how income is spent? (hers and other members')
- How has this changed in recent years? Why?

This will be complemented by an individual survey of women members of a sample of groups at a later stage.

Summary table

Group/Women	Role	Involvement in decisions/expenditures	Decisions not involved in/expenditures	Change/why
Group Ranch/Community				
Producer groups				
Household				

Appendix 3. Household survey questionnaire

HOUSEHOLD/INDIVIDUAL SURVEY (MEN AND WOMEN)

Date:..... **Interviewer:**..... **Name respondent:**.....

Gender: **M/F**

HH (gender).....**M / F**.. Relation of group member to HH?..... **Producer**

Group Name:.....

INTRODUCTION: Introduce yourself and what we are doing. That we are trying understand the situation of group members now and how it changes. You were selected to be interviewed as a representative of your group. The interview will be 30 mn. (Go through quickly the topics of the questionnaire: your household, your opinions on your skills, climate change etc.)

SECTION A: HOUSEHOLD CHARACTERISTICS

A.1. If head of household is a woman is she a Widow? Separated? Single ? (specify if husband lives elsewhere).....

A.2. How many people belong to your household (Aja iltongana lena ENKANG)?
.....(nkaji if husband lives really far)

A.3. How old is the HEAD of HOUSEHOLD (age set)?

How old are you (if not HH)?.....

A.4. Your level of education? **Level of education of HH?**.....

A.5. How many children in age of going to school in the household?.....

A.6. out of those how many are usually going to school?

SECTION C: ASSETS/SOCIAL CAPITAL

C.1. How much livestock does your household (TOTAL for ENKANG INCHI) own now

Livestock	Number
Chicken/duck	
Goats	
Sheep	
Cows	
Donkeys	
Camels	

C.2. Does your household own land? Yes / No acres?.....

If yes, how many

C.3. Do you or another person in your household (LTONGANI TENKANG INCHI) own?

Transport	Yes/No	Comm	Yes/No
Bicycle		Radio	
donkey		Mobile phone	
Motorbike		TV	
Car		Satellite dish	

C.4. Is the main house of the nkang permanent ? Yes / No (only answer if you know)

Housing	Material	Condition (3=good, 2=Medium, 1=Bad)
Roof		
Wall		

C.5. Where does your household get water from?

C.6. Does your household have access to electricity? (solar, generator)

C.7. Does someone in your household have a bank account or saving's account?.....

C.8. Do you have a bank account yourself?.....

SECTION D: FOOD SECURITY

D.1 In the last dry/wet season have people in your household have had to: <i>Ama te lamei loisha, amaa ltong'ana le nkang ino.. :</i> <i>Ama te lari loisha.....</i>	Dry season Yes/ No	If yes, How many times (1=many, 2=few, 3=once or twice)	Wet season Yes/No	If yes, How many times (1=many, 2=few, 3=once or twice)
1. Change de food they eat? (<i>Keibe le kenyeta nyata endaa</i>)?				
2. Reduce the food they eat?(<i>Intaa ndaa kini ni nyanya</i>)				
3. Have to stay without eating for one day (<i>itupukotie</i>)?				
4. Have to borrow from relatives for food -paran (<i>Ishomo paran endaa</i>)?				
5. Get in debt (<i>Iwaita sile te lduka</i>)				
6. Eat wild food/hunting (<i>Aanya ndaa entim (ngwesi o lng'anayo)</i>)				
7. Relief food/food for work (<i>ketaa reshen ake lng'oritata/food for work</i>)				
8. Sell livestock at low prices (<i>Itimira swom te silingini kuni – aiturraa</i>)				
9. Slaughter - Iteyienga swom				

*Many times (*enkatitin kumok*), Few times (*enkatitin kuni*), Only once or twice (*enkatitin nabo/are*)

SECTION E: CLIMATE CHANGE AND SUSTAINABILITY

E.1. According to you, is the climate changing in your area (*Ama te nduata ino, keibelekenyete larin*)?.....Yes/No.....If yes, in what way (*taa oite*)?.....

.....

.....

E.2. What effects do you think climate change has/ will have on you or household (*kaa enyamali eewa tana eiyau te enkang ino*)?.....

.....
.....
E.3. Do you think you can do something to reduce effects of climate change on your household? (*indol iye atuwa ketoki indim ataasa aiboyo kuna enyamaltin*) Yes / No

E.4. If yes, what are you doing or planning to do to reduce the effects of climate change?
.....
.....
.....

E.5. in your opinion, what are the main reasons for ensuring that Kirisia forest remains in the long term (*Amaa tenduata ino nyo sababu peiritai ntim ekarisia peebik oleng*)?.....
.....
.....

E.6. How much do you agree with the following statements (*nkebaa ndedei e kulo omon*):)

1. Totally Disagree (kaany pii) - 2. Disagree (kaany)– 3. Agree (kaikubali) - 4. Totally Agree (kaikubali pii) - 5 Don't know (mayolou)(Note the person's answer)

- f) The future will look after itself (*Iyolo ngolongi naaponu, meatai, nikias ikianuy metaasai naasai*).....
- g) I am interested in learning new skills and planning (*Kaiyeu shaake nayielou mbaa ngejuko naiyeu ambaki nayielou kipangare*).....
- h) It does not matter what people do on their land, there will still be the same amount of water available (*meijalisha siaitin loas ltongana to lshambai lenje amu kitum ake ngare tana shaake*).....
- i) It does not matter **how much** or **how** I collect medicinal plants/herbs, there will always be enough to satisfy my needs (*Meijalisha nowaa lkeek o mati laitei tana aturu, amu katum ake laitemu nanu –meishunye*).....
- j) Soil condition cannot be improved

- k) If I increase the vegetation on my land, I will increase water available and the productivity of my land (*Amaa tenepanunye lkeek o nkujit tanakop ang ikitum ngare kitok*).....
- l) Even if the forest disappears, it will make no change to my life or my land (*Ambaki tenemuta ntim meibelekeny maisha aai wo kulupo aine*).....

SECTION F: SKILLS (Ntakanano)

What is the level of your skills in the following: (*Kebaa ntakano niyata tokuna baa*)

F.1. Very weak (*alani pii*)- 2. A bit Weak (*alani*)- 3. A bit strong (*kogol*) 4. Strong (*kogol supat*):

- a) Harvesting honey (*naisho supat*).....
- b) Maintaining hives.....
- c) Storing honey.....
- d) Harvesting herbs in a way that they carrying on living (*tonduaroto*).....
- e) Planning, keeping track of expenditures and income.....
- f) Keeping records.....
- g) Running a business.....

SECTION G: WOMEN EMPOWERMENT

G.1. How much control do you have about the following (<i>nkitoria</i>)	Level of control Full control =4 Control but need to consult someone=3 Not in control but am consulted=2 No control (someone else has)=1
a) Your own assets ?	
b) Your own income?	
c) Your husband's income?	
d) Children schooling and welfare?	
e) Running of house?	
f) Small stock?	
g) Cattle?	
h) Borrowing food/money?	
i) decision to do business/activities outside the house	
j) Decision to go and see relatives/friends	
k) Family planning	

G.2. How does this reflect you? 1 Not at all, 2 a bit 3. Totally me

- a) I am in control of what happens to me.....
- b) I feel confident that I can learn new skills and do business (*Kasip ajo kaidim ateyolo ntakano naasie biashara*).....
- c) I like best when I plan and do things on my own (*Kasham aipanga tokitiny tokotei ai*).....

G.3 What is your role in the group?.....

G.4. How involved are you in decisions taken in the group? (1=invited to meetings, 2=voicing opinions, 3=opinion taken into consideration)

.....
.....
.....

G.5 Do you think it would be possible for a women to be chair in your group? Yes/

No

Why?.....
.....
.....

Appendix 4. Summary of informants and respondents interviewed per main topic area and sampling techniques.

Table 4.1 Kirisia

Location	Group	Method	N Women	N Men	Screening/gov/commitment	Wealth Ranking	Empowerment	Main source of income	Livelihood impact community and household levels	Med plants use	Med plant trade	Climate change Resilience	Business dynamic and infrastucture
Lporros	Nduat	FGD	0	0					x			x	
		KI	3	1	x	x		x	x		x	x	x
		survey	7	0			x	x					
Baawa	Byrug	fgd	0	0					x			x	
		ki	0	2	x	x		x	x				x
		survey	5	7			x	x					
Baawa	Women	fgd	4	0			x		x			x	
Baawa	Becog	ki	0	2	x	x		x	x			x	x
		survey	6	6			x	x					
Lodokejek	Nkorien	fgd	0	5					x	x		x	
		ki	0	2	x	x			x			x	x
		survey	5	7			x	x					
Angata	Saanata	fgd	0	9					x	x		x	
		ki	0	3	x	x			x			x	x
		survey	3	12			x	x					
Baawa	General	fgd	0	8						x			
Maralal	Traders	Ki	2	1	x						x		x
Total			49	65									

Key: FSD = Focus Group Discussion. KI = Key informant Interviews. Survey = Household Survey

Table 4.2 Mukogodo

Location	Group	Method	N Women	N Men	Screening /governance/commitment	Wealth Ranking	Women impact and empowerment	Main source of income	Livelihood impact community and household levels	Med plants use	Med plant trade	Climate change Resilience	Business dynamic and infrastucture
Musul	Mbeke	fgd	0	2					x	x		x	
		ki	2	2	x	x	x	x	x		x	x	x
		survey	4	3			x	x					
Dol Dol	Naiputaki	fgd	0	3					x	x			
		ki	2	2	x	x	x	x	x		x		x
		survey	4	2			x	x				x	
Morupusi	Naisukut	fgd	3	0			x		x	x		x	
		ki	0	3				x	x				x
		survey	4	5			x	x					
Lekuruki	Nadungoro/Tapapo	fgd	0	2					x	x		x	
		ki	0	2	x	x	x		x		x	x	x
		survey	0	1			x	x					
Nkiloriti	Nkiloriti	fgd	4	0					x	x		x	
		ki	6	0	x	x	x		x		x	x	x
		survey	5	8			x	x					
Kimango	General	fgd	4	5						x			
Dol Dol	Traders	ki	3	4							x		x
Total			39	43									

Key: FSD = Focus Group Discussion. KI = Key informant Interviews. Survey = Household Survey.

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