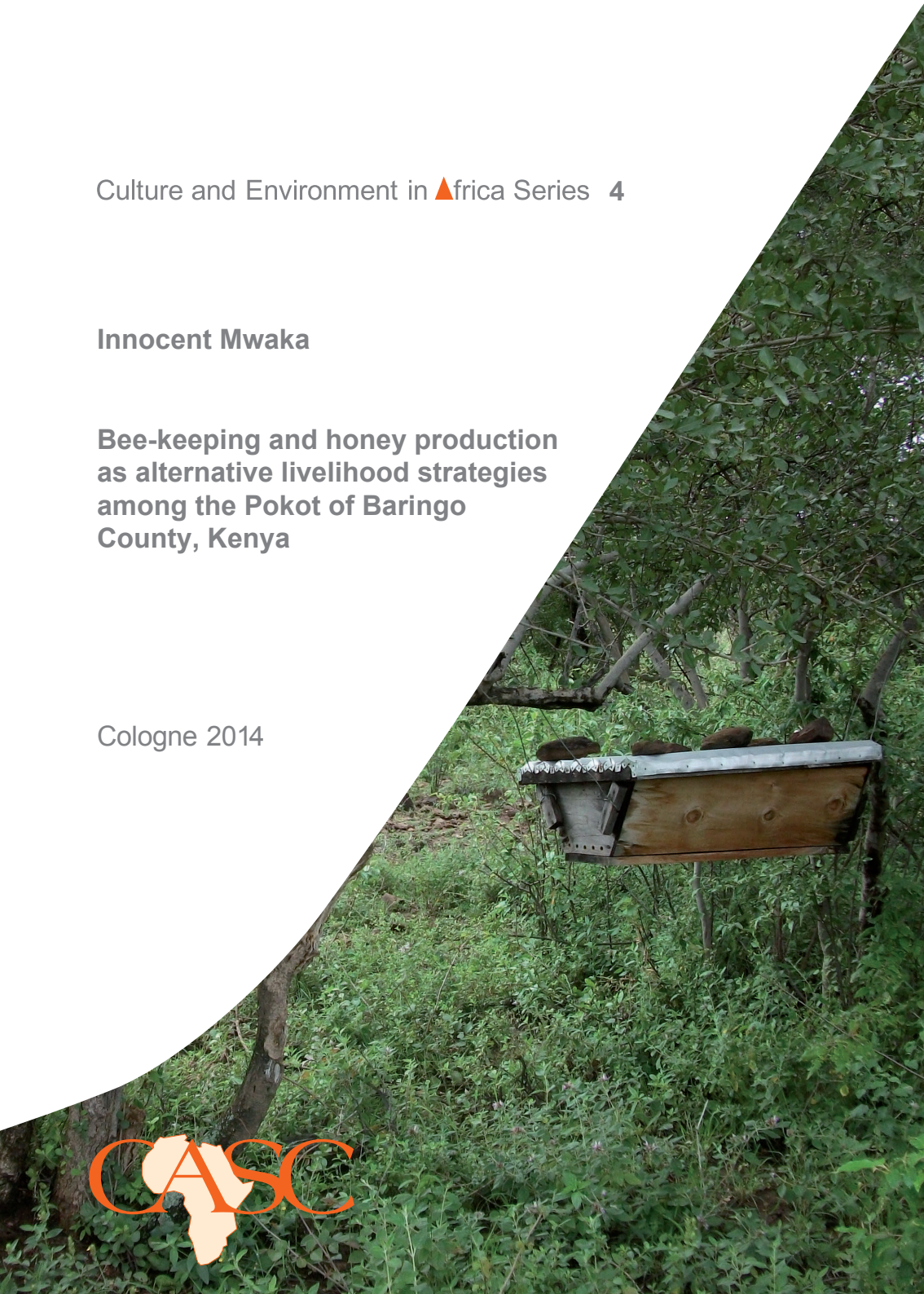
Culture and Environment in Africa Series 4

Innocent Mwaka

Bee-keeping and honey production as alternative livelihood strategies among the Pokot of Baringo County, Kenya

Cologne 2014



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Preface

Mwaka's thesis is contributing significantly to our knowledge on processes of transformation in East African pastoral communities. His research has been part and parcel of the interdisciplinary approach of the DFG-sponsored research group *Resilience, Collapse and Reorganisation in the Social-Ecological Systems of Rangelands of Southern and Eastern Africa*. Within this research project the rapid transition of formerly highly specialized pastoral communities towards more diversified agro-pastoral livelihoods is being studied. Mwaka's contribution to this project is a study on an alternative livelihood strategy which (formerly) pastoral households took to during the past two decades. Honey harvesting has been a traditional livelihood strategy among Pokot pastoralists. However, honey was only harvested by a very limited number of specialized people. Traditionally, it were individuals of specific patri-lineal clans who dealt with honey harvesting preferably. In recent years a number of development projects propagated the commoditization of honey. Apparently honey is widely available in large quantities due to the specific structure of the bush/tree vegetation. Since the 1980s development projects have preached that the abundance of honey as a resource should be used to improve food security. Improved hives were advertised widely and apparently got used throughout the region. Due to flaring prices for honey on urban markets incentives were high to invest more time into honey production. In some communities the income from honey production seems to parallel incomes from livestock husbandry. It is interesting that apparently communities which – due to ecological givens – did not have a chance to diversify into the direction of agriculture, keenly took the chance to take up honey production. Mwaka's chapter on the emergent honey trade is especially well taken. It clearly shows the enormous potential of honey trade.

Contents

List of Acronyms

ACTED	Agency for Technical Cooperation and Development
ALDB	African Land Development Board
ALRMP	Arid Land Resource Management Project
ASAL	Arid and Semi-Arid Land
CDD	Community Driven Development
CDPO	Community Development Project Officer
FAO	Food and Agriculture Organization
GoK	Government of Kenya
KARI	Kenya Agricultural Resource Institute
KFH	Kenya Freedom from Hunger
Ksh.	Kenya Shillings
KTBH	Kenya Top Bar Hive
NGO	Non-Governmental Organization
RMD	Range Management Division
USD	United States Dollars

List of Tables

List of Photographs

List of Figures

1. Introduction

1.1 Background

There have been many attempts to define pastoralism. This is a way of life which involves the keeping of livestock (cattle, goats, sheep, camels and donkeys) as the central part of the livelihoods and culture (Birch and Shuria 2001: 10; Novelli 1999 cit. Mutsotso 2010: 9). According to Swift: "Pastoral production systems are those in which 50% or more of household gross revenue (i.e. the total value of marketed production plus the estimated value of subsistence production consumed within the household) comes from livestock or livestock related activities" (Swift 1998)[1]. Ingold defines pastoralism as a form of livelihood based upon the management of herds of domestic animals (Ingold 2009: 710)[2]. These definitions point to livestock management as a source of livelihood but are largely general. For instance, the definitions from Swift and from Ingold would apply to most of European dairy farmers. Many at times, those who define of pastoralism "cannot (and do not want to) capture the diversity and inherently dynamic character of pastoral societies (Bollig and Schnegg 2013: 3). In their attempt to define pastoralism, they (ibid) look at pastoralism in the continuum of specialized and diversified pastoralism, and therefore consider the degree to which an individual or a community invest capital and labor in pastoral activities. The more an individual or community invests capital and labor in pastoral activities, the more they are specialized. They also consider a third view, a world-view and identity of groups. Certain communities define themselves as pastoralists despite their significantly diversified assets and labor investment into non pastoral activities in the recent years. Therefore pastoralism involves investing a significant amount of labor and capital resources into keeping livestock as a great part of livelihood and culture (including how people defined themselves), and is characteristically common in arid and semi-arid areas and involves seasonal movements in search for water and pasture for the animals.

The animals are a source of food in terms of the provision of dairy products, blood and meat[3]. Although the meaning of wealth among pastoralists can be debated (see Anderson and Broch-Due 1999), cattle is also significant as an indicator of wealth, at least in terms of the perception of the pastoralist community (Waller 1999: 21). This wealth can serve many purposes including the payment of dowries. Therefore, the absence of this kind of wealth can have social and cultural consequences beyond economic poverty. Cattle raiding is also a common theme in literature concerning pastoral communities (Broch-Due

[1] J. Swift (1988), 'Major Issues in Pastoral Development with special emphasis on selected African countries', Rome: FAO.
[2] Cit in Bollig et al (2013: 3) (eds).
[3] Galanty and Bonte, 1991; Fratkin et al., 1994 in Fratkin et al., 1999: 151.

1999: 50-51). This takes place for different reasons, such as initiation rituals, the desire to accumulate livestock, and, in some cases, revenge.

In Africa, there is no agreed figure for the number of pastoralist communities, since the definition of a pastoralist community depends on where one draws the line on the continuum stretching from pure pastoralists, to agro-pastoralism or highly diversified pastoralism and ultimately purely agrarian societies. However, a common trait among pastoralist communities is that a significant number occupy arid and semi-arid parts of the continent (Mutsotso 2010: 9). Arid and semi-arid environments, being harsh for agricultural activities, and having unpredictable weather patterns, pose challenges for communities to identify the best way to ensure sustainable means of livelihood? Birch and Shuria point out that the emergent work of academics and practitioners has recognized the adaptability and flexibility of pastoral communities, qualities well-suited to unpredictable environments (Birch and Shuria 2001: 1).

Africa's climate has been changing over time and today, the physical environment from the northern part to the southern part is diverse (McCann 1999). The vegetation is largely savanna and grasslands with tropical climates in the central and part of West Africa and desert environments in the northern part and part of southern Africa. Nonetheless, it would be wrong to conclude that arid environments are necessarily a disadvantage to the food security of a community. Different communities have lived in, and adapted to such environments for centuries. Likewise, it would be mistaken to conclude that environments with regular rainfall patterns and conducive to agriculture and free of food shortages. Nevertheless, the consequences of changes in the weather pattern can be more extreme in arid areas. They are more vulnerable than in non-arid areas of Africa in such situations. For example, the 1888/89, 1984, 1998/99, and 2010/2011 droughts across East Africa and the Horn of Africa had a more devastating effect on semi-arid and arid pastoral (Waller 1999: 21) areas than on the tropical agricultural areas. In times of drought in such areas, animals die in large numbers due to insufficient water and pasture. Anderson and Broch-Due explain that environmental events like the droughts of the 1980's took a heavy toll on livestock, weakening the productive base of pastoral societies (Anderson and Broch-Due, 1999: 5). In light of the above definition of pastoralism, this creates the risk of hunger or food insecurity for communities dependent upon livestock. The consequence is usually "drought-induced famine" (Fratkin et al., 1999: 149) which can result in poor nutrition, disease and death. Adaptation strategies include, but are not limited to, migration to areas with more food, migration to the bigger towns and cities, or finding other alternative livelihoods which could require sedentary settlement (Fratkin et al., 1999: 149; Talle, 1999: 108).

According to the Food and Agriculture Organization (FAO) 2009 report[4], inadequate seasonal rains, conflicts and displacements put more than 20 million people in East Africa in several consecutive seasons in need of emergency food assistance. Other threats to food security are trade disruptions, high prices for food or other essentials, and livestock disease. The FAO 2009 report further spells out that in Kenya, about 3.8 million people are estimated to be highly or extremely food insecure. These people are mainly located in pastoral and marginal agricultural areas. It elaborates that the scarcity of adequate pasture and water has caused major animal losses and/or worsening of livestock conditions with a detrimental impact on pastoralists' income and their ability to access staple foods. Reproduction rates of livestock have also suffered from successive poor rains since 2007, making the recovery of agro-pastoral and pastoral livelihood systems more difficult, thus worsening long term food insecurity. Indeed, the FAO 2011 report shows a worsening condition.[5]

The 21st century, however, has seen attempts to provide sustainable alternative livelihoods to vulnerable pastoral areas of Africa. According to Birch and Shuria, 60% of the total land area of Kenya is arid and a further 15% semi-arid (Birch and Shuria, 2001: 10). These, according to the authors, make up the Arid and Semi-Arid Lands (ASALs) of Kenya. Kenya introduced the Arid Lands Resource Management Project (ALRMP) in the 1990s. This initiative has been funded by the World Bank and consists of three components: drought management, marketing and infrastructure, and community development. It provides a medium through which policy options for pastoral areas can be defined and best practice promoted (Birch and Shuria, 2001: 12). Other initiatives began during the colonial and the post-colonial periods but these initiatives, it has been argued (see, for example, Keya 1991: 73-88; Flintan 2001: 57) were inappropriate and even detrimental to pastoralism in the ASALs.

It is against this backdrop that the current study examines bee farming and honey production in the ASALs of Kenya, a form of livelihood which is partly a result of the initiatives mentioned above and the pastoral environmental conditions. It is estimated that 80% of Kenya's land area could support bee keeping (Baiya and Nyakundi 2007: 1). Bee keeping is suitable in semi-arid areas where other modes of agriculture are not possible. In cases of frequent or prolonged drought, crop production is very low and livestock production adversely affected, leaving honey production as one of the few viable alternative (Berem et al., 2010: 3). This is because honey production is less dependent on or affected by weather or climatic variations, nor is it resource intensive. They continue to

[4] FAO 2009 crop prospects and food situations (see bibliography for full reference).
[5] FAO 2011 crop prospects and food situations (see bibliography for full reference).

say, referring to the GoK 2008[6] report, that Kenya's potential for apiculture (bee keeping and honey production) development is estimated at 100,000 metric tons of honey and 10,000 metric tons of bee wax but only one fifth of the potential has been exploited (Berem et al., 2010). However, a 2001 report from the GoK[7] noted a growing trend in production from 17,259 metric tons of honey in 1994, 19,071 metric tons in 1996, to 22,803 metric tons in 2000 (Berem et al., 2010: 3).

1.1.1 Area of Study

The study area covers the administrative areas of East Pokot and Marigat, both located in Baringo County. Baringo County is located in the former Rift Valley Province of Kenya.[8] It is bordered by Turkana to the north and the northeast, by Samburu and Laikipia to the east, Nakuru to the south, Kericho and Uasin Gishu to the southwest, Elgeyo Marakwet to the west and West Pokot to the northwest.[9] Baringo and East Pokot both previously formed the larger Baringo District[10]. By the time of the data collection, the two districts were still distinct. According to the 2007-08 annual progress report, Government of Kenya, Office of the President:

Baringo and East Pokot districts can be divided into three agro-ecological zones namely the Highlands, Midlands and Lowlands. The average annual rainfall [on the highlands] is 1,200mm and the average annual temperature is 25°C. These conditions coupled with the fertile volcanic soils make the highlands conducive for crops and dairy farming.[11]

The report also says that the midlands are inhabited by agro-pastoralists as rainfall is inadequate for crop production. Therefore, in this zone (the Midlands) irrigation is practiced, which is supported by the only three perennial rivers in this district, namely, the Perkerra, Molo and Kerio Rivers. The lowlands are mostly rangelands with temperatures above 32°C and with an average annual rainfall of about 600 mm. Livestock rearing is the main economic activity in this zone (see also Gichora 2003: 10-11). The focus of this study is on the pastoral rangelands found in the Midlands of East Pokot where apiculture flourishes. This is juxtaposed with Churo, which, although in the same province, is in the Highlands, and focuses more on agriculture. Last but not least, Marigat, which is a main

[6] Berem et al cite GoK (Government of Kenya). Economic Survey (various issues). Nairobi: Government Printer. Year not specified.
[7] Berem et al cite GoK, (2001). Second report on poverty in Kenya, Vol.ii. Poverty and social indicators. Nairobi: Ministry of Planning and National Development.
[8] http://softkenya.com/baringo-county/ 06-Aug-12.
[9] Ibid.
[10] Baringo and East Pokot Districts. 2008 short rains assessment report.
[11] Office of the president. Ministry of special programmes Arid Lands Resource Management project II Baringo/East Pokot Districts (2007-2008).

trading center in the region, serves as an investigative point for the economic trend of apiculture in Baringo County.

Baringo County is characterized by recurrent droughts, inadequate infrastructure, poor market access, lack of security, poverty and high vulnerability to diseases and hunger (Ogola et al., 2012: 4225). This report continues to say:

The region ranks highly on the nationwide poverty index with 60% of the households living below the poverty line (USD 1.25/day)[12] and at least 62% of which are food poor.[13] Poverty levels are volatile and depend on extreme weather events and conflicts. In years of crisis, the levels in Marigat can rise to 67% and East Pokot to about 70–73%.[14]

However, due to environmental stress in recent years, the pastoralist areas, largely occupied by the Pokot community, have adopted bee farming and honey production. Apiculture has been a growing trend in the region, mainly in response to devastating effect of drought on livestock. Thanks to the growth in apiculture, honey has been produced in large quantities and sold in order to meet the basic needs of the community, such as food, clothing and shelter. This new form of livelihood, previously confined to the poorer people of the community, has now been embraced by the majority of the people as a way of adapting to the harsh environmental conditions.

This research looks at the process of adoption of large-scale bee farming by the community by examining the patterns and trends of this change over a period of 20 years. It also highlights the economic benefits of this new livelihood to households, communities and to the district as a whole. The research is, however, limited to a regional level and further research at the national level would be necessary in order to make confident policy recommendations on the bee farming sector in Kenya as a whole.

[12]Cite after World Bank Kenya poverty and inequality assessment, volume I: synthesis report. Report No. 44190-KE. Poverty Reduction and Economic Management Unit Africa Region; 2008.
[13]Cite after Ministry of Planning, Kenya. Baringo district development plan 2002–2008; 2012.
[14]Cite after Chengole JM (Deputy Director). Kenya Agricultural Research Institute (KARI), Marigat, pers. comm.; 2010.

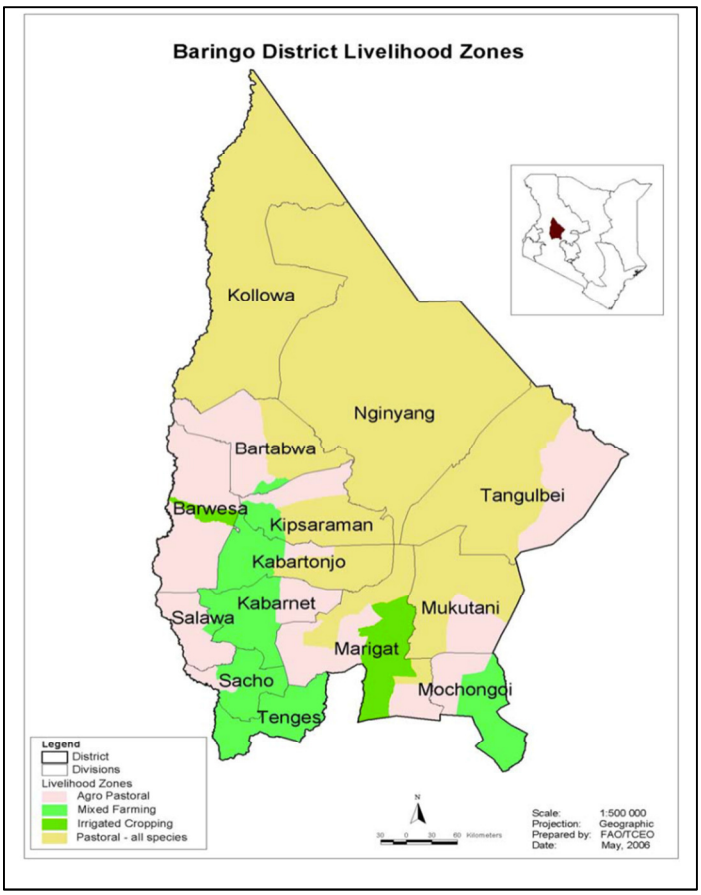

Figure 1: Livelihood Zones in Baringo
Source: Baringo and East Pokot Districts, 2008 short rains assessment report

1.1.2 Community under Study

Community is a fluid social unit, lacking in definitive markers. It would be difficult to pinpoint a group of people as characteristically Pokot. However, for the purpose of this study, the cultural group has been defined by reference to three factors: 1) the predominant way of life, (that is, pastoralism), 2) the politically/administrative and geographical boundaries of East Pokot in Baringo County, and 3) the sense of belonging to the Pokot community by individuals within the aforesaid political/administrative and geographical boundaries. This study, therefore, is unique in that it looks at a pastoral community which has taken up widespread apiculture. Naturally, in order to examine the networks of trade it is necessary to consider cross-border factors and commercial interaction with neighboring areas and cultural communities beyond the area of study. Nevertheless, it is not necessary to define these external groups as the focus is on the impact on the livelihoods of the individuals and households within the geographical and cultural spheres in Baringo County.

1.1.3 Conclusion

In light of the fact that little research has been done on bee farming and honey production in East Pokot and Baringo County, this study seeks to close this lacuna and, in so doing, add to work of Gichora (2003). It investigates the reasons for the large-scale adoption of apiculture, the pattern and trend that this has taken, the economic benefits to the local people, the operation of the market, (primarily at the local and national level), and people's perceptions of these changes.

1.2 Problem Statement

Livelihood diversification in pastoral communities has been an emerging pattern over the past century. This is due to the harsh environmental conditions common in pastoral areas and also the effect of unpopular colonial and post-colonial government policies which, according to Mutsotso, alienated, and marginalized pastoralist. The aim of these policies was to convert the pastoralists, wholly or in part, to agriculturalists or migrant laborers (Mutsotso 2010: 12, 15). Diversification, therefore, has been a response to circumstances making pastoralism less favorable. It has taken different forms across the different ASAL areas of Kenya. However, in Baringo County, little research has been done on the patterns of and trends within this change. This research focuses on the adoption of bee farming and its significance to the community under study, having been earlier considered a 'low class' job reserved for the poorest in society. As pastoralist rangelands are prone to food insecurity, this study seeks to examine apiculture as an alternative sustainable livelihood and to identify and address the challenges in this area. Finally, the study hopes to contribute to ways of addressing food security challenges faced by pastoral communities in arid lands across Africa.

1.3 Objectives of the Study

To attain the goal of the study, three objectives were formulated:

1. To establish the factors leading to the adoption of bee keeping in Baringo
2. To explore how the pastoral communities of Baringo County perceive bee keeping
3. To scrutinize the existing markets and trade networks and identify the levels of exploitation in the sale and distribution of bee products.

1.4 Justification of the Study

It is a goal of the international community to combat food insecurity through a number of strategies including meeting the first Millennium Development Goal. Despite this, food insecurity is still wide spread especially in Sub Saharan Africa. The number of hungry

people living in chronic hunger is still very high.[15] Pastoral areas are most affected due to their livelihood activities in unfavorable climatic conditions.[16] This study will contribute to enhancing pastoral livelihoods through encouragement of feasible alternative livelihood strategies as a supplement to pastoralism. It seeks to contribute to the knowledge of apiculture in Baringo County as an alternative livelihood strategy including its development, identifying any gaps and proposing ways to improve on this form of livelihood.

According to the District Officer, that is, the head of the civil service in the district, "bee keeping is one of the top economic activities with the highest income returns in East Pokot, surpassing pastoralism and agriculture"[17]. Therefore, this research hopes to inform policy makers at the district and national level in the drawing up of relevant policies for economic development of the region. It is to be hoped that the findings of this study may be applicable to other regions of Africa facing similar challenges and in comparable environmental contexts.

1.5 Scope of the Study

1.5.1 Geographical Scope

This study took place in East Pokot and Baringo districts, currently Baringo County in northwestern Kenya. Identified areas of the districts were Tangulbei, Churo, Chepkalacha, Kwokwototo, Chemolingot and Marigat. These are areas believed to have the highest potential for bee keeping and honey production, excluding Churo. Churo is situated next to Tangulbei, the latter being one of the areas that produces the highest quantity of honey Churo itself does not produce a lot of honey, despite its cultural similarity. Churo is more engaged in agriculture, primarily grains such as maize. It was therefore selected to highlight comparisons with other selected regions. The rest of the areas are geographically spread across East Pokot district and this diversity gives a geographically representative sample. Marigat is a center for trade in Baringo district and as such, it serves as a base of operation for middlemen trading in honey. Spending time in Marigat afforded observation of the trade and the economic mechanisms behind the honey industry.

[15] http://www.worldhunger.org/articles/global/foodashumrgt/special.htm
[16] FAO 2009. Crop prospects and food situation report.
[17] The Ministry of Livestock Development, Nginyang 06/01/2011 shows that the value in cash of the amount of honey produced in the year 2010 was 10,284,000 Kenyan Shillings.

1.5.2 Time Scope

Field research was carried out over a five (5) week period, from 1 August to 7 September 2011. A literature review took place prior to the fieldwork and was expanded after the fieldwork.

1.6 Theoretical Framework

This study adopts a framework for analysis of rural communities forwarded by Ellis 2000. The framework concludes that the ways in which rural people obtain their livelihoods are adapted to their local physical and human environments and are subject to constant change (Ellis: 2000).

In this case, the human environment is the social network of the local people which may involve receiving remittances from friends and relatives or aid from the government and non-governmental organizations. This framework puts land and labor as the source of livelihoods for rural communities. According to Ellis (2000: 28), the framework is particularly useful for formulating and analyzing micro-policies concerned with poverty reduction in rural areas. He says it might also serve a useful purpose for tracing local level impacts of macro-policies (ibid). Liwenga points out that "[a] search for extra income depends not only upon the specific circumstances of an individual or a household, but also on the local social, cultural, economic and political factors" (Liwenga 2003: 26); Liwenga further explains that, Ellis' framework for analysis of rural livelihoods assists in "situating an analysis of coping strategies within the wider context of change" (Liwenga 2003: 26).

Ellis (2000: 31) considers the rural household as the main social unit to which the framework is applied. This framework may not be able to explain the close interconnections between different livelihood activities and the actors in them; it is difficult to capture in a diagram the dynamics of livelihood systems that, in practice, involve innumerable feedbacks and complex interactions between components and, therefore, such dynamic categories are implied (see figure 2) rather than stated in the framework (Ellis 2000: 29). Nevertheless, the purpose of such a diagram is to organize ideas into manageable categories, identify entry points and critical processes and assist in prioritizing catalysts for change that can improve people's livelihood chances (Ellis 2000: 29).

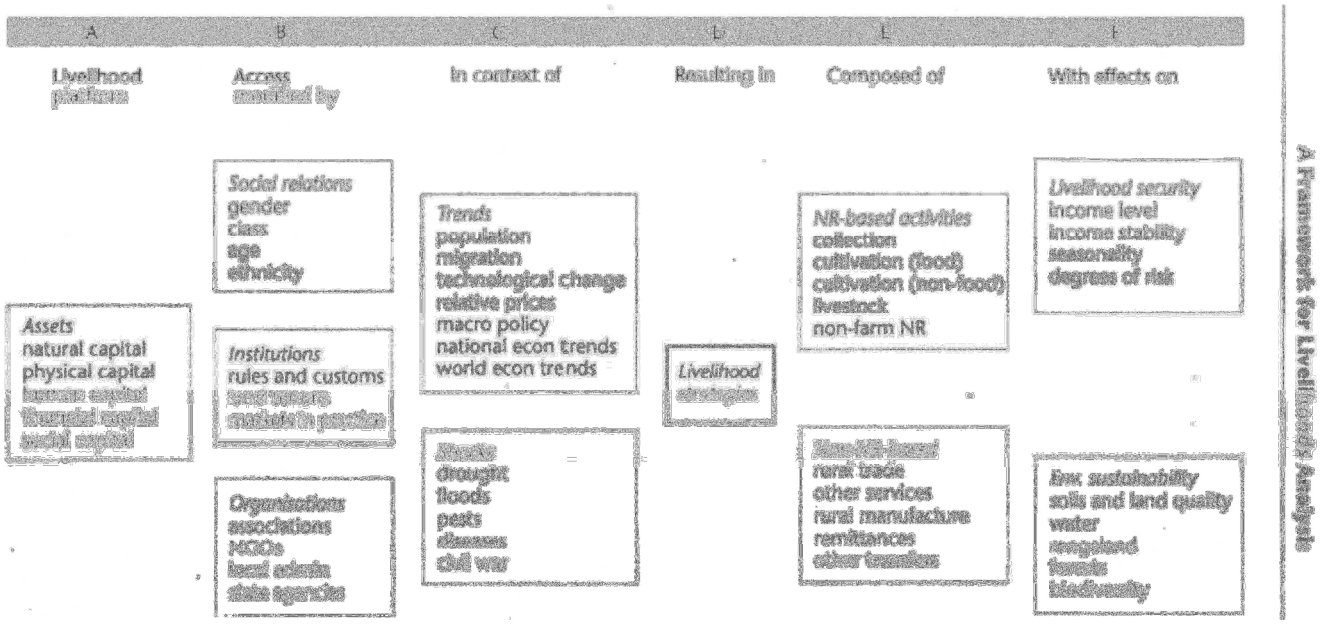

Figure 2: A framework for micro policy analysis of rural livelihoods
Source: adapted from Ellis (2000: 30)

Applying this framework to East Pokot, the livelihood platform includes assets such as land, livestock and labor, among other things. Access is modified by, inter alia, social relations, gender and age. The community being patrilineal, men own most of the assets. Women complement the men by way of labor. Nevertheless, the society is gradually changing: there are women, though comparatively few, who own property and occupy positions of authority. Cultural norms and rites, such as female and male circumcision, rites of passage, and ownership rights are mostly upheld through social institutions like families and clans. These social institutions are the primary sources responsible for bee-keeping and honey production. Access is further modified by NGOs like Heifer International and Government projects like Arid Lands which, in one way or another (as discussed in chapter three of this paper), aided the adoption of apiculture and agriculture. This was in the context of the decline in pastoral production due to bad weather, cattle disease, inter-tribal conflicts and colonial and post-colonial government policies (factors also discussed in chapter three of this paper). This has resulted in the diversification of livelihood strategies: towards apiculture, mainly in the regions of Kwokwototo, Tangulbei, Chepkalacha, Nginyang and Chemolingot; towards agriculture in the highlands of Churo; and towards trade, centered mainly in Marigat. The result has been increased income levels and enhanced stability, relative livelihood security, and a re-evaluation by the community of the significance of cattle.

1.7 Structure of the Study

The next chapters are as follow: Chapter two explains the methodology used in the study. It shows the research design, sampling techniques, tools for data collection, ethical issues and limitations of the study. The study used mainly a purposive sampling method to obtain the area and the theme of study and to identify respondents who were believed to have knowledge on the topic due to their status in society and, or, experience. There was also reliance on accidental sampling method to locate households for interview. This was to avoid bias of choosing only households practicing apiculture. In Tangulbei, Kwokwototo, and Chepkalacha, all households accidentally sampled practiced apiculture as well as pastoralism, whereas in Churo, half of the sampled households did not practice apiculture. They depended on rain-fed agriculture and pastoralism.

Chapter three is a review on the development of apiculture in pastoral Pokot of Baringo County. It examines literature concerning colonial and post-colonial policies and practices that forced Kenyan pastoralist to diversify their livelihoods. These policies led to the alienation and marginalization of pastoralists and the mounting pressures on their way of life. It also examines the effects of tribal conflicts, livestock diseases, and recurrent drought pastoralism in East Pokot. An adaptation strategy in East Pokot was to assume a livelihood once considered a low-status job: bee keeping and honey production. This was facilitated by external agents like NGOs, which trained community members in apiculture and aided them with materials like the improved Kenya Top Bar Hives (see section 4.2.3.1 below). This chapter also introduces the unit of analysis, the household, and the terminologies of livelihoods and food security.

Chapter four builds on the review of the development of apiculture in the region. It explains the means and methods of production, and environmental factors that favor apiculture in the region. The types of hive and the quantity and quality of honey each type produces are examined. It also shows the uses of honey generally and locally. This is to show both the potential and limitations of this livelihood strategy. This chapter also shows the perception of bee keeping (juxtaposed against pastoralism) amongst the pastoral Pokot community in Baringo County.

Chapter five shows the monetary value of honey in the region. It explains the market structures in the region examining the supply chain from household level, middlemen l to the wholesale level. It also has an exploratory section on the retail level, though this is not exhaustive. It ends with a discursive analysis of the honey trade in light of the findings made and considers how these findings can assist in developing beekeeping and honey

production as an alternative livelihood strategy in Baringo County.

Chapter six is a summary of the study. This is structured in such a way that the goal, objectives of the study are re-introduced and measured. It shows how the goal of the study has been met through the objectives. It goes through the challenges facing apiculture in Baringo County and within the ASAL of Kenya and gives some recommendations, in part derived from the literature or practitioners, in part deduced from this study. Finally, general conclusions are drawn.

2. Methodology

This chapter introduces and explains the methodology used in this study, looking at the research design and sampling techniques used. It also sets out the data collection method, ethical issues and the limitations of the research. The data collection took a period of five (5) weeks in the field, the literature research being carried out before, during and after the field data collection.

2.1 Research Design

This study was a combination of both qualitative and quantitative research designs. The qualitative approach was to explore and obtain perspectives on the bee farming economy from the respondents. This provided a practical insight into the way people feel about the adoption of bee keeping alongside with pastoralism. The quantitative element enabled the rapid appraisal of households in the bee farming business, and to identify the financial value of the honey sold as well as deduce the benefits and potentials of the new form of livelihood. Given the time constraints, the quantitative design made it possible for the speedy collection of data and, in combination with the qualitative design, enabled the compilation of statistical data and the acquisition of in-depth knowledge within in a short timeframe.

2.2 Unit of Observation

The units of observation included the bee farmers at the household level, the individual middlemen, key informants, such as administrative officials and local chiefs, and the ultimate wholesale buyers. The pastoral Pokot household in Baringo County is responsible for the livelihoods of its members. This is the unit that controls the income-generating activities of the family. The households are usually extended families and all family members are responsible for looking after the bee hives, but the harvesting of the honey and protection of the bee hives is usually left to the older boys and men. The household level faces the day to day challenges as well as the benefits of bee farming, which means they are well-placed to provide the necessary information for this study, and as such, they represent, an appropriate unit of analysis. The middlemen buy the crude honey from the households and find wholesale traders in the big towns and trading centers. This group is knowledgeable about prices at different levels and price fluctuations during different seasons. They are also knowledgeable concerning the potential markets and this made them suitable for the price analysis in the study. The administrative officials, such as the District Officers, have knowledge of the geography and areas of production. They are also knowledgeable about the whole economy of the region, the actors in the

economy and government policies on bee keeping in the country. This gives them a suitable position to guide the research in different ways.

2.3 Sampling Methods

The sampling methods used in this research were purposive sampling and accidental sampling. Purposive sampling means the selection of respondents as well as the geographic and content areas, based specifically on the need and the purpose of the research. This is where a researcher decides the purpose to be served and targets the sources. This approach is good for pilot studies and in the selection of a few cases for intensive study (Bernard 2000: 176-178). In this way, Baringo County and the subdivisions of Kwokwototo, Churo, Tangulbei, Chepkalacha, Marigat, and Chemolingot were selected as the area of study because of their involvement in bee keeping and honey production at the different levels. Tangulbei, being the center for honey production and trade, had the highest number of respondents at the household level. Other areas had fewer respondents but the responses were in line with those of Tangulbei. The honey producing areas have bee-farming groups consisting of an average of 30 households each. Five (5) bee farming groups were identified and the group leaders were interviewed. This was to gain an insight into group organization at the community level and how the community members view this new type of economic livelihood. Three (3) middlemen traders, two (2) parish chiefs and three (3) retail traders were also chosen due to their positions which made them knowledgeable about honey production and trade in the region. Key informants were also purposively identified and interviewed and these included the following: one household head who also was part of the 38 sampled people as he had been involved in the apiculture for about twenty years; another was the Community Development Project Officer (CDPO) of Arid Lands, a government programme supporting apiculture in the region; and the two (2) District Officers because of their experience and valuable knowledge in the bee farming economy. Other administrators were selected because of their knowledge about activities in their respective constituencies. The research sample during the research design initially had the same number of samples for all the areas; however, this was adjusted in light of the consistency in responses in the other areas after Tangulbei. The total sample consisted of fifty two (52) respondents. Thirty eight (38) individual interviews, with the heads of the respective households, were carried out because of their knowledge of family livelihoods. In the different areas, the households were selected according to the availability of the household heads during a transect walk. This was to avoid the bias of choosing only bee farming households; this method constituted accidental sampling.

2.4 Data Collection Method/Tools

The study used observation, interviews and document analysis in its empirical approach in order to meet its objectives. Open-ended questionnaires and interview guides were used to obtain the perceptions and opinions of the respondents and to acquire life stories. The life stories provided a detailed trend and patterns for the integration of bee farming into the pastoral community of East Pokot over the 20 year period.

Participant observation enabled the researcher to achieve an emic view of the interest of the communities of East Pokot in bee farming, the challenges they face and the opportunities this livelihood offers. The researcher participated in the harvesting of the honey together with farmers and also the transportation of the crude honey to the market. The financial aspects of the trade were also observed.

Questionnaires to the administrative officials helped establish their knowledge about government policies and guidelines on bee farming and the existing efforts to promote bee farming in the region.

Document analysis was utilized to get an idea of how much literature exists on bee farming and honey production in East Pokot as this would help guide the research.

These methods and tools of data collection enabled a wide and representative data sample on the topic to be obtained in a limited time period.

2.5 Ethical Issues

Ethical concerns that had to be observed by the researcher in conducting this research were informed consent and respondent.

The researcher sought permission to conduct the research from the different authorities in Kenya. The Kenya National Council for Science and Technology department gave permission to work in the country for a period of three months. The district of East Pokot and the authorities at the different levels acknowledge the presence of the researcher in their respective constituencies.

To the respondents, the researcher explained the reason for the study and asked for their time. Some respondents expected payment in return and/or thought this research was for an NGO. But before any interview, the reason for the research was explained to every respondent through his translator/research assistant and that no money payment or other

material benefit would be given. Respondents were also assured that their identity would not be revealed. This anonymity created confidence so that the respondents spoke freely and openly and were happy to provide all relevant information on the topic in response to queries.

The culture of the East Pokot community was respected and adhered to by the researcher and this enabled to creation of a rapport creation with the community.

2.6 Limitations of the Study

The limitations of the study vary at different levels: principally, time constraints and financial resources. Ideally, a longer time period would have been available for the qualitative data collection since bee farming is an activity that is undergoing a phase of change. A longer and sustained observation period would have given the research a deeper insight into the nature, trends and patterns for the adoption of bee farming in the pastoralist community. Financial constraints limited the geographical coverage of the research but did not affect access to representative data. Bad roads and inaccessible villages slowed down the research, necessitating the hiring of motorcycles to reach such places. However, by employing both qualitative and quantitative methods of data collection and using purposive sampling methods, it was possible to obtain the necessary representative data.

3. Historical Factors that Influenced Adoption of Apiculture in Baringo County

This chapter, in an endeavor to identify the reasons why bee keeping and honey production became prominent in East Pokot, looks at the historical developments from the colonial to the post-colonial era in Kenya. It emanates from the assumption that colonial policies that led to destocking, monetization, segmentation of land and a demand for sedentarization in the ASALs created a situation where the pastoralist livelihood was stressed. The stressed livelihood was further strained by environmental factors leading to hunger and poverty. Eventually, with the influence of external agents, which became the model for the development of the ASALs, bee keeping and honey production became prominent as an alternative livelihood strategy among the pastoralists of East Pokot. This chapter aims to clarify and answer objectives one and three; it introduces and conceptualizes social change and in this respect, defines and contextualizes the concepts of food security, and alternative livelihoods as well as the household as a basic unit of analysis. Finally, after looking at literature in the historical framework, it draws the conclusion that both environmental factors and governmental policies drove the pastoral community of East Pokot to adopt apiculture.

3.1 Dictates of Change: A Step towards Apiculture

This study recognizes that a social organization is not static. Over time, the social units that combine to form the society adopt new practices or disregard old ones so that, gradually, the society and its institutions change. However, the change is not always absolute and there are some aspects that remain and continue to form basis of the identity of that community. Such change is usually gradual and may go unnoticed for a long period of time until there is a significant marker of difference: and at this point, the transformation can then be identified. Nevertheless, there are points in time when the changes to the aspects that form an institution are fast and drastic. This usually happens when the social institution cannot resist the impact of a given shock and the severity of this shock determines the degree of disaster suffered in consequence. This, in turn, influences the subsequent pattern of the change. Pastoral communities in East Africa have gone through these two different patterns of change due to varying causes: most common is drought, disease, warfare, and government policies from colonial to post-colonial periods. Aklilu and Wekesa, in reference to drought, point out that in the short term, these cycles directly threaten lives by attacking the basis for pastoral survival: their livelihood, and that, over time, the accumulated shocks mean that the resilience of pastoral households decreases (Aklilu and Wekesa 2002: 1). The Maasai of Kenya, for

instance, suffered great loss during the 1888/89 drought followed by an outbreak of rinderpest and smallpox in the early 1890s. The drought killed many of their animals and in 1890, the rinderpest killed up to 90% of their animals within a few months (McCann 1999: 72). Considering that cattle was not only a source of livelihood to the Masaai but also an important, if not the most important, part of their cultural identity, this disaster rendered the social institutions that formed the Maasai community weak or non-functional. More was yet to come however: there followed an outbreak of smallpox in the area after this disaster. Since people in the area at that time were generally not familiar with the disease, many of them died, further weakening the bedrock of the society: the populace. The consequence was migrations to other regions to find a source of livelihood, mainly in trade with the costal people. As a survival strategy, many of the local people became dorobo, which means hunter-gatherer (McCann 1999: 72). However, with this unique example, the Maasai managed to recover and reorganize themselves, re-accumulating their central identity marker: cattle.

The 20th and the 21st centuries have seen great changes among the pastoral communities of eastern Africa and different ways of coping with these changes. Anderson and Broch-Due specify that the two decades (from the late 1970s to the late 1990s) witnessed a profound social transformation in pastoral settings across eastern Africa as increasing numbers of pastoralists have abandoned herding (Anderson and Broch-Due 1999: 6). Talle gives the example of poor Maasai men frequently finding employment as night watch men in towns and in cities as casual laborers, and women getting into petty trading, beer brewing and prostitution (Talle 1999: 108). Some of the Turkana, Maasai, and the Pokot men of Kenya, and the Karamojong of Uganda have moved to the cities to find a livelihood other than pastoralism. The sources of the changes, be they external or internal, and the pace of such change, be it drastic or gradual, have to do with restructuring, to some extent, the social system of the affected community. It is not argued that the change is necessarily bad, but that it could have happened due to certain unwanted circumstances, it may sometimes provide new opportunities. It may also lead to identification of other potentials for a community and the exploitation of this potential for their benefit.

This study acknowledges that the changes in these societies do not mean abandoning the past practices. Mutsotso, in examining other authors' works on changes in pastoral communities makes a succinct conclusion that:

"…the resilience of pastoralism remains strong in the face of numerous [c]hallenges [;] some of which are natural, others man-made and often externally imposed. Indeed pastoralism and pastoralists have undergone transformations over time and cannot be

compared to the pastoralism of the 18th century but it still sustains its people and itself" (Mutsotso 2010: 16).

The communities studied did not necessarily abandon pastoralism but adapted to the extreme conditions by engaging in apiculture. This study calls the new practices that have been integrated with the old "adoption". For the purpose of this study, adoption is looked at in line with livelihoods. In this case, therefore, we find that the pastoralists of Baringo County have, for the past 20 or more years, adopted new forms of livelihood strategies and prominent among these is bee keeping and honey trade. This has been due to the aforementioned factors: the negative factors of drought, disease, conflicts and harmful colonial and post-colonial government policies; and the positive factors of the benefits of honey trade. The negative factors are discussed further in this chapter and honey production and trade are discussed in detail in the following chapters.

3.2 Understanding Livelihoods and Households

3.2.1 Livelihoods Strategies and Food Security

Many authors have written about livelihoods (e.g. Ellis 2000; Ogola et al., 2012; Scoones 1998) and there are many reports on food security (e.g. FAO 2011 report; WATCH 2009 report). There is no single agreed definition of either term due to the dynamic nature of the concepts. According to the 2009 World Summit on Food Security; "Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food, which meets their dietary needs and food preferences for an active and healthy life".[18] The report identifies four dimensions of food security according to this definition. These are: food availability, economic and physical access to food, food utilization and stability over time.

On the other hand the term livelihood means the day to day activities that help households to earn a living and improve on personal and community development. It helps the individuals to get access to basic needs as defined by the community in question, including good nutrition and health. It may also include access to education. According to Liwenga a livelihood simply is "a means of gaining a living" (Liwenga 2009: 21). This may involve an activity that enables an individual or a household to get access to food, health, shelter and education among other things. Chambers and Conway elaborate as follows:

A livelihood comprises the capabilities, assets (store, resources, claims) and activities required for means of living: A livelihood is sustainable when it can cope with and recover from stress and shock, maintain or enhance its capabilities and assets, and provide

[18] FAO, IFAD and WFP (2013). The state of food insecurity in the world.

sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in short and long term (Liwenga 2009: 21 cit. after Chambers and Conway 1992: 6).
In pastoral communities, it is usually after food insecurity that we talk of alternative livelihoods.
Given this understanding of the concept of livelihood, the pastoralists of East Africa have adopted different forms of livelihoods which were perceived as unsustainable in their societies. The community of East Pokot adopted bee farming, something which 20 years ago was done at an unsustainable level.

The livelihood of the community, therefore, contributes to its economy. This means the total livelihoods in the community, when aggregated, form the economy of that community. Shuria and Birch in their study of pastoralist communities in Kenya demonstrate that livestock is still the bedrock of both the economy and culture in these pastoralist societies, but, significantly, they note that these pastoral communities have managed to diversify their livelihoods in ways that have increasingly made important contributions towards their economic security (Birch and Shuria 2001: 10). The group under study in this research, the pastoral community of Baringo County, have a diversity of livelihood activities including agriculture (carried out mostly in the highland areas), trade, receipt of remittance from relatives working within and outside the district and honey farming on the lowlands (see also Ogola et al., 2012). The unit of analysis, the household, is an active player in this livelihood change.

3.2.2 Household

The concept of household is complex and may vary from society to society. This concept is important for this study since it is the unit of analysis. Ellis (2000: 18) points out that the household is a social unit most appropriate for investigating livelihoods and for advancing the understanding of policy implications of diverse livelihoods. Ellis, acknowledging that a household is difficult to define in many cultural settings, and that it is a site in which particularly intense social and economic interdependencies occur between individuals in a group, argues that this makes it:

"sufficient reason for a household to be a relevant unit of social and economic analysis since the view is not taken that individual action (i.e. that of men or women on their own) can be interpreted separately from a social and residential space they inhabit" (ibid: 18).

Ellis goes on to point out, that from a conventional conception[19], a household is a social group which resides in the same place, shares the same meals and makes joint and coordinated decisions over resource allocation and income pooling (ibid:18). This definition is suitable for the present study, save insofar that a household must reside in the same place. The Pokot pastoralists in East Pokot sometimes move and reside in different areas in search of pasture and water for their animals, but still identify with the same household. Therefore, for the purpose of this study, a household in East Pokot is a social group that often resides in the same place and often shares the same meal and makes joint and coordinated decisions over resource allocation and income pooling. To the extent that members do not reside in the same place or share the same meals, they continue to self-identify as members of the household, having a sense of belonging and owing an economic contribution to the homestead. It is also important to note that a household's livelihood is sustainable if it can cope with and recover from shocks and stresses; maintain or enhance its capabilities and assets, while not undermining the natural resource base (Chambers and Conway, 1992; Scoones, 1998; Ellis, 2000; cit in Oparinda and Birol, o.J.: 3-4).

3.3 Dictates of the Environment and Governments

This part looks at the historical events that led to the modification of the livelihood strategies through the development of a cash economy among the pastoralist societies of Kenya. This eventually redefined poverty/wealth in pastoral Pokot community. The point was reached where the livestock economy could not support the livelihood of the Pokot of Baringo. Experiences with trade, showed how other alternatives involving the market economy could be pursued, especially in areas where agriculture was more difficult. It is in this context that bee farming comes to prominence. The following sections will discuss, first, the roles played by disease, drought and intertribal conflicts (essentially, cattle raids), and then the colonial and post-colonial policies, in order to examine the extent to which these factors may have pushed the communities of East Pokot towards honey production and trade.

3.3.1 Disease, Drought and Intertribal Conflicts

The FAO crop prospect and food situation report 2011 lists the factors affecting pastoral livelihoods in the regions in East Africa as inadequate pastures and water (due to droughts) that worsen livestock conditions, resource-based conflicts among pastoralists, and livestock disease (FAO 2011 crop prospects and food situation report: 13, 14). The report further says that reproduction rates of livestock suffered from successive poor rains

[19] She refers to the works of Meillassoux, 1981; Ellis, 1993: Ch.1.

(since 2007) and this makes recovery of agro-pastoral and pastoral livelihood systems more difficult thereby worsening long-term food security. The 2008 short rains assessment report of East Pokot and Baringo pointed out that the general food situation is alarming and worsening[20], while the 2006-2007 annual report on Baringo district pointed to the loss of animals through cattle rustling, disease (outbreak of rift valley fever in April and May 2007) and recurrent droughts. In 2011, 128,905 cattle and 530,072 goats were affected by Foot and Mouth disease.[21] Many writers point to some droughts years and their effects on the northern parts of Kenya. For instance, the loss of livestock to drought (especially those of 1984, 1992 and 1996) is one of the reasons many pastoralists abandoned the livestock economy to settle in or near towns (Fratkin et al 1999: 149).

The early and mid-20th century saw a series of droughts which, combined with other factors, and led the pastoral Pokot of Baringo County to adopt new livelihood strategies. However, it was only in the mid-1980s that clear signs of bee keeping and honey production started showing (Mutsotso 2010, my interviews). This suggests that the turning point was the droughts that occurred around that time. According to Mutsotso, the drought in 1984 marked a turning point in bee keeping that saw large-scale take up of KTBH, introduced in 1981/1982 by Mr. Peterson at Maron Centre (Mutsotso 2010: 82). The droughts of 1979 to 1981, and 1984 highlighted the vulnerability of populations living in Kenya's arid and semi-arid lands (Birch and Shuria 2001: 14). The resultant scarcity of adequate pasture and water weakens livestock, causing death and low resistance to disease. The price of the animals therefore declines when they are sold in the markets. Furthermore, during these times, livestock flood the market further reducing their prices. This is because of two prominent reasons: the first is that people are uncertain about the future and therefore tend to sell their cattle to reduce the risk of losing everything. Unfortunately, since many of them sell at round about the same time, the supply gets high and yet the demand does not increase thus lowering the prices. Secondly, the already malnourished and weak cattle mean low quality and therefore less money. Access to food was thereby compromised. In consequence, the Kenya Freedom from Hunger Council (KFHC) became active in the East Pokot and Baringo areas in mid-1980s. Not much, though, is recalled about KFHC by the local communities. Of the total households interviewed, only twenty percent (20%) talked about the KFHC[22], sixty percent (60%) had heard about it but did not know anything about it, and the remaining twenty percent (20%)

[20] Page 2 of the report.
[21] Government of Kenya. Ministry of Livestock Development, East Pokot. 30/08/2011. REF: DVO/EPKT/DIS.GEN/VOL.I/34
[22] To eliminate bias I did not ask them if they knew about KFHC but rather asked them to talk about they got into the bee keeping and honey production business.

had not heard nor had any knowledge of it. The latter were of a younger generation, or from Churo and Pwokototo. For instance, one of the traders, Charles Arupe, said that he started honey production and trade in 1983 following training from KFHC. He has only eleven (11) bee hives and this, he says, is because he later concentrated on trade. Mutsotso expounds that the KFHC launched the distribution of KTBH in 1985 to spur income generation activities among East Pokot (Mutsotso 2010: 83). But not many pastoralists in East Pokot adopted bee farming in this period. Mutsotso says that bee keeping picked up in the 1990s because of: the realization that bee farming is an easy source of income with little investment in terms of time; the avoidance of the threat of cattle rustling; the introduction of Kenya Top Bar Hives; and later (1999-2003) the interests of other promoters like the Arid Lands Resource Management Programme, the Catholic Diocese of Nakuru and Heifer International.

The drought of the early 1980s hit the community of East Pokot hard, but did not break it. The breaking point came with the recurrent droughts of the 1990s, further compounded by the droughts at the turn of the century. The 1999-2001 drought was more extensive and more severe than those of 1992-1993, 1996-1997 and its effects were felt most keenly by pastoralists in many districts including Baringo (Aklilu and Wekesa 2002: 1). Nearly 3 million pastoralists and agro-pastoralists were at risk (ibid.). All of the respondents interviewed for this paper mentioned that bee keeping and honey trade became widespread in East Pokot and Baringo region towards the late 1990s and early years of the new millennium. Before 1998 very few people from East Pokot were known to harvest honey as a vocation (Mutsotso 2010: 84). The decline in the prices of cattle and increase in honey prices during the 2007-09 droughts saw many households joining the bee keeping and honey economy. The 2007-09 drought saw up to an eighty percent (80%) loss of livestock (Mutsotso 2010: 79). One bee farmer, Akudu Makali, interviewed for this paper, recounted his life story of how he adopted bee keeping and honey production.

“I don’t know when I was born but it was in the year after president Kenyatta died. I have thirty (30) traditional log hives and twenty six (26) of them are occupied now as I speak. I started keeping bees in the year 2000 because all my livestock had died during the 1998/1999 drought. I had no more cows and goats then I said to myself: what can I do to get these animals? Then I knew that bees would help because I had seen my friend prosper from keeping them and selling the honey. I started keeping bees for honey. I began with four (4) hives which I bought from him (the friend) at one hundred shillings (Kshs.100) each. I used the first harvest to buy goats and later I used the profits to buy more hives. Eventually I had five (5) goats which multiplied to fifty (50) goats by 2009. But

in the process, I sold some goats and bought cows. I bought a cow in the year 2000 and this multiplied to fifteen (15). I lost most of my animals in the drought of 2009. Now I have only five (5) cows. I use the money from the honey that I sell to buy food and other things like clothes."[23]

This is similar to many more stories about how pastoralists in East Pokot joined the bee keeping economy or adopted bee keeping as a form of livelihood. As will be discussed in the next chapters, many people joined about the year 2000 onwards. Some of them were trained by interested NGOs like Heifer International but most of them saw the benefits from others and because they had been hit hard by the drought, they decided to "try" as most put it, bee keeping and honey production.

3.3.2 Colonial and Post-Colonial Policies

The colonial and post-colonial policies must be considered in analyzing the move of the Pokot of Baringo County in the adoption of bee keeping and honey production as an alternative livelihood strategy. This is because, as Flintan describes, policy interventions in Pokot have had significant negative impacts on local livelihoods and increased the vulnerability of both the pastoralists and the agro-pastoralists in the area (Flintan 2011: 57). Owing to population growth, which led to over-grazing, denudation and soil erosion, policy interventions in the ASALs began in the 1940s (Keya 1991: 76). These include policies that led to the de-stocking and commoditization of pastoral economies in Kenya. Zaal and Dietz (1999) define commoditization as the process whereby assets, goods and services gradually shift from having a use value purely in terms of subsistence to an exchange value as well as meaning that they will be increasingly sold and acquired on the market. In Kenya, this commenced with compulsory sale of cattle in the 1930s, then in the second half of the 1950s use of ecological arguments, and the launching of the World Bank-financed Livestock Development Programme in the late 1960s and early 1970s. But it is important to note that marketing of cattle in the Kenyan ASALs was not a completely new activity in the 1930s. Keya (1991: 75) cites Hjor (1988) who argues that there has always been barter trade between pastoralists and agro pastoralists, although, as Keya explains, due to the yearly increase of grain prices by the government, the pastoralists seemed to be getting a raw deal for their livestock. This means cattle had a lower exchange value than grains and therefore realized less money. And yet the colonial government demanded high taxes form the pastoralists. Therefore, having more cattle did not automatically translate into being rich. This was complicated by the demand from the colonial government that pastoralists should sell their animals to reduce their effects on

[23] This interview was carried out on 25/08/2011

the environment. The ecological discourse at the time was that agricultural behavior of the African (including pastoralist) was detrimental to the environment and led to soil erosion and desertification. Therefore, the market structures redefined poverty in pastoral communities in East Africa and colonial policies of destocking and taxation translated into a market economy. The effect since the 1940s has been to widen the gap between rich and poor among the pastoralists (Waller 1999: 34-35). Waller argues that the cash value from trade did not necessarily make households poor, but led to despair of the poorer groups. This means that people with cattle preferred to sell them and the cattle products for money rather than barter them. The poorer groups (with less cattle and hence less money) started depending on the richer groups for survival. Similarly, gender roles and ownership rights are highly differentiated in pastoral communities. Men usually own most of the property and women are entitled to use them (for the benefit for both the men and the women). But the decision of when to dispose them and at what conditions remains with the men. Therefore, women's entitlements were also reduced since money "dissolved the distinction between rights of use and disposal in different areas of pastoral production" (Waller 1999: 34). This, he argues, did not make women poor but made them "more vulnerable to the vagaries of men" (Waller 1999: 34). Vagaries since some of the men did not share the benefits with the women and therefore a woman depended on the goodwill of the man.

Monetization therefore created vulnerability for the pastoral community. The community became vulnerable particularly when droughts occurred. These droughts weakened and killed many of their livestock, and caused overcrowding of cattle in search for pasture and water. This leads, in turn, to greater vulnerability to the contraction and spread of animal diseases and, arguably, to a higher incidence of inter-community conflicts.[24] The weak and sick animals attract lower prices. This phenomenon, coupled with rising world food prices leads to poverty and food insecurity. Therefore, the livestock market became unsustainable leading to the desire for economic diversification and the adoption of bee farming among the pastoralists in East Pokot.

Colonial policies took various forms. In 1946, the government introduced a 10-year development plan (which ran from 1948 to 1959) which was adopted to effect an agrarian change in pastoral areas (Mwangata 1986 in Keya 1991: 76). Thereafter, the Swynnerton Plan policies were implemented by the African Land Development Board (ALDB) through grazing schemes and, at independence, the implementation was taken over by the Range Management Division (RMD) (Keya 1991: 76). Keya details the post-independence

[24] This argument is drawn from the FAO 2011 report page 13.

endeavors of the government in the ASALs, for instance, the integrated projects, mainly agro-based, with the objectives of human resource development, exploitation of productive potential, resource conservation and integration into the national economy (ibid: 77). However, Keya goes on to say, the National Development Plan (1989-1993), recognizing the need for restructuring in ASALs' development policies, outlined the main objectives and among them included:

"[m] available the means of exploiting the important production potential of ASAL resources, thereby contributing significantly to income, employment and food security goals" and "Determine ways and means of effecting symbiotic exchange of resources and products between ASALs and the high potential areas" (ibid).

Among the specific issues related to pastoral systems development in the National Development Plan was the promotion of bee keeping (Keya 1991: 78). But according to the Ministry of Agriculture 1967, the earliest attempts were made by OXFAM in the 1950s. This involved seeking to improve the amount and quality of wax produced, the provision of marketing facilities, particularly in areas where trade in hive products was not yet established. This resulted in the provision of improved bee keeping equipment, the establishment of refineries and the setting up of producer cooperatives for selling wax (Gichora 2003: 4). Kigatiira (1979) says in the early 1970s the Canadian government helped in the establishment of the bee keeping section in the Ministry of Agriculture in Kenya (Gichora 2003: 4, 6). This section was to guide research, oversee further development and advise government on policy matters (ibid: 6).

Mutsotso (2010) says that the Kenyan government policies in the colonial and post-colonial periods were to pacify, 'fix' and control the pastoral communities in order to maintain law and order. Boundaries were fixed, for instance, the Special District Land and Order Ordinance of 1934 mandated the Northern Frontier District Provincial Commissioner to define and delimit grazing boundaries for different pastoral groups as a way of controlling conflict and livestock raids. Flintan further argues that the alienation of land in Pokot in 1926, whereby the British administration evicted the Pokot from their ancestral seasonal grazing lands in order to make way for the settlement of white farmers, was detrimental to the pastoralists' livelihood. This situation continued even after decolonization as the post-independence governments made no attempts to restore land owners[25] (Flintan 2011: 57). There was also the creation of native reserves and stringent quarantine regulations in native areas. This, according to Mutsotso, suffocated off-take of African livestock leading to increased pressure on land, soil erosion, and overgrazing,

[25] Ownership is used here to mean that the pastoralists who had used the land for centuries had to right to continue using it instead of the continued white occupation.

which ultimately forced the government to undertake compulsory destocking.

3.4 Synthesis

The colonial and post-colonial policies seem, at first, to be an unlikely factor in the development of bee keeping and honey production as an alternative livelihood strategy in Baringo County. However, the contribution was significant, if indirect. For instance, the commoditization of livestock changed the perception of livestock within pastoralist communities from something with principally a cultural value to one of monetary value. Furthermore, the post-independence policies also required the use of local labor, resources, and encouraging apiculture. For example, this was done by introducing the bee-keeping section of the Ministry of Agriculture which carried out research and provided advisory roles on apiculture to the government. These policies created an enabling environment within which the organizations and individuals that supported and are still supporting this alternative livelihood strategy could operate.

Consequently, with the growing distress of livestock as a source of livelihood in the 1980s, but especially towards the end of the 1990s and the beginning of the new millennium, the adoption of bee keeping and honey production as an alternative seemed inevitable. Households started carving hives out of logs. This move was intensified after the drought of 1999 which left a lot of livestock dead, weak, sick and devalued for sale. The focus was then on the smaller livestock, like goats and sheep, as they have, relative to cattle, a greater ability to withstand drought. Highland areas, on the other hand, embraced agriculture rather than bee farming due to the higher amounts of rainfall. This was also the period when external agencies, like Arid Lands, Heifer international and KARI came in and promoted the bee and honey economy in Baringo. They trained people on improved bee keeping and honey production and marketing skills and strategies.

The bee farming project seemed to be very successful especially to the group members and individual households trained in this field. This group took better care of the hives and the bees in order to produce high quantity good quality honey. With practice, they learned when and how to harvest the honey. They had a market for their products including the wax. These, early adopters became examples to the rest of the village of the advantages of bee keeping, which further encourages its uptake. Consequently, other famine stricken households that had been reluctant to venture into the bee keeping economy started adopting bee farming on a small scale. Most started with one or two bee hives. But these households that had been reluctant to venture into the bee keeping economy started adopting bee farming on a small scale. Most started with one or two bee hives. But this

group used mostly the traditional log hives since they could not afford modern bee hives.

Photograph 1: Aftermath of Wild Honey Harvest
Source: Innocent Mwaka

Later they used the profits from the traditional logs to buy modern hives and improve production. Unfortunately, since this group lacked the right training, they continued with the crude ways of managing the bee hives. The hives where smeared with cow dung in the belief that this attracted more bees and harvesting was still done with smoke and fire. Nevertheless, the benefits must have been recognizable since these households continued with this new form of livelihood.

3.5 Conclusion

This chapter, in addressing objective 1, looks at historical background to the current phenomenon. Previously, honey was wild and harvested on a small scale level by the poor (see photograph 1). But now almost every household in East Pokot lowlands is actively engaged in apiculture. Some of the factors that have led to the adoption of bee keeping and honey production in pastoral Pokot of Baringo relate to the recurrent droughts in the region. As discussed earlier, drastic social changes are sometimes the result of shocks to the system . This was the case with the drought of the early 1980s but most pronounced is that of 1998/1999 which saw many pastoralists moving to apiculture. All the households interviewed for this study reported to have lost 80 to 90 percent of their cattle. Added to this was the effect of animal diseases and inter-tribal conflicts (that is, cattle raids). As Mutsotso points out, one of the reasons for the adoption of apiculture among the pastoralist in East Pokot is that the Turkana raiders were not interested in bees or honey (Mutsotso 2010).

The sources of change can also be internal and external. The decision by most pastoralists to adopt apiculture after watching other successful bee keepers may be regarded as an internal catalyst of change. External factors include the influence of NGOs and colonial and the post-colonial government policies, which, on the one hand, favored apiculture especially during the post-colonial period, and on the other, hindered pastoralism. All of these factors contributed to an institutional restructuring from the household level up to the community.

4. Honey Production and Harvesting in Baringo County

This chapter examines the processes of honey production and harvesting in Baringo County. It starts by describing the different uses of bees in general and in Baringo County in particular. It examines the different methods of production carried out in this area, giving the advantages and disadvantages of each. It examines the environmental conditions that enables the high yields in the honey production and also identifies the limitations. And through life stories and participant observation, it will be explained how honey is harvested in Baringo County. Understanding this may explain, in part, why external actors are interested in supporting the communities in this area and why the communities have embraced bee keeping and honey trade as a viable alternative livelihood.

4.1 Methodology

To get information about the uses of honey, all the fifty-two (52) respondents were asked to identify the uses of honey, first in general, then specifically in the local communities. The respondents who were trained in apiculture were able to recite the general uses of honey. All respondents could list the uses of honey in the local communities[26]. The uses of honey show the functionality of this alternative livelihood in this area. Functionality in this instance means the benefits and relevance derived from the resource which people use. This should be seen in people's daily practices and in their ability to meet their daily needs and, where possible, reserve any surplus. Functionality, therefore, must be tangible, not merely theoretical. For example, cattle may be functional, however, when cattle is scarce or absent, this affects its functionality. The loss of cattle renders this resource non-functional. These concepts are aimed at helping to understand the perception of bee keeping in the local communities. Perception is how a certain community sees a given resource and this depends on its functionality. If bees and honey are a functional source of livelihood then it may be assumed that this would influence the perception of bee keeping as a valuable resource. Conversely, the decline in the functionality of cattle would lead to a change in the perception of cattle as a resource, that is to say, an unreliable resource, and therefore lowering its cultural value. On the other hand, if bees and honey are non-functional to the local communities, then the perception would be that this resource does not justify the time or money investment. This would also help show how much the local communities still depend on cattle since the question of perception is juxtaposed between bee keeping and honey production as an alternative livelihood against other the other livelihood strategy which is pastoralism (with the exception of

[26] More literature about the uses of honey in Baringo and in general was got from different books and reports

areas where agriculture is practiced in the Baringo region).

To get an insight into the different methods of production, all the respondents were asked how the production process took place. Questions of who was involved in the production process (whether men, women, elders or children); which types of hives were used in the production; the quality and quantity of the honey the different hives produced and why; the processes of constructing the local hives; when the hives are hung and when the harvesting takes place; and who is involved in the harvesting process. These questions arose in response to the claim that the production process is not stressful or taxing and it is an easy fall back, unlike dependence on pastoralism and agriculture. The production process was also aimed at determining how the effort (human resource) and the land (environmental resource) would affect the quantity and quality of the honey produced. The assumption was that this would open up the loop-holes in the production process and provide room for criticism and improvement.

To ascertain local people's knowledge of their environment, the respondents were asked to give reasons why bees are plentiful in their environment and to describe any changes on their environment, if any, over the past 30 years. Therefore, this chapter is aimed at answering the questions of how the people of Baringo County perceive bees; what are the existing trade networks in the bee farming economy among the communities of Baringo County (this question is answered more precisely in the next chapter); how much do the communities of Baringo County still depend on their livestock for survival?

4.2 Discussion

4.2.1 Uses of Bees and Honey

In general, however, bees and honey have various functions and to understand the potential of the region in alleviating its inhabitants out of poverty, it is important to outline the general uses of bees and honey. In a KARI (2005) report, Make Money from Bees, various uses of bees and honey are explained: honey is used as food for the people and to provide energy for the sick; it is used in the manufacture of confectioneries like cakes, sweets, biscuits and bread among other things; honey is also medicinal, that is, it can be used to treat wounds, coughs and burns. The report goes on to say that in pastoral communities and elsewhere, honey is used to treat wounds resulting from foot and mouth disease. Finally, honey is used as a preservative for food. The report lists the uses of wax obtained from bees to include; making candles, shoe polish, and water-proofing materials. It is also used in the cosmetic industry and in pharmaceuticals to encase human drugs in order to prevent degradation by the stomach enzymes. It comes as no surprise, therefore,

that the Ministry of Agriculture 1967 reports that OXFAM, in the earliest attempts to streamline the beekeeping industry in Kenya in 1950, aimed to improve the amount and quality of wax produced (Gichora 2003: 4). At that time, most bee keeping improvement efforts focused on the recovery of wax from the traditional honey beer brewing processes.

The other products from bees and their uses include bee venom, bee brood and bee propolis. Bee venom is used to produce drugs against allergies. Bee brood, which consists of eggs, larvae and pupae, is used as agro-feeds for livestock because of its richness in proteins. Propolis is a sticky substance collected from the gum of trees by bees and has anti-biotic properties. It heals backache when chewed and is used for making adhesives, for example, glue, wood pastes for sealing leaking roofs and cracks on wooden furniture.

Given all of these uses for the products of bee keeping and honey, the potential for Baringo County to break out of the cycle poverty seems obvious. However, not all of the benefits of bee keeping are fully manipulated in Baringo County. The uses of honey, among the pastoralist Pokot in Baringo are various. In the interviews, all of the respondents said that they use honey for food. The honey is easy to store and can be kept for a long time and still be used. Honey is, therefore, used as a guard against hunger in terms of food or sold to buy food. All respondents said the honey is used for making a local brew called *Sali* which has a cultural significance; it is drunk by elders during a traditional function called *Sapana*. This is a rite of passage from boyhood to manhood. This beer is also used during marriage ceremonies, and when one is borrowing items like cows or any other assets. Elders love it and they easily bless people after drinking it. During times of scarcity, it is reserved for the elders; women and children are not allowed to drink it in a strict sense. Among the Pokot, honey is also used as medicine to treat wounds, coughs and backache. Respondents also acknowledged its importance as a source of energy for lactating women. Apart from treating cough, it is hard to confirm the extent of honey being used as medicine for wounds and backache since the answer to this did not come out easily and not all respondents were able to confirm this. Most people go to hospitals and clinics to treat their wounds and backache.

4.2.2 Environmental Conditions and Knowledge

Baringo County is mostly semi-arid with acacia vegetation. Rainfall is minimal and this makes most areas unsuitable for rain-fed agriculture. Of most importance for the bee keeping and honey economy is the flowering of the plants present in the area. In the words of most respondents, “bees love these flowers” and the “honey from these flowers

is of the best quality". According to the Ministry of Livestock, Chemulingot, 2010 report (cited in Mutsotso 2010: 83-84), the types of the plants present in this area favor bee keeping and honey production since the flowering is good for this. They specify the plants *Talamou* (Acacia *melifera*), *Chemanga* (Acacial *senegal*), *Anywa* (Acacia *ruficients*), *Ses* (Acacia *tortilis*), *Atat* (Acacia *elatior*), *Kiptari* (Acacia *brevispica*), *Kamal* (Acacia *africana*), *Amekunyan* (Sia sp), *Askuruyon* (Tribulus *terrestis*), and *Chepkoi* (Evlangia sp) (see also Ministry of Livestock Development, East Pokot 2010; 2011)[27]. In spite of irregular rainfall, sporadic rains and seasonal rivers, if manipulated by the human resource, are adequate to realize a considerable level of bee products in the region.

Most of the elderly respondents talked about the environmental changes that took place over the years in Baringo County. They claimed that the land was bare and trees and shrubs were only found on the highlands, rocks and small mountains. However, over the past thirty (30) years, the number of trees has been rising and the flowering of the trees attracted bees in the area. In interviews, one old man from Chepkalacha village interpreted this from a moral perspective. He said the growth of trees in the region was a sign from God that there would be no more war in the region. This, he claims, is because in 1977, the Turkana attacked the Pokot. There was a violent conflict in a place called *Lotwol* which means "flat land with no trees". Many people died in this conflict. The conflict was possible, he claimed, because the enemies could see each other from afar and plan attacks. So God decided that trees would grow in the area in order to prevent more violent conflicts from arising. After this bloody conflict between the two communities, the shrubs started growing taller, and grass covers emerged. Subsequently,

Photograph 2: Vegetation of Tangulbai
Source: Innocent Mwaka

[27] GoK, Ministry of Livestock Development. 09/01/2010. Ref: DLPO/EP/ANN.RPT/02/12; GoK, Ministry of Livestock Development. 06/01/2011. Ref: DLPO/EP/ANN.RPT/02/15.

bees migrated to this area.

Flintan, (citing Wosonga et al., 2011) offers a more prosaic explanation, pointing to the introduction of *Prosopis Juliflora* in Baringo by the Joint FAO/Government Fuelwood Afforestation in 1982. By 1990, a total of 740 hectares had been planted and this plant has spread in Baringo, colonizing bare ground and invading critical grazing areas, suppressing herbaceous vegetation (Flintan 2011: 57, 70-71). It was not only *Prosopis Juliflora* but also other exotic species like P. *chilensis*, *Opuntia ficus-indica* and *Euphorbia tirucalii* (ibid: 70). Whatever about the old man's divine attribution for the large scale growth and spread of trees in the Baringo region, the literature substantiates the claim of afforestation became evident in the 1980s and 1990s (See Wosonga et al., 2011). The invasion of grazing land by the new species and its provision of ample grounds for bee keeping and honey production contributed to the adoption of apiculture in the region. Mwangi and Swallow have analyzed the wide use of *Prosopis juliflora* in this process (Mwangi and Swallow 2005: 38).

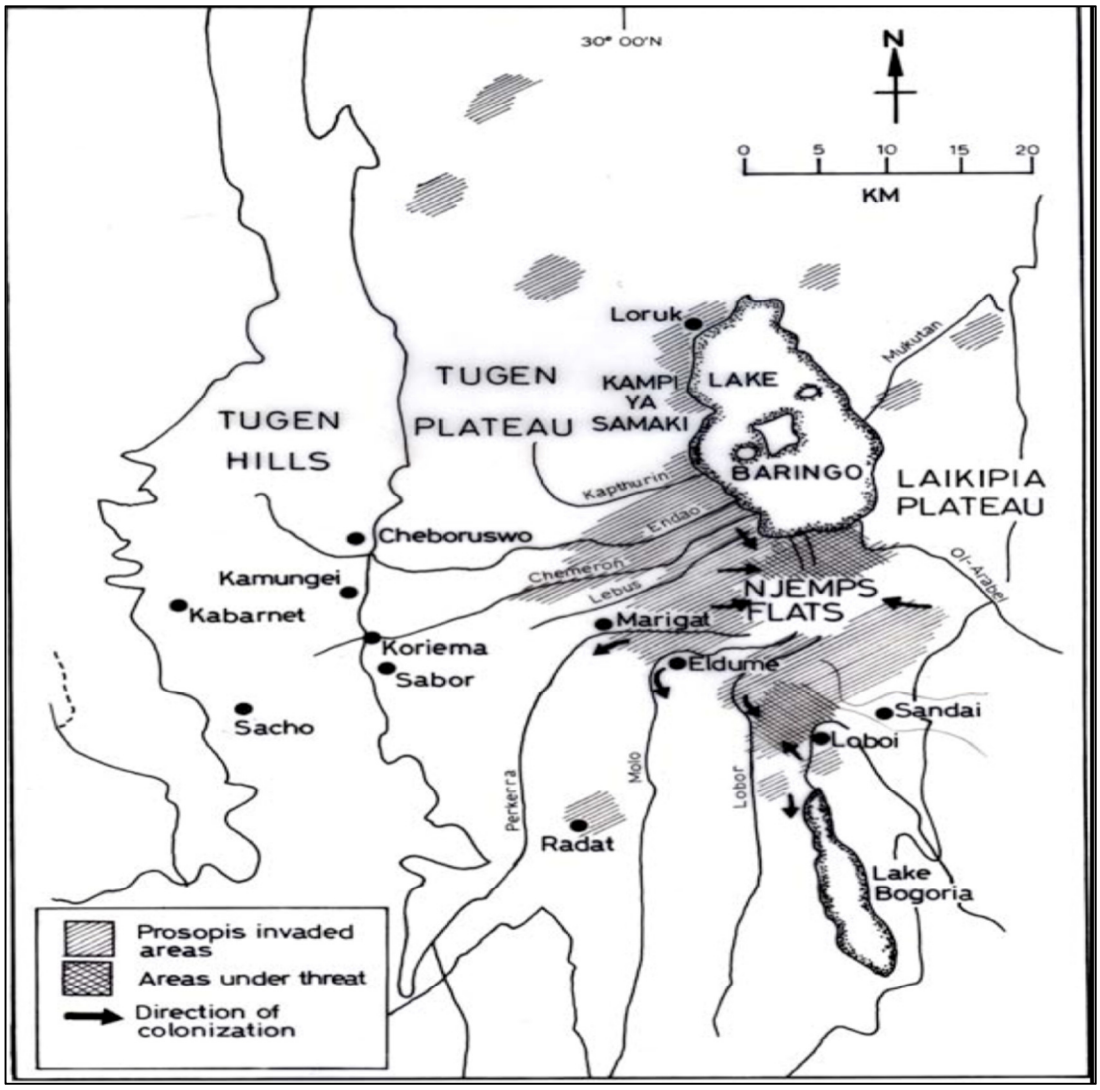

Figure 3: Status and spread of prosopis juliflora in Baringo
Source: Mwangi and Swallow 2005

4.2.3 Methods of Production

In order to understand the economic change, it is important to understand the means of production of the new alternative livelihood in Baringo County. This will assist in understanding and analyzing the level of production, quality of the honey and the nature of the market. This micro-level analysis helps to determine the influence of the external actors in producing the change. The two areas of focus are, first, the type of hives and, second, the process of production.

4.2.3.1 Types of Bee Hives in Baringo County

The Traditional Log Hive

Towards the turn of the millennium, the main type of bee hive in this area was the traditional log bee hive (traditionally known as the *Maghen*). This is a handmade hive,

carved out of the stems of trees, and usually smeared with cow dung. It is a hollow tube from wood with both ends partially closed by timber. Gichora gives a detailed description of the process of constructing log hives (Gichora 2003: 45-46). She says the bee keepers look for dry standing trees or sound fallen ones. These are then cut into logs according to the desired dimensions, split in half lengthwise. The inner part is etched out leaving two separate troughs of a hollow cylinder. They are paired and fixed together again using strong flexible wires. It is made commonly made out of wood from the Ficus Thoningii, Terminalia and Euphorbia trees, which average 1 meter by 0.4 centimeters (Mutsotso 2010: 84). Mutsotso goes on to explain that the *Maghen* takes usually three (3) months to prepare, and that it is deployed during flowering when the swarms are abundant. In Gichora's research, the timetable for hanging the hives is similar since the hives are hung just when the long rains are about to start. This usually marks the beginning of flowering in the region. Mutsotso says the *Maghen* are hung six (6) to eight (8) meters from the ground to avoid pests (Mutsotso 2010: 84). Nevertheless, it became clear during field research for this paper that these measurements are not strictly followed. It is easy to find smaller hives than those described by Mutsotso and also hives hung at the top of trees, well in excess of eight (8) meters above the ground. In her research, Gichora mentions different sizes of the traditional hives and points out also that some are made from trees different from those mentioned by Mutsotso. These are *Terminalia brownie*, *Ficus sycomorus*, *Grewia similis* or *Podocarpus falcatus*, (Gichora 2003: 26, 45). This can perhaps be explained by differences in the locations of the research areas within Baringo County. Gichora mentions two methods of placing the hives on the tress. These are: "placing a hive in a horizontal position on branches of a tree then securing it by wire", and "by attaching a loop of strong wire to the hive to create a handle then suspending it from a strong branch by a wooden hook" (Gichora 2003: 46).

Photograph 3: A traditional Log Hive Hung from a Tree
Source: Innocent Mwaka

Level of Occupancy and Production

From the perspective of the respondents, the log hive has the best chance to get colonized by bees. Mulindo et al. o.J. argue that this is attributed to the low temperature levels in the bee hives which attract bees. The local bee keepers argue that this is because the bees love the smell of the wooded hive and the cow dung. The farmers however believe that the honey from this type is of lower quality. This is because it is mixed up with the brood and the smell of the wooded tube. From the perspective of the district leaders, this type of hive has been discouraged since it encourages logging and consequent destruction to the environment. This semi-arid land has many acacia trees which when cut would leave the ground barer and intensify erosion. The district of East Pokot issued a bye-law that penalizes the cutting down of trees for bee hives. There is a belief, which Mutsotso also mentions (Mutsotso 2010: 84), that nobody steals the *Maghen* hives but in case someone is suspected of doing it, and is found guilty, it attracts a fine of six (6) goats or two (2) cows, or if the thief is not found, then he or she receives a curse. This phenomenon may have happened before bee keeping and honey production became popular in the area but not today. One of the major challenges for the bee keepers today is theft of the hives.

The Kenya Top Bar Hive

The second type of hive is the Kenya Top Bar Hive (KTBH) which is an improvement of the traditional log hive. It has waxed bars suspended inside which provide foundations

from which bees construct their combs to hold honey and brood (Mulindo et al. o.J.). This means the bars assist the bees to start honey manufacturing more easily. The internal volume of the KTBH is also bigger which allows for higher production. The KTBH was one of the outcomes of the bee keeping project supported by the government of Canada. Paterson 1985 in Gichora (2003: 63) says the top bar hive has several variants in specification for components according to the different designers. But the principle of the movable combs is that the bars of the frames are made to help in maintaining a correct “bee space”, a gap of a given width allowing bees to move about in the hive between any two facing surfaces (Gichora 2003: 63). The challenges come in the fitting of the top bar. Top bars should fit together forming a solid cover over the hive to stop bees from passing through (Gichora 2003: 65). However, in her study in Baringo district, there were substantial changes in the components of KTBH and sometimes they fail to fit together once in the field. This was confirmed during the field research for this paper, where it was observed that the farmers tended to attempt to remedy this on their own, despite lacking the necessary skills. This alters the functioning of the hive always to the disadvantage. For instance temperatures in the hive may rise causing the wax to melt.. Bee farmers did not report the same problem for the log hives.

Level of Occupancy and Production

The locals agreed that the rate of colonization is high but not as high as that of the traditional log bee hives. Mulindo et al. (n.d.) state that the relatively low rate of colonization is because of the iron-roofed but aerated hive. The quality and quantity of the honey are higher than in traditional log hives, although not high as that of the Langstroth beehive.

Photograph 4: KTBH suspended for Colonization
Source: Innocent Mwaka

Their goal of higher colonization occupancy might not be met but it delivers better quality honey and at a higher quantity (Kigatiira 1976, 1985 cit. in Gichora 2003: 63). It should be noted that higher levels of colonization may not necessarily mean higher yields. Yields are affected by the degree of precision in the construction and maintenance of a hive. This study found that there is a low level of use of the KTBH in Baringo County, it being more expensive than log hives. This confirms the fears of Paterson 1985 and Crane 1985 that the new technology would impose financial strain on the bee keepers (Gichora 2003: 63).

The Langstroth

The Langstroth bee hive, the third type used in this area, is an improvement of the Kenya Top Bar Hive. Mulindo et al o.J describe this hive as being similar to the KTBH, the difference being that the Langstroth has two boxes: the lower box or the brood box and the upper box (or the super compartment). The boxes are separated by the queen excluder. This means the queen is restricted to the brood box and the super compartment has honey free from the brood. This type of hive has very high quality honey, in comparison to log hives and KTBH. However, it gives the lowest yields.

Level of Occupancy and Production

The Langstroth bee hive has the lowest level of colonization among the three different types of hives. This type of bee hive is not widespread since it is the most expensive.

Photograph 5: Langstroth Bee Hives suspended under a Shade for Occupation
Source: Innocent Mwaka

Furthermore, the honey sold at the local market is not valued according to the quality but the quantity (see below). Therefore, although the quality of honey produced supersedes that of the other types, local people prefer a higher quantity producing hive.

4.2.3.2 Views of the Respondents

Speaking to the bee keepers in Baringo County, the preference was more for the traditional log since this was cheaper to get, easier to get colonized by the bees and it also produces the highest quantity of crude honey.

Division	Log	KTBH	Langstroth	Remarks
Nginyang/Mondi	5861	2165	182	Honey mainly is from log hives
Tangolbey/Churo	4391	730	300	
Kolloa	5569	1500	125	
Total	15821	4395	607	

Table 1: Number of Hives in Production Areas 2009
Source: GoK, Ministry of Livestock Development, East Pokot. 09/01/2010

The respondents pointed out that, the quality of the honey notwithstanding, the middle men still bought all crude honey at the same price. All the bee farmer groups and the middle men interviewed preferred the Langstroth and the KTBH because of the higher quality of the honey. They argued that the higher the quality of the honey, the easier it was to sell to institutions like KARI who would offered better prices.

Division	Log	KTBH	Langstroth	Remarks
Nginyang/Mondi	5892	2184	193	Honey mainly is from log hives
Tangolbey/Churo	4439	900	300	
Kolloa	5596	1500	143	
Total	15887	4484	636	

Table 2: Number of Hives in Production Areas 2010
Source: GoK, Ministry of Livestock Development, East Pokot. 06/01/2011

The question therefore was: why did the middle men still buy the lower quality honey at the same price from the household producers? Much as it was uncomfortable for them to answer this question, the general answer was that honey can be stored for a long time therefore, at the end of the day everything would still be sold anyway. Most farmer groups sold their honey directly to the agricultural institutions and therefore they preferred higher quality honey. But why sell to these institutions?

4.2.3.3 Organizational Influence

The major institutions that buy honey from these farmer groups are KARI, an agricultural research center, and the NGO Heifer International. These two organizations are significant in influencing the pastoralists in Baringo County to adopt bee farming. At the turn of the millennium, Heifer International was involved in finding an alternative livelihood for the Pokot of Baringo. This was after the drought towards the end of the 1990s which left a lot of animals in the region dead, sick and their value depreciated. Hunger and poverty stretched across the land. Together with Arid lands, a government programme, alternative livelihoods in this region were sought. The process involved the participation of the local communities. In order to get support, they had to choose the form of livelihood in which they needed support. According to Gichora, the ranking of the most important economic activities in Baringo district varied from areas with potential for rain-fed crop farming to highly pastoral areas (Gichora 2003: 19). In the research areas of this study, bee keeping and honey production ranked highest. This, therefore, points to the fact that this change was not imposed by the external agents but rather encouraged by them. The households in the region were asked to get into groups of at least thirty (30) members. The group members were then trained on improved bee keeping and honey production by KARI. Heifer International also carried out community exchanges, taking the groups under training to regions with established bee keeping and honey production. Witnessing the successes of the different communities that they had visited enhanced the motivation for the adoption of bee keeping and honey production. The trained groups would then get improved bee hives for high quality honey and, in order to gain markets for their products, KARI would buy this honey at a fair price for later resale. The groups contributed 30% of the total cost of production. This was a way of community empowerment. This process has been going on since the year 2000 and partly, its success has led to the popularity of bee keeping and honey production as an alternative livelihood.

4.2.4 Production Process

"Bees are very sensitive animals, the better you care for them, the better the yield" according to one of the bee farmers interviewed for this paper. He went on to describe how he learned to do this; a story similar to many of the bee keepers in the region.

Ten years ago, before bee farming became popular in Baringo honey production was "wild". The most important source of wealth was livestock, especially cattle. Although the popularity of cattle in this region was and still is high, its functionality has in recent times been questioned. Honey production was considered to be a poor man's occupation. Honey was mainly wild and unsustainable as a livelihood. It was found in between rocks

or on trees in the forests and harvested by young boys, youths and poor men. It was mainly used for brewing a special type of alcohol called Sali, discussed above. The harvesting was crude. After identifying the tree or the rock with the bee hive, the harvesters would go there at night. Whether the honey was ready was determined by experience although sometimes this experience was inaccurate. The harvesting was done with fire. “Bees are afraid of smoke and heat” as one respondent commented. The harvesters would light a torch of grass and the heat and smoke would drive away the bees. In this way, they are not stung. Unfortunately, many of the bees die in this process and the smoke, ashes and brood mix up with the honey; the quality of the honey is compromised. The surviving bees migrate to another place or to another village. This process is still practiced by some bee keepers (who are new in the business and lack the experience) today.

Production has several stages: the setting up the hives for the bee swarms to occupy, monitoring and maintaining the hives after occupation, and harvesting, marketing and selling the produce.

4.2.4.1 Setting up Hives

A respondent from Pwokwototo relates his hive set-up:

“…I have fifteen (15) bee hives and seven (7) of them have been colonized. After harvesting the honey, i clean up the hives thoroughly. I have twelve (12) traditional log hives and 3 Kenyan Top Bar Hives which I bought from a friend. With the traditional hives, I clean and smear them with cow dung then I suspend them on trees and wait for the swarms to occupy. Sometimes they are occupied and sometimes not. It depends on how lucky you are. But it is harder for the KTBH to get occupied. Right now, I have seven (7) hives colonized but none of them is KTBH. I hope at least one of them will get colonized because they produce good honey…”[28]

The hives are suspended on the lower tree branches or the top branches. The respondents argued that hanging the hives at the highest levels hinders theft since the risks for the thief are greater when hives are hung at higher levels. The process is usually done during the flowering season since this is when swarms of bees are abundant. Farmers prefer setting up the hives near rivers or streams since “bees need water or else they will migrate to the person who gives them more water”

[28] Interview carried out on the 22/08/2011

Photograph 6: Picture showing Hives suspended high up a Tree in Baringo County
Source: Innocent Mwaka

4.2.4.2 Monitoring and Maintenance

This is done by the family members, especially the males. Water tins are put near the hives and in a way that is accessible to the bees but inaccessible to birds. For instance, they use a cylindrical tin with a dip end and sometimes a narrow mouth. Sticks are put in these tins to enable the bees walk down and get the water that they need. These are refilled regularly as water is used or evaporates.

Aside from the threat of thieves, monitoring the hives also involves watching for pests that enter the hives. Pests include the honey badger or Melivoera Capensis, Kinkina (tree squirrels), Kendele (black ants), and the Galleria Meloneral (wax moth). To some households, the process is tiresome as the hives are set up on trees in bushy areas, some distance from homes so as to limit human interference. This process of monitoring the hive continues for about three (3) months, at which point harvesting commences.

4.2.4.3 Honey Harvesting

Harvesting is done two to three times a year, mostly by men. Most respondents reported that harvesting is done in the months of March, August and December. On average, a family gets about 20 liters of crude honey per harvest per family. Some bee farmers however get far more than that, averaging 60 liters per harvest. This level of harvest is viable, having regard to the honey prices discussed below.

Photograph 7: Water Tins with Sticks Hung for Bees
Source: Innocent Mwaka

As already discussed, the use of fire for harvesting remains extant, despite resulting in the loss of the colony. Some trained farmers with proper equipment use the professional techniques of harvesting the honey.

4.2.5 Challenges Faced by Bee Farmers

Although a promising alternative livelihood, bee farming still has its challenges. Much as Bees may not be so rain dependent as livestock, nevertheless, they still need some rains in order for the flowers to blossom. Sometimes the rains are irregular in this part of Kenya and this limits the quantity of honey produced. This inconsistency in quantity produced affects the market too since some middlemen will opt to go to West Pokot and the southern region to purchase honey, which is cheaper compared to the Baringo area. In the production process, farmers face the challenge of *kendele*. These are small black ants that crawl into the hives and drive out the bees. They are hard to deal with because the remedy - spraying them with chemicals - drives the bees away too. Not only that, the chemicals sprayed also affect the quality of the honey. Therefore, the farmers try to keep them swept off the hives or they make hives with very little aeration. The disadvantage of the latter is that it limits the level of occupancy and quantity of honey produced. Squirrels often steal the honey when it is ready. The bee farmers deal with this by setting traps, which works occasionally. Squirrels are not the only thieves: humans steal too. All respondents confirmed that theft is a challenge. Some members of the society monitor the progress of people's hives and when the harvest time is right, they go at night and steal the honey. In some drastic cases, the thieves not only steal the honey but the hives too and sell them. One group, the ASALI group told me that they had sixty (60) hives and one time some youths came and stole forty (40) of them. The hives had been set by a stream, a perfect place for the bees. Unfortunately, watching over the hives was impossible.

Sometimes, the thieves are guided by a bird called *Chepkacheyi*. It is a small bird that directs people to hives where the honey is ready. Earlier, in the days before bee keeping became popular in Baringo, this bird would direct gatherers to wild honey in the bushes. It comes to people and makes a chattering noise calling for the listeners to follow it. People follow until they reach the hive. It stands on a branch nearby as someone harvests the honey. Afterwards, some honey is given to it in appreciation. However, people are careful not to follow it blindly, since sometimes it leads one to a big snake or a buffalo. Other challenges are in selling honey. Since the honey brought to the market by the households is crude, it is sold cheaply. A four liter can be sold from anywhere between Ksh.400 to Ksh. 750 depending on supply and demand. Therefore, it takes time before profits are realized.

4.2.6 Perception

As elucidated in the next chapter, the monetary value of honey is high and reliable, whereas cattle is not as reliable, even though its monetary value is as high or even higher than honey. The cultural significance of cattle has not deteriorated significantly. Fifty percent said they would prefer having cattle but they had access to just a few or none at all. These were grouped under non-functionality of cattle. The other 50% were hesitant on what they preferred given that the question was posed in a strict sense of “either bees and its products or cattle and its products”. Being a traditionally pastoral community, the assumption was that preference for cattle would be predominant. All the households ended up at some point to prefer both. All these respondents still had many goats and sheep and they confirmed the functionality of these as well. Therefore, the perceptual outcome is that, although cattle tends to be more non-functional (because of their limited number), it is still important and many farmers who have lost their animals are working towards regaining them. But the perception of honey is a positive one since it is functional and is no longer the preserve of poor members of society. It is now the practice of progressive members of society. Note that this does not mean that bee keeping has replaced cattle in terms of perception, merely that the gap between them as an indicator of progress and class in society has narrowed in the past 10 years. In this analysis, the roles of other alternative livelihood strategies, such as farming, has not been considered. This is because Churo, which practices agriculture, has not been analyzed and the remaining three sites practice mainly apiculture and pastoralism.

4.3 Conclusion

This chapter has discussed the uses of bees and honey in general and specifically to the Baringo County community, the methods of honey production, the types of bee hives and

the stages of production. The stages include the development of this process, setting up hives, monitoring and maintenance, harvesting the honey and the challenges faced by the bee farmers at the household and group levels. This chapter seeks to answer the first two of the objectives of this paper, viz., what are the factors that have led to the rapid adoption of bee keeping in Baringo County, and how do the people of East Pokot and Baringo districts perceive bees? It also contributes answers to the question of how much the communities of Baringo County still depend on their animals for survival. The answers may be summarized as follows:

1. The favorable physical environment, in terms of tree species, provide good flowering for bees.
2. The influence and motivation provided by Heifer International which worked in partnership with KARI to train bee farmer groups, provide them with subsidies on modern bee keeping equipment, and the carrying out of the community exchange. This was done as part of the Arid Lands programme. This pushed the rapid adoption of bee keeping and honey production in the new millennium.
3. The beneficial uses of honey in terms of monetary value (specially discussed in the next chapter) in the area also contributed to this adoption.
4. This was aided by changes in perception, caused by the functionality of honey and the non-functionality of cattle in certain periods.

However, the challenges named show the continuous development of bee keeping and honey production as an alternative livelihood strategy in Baringo County and also shows the loop holes to this livelihood strategy, therefore, identifying potentials for improvement. These are:

There is need to put more effort into the production of wax. The value of wax is not known or appreciated by the bee keepers in the area. This goes for the other uses of bees as described earlier.

The paper also found out that, notwithstanding government programmes designed to improve on the honey industry in the country, the information flow to the local level is ineffective. The district leaders in Chemulingot were not aware about these endeavors apart from identifying the Arid Lands programme in its generality but not in relation to bee keeping and honey production. These programmes need to focus on providing information on the ground to educate the locals about bee keeping, and create awareness about its potential.

5. Honey Trade and Market Networks

Trade is not a new thing to the Pokot community, let alone to the Pokot of Baringo County. Hjort 1988 says that there has always been barter trade between pastoralists and agro-pastoralist (quoted in Keya 1991). As seen earlier, this group had traded a lot during the colonial time. Monetary-based trade in cattle had been encouraged by the colonial policies, even when numbers or values declined, such that the monetization of items became part of the system. It is contended that bee farming in Pokot would not have been sustainable had it not been supplemented by trade (both barter trade and cash payment since most of the honey is sold.

From a wider perspective on the honey trade in Kenya, Baiya and Nyakundi in their 2007 synthesis report on linking Kenyan bee keepers to the market, note that Kenya's bee keeping sector suffers serious market dysfunctionality. They point out that 80% of honey is sold outside its production area, mainly in the city Nairobi. The majority of bee keepers produces and sells lower-value "raw honey" (Berem et al 2010). Despite this, bee keepers in Baringo District earned KShs. 7.2 million in 2001 (1US$ = KShs. 75) from the sale of honey and that this compared favorably with other activities in the livestock-rearing sector (Gichora 2003: 15). By way of comparison, milk earned farmers KShs. 6.6 million in the same period. Earnings could have been higher but for poor market infrastructure (ibid). A further encouragement comes from the June 2006 - July 2007 Baringo/East Pokot CDD annual progress report commenting on the Ngoron community living in the northern part of Baringo district. The report states that honey has become one of the community's main livelihood strategies in the recent past because of market prices rivaling (and in dry seasons, exceeding) that of goats.

This study breaks down the chain of supply of honey to the market in order to ascertain the potential of the region and also to identify loopholes. The honey market passes through four stages or levels: at the household/village level, trans-border/regional level, national level and international level. My discussion will be limited to the first three levels. This chapter will examine the existing trade networks in the bee farming economy among the communities of Baringo County. It maps how these trade networks function. In this way, the study details knowledge of the local bee keepers about market opportunities of bee products and the market value of honey. It will then consider the earlier assumption that value equates to functionality and this, in turn, influences perception.

Methodologically, the interviews were at the household, local village markets (in the case of middlemen) and wholesale levels where the respective respondents were asked

questions on quantity and quality of honey sold, where it is sold, and for how much. The cost of production is also estimated by valuing the equipment required for production and transport costs. Since most of the respondents had started this business before the year 2005, the initial capital cost is not considered since it was hard to measure. In any event, most respondents had forgotten the initial cost since they had entered into the business gradually. Time costs will not be estimated since this would be hard to value. It is the respondents' perception of comparative time advantage between cattle keeping and honey production that is considered. Considering that the market forces of demand and supply, does not significantly influence price since in general, the quantity of honey produced in Kenya, as Baya and Nyakundi 2007 argue, is still short of demand. This means that despite the amount of supply of honey in Baringo County, demand for its does not change significant and hence prices remain between 400Ksh and 750Ksh.

Participant observation also played a role in this study whereby traders were followed from the village market to the wholesale markets in Marigat, an average distance of 200 kilometers from the study areas (or four to five hours drive by public transport). Larger traders in Marigat were also interviewed and finally the small scale retailers.

5.1 Results

5.1.1 Household and Village Level

This level is significant since it is the basis from which the importance of bees and honey as an alternative livelihood strategy in Baringo has been assessed in this paper. It is this unit that is a factor in changing the face of production in Baringo. Households are the primary and the most widespread producers of honey. After harvesting, honey is kept in big containers of 20 liter capacity. It is basically crude honey at this stage. Most families do not have the capacity or the technology to purify the honey. Some families store the honey in order to take advantage of later price increases. Others must, out of necessity, sell it as soon as it is harvested. There are specific market days for the different villages. For instance, the market day for Tangulbei is Fridays, for Churo is Wednesdays and for Kwokwototo is Thursdays (see also Mutsotso 2010: 86). The market days are not limited to the sale of honey but include other products, such as livestock, fabrics and other household necessities. On these days, middle men come from all over the county to the village to buy honey. It is mainly the young men and boys of the family who sell the honey at the market and sale is on a cash basis. The honey is packed in a four (4) liter container which the middle men buy at an average of 600 Kenyan shillings. During times of scarcity, the prices rise up to seven hundred and fifty (750) Kenyan shillings and during times of abundance, the prices drop up to four hundred (400) Kenyan shillings per four (4) liter

container. Once in a while, the buyer of the honey, who is the middle man, checks the quality of the honey and if it is not good, he rejects it or buys it at a cheaper price. Nevertheless, the respondents at the household level said that even if the quality is not so good, the middle men will still buy the honey at the same price as good quality honey. At times, the poor quality honey is stored longer and sold during times of scarcity. But in most cases, as the respondents reported, prices are determined by the buyer and not the seller.

Photograph 8: Crude Honey displayed after Harvest
Source: Innocent Mwaka

These containers that the households use to pack honey for the market jeopardizes, further, the quality of honey produced. These are recycled metallic tins, which are sometimes rusty (see also Gichora 2003: 30). They appear, and usually are, dirty. The hygiene of the honey is further jeopardized by the way in which the middlemen test the quality of the honey. They dip their fingers into the tin and put their fingers in their mouths. This process is repeated for every tin a middleman wishes to check. Upon purchase, the honey is tipped into a bigger plastic bucket of about 20 liters, which appears just as dirty as the containers in which the honey was sold. To get out all the honey from the smaller tins, the middlemen use their fingers, continuously licking them to make sure the honey does not flow down to their elbows. Needless to say, this method of testing and packing lowers the quality of the crude honey.

5.1.2 Intermediate Level/Middlemen

The middlemen are the link between the households and the wholesalers. They buy the crude honey in the village markets and transport it to the bigger trading center for sale. All the middlemen interviewed for this study sell their honey in a place called Marigat. This is a relatively large trading center in Baringo. Compared to the villages where the honey is mostly produced, it is more accessible for traders from bigger towns and cities like Nakuru and Nairobi. The middlemen are financially more established than the household producers. They also have a market network with which they trade. The honey that they buy at the village level is kept in stores the villages themselves. It is only when enough honey has been accumulated that it is transferred to Marigat for wholesale. Sometimes, the middlemen communicate with the buyers in Marigat in advance before transporting the honey. Sale is on cash-on-delivery basis although occasionally the buyers in Marigat get the honey on credit. The middlemen travel to the different villages on their respective market-days, buy the honey and store it in a more central place, usually Tangulbei or Chepkalacha. Usually, after the honey accumulates from six (6) to ten (10) twenty-liter containers, it is then transported to Marigat. The middleman transports it himself by public transport. They spend on average two hundred and fifty (250) Kenyan shillings on his transport from Tangulbei to Marigat, one way, and about three hundred (300) Kenyan shillings from Churo, three hundred (300) Kenyan shillings from Kwokwototo and three hundred (300) Kenyan shillings from Chepkalacha. They pay fifty (50) Kenyan shillings for each twenty (20) liter container for transport to Marigat from any of the aforementioned villages.

Photograph 9: 20 Liter Containers of Honey displayed in Marigat for Sale
Source: Innocent Mwaka

On average therefore, a middleman with ten (10) twenty-liter containers spends one thousand (1000) Kenyan shillings on a round trip, transporting the honey to the market in Marigat. He then sells each container at prices ranging from three thousand (3500) Kenyan shillings (during times of abundance) to four thousand five hundred (4500) Kenyan shillings (during times of scarcity). In essence, ten (10) containers collects him thirty five thousand (35000) Kenyan shillings in total and a profit of fourteen thousand (14000) Kenyan shillings of profit. Storage is not costly since the middle men own their stores in the villages. These are neither taxed nor insured. Usually, they build and maintain it themselves and so such costs are hard to determine financially. They do not spend the night in Marigat (see calculation below). Therefore, depending on the number of containers of crude honey transported, the profit is still high compared to the costs incurred. There is usually one main middleman from each village who, to a large extent, monopolizes the local market. Therefore, the number of middlemen is limited and they enjoy a comparative advantage over traders elsewhere. Asked why they could not work as middlemen too, household members said the business needed a lot of start-up capital (such as building the storehouse), needed a lot of honey to transport (since it would be cheaper to transport honey in bulk), and the established middlemen had consolidated most of the local market and have networks of buyers in Marigat. They thought (local households) they could not compete with them. The district leaders said they allow a free competitive market to operate so they did not want to interfere. And since most of the households have not been trained in bee keeping and sale distribution, they still sell the honey at the village level.

On one hand, the wholesale buyers in Marigat do not want to buy directly from the local households in the villages since this would be costly – they would need to go to the different collection points every market day, find storage for the honey (middlemen would charge them highly to make it costly for them and hence eliminate competition) and spend time in the village as to wait for the honey to accumulate. In other words, the risks would be too high and the business would not be cost effective for them. The middlemen, on the other hand, come from the local communities and therefore establish themselves more easily.

Calculated profit during times of abundance[29]:

If 4 liters of crude honey are sold at 400 Ksh and 20 liters of crude honey sold at 3,500 Ksh, the profit of 10 tins of 20l will be

(10 * 3,500) - (20/4)*400*10

= 35,000 – 2,000*10 (This means every 20 liter tin earns a profit of 1,500Ksh. Before transport is included)

=35,000 – 20,000

=15,000 Ksh.

But a round transport cost for the trader is 500Ksh.

Transport cost per 20l tin is 50Khs

Therefore, Transport cost for ten 20l tins	= 50*10
	=500 Ksh.
Therefore, total transport cost	= 500+500
	= 1,000 Ksh.
Total profit for 10 tins of 20liters of crude hone each is	= 15,000 – 1.000
	=14,000 Ksh.

In a region that, by 2009, ranked highly in the nationwide poverty index with 60% of the households living below the poverty level (USD 1.25 per day)[30] (Ogola et al 2012: 4225), a profit of 14,000 Ksh (USD 167.064) is remarkable. It is also a sign of how much the final consumer is willing to pay for the honey at the national level. Baiya and Nyakundi 2007 note that there is still an overall shortage of supply throughout the year. The Ministry of Livestock Development also notes an increase in the income earned from the sale of honey from 2009 to 2010 (tables 3 and 4). This indicates the growing market in this product and the growing value of honey in the region. The stable increase in the quantity of honey marketed in the district since 2007 and the projected increase up to the year 2014 further confirms the increasing value of honey in the district and in the country (see table 5).

[29] The profits during times of scarcity must be higher due to the market forces of supply and demand, though the net profit may be the same since the total quantity sold during the times of scarcity is less. This calculation is for Tangulbei only. It does not vary much for other places.

[30] Cited from World Bank Kenya poverty and inequality assessment, volume I: synthesis report. Report No. 44190-KE. Poverty Reduction and Economic Management Unit Africa Region; 2008.

Division	Amount per Kg	Value in Ksh.
Nginyang/Mondi	2779 containers of 20kg @ 100	5,556,000.00
Tangulbei/Churo	293 containers of 20kg @ 100	586,000.00
Kolloa	169 containers of 20kg @ 100	338,000.00
Total	3241 containers	6,482,000.00

Table 3: Amount of Honey marketed in 2009
Source: GoK, Ministry of Livestock Development, East Pokot District. 09/01/2010

Division	Amount per Kg	Value in Ksh.
Nginyang/Mondi	2369 containers of 20kg @ 120	5,685,600
Tangulbei/Churo	1166 containers of 20kg @ 120	2,798,400
Kolloa	750 containers of 20kg @ 120	1,800,000
Total	4285 containers	10,284,000

Table 4: Amount of Honey marketed in 2010
GoK, Ministry of Livestock Development, East Pokot District. 06/01/2011

Year	2007	2008	2009	2010	2011	2012	2013	2014
Quantity (Kg)	62536	795208	75208	76812	78348	79905	81503	83133

Table 5: Amount of Crude Honey in kg marketed out of the District from 2007-2009 and from 2010-2014 projection (2%)
Source: GoK, Ministry of Livestock Development, East Pokot. 20/07/2010

As discussed before, the trained groups in the earlier cases sold their honey to the agricultural institutions. The agricultural institutions bought this honey at an average price of seven hundred (700) Kenya shillings per 4 liter tin. They had also trained these groups how to make candles and soap from the wax of the honey and they bought these products from ASALI group in particular who had the machine to process these products. The ASALI chairperson told me that the machine broke down about two years from the time of the research and they stopped producing the candles. But at the time of research, these groups had not sold any honey to these institutions. The group members claimed that the quantity was not enough for sale. Some group members complained of corruption among the leaders of the groups and decided to withdraw completely from or reduce their input to the group. The group leaders, on the other hand claimed that the group members were

greedy and impatient and also accused some members of not contributing enough effort to the success of the group. Eventually, these groups are becoming weaker and more individual-centered. But despite this, these groups helped popularize bee keeping and honey production in this region since most respondents at household levels confessed that they were inspired by the groups that had been trained.

5.1.3 Wholesale and National Level

The wholesalers provide the link between the middlemen and the rest of the country. This group buys crude honey from the middlemen and sells it to the super markets in the big cities in Kenya. The supermarkets include, Nakumatt and Uchumi (see also Baiya and Nyakundi, 2007). This is usually after purification. This group was reluctant to engage with the research for this paper. There were suspicions as to the motivations and ultimate destination of the information provided. Given this reluctance and the time constraints involved, only limited data could be obtained in respect of this aspect of the honey trade.

Nevertheless, what could be established was that, after buying honey in Marigat it is taken for purification. The twenty (20) liters of crude honey is purified then sold to larger distributors or super markets at prices ranging from six thousand five hundred (6500) Kenyan shillings, when honey supply is high, to seven thousand five hundred shillings (7500) when honey supply is low. Insufficient data is available regarding the costs of the purification and distribution, therefore it is not possible to estimate the margin of profit available to the wholesalers.

5.1.4 Retail Sale

Also, the purified honey is not only sold to the large distributors and super markets but resold at retail as well. This means the purified honey is sold to smaller outlets (kiosks, and small shops) who then sell this to the final consumers in Marigat. For the retail sale of honey, purification is sometimes done traditionally by boiling the honey and then cooling it. It is then packed in different bottles of different capacities. According to Gichora, semi-refined honey is decanted directly into recycled bottles of between 150 ml and 1 liter volume and, on request, it can be packed in bulk quantities using 4 liter tins or 20 liter buckets Gichora 2003: 54). The research for this paper revealed retail prices ranging from (on average) one hundred (100) Kenyan shillings for a 200 milliliter (ml) bottle, to two hundred (200) Kenyan shillings for a 350 ml bottle, to three hundred and fifty (350) Kenyan shillings for a 750 ml bottle; and 2000 Kenyan shillings for a 5 ml bottle. These retail sales are mostly conducted by the roadside in Marigat and on the way towards Marigat on the Marigat-Nakuru highway, and the Marigat-Kabaranet highway. The quality

of this “purified” honey, however, is not controlled or standardized and, therefore, it can vary from seller to seller. It is said that, since most of the sellers purify the honey locally at home, some of them add water in the honey to increase the quantity.

The honey sold at the supermarket, however, is controlled and standardized. It is packaged in different tin sizes and sold off at different prices. The research for this paper was limited to the geographic area of Baringo County and to the whole-sellers at Marigat.

5.2 Conclusion

This chapter has identified links in the chain of the honey trade and the margins of profits. It can be seen that profits increase substantially at every step after the primary producers or households have sold their produce to the middlemen. The middlemen sell the honey with a large margin of profits. Given the inconsistencies and possible exploitations in the honey trade network, opportunities to address some of these challenges will be addressed in the last chapter.

6. Conclusion and Recommendations

This chapter summarizes the study by reviewing the objectives, summarizes the findings, and the extent to which the goal has been achieved. This chapter also indicates whether the hypotheses stated in the first chapter are directional or null. It goes on to discuss the challenges facing the promotion of sustainable livelihood strategies in the ASALs and suggest ways forward.

6.1 A Review of the Objectives

The study looked at bee keeping and honey production as an alternative livelihood strategy among the Pokot of Baringo County in Kenya. The goal was to identify the trends and patterns of the development of apiculture as an alternative livelihood strategy in Baringo County and to forge strategies that will empower pastoralists in semi-arid and arid lands in Africa with tools to identify and exploit their best alternative livelihoods and encourage government support of these strategies. To achieve this goal, three objectives were identified and their results are discussed below:

6.1.1 Objective 1

To establish the factors leading to the adoption of bee keeping in Baringo County.

Since beekeeping and honey production had long been regarded as a poor man's job in the Pokot pastoral community of Baringo, and since in the past 20 years it had become one of the main livelihood strategies for both the poor and the rich in the region, it was imperative to examine the reasons for this trend and also the patterns. To achieve this objective, the study examined these factors from the colonial and post-colonial periods in terms of policies and environmental factors.

Results:

Colonial policies that led to destocking, monetization, and land alienation of in the ASALs suffocated the pre-existing way of life of the pastoralists and led to a redefinition of poverty for the community. For instance, monetization and a cash economy reduced the cultural value of cattle. This was a result of destocking and taxation policies of the colonial governments which led to privatization and widening the gap between the rich and the poor among the pastoralists since the 1930s (Waller 1999: 34-35). Waller argues that cash value from trade did not necessarily make households poor, but led to despair among the poorer groups. Since cattle and its products were now marketable in terms of cash, the poor, who had depended on livestock for a livelihood, had to depend on the rich. Women's entitlements were also reduced since money "dissolved the distinction between

rights of use and disposal in different areas of pastoral production" (Waller 1999: 34). This, he argues, did not make women poor but made them "more vulnerable to the vagaries of men" (Waller 1999: 34). Land alienation, where grazing Pokot land was taken away and given to colonial farmers, further deepened their vulnerability. The reduced availability of land led to congestion, overgrazing, the quicker spread of livestock disease and conflicts over the limited grazing resource.

These factors alone may have not led to immediate livelihood diversification but were compounded by harsh environmental factors. The recurrent droughts in the region that killed much of the livestock, or weakened those that survived (thereby lowering their market value) worsened the state of food security. This was the tipping point that forced the Pokot of Baringo County to adapt and diversify, principally through the adoption of apiculture. Apiculture in the region was supported by endeavors commencing in the 1950s and continued through post-colonial policies which eventually enabled an organization like Heifer International to train and support local communities in apiculture. The benefits of this livelihood strategy quickly became evident and hence encouraged its spread in the region.

6.1.2 Objective 2

To explore how the pastoral communities of Baringo County perceive bees.

The assumption at the outset was that, by viewing livestock in terms of its monetary value, to the detriment of its cultural value, coupled with the its obvious unsustainability as a livelihood evidenced every time drought or disease recurred, and set against the ever emerging benefits and security offered by the nascent apiculture livelihood, the community would perceive apiculture as a way of life preferable to livestock pastoralism. The result however, was that, despite the apparent benefits of apiculture, the residual cultural value of livestock means many community members still work towards re-accumulation of livestock. The common way to do this is through bee keeping and honey production. This may make perception of bees rank high as a means to an end. In the question of preference, half the respondents preferred apiculture while the other half preferred pastoralism. Nevertheless it should be noted that neither answer was straight forward as respondents mentioned (unprompted) that both livelihood strategies would be important.

6.1.3 Objective 3

To scrutinize the existing markets and trade networks and identify the levels of exploitation in the marketing of bee products.

In the framework for the analysis of rural livelihoods, the household is the most important unit of analysis since it is where most livelihood strategies start and has the highest impact. The household having social and economic interdependence is sufficient reason to be a relevant unit for social and economic analysis (Ellis 2000: 18). This objective would therefore help in the identification of markets from the household level to the final consumer and compare differences in benefits. The result is that although, the quality of the honey produced from the household level is low, the marginal profit is still very high at various stages along the supply chain. Despite that, the markets structures are still weak and the levels of production in terms of methods, technology, quantity and quality remain low. The identified market prices and trade networks are that: the household sells its honey at the local market to the middleman at an average price of Ksh.600 per 4 little tin. The middleman transports this to the market center in Marigat and sales it there making a profit of about 70 Ksh. per liter. Eventually the chain continues beyond Marigat.

This leads to an endeavor to draw a guideline of promotion of alternative livelihood strategies in Kenya's dry lands.

Livelihood strategies in Kenya's dry lands should be sensitive to the needs of the community. The policies of the colonial and the early post-colonial periods led to the alienation, marginalization and "demonization" of pastoralists (Mutsotso 2010: 12). Today, there is an opportunity to atone for these mistakes by empowering these communities to build and develop alternative, sustainable livelihood strategies. Despite this, there are still no clear national policies for the development of the beekeeping sector (Baiya and Nyakundi 2007: 1). The Kenyan government has a Ministry of Livestock but there is little emphasis on the promotion of apiculture. Few, if any, district administrators were aware of any policies supporting apiculture in the country despite its potential for economic empowerment of those who need it most. As mentioned in the first chapter, the GoK 2008 report states that Kenya's potential for apiculture development is estimated at 100,000 metric tons of honey and 10,000 metric tons of bee wax but only one fifth of the potential is exploited (Beram et al., 2010: 3). Therefore, the current levels of honey production fall below the nation's actual potential (Baiya and Nyakundi 2007: 1). The department in charge of apiculture in Kenya could set up a special force to train and promote apiculture at the household levels in environments suited to beekeeping. The sale and distribution of honey should be formalized at the local levels. For instance, collecting statistics on how many people are involved in the business and how much they produce and earn so that

market infrastructures can be improved. Promoting the production at the household level would improve the quantity and quality of honey produced. The creation of more business opportunities and enhancing the potential profits would provide additional motivation for farmers to become involved in the industry. With more farmers entering the honey trade, there would be greater opportunities to develop pools of expertise and more specialized knowledge. If these farmers grow in number and become more sophisticated in their methods, there is the potential for them to act together to engage directly with wholesalers for their own commercial benefit.

6.2 Deductions from the Study

6.2.1 Deduction 1

Bee farming is a formidable food security project and a practical alternative livelihood in Baringo County of North Western Kenya.

Considering the findings of the objectives of the study, this hypothesis is true. Bee farming is already widespread in Baringo County and continues to grow with pace. The findings in chapters 3, 4 and 5 show that this alternative livelihood strategy has been growing for the past 20 years. The findings in chapter 5 shows the monetary value of apiculture in the region and the households studied reported that they use this money to access other basic community needs. These include, but are not limited to, food, shelter, education for the children, and transportation within and outside the region. The Ministry of Livestock Development report for East Pokot 2009 and 2010 show a growing quantity in production and an increase in total income at the County level. The rise of the status of apiculture in a pastoral community shows its growing importance and practicality as an alternative livelihood strategy in the region.

6.2.2 Deduction 2

The County found in the semi-arid Kenya has the potential of complementing pastoral livelihoods through honey production and trade to a point that would lift the community out of poverty and end food insecurity.

The region ranks highly in the nationwide poverty index with 60% to 73% (depending on the level of crisis) of the households by 2008 living below the poverty line and at least 62% of which are food poor (see Ogola et al., 2012: 4225). However, the environmental factors discussed in chapter 4 favor beekeeping and honey production in the region. The market analysis, especially at the middleman trade level, reveals the monetary potential of the honey production in the region. The Ministry of Livestock Development report for East

Pokot 2009 and 2010 further elaborate on the potential of the region to be food self-sufficient and alleviate itself out of the poverty realm. 2010 saw an aggregate income of Ksh.10,284,000 earned from selling honey alone in the region. However, the potential of the region is not fully utilized. Other products from bees which are mentioned in chapter 4 are not utilized. For instance, the wax is usually sieved and thrown away despite potentially having a high market value. Chapter 4 of this study also shows that production is still low due to poor technology and lack of training in apiculture. Overcoming these hurdles, together with encouraging of pastoralism will not merely alleviate poverty in the region, but create a future of rising living standards and sustainable food security. Therefore, the second hypothesis is directional as well.

6.3 General Challenges of Apiculture in Baringo County

The challenges are numerous and range from production processes to sale and distribution and policymaking:

At Policy Level

- Baiya and Nyakundi agree that there are no clear national policies for the
- development of this sector.

At Production Level

- Crude means of production which includes the use of log-hives and poor harvesting techniques.
- Lack of proper refineries for honey. This is also emphasized by GoK Ministry of Livestock reports of 2010 and 2011. Therefore, the majority produces and sells raw (crude) honey, and therefore, receives low compensation (Berem et al., 2010: 3).
- Lack of knowledge about the utilization of bee products like the wax.
- Poor packaging of the crude honey.
- Poor maintenance of the bee hives and inability to control pests.
- Theft of bee hives and honey.

At Market Level

- Informal markets leaves the trade volatile. The GoK Ministry of Livestock
- Development reports 2010 and 2011 point to the lack of organized buying
- groups which led to poor marketing systems.

Baiya and Nyakundi (2007: 1) list six major problems which are general to the country but also apply to the Baringo County. These include: lack of functioning markets; limited access to extension services, training and investment for business growth; inadequate beekeeping skills and equipment; poor production and processing technologies; high transactional costs (though this does not apply to the limited region of this study); and lack of organized producers.

6.4 Recommendations

Forming farmer groups is crucial for the promotion of apiculture in the region. The study shows that farmer groups helped in the adoption of apiculture because of their successes. This may be because of a number of factors, but Berem et al show that the decision to add value is dependent on, among other things, group membership. The group however, must be well organized with transparent systems and agreements on the sharing of risks, burdens and profits.

- More training on apiculture management in the communities since the research shows, as might be expected, that trained members performed better than non-trained members.
- The establishment of demonstration apiaries (recommended in the GoK, Ministry of Livestock Development 2010 and 2011 reports.
- The development of a GoK scheme to buy wax from the local producers as this will show the community the value of wax. Private sector involvement in such a scheme is also an option.
- Setting up a formal market structure for beekeeping and honey production in the region to create further business opportunities for bee-keepers.
- A clear national policy for the apiculture sector should be established.

6.5 Conclusion

Pkalya et al., (2003: 14) note that pastoralists are among the most marginalized people in Kenya, often having virtually no say over the changes that are impacting upon their lives. This study has reviewed some of these policies and how these, coupled with environmental factors, have seen the move of the pastoral Pokot of Baringo County towards the adoption of apiculture. It was because of the policies that redefined and exacerbated poverty among this group that alternative livelihood strategies were pursued. This was compounded by the recurrent droughts of the 1980s and 1990s, the government's interests in developing the ASALs through the Arid Lands Programme, involvement of external agents like NGOs that promoted apiculture in the region and the benefits of bee products in the face of declining function of livestock. Beekeeping and honey production has proven functional in the region and has the promise to be a formidable livelihood strategy in the region. It is up to the government, educators, practitioners and policy makers to see that this alternative livelihood strategy is promoted in the region. However, as has been argued, in trying to promote livelihood diversification in the ASALs, pastoralism should not be discouraged as the colonial and the earlier post-colonial governments tried to do. Livelihood diversification in the ASALs should, however, be contextual. Not all ASAL areas might favor apiculture. As discussed already, Churo is

part of the East Pokot and next to honey producing regions like Tangulbei, Chepkalacha and Kwokwototo, but it has instead embraced agriculture more than apiculture because of its high altitude location which has relatively higher humidity. Therefore, national policies should also take into account micro-level differences in order to be effective.

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