



Regional Pastoral Livelihoods Resilience Project (RPLRP)



Stocktaking Study of Complementary Livelihoods Market and Value Chain Analysis for Identified Priority Products in IGAD Region Cross-Border Areas

Assessment Report, April, 2017



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IGAD Centre for Pastoral Areas and Livestock Development (ICPALD)



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Executive Summary

Because of ecological and climatic changes, animal diseases and increasing insecurity, many pastoralists in East Africa in general are being forced to fully or partly exit the pastoralism. Instead, they are increasingly getting involved in complementary livelihoods and adopting non-pastoral income strategies in order to supplement their income, meet consumption needs and cushion themselves against shocks.

The overall objective of this study was to identify activities that are providing complementary livelihood support and to conduct market and value chain analysis for the selected commodities. This included understanding the potential of complementary livelihood activities, marketability of the products and the challenges encountered. This is necessary in the design of appropriate intervention mechanisms to support the pastoralists with their agro based activities. The study was conducted in targeted clustered areas in the IGAD region, including the following: (i) Borana and South Omo zones in Ethiopia, (ii) Marsabit, Turkana and West Pokot counties in Kenya and (iii) The Karamoja region in Uganda. This was a qualitative study where data was collected through key informant interviews, focused group discussions, and was substantiated with extensive review of literature.

The study found out that a number of complementary livelihood activities exist in all the areas visited, but the potential for their commercialization varies from one location to another depending on the abundance of relative resources and access to market which leads to their socio-economic contribution. Moreover, the fact that projects often have a short life based on support, adopting complementary livelihood activities is more advisable than introducing new ones. Consequently, the six most essential complementary livelihood activities for the targeted cluster of pastoral areas are poultry farming, fishing, beekeeping, use of Aloe Vera plant to make products, milk collection and processing, and basketry. Their relative importance, however, varies from place to place. Accordingly, the following applies: (i) Poultry farming is more prevalent in West Pokot and Karamoja regions; (ii) Fishing is more sustainable in South Omo zone and Marsabit County; (iii) Milk collection and processing is viable in Borana and Marsabit; (iv) Beekeeping in South Omo, Turkana, West Pokot and Karamoja; (v) Basketry in Turkana; and (vi) Aloe Vera plant is applicable in all study areas considered.

The findings show that these complementary income-generating activities have become increasingly significant and significantly reduced poverty and vulnerability to food insecurity. Both men and women and even children participate in complementary livelihood activities, but the women's role is the greatest.

However, a number of constraints restrain the realization of the full economic potential and opportunities of these income generating activities. These include: lack of transport, poor access to markets; lack of technical and business skills; inadequate supply of basic inputs; limited startup capital; absence of improved technologies for production and value chain development; and weak supportive services, among others. The intensity and severity of the challenges vary across the region and from product to product. The challenges, along with recommendations, are explained in each section of this report.

Introduction

Today, pastoralists are increasingly under pressure to diversify their livelihoods beyond the reliance on livestock which has traditionally been their main source of income. The upsurge in human population, recurrent droughts, severe land degradation and the consequent shortage of fodder and water have constrained the sustainability of the livelihoods of pastoralists. These challenges are further compounded by stresses related to changing global climatic conditions and increasing insecurity that have forced many to drop pastoralism. Thus, it is apparent that the traditional livestock keeping system alone can no longer adequately support livelihoods in pastoral areas.

Due to a general misconception that drylands are resource-poor, arid and semi-arid areas have not attracted much investment or any significant development initiatives from either the private or public sector. Despite this, pastoralist communities living across the Greater Horn of Africa are undergoing rapid social and economic changes such as expanded linkages with national and international markets. This has led to the growth of small trading towns. Furthermore, these areas are endowed with natural products with market value at local, national or international markets. These offer a good opportunity for development of tradable complementary livelihoods and hence poverty reduction.

Today, a diversity of commercially oriented resource usage and complementary economic activities are emerging. In particular, women are undertaking a wide-range of enterprise activities that take advantage of available opportunities. These activities aid in the provision of services and improved access to markets along road networks, in small towns and at trading centers. However, there are still a number of constraints that limit the realization of the full potential of the emerging complementary livelihood activities. These particularly include being in remote locations away from large markets and economic centres, lack of skills, and the absence of training necessary to enable full participation in value addition among other factors. Thus, identifying high potential complementary income generating activities that can contribute towards reducing problems associated with poverty and vulnerability to food insecurity, and also facilitating an understanding of their market potential and challenges are all essential in the design of appropriate intervention mechanisms to support the agro based pastoralists.

1.1 Background to the Assignment

As part of its wider drought resilience building initiative in the Horn of Africa, IGAD has secured financial support from the World Bank to execute a regional project called Regional Pastoral Livelihoods Resilience Project (RPLRP). The Project's main objective is to enhance livelihood

resilience of pastoral and agro-pastoral communities in cross-border drought-prone areas of selected countries, and to improve their capacity to respond promptly and effectively to crisis or emergency. Livelihood support is one of the key components of the RPLRP. It aims at enhancing the livelihoods of pastoralist and agro-pastoralist communities, focusing on livelihoods diversification (in addition to livestock and crop production) through identification and strengthening of complementary activities.

Within the context of RPLRP at each country level, the project will support feasible complementary livelihoods; that is, support specific products with potential for local and cross-border trade. This should have impact by raising interest among countries for improved processing and marketing of their products. Thus, IGAD/RPLRP was commissioned to carry out a stock taking study to identify major complementary livelihoods and products and hence conduct market and value chain analysis.

1.2 Objective of the Study

The overall objective of the study was to identify activities and products that are providing complementary livelihoods support in pastoral areas. Specifically, the study had two sequential objectives:

- i. To identify major products that are common among the targeted trans-border communities; and
- ii. To conduct market and value chain analysis for the selected commodities.

1.3 Limitation of the Study

The study concentrated on identification of the most economically important complementary livelihoods and value chains in selected cluster areas of IGAD in Ethiopia, Kenya and Uganda. It further went on to analyze the value chain development of the products. The study entirely depended on primary qualitative and quantitative data. Owing to inadequate research in the area of development interventions, the researcher could not get time series data on basic variables such as prices and volume of production and market supplies from secondary sources. This made the researcher to limit the scope to forecast on the price and production trends of some products. In addition, the researcher could not reach the final destination markets (for example, Kisumu, Congo, and others) for some of the products due to time limitation and also because some of the markets were inaccessible. Nevertheless, an extensive review of literature using the internet filled this gap. Thus, this study still gives sufficient information to development practitioners and policy makers with an interest in value-chain development interventions for selected products.

Methodological Approaches

Among the cross border target clusters of IGAD, primary data was collected from Karamoja (Uganda), and Borana and South Omo (Ethiopia), and Marsabit, Turkana and West Pokot (Kenya). The study involved an extensive review of available reports, literature, and past studies by various scholars and authors. It also looked at reports from governmental, non-governmental organizations, and development partners related to complementary livelihood activities and market issues. Information on areas such as non-farm income generating activities and their contribution to household livelihoods, geographic distribution, and socio-economic characteristics of the value chain actors as well as trends and production seasons, sales and prices was also collected through Key Informant Interviews and Focus Group Discussions. More importantly, primary data was collected through field visits in selected areas of the clusters. The data collection and analyses followed two phases as discussed below.

2.1 Phase I: Identification of Complementary Livelihood Support Options

Key Informant Interviews (KII) and Focused Group Discussions (FGD) were conducted in the target locations at Zonal/District and County levels in the selected IGAD RPLRP cluster areas in Ethiopia, Kenya and Uganda. Checklists and sub-structured questionnaires were used to collect information through KIIs. The researcher held discussions and consultations with key stakeholders such as traders, processors, consumers, Government officials, and NGO representatives. Other researchers and scholars were consulted to share their experiences and opinions on the subject matter.

In addition, FGDs were conducted with agro-pastoralists who are engaged in different complementary livelihood activities. Table 1 below shows sample locations visited for primary data collection across the agro-pastoral areas of the program countries. For the results of FGDs to be effective, between two and three specific localities were visited in each sample zone, county and district of the respective program countries (see Table 1). This process helped to exhaustively come up with a list of marketable products used as complementary source of income in the cluster areas.



Figure 1: FGD conducted at Lokichogio, Turkana West, Kenya.

Based on the results of the FGDs, the KIs as well as the analysis of the literature review, top priority products were selected using specified criteria such as; socio-economic contributions, marketability, sensitivity to shocks and sustainability for detail market and value chain studies (This is highlighted in section 4.2 below).

Table 1: Sample Areas Visited for the Field Survey in the Program Countries

Ethiopia	Kenya	Uganda (Karamoja region)
Borana Zone	Marsabit County	Moroto District
Yabello	Saku	Abim District
Moyale	Moyale/Sololo	Amudat District
	Laisamis	Katakwi District
South Omo Zone	West Pokot County	
Dasenech	Kacheliba	
Hammer	Chaparreria	
	Turkana County	
	Turkana West /Lokichoggio	
	Loima/Kospirri	
	Turkana Central	
	Lake Turkana	

2.2 Phase II: Undertaking Market and Value Chain Studies on Selected Products

The field visits also entailed interviews covering issues related to market and value chains. This was done with community members producing the selected products and all actors along the market chain. The researcher undertook a detailed assessment of market and value chain studies to establish the extend to which the identified products are produced, processed, distributed and reach destination markets in these three countries. The level of production and sales at each segment of value chain actors, and perceived constraints and opportunities for greater access to these markets were also assessed. In addition, best examples and experiences regarding the linkage of pastoralism and complementary livelihood resources were explored.

2.2.1 Framework of Value Chain Analysis

According to Richter, P (2005), a Value Chain (VC) is defined as a sequence of related business activities (functions) from the provision of specific inputs for a particular product to primary producers, processors, sellers and distributors and final consumers. Value chain analysis (VCA) is

a method for accounting and presenting the value that is created in a product as it is transformed from raw inputs to a final product consumed by end users. According to Lundy, M; Gottret, M.V, et al. (2004), it consists of the following four major elements:

- (i) The first component is value chain mapping, which systematically links different actors involved in the ladder of value chains. This is production, processing, marketing, distribution and consumption of a given product. Such a mapping examines the basic features of actors, the gross margins and nature of costs, the flow of commodities within the chain and the final destination of the goods produced and traded.
- (ii) The second element is the analysis of distribution of benefits among actors of the VC at each level.
- (iii) The third is inspecting the importance of upgrading in the VC. This involves improvements in quality and product design that enable producers to gain higher value or through diversification in product lines served. While analyzing the upgrading process, one assesses the profitability of each actor within the chain and identifies constraints that prevail in the VC.
- (iv) Finally, it entails identifying governance within the VC, where governance refers to the structure of relationships and coordination mechanisms that exist among actors in the VC. Governance is important from a policy perspective. This is done by identifying the institutional arrangements that may need to be targeted to improve capabilities in the VC, remedy distributional distortions, and increase value added in the sector under consideration. Access to chain is influenced by a wide range of factors at macro and micro level including the nature of state and regional policy, level of infrastructure and access to technology, as well as the characteristics of markets.

Socio-economic Characteristics of Livelihood Diversification Pathways

In this context, pastoral diversification is defined as the pursuit of any non-pastoral income-earning activity in both urban and rural environments. This includes various forms of production and sale of honey, fish, and other artisanal goods. Others include waged employment and the gathering and selling of firewood, charcoal, wild products such as gum Arabic and medicinal plants among others. Gender, proximity to urban centers and wealth status of a household are key determinant factors to involve in livelihood diversification in pastoral areas. These are discussed as follows:

Gender: Gender is one of the key determinants of the options chosen for diversification (Little, 2001). According to Field (2005), single mothers are most likely to try new income generating activities even though they may have limited resources and may also possess low levels of capital. In general, women tend to engage in micro businesses such as trading in milk, wild fruits, processing and selling fish, charcoal, firewood, alcohol, mat and basket weaving, and offering their services to fetch water (Nduma et al., 2001). Conversely, men frequently engage in livestock trading, fishing, carpentry, construction work, long distance hawking, and provision of security services. They take advantage of comparatively more remunerative waged employment compared to women, which often involves labour migration. They sell poles, rent buildings, and own shops, including butcheries (Little et al., 2001). According to Little (2001), waged employment is often prioritized and regarded as the most appropriate form of diversification to ensure food security.

Proximity to Urban Centres: Proximity to urban centres also affects the number and range of options open to those interested in livelihood diversification. Casual and permanent jobs are readily available in urban centres. In addition, there is ready market to sell foodstuffs like fruits, milk, chicken, fish and other commodities like charcoal and handcrafts.

Wealth Status: Pastoralists' diversification profiles illustrate clear dualistic tendencies. For example, the wealthy diversify in order to promote economic growth and accumulate additional wealth, whereas the poor diversify in order to survive (Little 2001). According to Little et al. (2001), mid-level income pastoralists tend not be so much involved in income diversification; something that was also noted over 40years ago by Barth (1964).

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Identification and Selection of Complementary Livelihood Commodities for Value Chain Analysis

4.1 Identification of Complementary Livelihood Commodities

Both men and women are capable of getting involved in complementary income generation activities if the right conditions exist. Pastoralists have attempted to diversify their livelihoods traditionally to an extent that they have not been involved in modern financial transactions per se. They have been producing goods using local natural resources and engaging in barter trade. For instance, diverse plant species in ASALs provide opportunities for complementary livelihood activities that can be used to produce commercially important products.

The researcher had two important issues to study namely; (i) identifying the commodities, and (ii) conducting marketing and value chain analysis. From experience, there are principles and procedures to be followed in both cases.

A list of Complementary Livelihood Activities (CLH) was identified through participatory survey as indicated in the methodological approach. This was done in consultation with communities, governments and non-governmental organizations that are supporting the locals, other researchers and scholars with enough experience of the local economy. The CLHs identified are mainly those currently practiced by the pastoral communities but differ from location to location and across program cluster areas. Table 2 below shows the list of major CLHs with associated opportunities and challenges in production, processing and marketing.

Table 2: List of Complementary Livelihoods, Opportunities and Challenges Across the Study Areas

Identified CLHs	Current Situation	Opportunities/Strength	Challenges	Applicability to specific location
<p>1. Aloe Vera plant for soap, lotion, cream, etc.</p>	<ul style="list-style-type: none"> • NGOs have been introducing new methods of making soaps, lotion, cream, etc. For example, in Ethiopia - South Omo Zone (Hammer) through AfD, Borana by SoS -Sahel; Kenya in Baringo County & Turkana West ; • Quality taste is acceptable • Women are more attracted to the business – can easily be done at home or in the garden. • Some groups in Turkana & South Omo have already domesticated the plant in operation areas. 	<ul style="list-style-type: none"> • Wildly and widely growing in many bushy areas & available throughout the year. It is little affected by drought. • Shift of perception – Aloe Vera moves from being invasive to use in making detergents & cosmetics. • Freely available for use except for the labour cost of collecting the liquid sap. • Can easily be learnt through training within a short span of time. • Not labour intensive and time taking. It involves participation - women, men, children, elderly and even disabled can be involved • Aloe-soaps & lotions have medicinal values for curing skin diseases. 	<ul style="list-style-type: none"> • New and not familiar within the community. • Problem of access to inputs, molding and packaging materials. • Competition with industrial soaps already in the market. • Weak in group management and marketing • Currently, the plant is over-utilized by some uncensured individuals (massive harvest & burning to form cake for export in Kenya and Uganda). This is unsustainable. The marketing & the purpose is also not clear to the community. 	<ul style="list-style-type: none"> • Ethiopia (many places in South Omo & Borana) • Kenya (West Pokot, Turkana) • Uganda (Amudat, Katakwi, Moroto)

Identified CLHs	Current Situation	Opportunities/Strength	Challenges	Applicability to specific location
<p>2. Fishery</p>	<ul style="list-style-type: none"> Fishing is primarily for market & home consumption of the food is secondary. Well practiced in Turkana County in Lake Turkana (Kenya). Households are organized in Groups/Cooperatives & Unions. Gets support from NGOs (USAID). Employs improved facilities (Nets, motorized boats) and is linked to the market (Loyya Consult). Marsabit County least benefits from fishing compared to Turkana's traditional fishing activities and has a disorganized marketing system. Ethiopia –fishing is along the Omo River but some traditionally comes from Lake Turkana. Semi-processing (drying & salting) is practiced. Ponds and dams are emerging with high potential for fishery in Karamoja (Uganda). High government interest and attention 	<ul style="list-style-type: none"> Availability of fishing water bodies along the Oromo River, dams and Lake Turkana. Both men and women participate Growing market demands in local towns and cross boundary trade. 	<ul style="list-style-type: none"> Lack of fishing facilities -lack of modern nets and boats Lack of access to market center - far from market places & weak bargaining power Poor processing and storage facilities Middle men are most benefited 	<ul style="list-style-type: none"> Ethiopia (South Omo-Hammer, Dasenech & Nyagatom) Kenya (Dasenech, Turkana) Uganda (Katakwi)

Identified CLHs	Current Situation	Opportunities/Strength	Challenges	Applicability to specific location
<p>3. Beekeeping</p> <ul style="list-style-type: none"> • It is not taken as a business in all areas; only limited people do practice • Limited to areas with good bee fodder (good vegetation cover) and access to water • Local beehives are used; introduced KTB is largely rejected due to inadequate orientation & follow up • Honey production & sales is individually practiced; not processed • some cooperative are also formed for collection and processing - but weak 	<ul style="list-style-type: none"> • Availability of good flora and water in areas where it is currently practiced • There are some traditional experience that could be promoted • Men are actively engaged 	<ul style="list-style-type: none"> • Still low local knowledge • Lack appropriate technology • Seasonal with rainfall pattern • Women are weakly participating • Attacked by wild predators (e.g Black ants) • Susceptible to bush fire 	<ul style="list-style-type: none"> • Ethiopia (South Omo -Hammer, Male, Selemago & Benetsemay) • Kenya (West Pokot, Turkana) • Uganda (in all Karamoja region) 	
<p>4. Gums & Resin</p> <ul style="list-style-type: none"> • Individual women and children do collect while herding the livestock • Cooperatives are established in South Omo and Borana – but weak in performance • Somalis buy Resin in large quantities for export to Arabia; local people also do some • Gums are collected by cooperatives – but cannot get market 	<ul style="list-style-type: none"> • Women are most involved and be beneficial • Environment friendly • Cooperative already established - but able to produce - resin 0.45 ton/year only • Gum Arabic trees (Acacia Senegal) is sparse - often browsed by camel/ goats and cut off for charcoal • Resin price is - 45 birr/kg in 2016 • Widely used in cosmetics, pharmaceutical and confectionary (food) industries and for many other purposes 	<ul style="list-style-type: none"> • Demands enclosure of the area - may create conflict in the community for grazing • Susceptible to bush fire • Limited natural potential for supply -seasonal for max 3 months/year -supposed to go far from home (>25 km) • Reliable market information on gum resins is lacking • Only women are engage in • Gums do not have local market, and are weak for the resin, but inadequate supply for export 	<ul style="list-style-type: none"> • Ethiopia (in few areas of South Omo and Borana) • Kenya (Marsabit and Mirille) • Uganda (Moroto) 	

Identified CLHs	Current Situation	Opportunities/Strength	Challenges	Applicability to specific location
<p>5. Handicrafts- ornamental beads, pottery, wood & metal works</p>	<ul style="list-style-type: none"> • Beads are locally produced as ornaments largely for women and some for men, traded and bartered with goats; • Few are marketed to tourists & passengers • All the intermediate inputs for beads imported from Nairobi or abroad 	<ul style="list-style-type: none"> • Culturally, commonly use by a large number of women • Good demand in the local market - particularly during wedding & cultural ceremonies • SCLH ble as gift items in gift shops in small & big town (but limited) 	<ul style="list-style-type: none"> • Limited market outside the community • Depend on industrial raw materials • Limited capacity to contribute to the HH economy of the poor • Pottery and metal works are restricted to certain clans only - which are stigmatized • Area of intervention to support is not clear 	<ul style="list-style-type: none"> • In pocket areas of many agro-pastoralists across the country
<p>6. Basketry</p>	<ul style="list-style-type: none"> • Pastoral women and girls collect palm tree leaves and produce different kinds of baskets • They sell to women groups at Lodwar basket market centre, or on the road sides 	<ul style="list-style-type: none"> • Abundant resource (palm tree leaves) along the lake Turkana and Turkwel River 	<ul style="list-style-type: none"> • Limited access to market & low bargaining power • Lack skill to fit the needs of Tourist & urban clients 	<ul style="list-style-type: none"> • Kenya (Turkana)

Identified CLHs	Current Situation	Opportunities/Strength	Challenges	Applicability to specific location
7. Poultry	<ul style="list-style-type: none"> Local breed and free grazing Agro-pastoralists and dropouts are more engaged than pure pastoralists Generally few pastoralist practice poultry (better in West Pokot of Kenya & Karamoja region in Uganda) Chapareria Sub-county (W. Pokot) is best place for poultry & well connected to market Karamoja region is moderately practicing poultry farming. 	<ul style="list-style-type: none"> Good and fast source of food and cash for the poor High market demand for chicken and eggs 	<ul style="list-style-type: none"> In adequate number of HH participation in the production Lack of skill in poultry management Diseases like New Castel Disease - NCD Low productivity, poor quality Poor transport and market Compete human being for food grains 	<ul style="list-style-type: none"> Kenya (West Pokot) Uganda (in all Karamoja Region)
8. Informal Trade	<ul style="list-style-type: none"> Concentrated in towns & mostly practiced by women Products are often retailing varieties of consumable industrial goods, local food & drinks, goats, etc – anything tradable sometimes moving the product from one to the other market places 	<ul style="list-style-type: none"> Aliened to group saving and credit - would improve the saving culture because of peer pressure, getting into business through value addition 	<ul style="list-style-type: none"> Illiteracy and lack of capacity in numeracy, reading and writing Lack of skill in entrepreneurship Hard to define the market chain 	Everywhere practicable
9. Milk collection & processing	<ul style="list-style-type: none"> Many pastoralists sell fresh milk in the local market to local consumers and traders/brokers – mostly those near the market centers or road sides The volume of sales is proportional the number of milking cows & camels owned Minor processing is done at household level – boiling, extracting butter, etc, 	<ul style="list-style-type: none"> The milk from cows and camel is abundantly available during wet season; camel milk is stable in both dry and wet season. Already there are some experiences by groups / cooperatives – but weak High demand due to growing hotels & Cafes Women would be most benefited 	<ul style="list-style-type: none"> Poor organizational arrangements in group and cooperatives already involved lack of entrepreneurial skill lack of transport to the market places lack of cooling and storage facilities 	<ul style="list-style-type: none"> Kenya (Marsabit) Ethiopia (Borana zone)

Identified CLHs	Current Situation	Opportunities/Strength	Challenges	Applicability to specific location
<p>10. Mining (gold)</p>	<ul style="list-style-type: none"> Extraction is absolutely by informal groups or individuals (men, women & children participate) The volume of production cannot be estimated over time –exploration is random, very traditional tools are used & efficiency is very low High immigrants to extraction sites Marketing is also very informal Gold miners remain poor; but middlemen and the traders are getting richer 	<ul style="list-style-type: none"> High market demand 	<ul style="list-style-type: none"> Important areas of mining have been already occupied by few individuals; Not easy to find potential places elsewhere No clear evidence as to the potentials of mining – the current operation is just a random and chance Operators lack improved tools for extracting and processing Existing resource is near to be depleted – unless newly explored but no exploration works 	<ul style="list-style-type: none"> Ethiopia (some places in Borana) Kenya (some places in West Pokot, Turkana) Uganda (Ambi, Moroto)
<p>11. Charcoal and firewood</p>	<ul style="list-style-type: none"> It is practiced everywhere and anytime in pastoral areas The trend in the supply is dramatically increasing Income is easily available 	<ul style="list-style-type: none"> High local market demand The resource is currently easily available Widely practiced by both female and male 	<ul style="list-style-type: none"> Cause to deforestation and land degradation – not sustainable Need careful management plan 	<ul style="list-style-type: none"> Common practice to everywhere in pastoral areas

4.2 Selection of Products for Value Chain Development

The researcher had the following questions to answer:

- 1) How should we select the commodity?
- 2) What is the criteria to follow in the selection?

Answers to these questions were sought before the researcher went to the field to undertake market and value chain analysis. The general principle followed was that commodities for value chain development intervention are selected based on their respective contribution to defined socio-economic indicators. In the context of agro-pastoralist communities in East Africa, the fundamental criteria used to select a commodity for value chain development include the following:

- (i) Contribution to poverty reduction (food security).
- (ii) Volume of product and size of participating stakeholders.
- (iii) Marketability of the products which include; product demand and market potential/opportunity, for example, the possibility of accessing niche market, and many more.
- (iv) Fairness to gender balance.
- (v) Potential growth with the support and access through technology.
- (vi) Low risk due to climate change and
- (vii) Environmental sustainability.

After consultation with key informants in all study areas, the criteria mentioned above was used. Weight was given for each factor depending on the social and economic context of the respective study areas. Values were then aggregated from the list of complementary livelihood activities indicated in section 4.1 above. Based on consultation with stakeholders, the most important complementary livelihood activities were selected from the various options. These included poultry farming, fishery, beekeeping, and use of Aloe Vera plant for the production of soap, lotion, shampoo and cream and also the collection and processing of milk products and basketry.

Table 3: Selected Complementary Livelihoods Specified by Locations

No	Products	Ethiopia	Kenya	Uganda
	Poultry	-	West Pokot	Karamoja
	Fishing	South Omo	Marsabit	Katakwi
	Beekeeping	South Omo	West Pokot, Turkana	Karamoja
	Aloe Vera soap and other products	South Omo Borana	West Pokot, Turkana, Marsabit	Karamoja (Amudat)
	Milk collection and processing	Borana	Marsabit	-
	Basketry	-	Turkana	-

Note: In Karamoja region, the specification refers to Moroto, Ambi, Amudat and Katakwi districts.

However, in the validation workshop held in Naivasha on 31 March, 2017, a section of participants from the three countries proposed additional complementary products as depicted in Table A1 in the Annex section of this research. While appreciating the suggestions from the participants, the consultant, however, was hesitant to consider their proposals as part of the commodities (see Table 3 above). The researcher instead recommended for intervention arguing that they do not meet the required criteria. Moreover, given the available budget and timeframe of the IGAD program, these products could not be made a priority. In addition, clients should carry out further investigation to generate facts and evidence, if interested to take up the products in the priority setting for intervention.

Marketing and Value Chain Analysis of Selected Alternative Livelihood Activities

This chapter presents details of the production and marketing process as well as the value chain maps of the selected value chain commodities presented in section 4.2 above. It includes the roles and functions of the value chain actors, the challenges, opportunities and the recommendations on the value chain. It should be noted that the value-chain analyses of the commodities stated are specific to the locations that are recommended.

5.1 Poultry Marketing and Value Chain Analysis

As previously mentioned, chicken production and marketing is found to be most feasible complementary livelihood, particularly for the people of West Pokot in Kenya and Karamoja region in Uganda. The respective key informants estimated that over 70% of the total households in both West Pokot and Karamoja are involved in the sub-sector and almost all keep indigenous chicken. The main activities identified in this sub-sector are production, marketing (secondary bulking and primary bulking, transportation, wholesaling and retailing). These activities, along with the range of participants who engaged in the various functions are described in details in the section below.

5.1.1 Poultry Production and the Roles of the Actors

Poultry ownership: This is not as simple as cattle and goats keeping in pastoral areas. The ownership is apparently diverse; that is, it is kept by both men and women and children as well. From the results of the FGD, majority of poultry farmers are women. The role of women in poultry management is significant through provision of basic care.

Poultry feeding: Based on the researcher's observation followed by a discussion with government experts and producers, it emerged that currently, indigenous chicken management is a low-input based project. Chicken are basically left to wander independently (on free-range to scavenge) and look for food. Feeding the indigenous flock is simply a matter of choice and is often not planned. For, example, a female winnowing grains or threshing maize can end up shedding the leftovers that chicken will eventually feed on. Deliberate flock feeding is not common. In most cases, it is accidental. Producers tend to either leave food leftovers and/or waste from the

kitchen for the poultry and dogs to feed on. There are no reported cases of supplementary feeding for indigenous chicken since the people lack enough to feed their families from the farms and therefore cannot reserve or afford chicken feeds.

Health Care: It is reported that very few poultry keepers bother to buy drugs and pay attention to threats of pest and diseases control. Poultry health care is often done through use of herbal medicine. This mainly takes place during epidemics. Red pepper and fresh leaves of aloe spp. are usually crushed and put in a trough with water for the chicken. Veterinary services are rarely sought unless there is a general support program to the sub-sector from either the government or the NGOs. This is associated with three factors; (i) lack of knowledge among the poultry keepers on modern drugs that are available for managing chicken related diseases and the availability of associated services, and (ii) little attention is given by the service providers as well as lack of resources to seek for veterinary advisory services.

Housing: Less than 5% of the households have built dedicated pens for their flocks. On the other hand, the bulk of those keeping chicken shared their houses with the chicken. The chicken either sleep under the bed or in the kitchen. Little or no management and care is offered. Farmers tend to forget and assume the needs of their flock.

Breeding: There is no selective breeding being done. Stock breeding is left to occur naturally. Therefore, it is apparent that no breeding is practiced except for rare cases involving informal breeders. However, inbreeding is common but no specific controls are employed.

Production and Productivity: The average flock sizes per household in the two districts were varied. There were between 5 and 16 in West Pokot County (average of 10 birds) and 2 to 10 in Karamoja region (average of 5 birds). A hen lays eggs three times a year which hatches to between 10 to 15 chicken in both localities. This is considered low and occurs as a result of poor management practices. The rate of hatching is as high as 75 percent, but chick mortalities range from 40 percent to 50 percent in West Pokot and 50 to 75 percent in Karamoja. This means that the survival rate is very low. Mortalities are associated with predation, pests and diseases, hunger, and poor housing. It is considerably high during very dry seasons.



Figure 2: Traditional Chicken husbandry

5.1.2 Poultry Marketing and the Role of the Actors

In general, the poultry market is relatively much better developed in West Pokot in Kenya than in Karamoja region in Uganda. The transaction and roles of local collectors, brokers and traders are more significant in West Pokot but trivial in Karamoja. Hence, large transactions take place between the individual producers and the end users (individuals, restaurants/hotels). As noted in both study areas, selling of eggs from indigenous poultry is very rare. Eggs are also rarely consumed at home. The communities consider eggs as a stage of flock size development but not an end product.

In West Pokot, individual poultry keepers utilize three marketing nodes which include; sales at home, by engaging local collectors and through traders. During the local market days which are periodic, poultry keepers have the opportunity to sell to brokers. These brokers are normally positioned on the market access paths. Alternatively, they can also sell to traders based at the market. Brokers are important market connectors as they source birds from producers in the interior. They then supply these to traders operating in the markets. Flock trading arrangements take place throughout the week. Different regions have dedicated periodic market days. The tendency and preference is to sell to brokers since this offloads the burden of taking the chicken to the market and also waiting for the market day.

The price of chicken varies by their size, season and sex. The price determination mechanism is not through a calibrated scale. The practice is to weigh the chicken by lifting it up and assessing its weight. This can also be done by determining the amount of flesh on the chicken's breast. During the time for harvesting crops, the prices of chicken are higher since a small proportion of households are willing to sell. This is because the sale of chicken is used to generate cash to buy complementary food for the household. By coincidence, this is also the time when chicken are relatively healthy. The number of birds in the market is high during the dry period. Incidentally, these times also coincide with disease outbreaks and severe food scarcity. Poultry keepers market their birds for two reasons. First, to address household financial needs, and secondly, if need be offload the flock so as to shift the mortality burden.

Of the various transitional bulk markets that were identified, Chepareria in West Pokot and Moroto in Karamoja are the most important. These areas are sources of true organic chicken and could be the best market niche for organic demanding consumers. They handle the highest number of birds per market day and exhibit the highest level of trade interactions. This can be attributed to its convenient location and ease of access. In addition, the producers, the local collectors/assemblers, intermediate traders, wholesalers and retailers are the key market actors in the study areas.

a) Local Collectors

In West Pokot, local collectors handle over 90 percent of poultry that goes to distant places. These actors are of two types; village-based collectors responsible for bulking throughout the week and routes-based collectors who act as traveling traders. These two have similar

roles, however, there is a small difference; the traders at the villages offer comparatively low prices and are directly linked to associating traders whom they have supply arrangement with.

- (i) **Village-based collectors:** This sub-category is made up of the local population living in the villages where poultry farmers are. During the period that the brokers are not in the periodic market, they move from one household to the other in search of those willing to sell their chicken. Since the locals also know the brokers, quite often they are invited to the homes of the poultry keepers to buy chicken. Their tools of trade are a bicycle for moving around, a crib to carry the chicken and a housing pen located at their homes. Village-based brokers serve a limited number of periodic markets, usually between one and two. In addition, each one of them is associated and linked to an individual trader who visits a particular market during a designated day within the week. Price determination in the poultry business is subjective, for example, no weighing scales are used. About 90% of these village-based collectors buy chicken in bulk and keep them in their homes while waiting to deliver to the market during the market day. Alternatively, they arrange to meet the contact trader as per informal business arrangements. All the chicken that the broker handles is exclusively done on behalf of the collaborating trader. No formal records are documented for such relationships and the transactions are based on personal trust. The trust is developed through a trading relationship with time.
- (ii) **Routes-based collectors:** This sub-category is made up of itinerant traders only available during periodic market days. They are highly mobile for most part of the trading period. They actively operate on a radius of between 50 to 100 metres from the main market centre. These brokers offload poultry from individual producers visiting the market and on rare occasions they get in bulk from village-based brokers (especially those new in the business). Their operations are often facilitated by use of bicycles and cribs. The business tendency within this category of brokers is to be highly mobile along different routes. Compared to the village-based operators, their price quotation is relatively higher.

In general, the common issues of value to this analysis for village and route-based traders are;

- The marketing channel is still affected by mortalities that negatively affect the business. This can be attributed to poor transportation, management and diseases, among others.
- The close relations and links, especially for the village-based brokers to the producers, could be used for piping embedded service provisions. In the case of traders, there are opportunities for strengthening credit provision and guarantees for repayment.
- By identifying market expectations in terms of sizes and other specific requirements, brokers are better placed to support information provision at the production level geared towards improving quality production of indigenous poultry.
- They also act as 'market connectors' for and on behalf of producers.

b) Intermediate Traders

Joseph M. Mathuva (2005) on his study of Kenya, categorizes these traders into two; distant traders and stationary traders. Both sub-categories rely on local collectors to get and offload chicken before transporting to market destinations.

- (i) **Distant Traders:** These traders operate in selected markets as dictated by the periodic market. They are rather selective on the markets they visit depending on competition. This may be based on how many traders go to the same market, the general flow and reliability of poultry into the market, availability and cost of transport to the destination markets, and availability of market intermediaries to support secondary bulking of the chicken. In order to enjoy economies of scale, distant traders target between 50 and 100 chicken for a single delivery. However, some markets demand lower volumes and present a challenge in this respect.
- (ii) **Stationary Traders:** This sub-category has a limited number of operators and is mainly made up of poultry traders with many years of experience in the poultry trade. The supply of chicken to this sub-category is from two core sources namely brokers and individual producers. Stationary traders have extensive operational knowledge of the poultry business as a result of many years of involvement. They have established reliable contacts to supply and deliver. These traders rarely move to the markets. In Kenya, they are well known locally within the market channel.

c) Wholesale Traders

These comprises of traders who usually deliver stock to destination markets in big towns. They prefer to offload their stock by wholesaling. However, wholesale in this context refers to offloading all the chicken delivered by a single trader at once to a single market-based trader.

Between primary bulking and wholesaling, traders are involved in transporting the stock. Depending on the source market, transport costs vary though the cost per bird from one market to the other is not well standardized. Trade-fares, however, do vary and influence the profit margin depending on the locality, connectivity and /or distances.

d) Retail Traders

Retailers are the key function in the entire sub-sector that makes the business work. They sell in single units to individuals and institutions. This function has differentiated players. Although retailing is a common practice, brokers and intermediate traders do not practice it as they bulk chicken on behalf of traders in big towns. In few cases, however, brokers and traders do practice retailing of chicken to known regular clients.

Traders at destination markets form the last stage of the value chain actors where live chicken can be traced. Traders at this point serve individuals and hotels where some of them have supply contracts. From the transactional activities within the trading hierarchies, there is evidently a pattern of market relationships and dependability. The main points arising from the above analysis are as follows;

- Cocks attract a higher return along the marketing chain compared to hens yet only 26 percent of the birds sold are cocks. By employing enhanced care and management practices which may increase the number of cockerels, pastoralists are better placed to increase their income from poultry.
- Among different categories of traders, brokers make a significant margin from poultry trade. This activity is, however, associated with low input in the enterprise and tough negotiation for favorable pricing. Brokerage is a service with minimal risks and inputs.
- Along the chain, there are no formal traders (particularly in Karamoja) who operate or directly source poultry from the pastoralists and then sell directly to the terminal distant markets. This is due to distance and bulking processes.
- Producers have to sell poultry as a last resort to raise cash for immediate needs and therefore are in a weak bargaining position. They also lack current information about markets and market trends.
- There is lack of proper and transparent mechanisms of price determination since the mechanisms used are subjective and highly depend on the buyer's assessment.
- There is an apparent gap in the supply of indigenous poultry .Smaller markets that producers and traders can take advantage of exhibit poor returns.
- In support of mainstream business services, the participation of brokers is considered particularly critical as they retain contacts with producers.

5.1.3 Pricing and Gross margin

During the study period, it was observed that the prices of chicken in the local pastoralist markets and the terminal markets in Kenya doubled compared to the year 2005. The prices of cockerels and hens are differentiated with cockerels being much higher at all market levels. It became obvious that the price of live chicken increases upwards as it moves from the producers to the end consumers. This is because of the build-up of transactional costs such as purchase of feeds, transportation permit, loading charges, among others. At the final market (such as supermarkets and hotels), the value-added services like slaughtering and packaging depending on the needs of the final consumers may be provided. Accordingly, the price margin from producers to final retailers is on average KShs 350 for hens and KShs 450 for the cockerels. This means the final price for the consumer is almost twice that charged by the producers in Kenya. The Gross margin excluding the transport and other associated costs is higher for the retailers at the end market. The range is from 100 to 165 per head for chicken. Although the chicken market is very much rudimentary due to poor involvement of traders, similar observation holds true for the Karamoja

region in Uganda. It is also worth noting that the prices of chicken often increase by more than 50 percent during holidays such as Christmas.

Table 4: Average Price of Chicken in Kenya and Uganda during August 2016

Value Chain Actors	Hen	Cockerel	Gross margin
Kenya	(KShs/head)	(KShs/head)	(KShs/head)
Producers (West Pokot)	300	500	270 – 470
local Collectors	350	600	50-100
Intermediate traders	400	725	50-150
Wholesalers	560	800	90-120
Retail price at big towns	650	950	100-165
Uganda (Karamoja)	(UGX/head)	(UGX/head)	(UGX/head)
Producers (Almudat)	7,000	8,500	6,500 - 7,000
local Collectors	8,500	10,000	1,200 - 1,500
Intermediate traders	12,000	15,000	2,500 - 3,500
Wholesalers (no information)	-	-	-
Retail price in big towns	16,000	20,000	3,500 - 4,000

Source: own source based on interviews with pastoral producers, traders and key informants
 Note: KShs – Kenya Shillings; UGX - Uganda Shillings

5.1.4 Poultry Value Chain Mapping

The Value Chain Analysis (VCA) concentrates purely on live birds. The mapping is done based on the different functions that are carried out in getting indigenous poultry from the producers to the end-markets. The poultry market chain is organized around market hierarchies. At each of these points, mean poultry price vary by type. The participants are also divided into different categories based on their upfront and backward linkages and their use of technology.

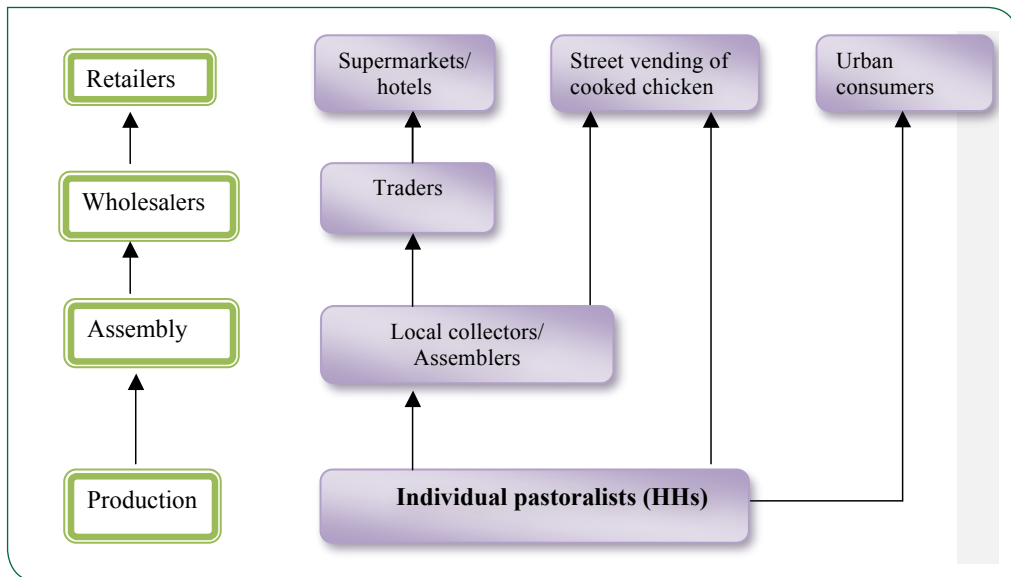


Figure 1: Value Chain Mapping of Indigenous poultry in the Study Areas

The market hierarchies:

Production end: This is the breeding point where the actor categories are poultry producers (pastoralists and agro-pastoralists).

Brokering point: There are two points at which poultry brokerage takes place; at the production end and along the routes leading to the periodic markets. Brokers form the basic bridge between the poultry producers and the traders. Their significance is in secondary bulking.

Primary markets: These markets are the lowest in ranking generally and are located in the rural areas/villages. The number of poultry is significantly less and attracts competition between traders. The brokers are, therefore, the ones playing the marketing roles.

Secondary markets: These form the critical nodes for terminal bulking of chicken in markets. Both traders as well as brokers play a major role here. Market centers within this hierarchy handled over 200 birds per market day (e.g. Moroto in Karamoja and Chepareria in West Pokot).

Terminal markets: These focuses on the end markets chiefly targeted by traders. Of importance is not the size but the destination. The interests of traders determines the markets in this category. Of particular mention is Nakuru and Nairobi in Kenya and Kampala in Uganda.

5.1.5 Poultry Production and Marketing Challenges

5.1.5.1 Challenges in Poultry Production

The indigenous poultry sub-sector is faced by a number of constraints at different levels. During the survey, these constraints were authenticated through FGDs and expert consultations. In this section, the constraints are categorized appropriately.

- **High incidences and rates of diseases:** Along the production and marketing chain, poultry diseases are notably reported and identified as a challenge. New Castle Disease is cited as one of the key poultry health concern. The disease is known to cause high chicken mortalities worldwide especially among the unvaccinated birds. The disease occurs as an epidemic and can wipe out the entire bird population in a short period.
- **Poor management and absence of business orientation:** The current indigenous poultry production systems are not business-oriented. Keeping poultry remains a traditional practice in which minimum input is applied hence achieving minimum return. The contribution of poultry sub-sector to the household economy is generally minimal (currently not exceeding 5 percent of the overall average household income).

Efforts to integrated approaches by addressing these constraints present valuable opportunity in;

- Increasing the sub-sector production and hence the incomes of the producers,
- Enhancing the quality of birds from the region,
- Increasing general sub-sector management knowledge and competence,
- Facilitating active participation of women in the sub-sector, and
- Overall commercialization and general organization or linkages in development.

5.1.5.2 Challenges in Poultry Marketing

Various diseases in the background of poor poultry management systems present a threat to overall production and marketing. The following are challenges specific to the poultry marketing aspects.

- **Limited marketing facilities and market development:** Poultry marketing is taking place at the household level, along the roads and in the market centers yet the local authorities are doing little to facilitate and support the market organization. The local government support to the business is quite limited. For instance, traders do not have access to relevant services and infrastructure to facilitate smooth business flow yet they still pay for permits. The Figure 4 below shows a chicken market.



Figure 4: Local Chicken Market at Chapereria in West Pokot

- **Transportation mechanisms and associated challenges:** Technologies used in the handling and transportation of chicken such as cribs are poor. This is responsible for injuries suffered by the chicken, and is likely to explain the notable mortalities. Quite often, chicken are suspended on public transport vehicle carriers and on bicycles during long distances transportation. They are also put either in the boots or under the seats exposing them to risks of being stepped on. Nearly 80 percent of the mortalities experienced by chicken traders are associated with transportation systems. It is therefore evident that interventions related to better handling of poultry on transit present an opportunity for reducing losses especially among brokers and distant traders.
- **Supply shortage:** Attaining economical volumes per market by individual traders is emerging as a limitation. For example, high supply gap as a result of excessive competition. This is especially true for markets enjoying better transport network and connectivity as exhibited by, for instance, Chapereria in West Pokot.

5.1.6 Recommended Intervention Activities

A thorough review of the sub-sector map and emergent interactions show that there are a number of services that can improve the production and marketing ends. However, some of these are weak, unexplored and non-existent. Thus, the state of value-addition as the sub-sector operates is quite minimal. In an effort to improve it, opportunities for value-addition exist at production, brokerage, market structure developments, input supply arrangements and trading.

Production

- The main weak hub that currently requires input and nurturing is the production side. Significant efforts are required in stimulating larger production with better quality through a number of approaches. This include; sensitization in the promotion of indigenous poultry production as a business among selected villages, intensive and extended training and support in improved feeding, housing and disease management system.

- Technical support to breeds selection adaptable to the region.
- Development and delivery of a comprehensive training on indigenous poultry keeping and management as a business venture as a shift from a traditional system to commercial system along segments of the chain.
- Facilitating active participation of women in the sub-sector.

Marketing

- Developing improved market structure and facilities at primary and secondary markets.
- Creating a 'win-win' market linkage among market actors (producers, brokers, traders and end users) and establishing transparent pricing mechanisms.
- Introducing improved transportation systems to enhance safety of the chicken. This will reduce mortality rate and maintain their qualities.

5.2 Fish Marketing and Value Chain Analysis

Fishing as a complementary livelihood is for selected areas particularly the Pastoralists in Marsabit County of Kenya and South Omo zone of Ethiopia. These communities source fish from Omo River (Ethiopia), Lake Turkana (Kenya) and possibly Katakawi (Uganda). Lake Turkana is a large water reservoir in the eastern arm of the Great Rift Valley extending 265 km in North-South direction and about 30 km wide. Approximately 90 percent of the lake's inflow is from river Omo, which is entirely in Ethiopia and enters the lake at its Northern end, creating a swampy delta. The seasonal Turkwell and Kerio rivers in Kenya flows into the lake from the Western shores. Lake Turkana constitutes a huge source of fish, and it is estimated that about 1,500 ton of fish per year can be harvested with traditional practice. However, there is no reliable evidence of fish stock density.

In addition to the Omo, the Waito River is also a rich source of fish for the South Omo people of Ethiopia. The rivers extend over a large area of land. In particularly, the Omo River crosses three Woredas in South Omo Zone namely Dassenech, Hammer and Nyangtom. This means that many people could potentially benefit from these water resources. Furthermore, Lake Turkana, which borders Ethiopia and Kenya, also gives an opportunity for fishing to the residents of Dasenech and the other neighboring Woredas of Ethiopia.

For a relatively long period of time the people of Turkana County have been assisted by NGOs and are still benefitting today. However, this is not the case in Marsabit. This is despite the fact that 70 percent of the lake is located in this county. The county has few alternative economic livelihood options. Similarly, people from the South Omo of Ethiopia are little benefitting from the flowing rivers and Lake Turkana.

There are tens of thousands of agro-pastoralists and other pastoralists dwelling on both sides of Lake Turkana and Omo River. However, only a few are registered and organized into cooperative

or Beach Management Units. Both men and women participate in the fishing and marketing process.

The world demand for fishery products has been increasing steadily over recent time, and is currently higher than supply. There has therefore been increased fishing pressure on freshwater and marine fisheries.

5.2.1 Fish Farming

Data collection around River Omo and Lake Turkana has always been a big challenge owing to the remoteness of the main fishing areas, and the rough terrain between them. Generally, most fishing activities are undertaken in the Western side of the lake, or the Kalokol neighborhood where fish lands. Data from fishing activities in the eastern side of the lake is hardly recorded, mainly because fish is consumed locally or follows nontraditional marketing pathways. The fishing done by Ethiopian fishermen at the North of the lake, especially in the delta region is reported to be still more of traditional than those in Kenya are and is mainly targeting the Nile perch and Tilapia.

Fishing is generally regarded as either traditional or artisanal type. The artisanal fishermen use wooden rafts made from fibrous wooden logs which easily float on water. They use them for navigating the short distances within which they operate. Some full-time fishermen navigate across the lake regularly, targeting large sized fish such as the Nile Perch. In order to undertake fishing, it is important to have fishing nets, refrigerators in the case of traders, and fishing boats that vary from those made from wooden materials to the motorized ones.

Majority of the full-time fishermen in Lake Turkana use wooden boats. These are not suited for navigating the open water sections of the lake which suffer strong diurnal wind patterns. In South Omo, fishermen use their own fishing net or fishing nets supplied by traders in order to catch fish. The alternative arrangement is whereby traders provide the fishermen with fishing nets. An agreement is then reached where anyone who is given a net should supply the trader with fish. Different kinds of fishing nets are used depending on the size of the fish to be caught. The cost of these nets range from 500 to 3,000 Ethiopian Birr. The fact that the price goes up to 3,000 Birr seems to explain why pastoralists are forced to establish a network through which they receive fishing net from traders residing at Omorate town.

Fish harvesting generally suffers from high rates of post-harvest losses. These are due to lack of hygiene and sanitation facilities for its handling. The bulk of what remains is dried under dusty conditions, resulting in a five-fold loss in market value. Fishing is practiced in the waters of Lake Turkana where Tilapia and Nile Perch are the main species caught. This is due to their popularity by the local communities and in the various market destinations within the country. The potential of fish farming is not yet fully exploited. Fishing as a business is also affected by poor road network and general lack of better transportation systems.



Figure 4: Tilapia (Left) and Nile Perch (right) from Lake Turkana

The main fishing communities in Lake Turkana are the Turkana tribe. They reside along the western shores mainly from Lowarengak to Kerio. The main fishing centre is at Kalokol. The other fishing activities are concentrated in places such as Eliye, Kerio, Kataboi, Nachukui and Lowarengak on the Western side, and Ilaret, Koobi Fora, Alia Bay, Moite, Elmolo Bay and Loiyangalani on the Eastern side. Most of the fish from the fishing activities on the Western side of the Lake are transported to Kalokol for marketing in the neighborhood and for large domestic trade within Kenya. The Western side of Loiyangalani is the main fishing centre and significant quantities of fish are harvested and dried on this location.

Currently, the fishermen in these areas use more efficient crafts or motorboats with an outboard engine and 3-inch nets. They are able to cross the lake to access fishing grounds in the Eastern, Northern and Southern shores. Lake Turkana fisheries is becoming more commercial and the communities on the Eastern shores of the lake have taken advantage of the fishing activities. They have invested more long lasting resource to the activity and access arrangements have been worked out.

On the North Eastern shores of the lake, the Dassanach tribe forms the main fishing community. The main fishing point in this region is located around Omorate. To the extreme North of the lake, between the border of Kenya and Ethiopia, the Merille tribe forms the main fishermen. They reside at the Omo river mouth and the delta as well as in the Northern part of the lake which is in Ethiopia. However, it is important to note that there are no clearly marked boundaries. This causes serious conflicts between the Turkana and Merille fishermen. The current high demand for large fish, especially the Nile Perch is likely to escalate the conflict in this region as the two fishing communities clash over fishing grounds.

Currently, there are no such strong mechanized fishing activities. Some fishing boats are being utilized about a mile from the shoreline by the Turkana people, but nothing for those in the South Omo side. There has also been a steady increase in demand for motorized transport.

There has been several reported incidents of attacks against Turkana fishermen by surrounding tribes such as Gabra and Boran. However, constructive dialogue between the Turkana fishermen communities and the local clan leaders is usually sufficient to cease these attacks.

Fish Marketing and Value Addition

The domestic fish market entails buying of fish at the beach by small-scale traders. These then sell to various open-air markets and fish shops in the primary and terminal markets. The fish is sold either dried, fresh or processed for later consumption. Fish processing is generally traditional (artisanal processing) using methods like drying in the sun and smoking. Unlike other fishing centres in River Omo and Lake Turkana, only a small proportion (perhaps less than 5 percent of total landings) is traded fresh mainly to the nearby communities. The bulk of fish from Lake Turkana and Omo river is wholly dried, fried, smoked, or salted. This is a process that usually takes about 3 to 4 days. The traders usually purchase their catch from landing sites, and often bring along some ice for preservation after purchase. The buyers are usually very selective because of the high supply conditions at the landing sites. The traders mainly prefer Tilapia and Nile Perch.

The vast proportion, which is estimated at about 80 percent of all fish traded from Lake Turkana, is in sun-dried form.

Deep-frying is second in preference to sun drying, in terms of volumes of fish handled. Sun drying is mainly carried out on Tilapia, even though smaller quantities of similar sized fish and chunks of larger fish are also processed this way. Small amounts of fish from Lake Turkana are processed by smoking and salting but only on rare occasions. This may be due to scarcity of firewood in the arid areas and also adding salt is a big additional cost to the poor fishermen.

The fish is sold whole after washing in the lake water, except for Nile Perch which fishermen insist on removing the air bladder (maws) for trading in separately. Therefore, the main by-product marketed from Lake Turkana fish is Nile Perch maws (air bladders). These are removed from the fish immediately after they are caught, and dried in the sun. A typical 60-70 kg of Nile Perch produces a maw of about 6kg, which once dried is about 2.4 kg. A Kilogram of dried fish maw is purchased at KShs 2,500. It is then sold to fish exporting firms in Kisumu and Uganda at approximately KShs 3,000. Given the lucrative price of fish maws in the market, the price of the edible portion of Nile Perch sometimes is less than that of the maws. Fishermen, therefore, mainly target this fish for the maws. Dried fish maws are exported to the Far East, mainly china, where they are consumed as traditional foods usually associated with health or aphrodisiac properties.

Other fish by-products such as skeletons are usually not traded, and are mainly left by the lakeside to decompose after filleting. This is evidence from the numerous scattered fish bones on the shores. Skins are usually not removed during filleting or drying; they form an integral part of dried fish.

5.2.2 Fish Value Chain Mapping

Fish from Lake Turkana on both sides of Ethiopia and Kenya are marketed in several destinations. Currently, Nile Perch and Tilapia are the main types of fish harvested and marketed. Due to perishable nature of fish, fresh fish is marketed in the localities around the lake. The longer the

distance from the shore the more dried fish is marketed. There are no formal and centralized fish markets in Kenya and Ethiopia. Despite this, three main fish marketing and value chain channels could still be mapped:

- **Kalokol route:** The fishermen here use more efficient equipment such as out board motors and collector boats, and catch large fish swimming upstream to spawn. These take a large proportion of the fish they dry for sale. On the Western side of Lake Turkana, fresh fish traders who sell to several hotels in Lodwar or Lokichoggio, usually have to arrange for the collection of fish from the landing site at Kalokol and transport it to their retailing centers.
- **Loiyangalani route:** Marketing of fresh fish around Loiyangalani is partly due to consumption by local populations. The rest is transported to markets in Marsabit, Isiolo, Nairobi and Kisumu.
- **Omorate Route:** In Ethiopia, nearly all fish harvested in the Omo River in the delta region and the Northern part of Lake Turkana (Todenyang) are marketed in Ethiopia. Some of this fish is consumed locally in various parts of Ethiopia such as Omorate, Turmi and Jinka. Another significant portion is eventually marketed in large towns such as Arbaminch and end of the market in Addis Ababa. Dried fish collected from Lake Turkana by the communities in South Omo zone of Ethiopia is also exported largely to Kenya through Loiyangalani and transported to Konko.

Interestingly, a considerable amount of dried fish from Loiyangalani and Kalokol are exported to Congo. There is a significant number of traders from Congo who are positioned in the coastal region and regularly export dried and salted fish. It should be noted that Kisumu is also the main destination for dried fish from Lake Turkana. Dried fish is brought here from centres such as Loiyangalani and Kalokol, and is then retailed to the local populations who have a strong culture of fish eating. Busia and Kitale are the main destination for fried fish from Lake Turkana. These are either retailed in the town or sold to neighboring markets. Urban centres such as Nairobi city frequently stock significant volumes of dried fish and these are distributed to hotels and restaurants.

The fish industry has a chain of value chain actors, which include the artisanal fishermen, agents and sub-agents, and processors. The fish market has a structure that categorizes traders into those focusing on the internal market and those that deal with the international market. The later market requires high fish handling standards especially of Nile Perch fillets and others that are exported to various countries.

Transportation of fresh fish at production is done by the fishermen themselves using fishing crafts. Fresh fish for domestic market is transported mostly in private, small commercial vehicles or by public transport in the case of small-scale traders. The fish is usually packed in between ice placed in polythene sheets before transportation. Fish packed in this manner usually ends up in local market not more than 200 km from the lake. Processed fish such as sundried Nile Perch and Tilapia for domestic market are transported by road to the various urban markets. The transport may be private or public and this depends on the quantities being transported.

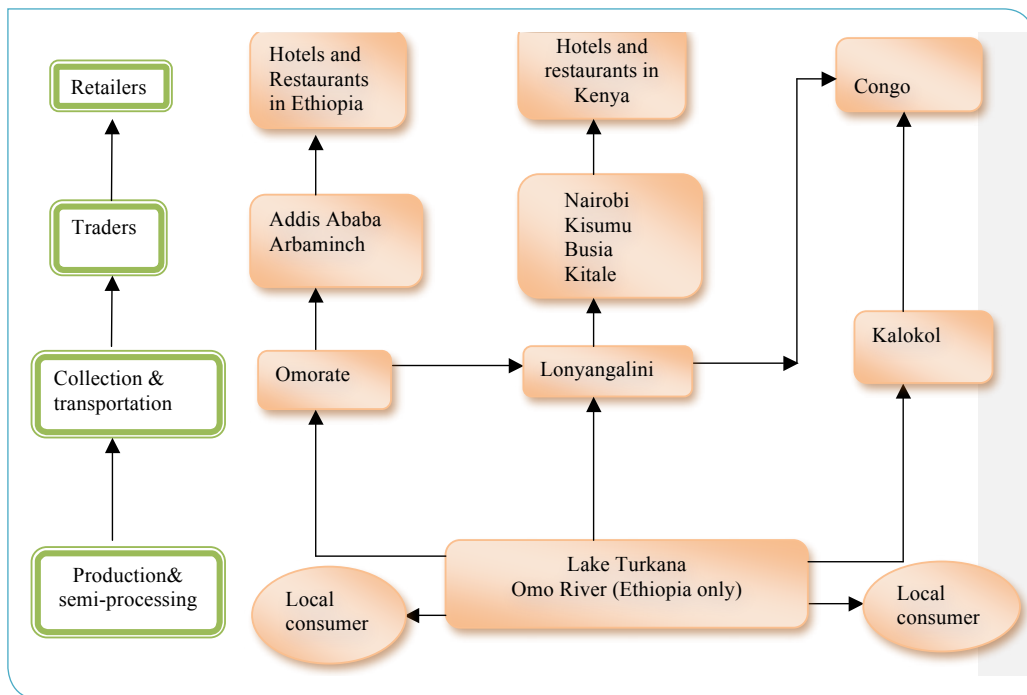


Figure 2: Fish Value Chain Map

5.2.3 Value Chain Analysis

The prices for fresh and dried fish were analyzed from the interviews conducted with the fishermen, the local traders as well as consumers. Unfortunately, the prices of fish in Congo could not be revealed by traders who were not interested in giving the information. As prices vary widely, a rough estimation is used within a certain range to represent the price. Due to poor market linkages between production and marketing sites, fish is usually cheap at landing sites, but fairly expensive at nearby towns such as Lodwar and Kisumu (See also the average of prices at Kalokol, which is the main fish trading centre, where the landing site price for fresh fish is compared to the prices at the lakeshore). Table 5 below summarizes the prices and gross margin of fish at different market level.

The price at the consumers end is nearly threefold or more compared to the prices of the same fish at the farm sites. Just like any other farm product, the primary producers are always the least beneficiaries due to low price. On the other hand the consumers are harmed from the high price the retailers charge. The value chain actors at the middle and at the end are the most advantaged. The gross margin of the value chain actors also indicate upward increment as the product moves from the bottom (producers) to the end of the market (consumers).

Table 5: Fish Pricing and Gross Margins for Different Actors

Market Actors	Prices	Price	Gross margin	
	Fresh	dried	Fresh	Dried
Kenya (KSh/piece)				
Tilapia (fishermen) at the Lake shore	80-100	25- 50	50-70	15–35
Tilapia (agents) at Kalokol, Marsabit	200- 250	75-80	80-120	40–50
Tilapia (Trader) at Kisumu, Busia	300- 350	85-100	80-120	20–30
Dry fish retailers (local hotels, restaurants)	450- 500	150-160	100-110	60–75
Ethiopia (Birr/kg)				
Fresh Tilapia (fishers) at Omorate (Birr/pc)	2 - 2.50	NA	2.00	-
Fresh Nile perch –(fishers) at Omorate	40 -50	-		30 –35
Dry Nile perch (traders) Omorate	-	80 - 100	-	40–45
Dry Nile perch (trader) - Arbaminch	-	120 - 150	-	42–48
Dry Nile perch (trader) - Addis Ababa	-	220 - 230	-	50–75
Dry Nile perch (trader) - Consumers	-	350-400	-	80–100
Dry Fish at Congo	NA	NA	-	-

5.2.4 Challenges in Fish Value Chain

Fishing in Lake Turkana and Omo River is a complementary livelihood activity for both the pastoralists in Ethiopia and Kenya. There are hardly any government development activities around the lake. There are some fisheries support activities being undertaken by development organizations and NGOs, but these are few and uncoordinated. The production, marketing and overall business environment is confronted with complex problems and challenges. This has, therefore, restricted the livelihood activities of the people who benefit from the resource. The following are the key challenges:

- (i) **Long distance and poor road condition:** Infrastructure to and around Lake Turkana has always been considered a major limitation to potential investments. Lake Turkana is about 750 km from Nairobi and 430 km from Eldoret (both in Kenya). It is approximately 850 km from Addis Ababa and about 370 km from Arbaminch (both in Ethiopia). Omo and Waito Rivers are more or less at a similar distance from Addis Ababa. These distances are long, often with poor road conditions or sections of it. It is also a long distances between fishing sites and market centres.
- (ii) **Lack of equipment and facilities:** The most critical is lack of electricity followed by lack of modern fishing boats and ice or cold storage infrastructure. At an average daily ambient temperature of over 30°C, fish that is not stored in ice cold storage will spoil by the end of the first day of capture.
- (iii) **Lack of quality control and high post:** Harvest loss is estimated at 30 to 40 percent. This is due to the following reasons:
 - **Lack of standards:** No established handling, processing and preservation procedures for fish. Dried fish from several traders may have batches with quite different moisture

contents and other unwanted parameters, and thus traders are left to their own intuition in grading different qualities.

- **High temperature:** High levels of post-harvest losses due to high temperatures: It is a best practice procedure across the world to place fish on melting ice immediately after catching.
- **Lack of proper landing sites:** There are no proper landing sites around the lake. Fish along the lakeshores is usually placed on bare ground, and this compromises the handling and consumption of the fish due to hygiene factors.
- **Unhygienic handling:** Unhealthy handling and processing conditions is practiced in the boat or on the net, and all through during processing of fish mostly done on dusty sites.



Figure 6: Fish Marketing in the Open Field at the Turkana Lakeshore

- (iv) **Lack of saving culture:** Disappointingly, the pastoralists involved in the fishing business do not have a saving culture and it is worse for those in South Omo zone. Although they can get a good deal of money from fishing activities, their culture for example, makes them share the money with their relatives or neighbors and sometimes immediately spend it on drinking and feasting. This is because their life is more of social (communal) rather than private (individual). If any member of the community attempts to use the entire money alone (money obtained from fishing), he/she may be made a social outcast. Since this is considered a serious practice, people do not deviate from societal norms.
- (v) **Low price for the fishermen:** The cumulative effect of all the challenges mentioned above down plays the price of fish that the fishermen should get. Due to lack of ice in such areas with high temperatures and also poor handling practices, the likelihood of spoilage is very high. Thus, fishermen are supposed to sell immediately after the catch, or alternatively, preserve in dried form. In both cases they are forced to sell at low price in order to avoid a

catastrophe of losing all the fish. Lack of a saving culture from their earnings also contribute to low price bargaining power of the fishermen as they need to sell to get their daily subsistence.

5.2.5 Recommendations

Considering that Turkana is the largest source of fish for people in Kenya and Ethiopia (together with Ormo and Waito rivers), and that fishing can greatly contribute to economic development of the arid Marsabit County and South Omo zone - just like it is doing for Turkana Country, there is an urgent need to put measures to develop the fishery business. The following are recommended areas of intervention:

- a) Provide skilled training to improve fish production, harvesting, processing and preservation.
- b) Develop and enforce quality control and fisheries management measures to minimize post-harvest losses. For example, establishing and strengthening Beach Management Unit (BMU).
- c) Develop the capacity of private sector players and associations to spearhead sustainable trade around the lake.
- d) Formulate a strong sustainable fish trading and fisheries management in the lake. This calls for regional collaboration between Kenya and Ethiopia.
- e) Supporting fish farmers with facilities and equipments such as acquisition of motorized fishing boats, cold chain (ice box), and the establishment of proper landing sites so as to minimize spoilage and post-harvest losses.
- f) Introducing sustainable management mechanism for fish harvesting (controlling the volume and age) to mitigate over fishing and depletion of the resource.

5.3 Milk Marketing and Value Chain Analysis

Fresh milk collection and processing is the most important complementary livelihood for Borana and Marsabit pastoralists. Borana and Marsabit pastoralists are geographically and socio-culturally connected. It is obvious that these pastoralists keep a large number of livestock. However, the production system is very traditional, and their products are not well commercialized. The productivity of their animals, such as milk and milk products, is absolutely determined by the availability of natural pasture and water. In pastoral areas, livestock production is entirely dependent on a mobile grazing system. The livestock feed is mainly obtained from rangeland (natural pasture), trees and shrubs. Some fallow land and crop residuals are also used as source of livestock feed during dry season in a very limited pastoral area by agro-pastoralists. Only agro-pastoralists provide their animals with crop residues from their own farms.

The FGD and key informants indicated that there are very little practices of providing supplement feed like concentrates. Temporary surface rain water, ponds, traditional wells known as “Ellas”, and hand-dug wells are the main source of water for livestock in Borana and Marsabit. Temporary

surface water and ponds are available during the wet seasons while the “Ellas” and hand dug wells, are the only accessible water sources during dry season. The frequency of watering livestock varies from one season to another, species to species and accessibility of water sources. During the wet seasons, most of the livestock are given water every 1-2 days. However, during the dry season cattle are watered every 2-3 days and camels every 3-5 days based on availability and accessibility of watering points. The pastoralist with their livestock travel six hours on average looking for a water source for their livestock during the dry season.

5.3.1 Milk Production

Production is the basic segment for any value chain analysis. It is the pivotal point that makes the value chain to develop and attain competitiveness. Borana and Marsabit pastoral areas have potential in milk production. They produce milk from cattle, camels, sheep and goats. The frequency of milking per day varies based on the type or pedigree of livestock and the season of the year. A cow that has given birth to a calf is not milked for a period of 2 to 3 weeks. This is to ensure that the calf gets adequate milk and colostrum for its healthy growth. During the wet season, when forage and water is available, lactating cows are milked twice a day. This is done early in the morning before grazing time and in the evening after grazing. On the other hand, during prolonged drought when livestock feed and water is very scarce, the pastoralists milk the lactating cows only once a day. Sometimes, they do not milk and completely leave it for the calves. This will depend on the milk productivity of the cow. Interestingly, the pastoralists keep a good proportion of female animals compared to the male counterparts. This is estimated at 60-70 percent of the total herd. Out of this female population, about 30 percent are assumed to be lactating (i.e. producing milk).

On average the milk produced by a cow from the pastoral communities is about 1.5 liters per day. However, this figure can increase to 2.0 liters per day during the wet seasons. It can also fall below 1.0 liter per day in the dry seasons. On the other hand, milk productivity in camels is nearly twice that of cows. On average a camel gives about 3.5 litres of milk per day. This can fluctuate between 3.0 litres per day during the dry seasons to 4.0 liters per day in the wet season. It should be noted that milk productivity in camels is much more stable than in cows in extreme climatic conditions. Therefore, considering the large population of animals (cows and camels) being milked in the pastoral areas of Borana and Marsabit, milk supply is substantially huge. This should encourage commercialization of milk and milk products.

The major activities of pastoralists and agro pastoralists include livestock management ,the acquisition of milking cows through purchasing or raising of young female calves, herding (pasturing), feeding and watering livestock, livestock health care (both traditional and modern methods), milking and selling milk and associated products and selling livestock itself and associated products as well.

The methods used in cattle production are both traditional and modern veterinary drugs. The traditional veterinary medicines are purchased from pastoralists who have the skill and knowledge of a traditional doctor. The modern veterinary drugs are purchased and include antibiotics, trypanocides, antihelmintics, and additives like minerals (common salt). The most important drug

used is Tryquin for treating Trypanosomiasis. The drugs are supplied by traders who get them from Moyale Kenya and from Hawassa and Addis Ababa in Ethiopia.

5.3.2 Milk Marketing and Value Addition

Fresh milk is marketed in many woredas of Borana zone and Marsabit sub-counties. Milk is often in surplus immediately after the rain seasons. The pastoralists sell their surplus milk in order to purchase household goods and consumables for their immediate needs such as food, clothes, health care and other social obligations. In general, the proportion of milk utilized per household is dictated by a number of variables. Among these is accessibility of pastoralists to market (roads), the numbers of animals being milked, the volume of milk produced and the number of neighbors and relatives that do not or have fewer animals to milk. It is also learnt that seasonal and yearly climate fluctuations also influence the proportion of household milk utilizations.

In general, the utilization of milk is affected by the location where the pastoralists are based and how wealthy they are. The pastoralists who do not have access to market and are far away from urban centers tend to process more of its milk into butter. Their propensity to supply fresh milk to the market is low. According to the information derived from the key informants, an average household supplies 40 percent of the total milk they produce to the market. Another 45 percent is for household consumption and for 'social gifts' and the remaining 15 percent is processed into butter at house hold level for sale. In one way or the other, a small portion of the total milk produced reaches the terminal market. Furthermore, of the total milk supplied to the market, milk from cows contribute 60 percent and from camel about 40 percent at both local and terminal markets. The information given to the researcher is that there is a trend where camel milk supply is increasing while cow milk is decreasing. This is mainly due to the relative change in the population of the animals. Out of the total marketed milk by the Borana pastoral communities, only 6-10 percent reaches the terminal market in Moyale. The remaining milk is supplied to rural neighborhood markets to those who do not have milk.

Pastoralists sell milk and milk products, not necessarily for commercial purpose, but to generate cash to purchase food commodities which complement their livelihoods. The pastoralists supply fresh milk, butter and yoghurt. Most of the milk sellers in the market (apart from terminal market like Moyale) are also milk producers. They are all female. The milk is sold to cafes, restaurants and hotels. However, non-pastoralists in the community also buy the milk. Unlike other products, there are very few intermediaries in the milk market in Borana and Marsabit.

Milk from the pastoralists is supplied in the market packaged in local containers like Qabbe, Sorora and jerry cans. The milk is measured using 300ml cups. Butter is supplied in Qabbe, tins and cups of different sizes. The volumes of these local containers are not standardized.

Quality Control

During the process of milk collection and bulking, testing of the quality of milk is considered as one of the most important activities. Quality control activities such as checking the taste, smell or visual observation for cleanliness is done amongst other activities. These methods are traditional

but effective. Pastoralists who supply milk to terminal market like Moyale fumigate and clean their containers using water and locally available wood chips to keep milk fresh and prevent it from spoiling.



Figure 7: Milk and Related Products Being Supplied at Sarupa Market in Borana

Moyale market at the Kenya-Ethiopia border is the largest milk market for both Marsabit and Borana. It has a population of more than 150,000 people with a well-known culture of milk consumption. On the Borana side, the major milk supplying areas are Surupa, Finchawa, Elweya and surrounding Kebeles market. In Moyale on the Kenyan side, markets such as Karer, Sololo, Dabel and Godoma are the key milk suppliers. In addition, pastoralists in Wajir County on the Kenyan – Somali border are also supplying a substantial amount of camel milk to Moyale. Immense transportation of milk to Moyale as a terminal market is mainly because of its capacity to absorb in bulks. This is attributed to high milk consumption by the population. However, there are instances where prices are similar with that of Yabello and Marsabit as shown in Table 6. It should be noted that the largest milk suppliers are also the largest suppliers of butter.

Pricing and Gross Margins

The milk producers get significantly higher gross profit margins compared to other traders, but in reality this is not realized. This is because the calculation overlooks the cost of time and energy that pastoralists use while herding and managing their animals. On the other hand, the traders/retailers get such benefit (which may be negligible) in less than a day without much value addition. However, the cumulative private gains from collection and sale of large quantities of milk is immense.

The average price difference between dry and wet seasons is huge particularly for the producers. This is estimated at between 40 percent and 50 percent as compared to 10 percent or less for the traders (retailers). That means that the producers are more affected by price fluctuation than the other market actors, as shown in Table 6 below.

Table 6: Milk Prices and Gross Margin

Value Chain Actors	Price (Dry Season)	Price (Wet Season)	Average Gross Margin@
Marsabit/N.Kenya (KShs/litre)			
Sololo (Producers)	90	60	45
Moyale (Producers)	100	60	50
Traders	110	75	12
Marsabit (Retailers)	130	100	25
–Moyale (Retailers)	140	120	15
Borana - Ethiopia (Birr/litre)			
Producers	18	14.5	12.0
Traders	21	17	2.5
Yabello (Retailers)	24	20	3.0

@ Gross margin = Gross revenue – Market Transaction Cost

5.3.3 Milk Marketing and Value Chain Map

Milk producers transport their milk directly to the local market (primary market). Traditionally, female pastoralists in both Borana and Marsabit have informally organized themselves at village level to collect and bulk milk from the households in the villages. In each village, each member of the pastoral women group contribute milk daily to the group. This is, however, based on the individual interest, production and contribution capacity. The collection and bulking is done on a daily basis. Milk collected and bulked is supplied to the market.

Milk from the primary market is collected by traders in bulk, transported and supplied to the terminal markets using trucks (Isuzu). There is a dedicated truck (Isuzu) which transports milk from the major sources. Motor bicycles are also extensively used in Marsabit to collect milk from as far as 60 km. According to information obtained through the focus group discussion held with milk freighters association and information obtained from transporters, up to 1,500 litres of milk is supplied during the dry season and up to 4,600 litres during wet season, from the same area.

The task of transporting milk in the Borana area is done in two phases. The first phase involves transferring the milk packed in 5, 10 or 20-litre jerry cans from the production areas to the roadside bulking and collection centers. This is mainly done using donkeys and women carrying the cans on their backs. The second phase involves transporting the milk from collection centres to the terminal market in Moyale. This involves traveling a distance of between 30 and 240 kilometres. The transportation costs vary considerably depending on the distance covered and the quantity of milk transported. This may range from 5 Birr to 10 Birr per a 10-litre Jerry can.

The information obtained during the study from different sources shows that the milk subsector has three main market channels. This analysis is summarized and presented in Figure below.

Channel I (from pastoralists directly to rural consumers): According to the key informants, pastoralists who don't have cattle and those who have cattle but not milking cows buy milk directly from the producers on this channel.

Channel II (whole milk to urban consumers): The largest proportion of milk in this channel is supplied by the producer/women group composed of pastoralists. Most of the producers travel long distance to reach the pre-urban and urban centers. Most of the fresh unprocessed milk in this channel is supplied to households and restaurants for making tea, food for children and for other consumption needs. The pre-urban and urban dwellers buy raw milk from this channel and further process to get butter and cheese for hotel and household consumption. A substantial amount is also consumed directly as fresh or fermented yoghurt. The women group that process milk can also be categorized under this channel. They buy milk from the producers and add their own contribution. They also produce butter whenever there is excess milk supply. Most of the milk in this channel is sold on open markets and are exposed to sun light which contributes to its fermentation or spoilage. Unless the milk is sold in the morning, its price will decline by the afternoon because of the problem of fermentation or spoilage.

Channel III (whole milk to Moyale terminal market and to Gambo-Kenya): In this channel, milk is transported by the informal women group, traders and or agents to Moyale terminal market and to Gambo in Kenya. The milk is assembled in major milk market centres and transported by motor cycles, trucks and buses to the destination market. Each milk container is labelled with the name of the owner/trader. A group of milk traders or agents then gather their milk at the town centre for transport by trucks and buses. This channel is relatively organized in terms of transportation and operations. It is also based on trust. The retailers/traders patiently wait for the milk in Moyale town and as soon as the trucks or buses arrive they take the milk to the consumers. Timing is important and any delay in the process leads to milk spoilage. Because of this, the actions taken in each value chain steps to facilitate the milk to arrive at the final destination should be very well understood by the actors.

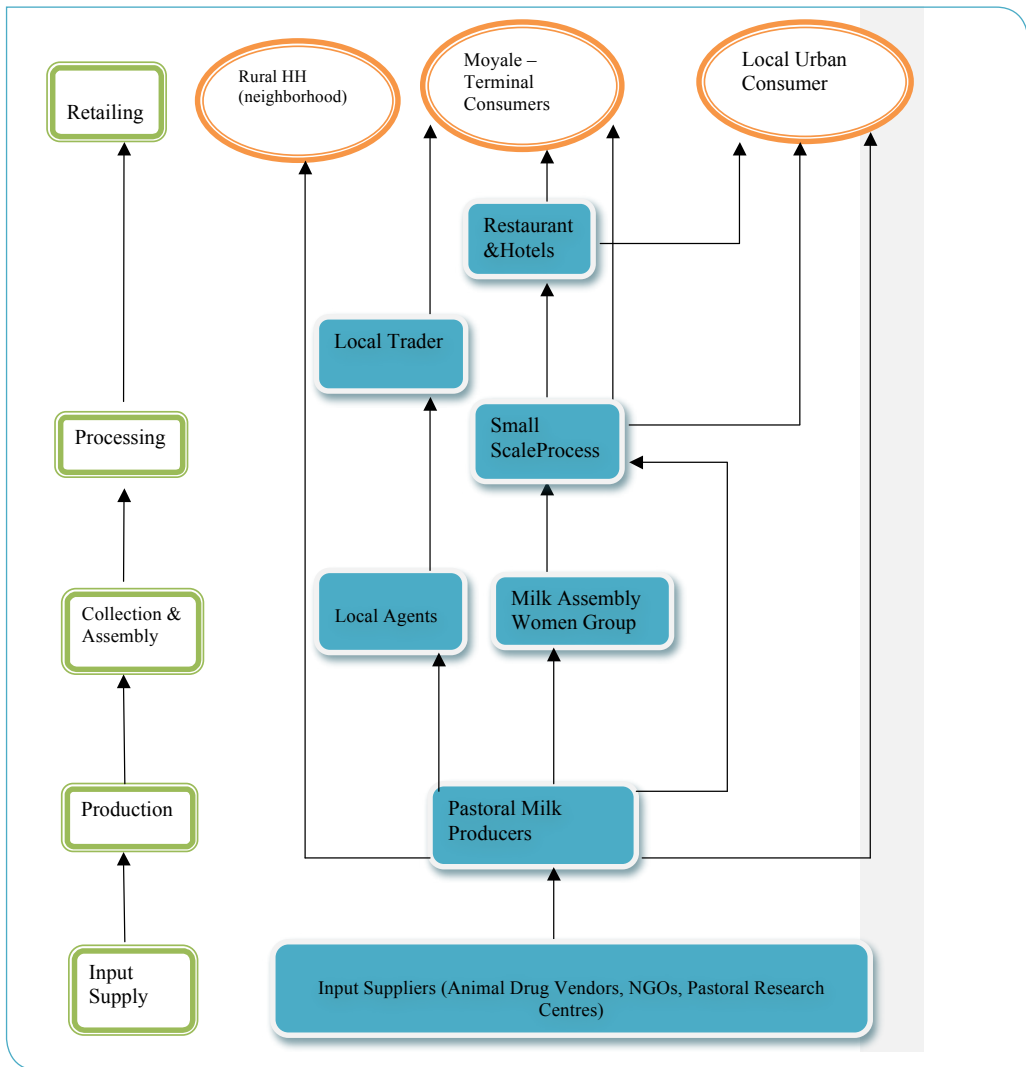


Figure 3: Milk Marketing and Value Chain Map

5.3.4 Milk Production and Marketing Challenges

5.3.4.1 The Production Constraints

The most critical constraints observed are described below.

- i. **Shortage of animal feed and seasonal variability:** This is a problem caused by the deterioration of the rangeland due to over grazing, bush encroachment and frequent drought. Animal feed is scarce during dry season and this severely affects milk production and market supply. During the wet season of the year in March, April and May, animal feed is readily available but is usually unavailable during dry months such as January, February and December.

- ii. **Water shortage:** Water is the basic element required by animals for milk production. Water shortage is mostly persistent during the dry season. In this case, pastoralists are forced to travel very long distances (approximately 6 to 12 hours per day) in search of water for their livestock. In addition, water shortage is highly aggravated by prolonged dry seasons and recurrent drought. The regular livestock watering system which is done every two days during the wet season and three days during the dry season for cattle cannot sufficiently address milk production in these areas.
- iii. **Prevalence of livestock diseases:** Among the prominent livestock diseases affecting milk production and productivity in cattle are FMD, Mastitis, tick and tick-borne diseases, milk fever (hypocalcaemia), Trypanosomiasis and Back legs.
- iv. **Weak public service:** There is no specific policy on pastoral dairy development issues. There are also no agricultural extension systems that are established to gear the pastoralist towards market oriented livestock husbandry and milk production. Public veterinary service is poor or absent in some cases.
- v. **Knowledge and skill gap:** Milk production systems among the Borana and Marsabit pastoral communities are practiced under traditional husbandry systems. They are faced with the challenges of inadequate attention to, for example, feeding of the milking cows, selection of breeds and controlling milk qualities.

5.3.4.2 Milk Marketing Challenges

- **Adulteration:** Milk and milk products are very susceptible to adulteration. There is less probability of contamination at production level, but it is likely to increase as the product moves from the original producers to the market, particularly in the pre-urban and urban centres. In some cases some sellers may add water to the milk to increase the quantity and hence sales.
- **Milk supply is highly seasonal:** This is due to variation in seasons which affect animal feed and availability of water. Milk supply is abundantly available during March, April and May. On the other hand its availability is extremely low in December, January and February. Sometimes it is not available at all. The rest of the months experience moderate supply.
- **Lack of access road and market infrastructure:** There is limited or no feeder roads that connect pastoralist in remote areas to the market centres. This distance may be greater than 20 km. Moreover, there is no shelter provided for the milk at the market centres even in the urban areas. This contributes to low milk supply due to long distances pastoralists have to walk to supply milk to the community and the milk also get spoiled easily because of high temperature.
- **Lack of business skill:** The female pastoralists do not have adequate skills to do business and market their products. Those in remote areas are not even connected to market and milk production is not market oriented.

- **Illiteracy:** lack of group management skill, leadership, numeracy skill in business process.
- **Weak market linkages and cross border trade:** Weak upward integration between milk producers and milk processing units and urban consumption centres. There is no organized cross boarder (Ethiopia -Kenya) trade for milk and other products. The existing trade system is just traditional established from long harmonious relationship between the citizens from the two countries.

5.3.5 Milk Production and Marketing Opportunities

The major opportunities that need to be exploited for upgrading of milk value chain in Borana and Marsabit pastoral areas are as follows:

- Introduction of information communication technology. For instance, mobile phones can be used for price information dissemination, direction and location of livestock migration.
- Increased government involvement in farming activities in the pastoral areas in recent years.
- Dedication and commitment by the female pastoralists in milk production and milk product marketing is required. Female pastoralists are mostly involved in managing the milking cows, milk and milk products. They have considerable power to make decision on the production and marketing of the milk. This should be considered as an asset to effectively improve the livelihood of the pastoral households.
- High social capital involving a network of and proper relationships among female producers, female traders, transporters. A very strong relationship is required.
- Smooth social and business linkages between Borana and Marsabit people is a big asset that can be exploited for cross border trade.
- Pastoralist culture of keeping a higher proportion of female animals, for instance, a ratio of 60 to70 percent of the herd is a good potential for the development of the milk sub-sector.
- Good practice of forming informal milk producer and marketing groups within villages.
- There is huge unmet demand for milk and milk products at local and export market.
- The indigenous knowledge in livestock holding. The pastoral communities in Borana are well experienced in handling livestock resource and have a well-developed herd management system. The indigenous knowledge and experience of pastoralists favour sustainable milk production.
- Existence of pastoral development actors such as the presence of different NGO's that are working towards improving the livelihood of the pastoral communities is also an asset to improve the milk production which generates the lion's share of the household income of the pastoral communities.

5.3.6 Recommendations for Interventions

Based on the findings, challenges and opportunity of milk value chain analysis, the following intervention factors that can potentially be accomplished by all the stakeholders along the value chain were identified.

5.3.6.1 Milk Production and Supply

- **Ensuring sustainable milk supply through better feeding and watering system:** Borana and Marsabit have a high potential in the total process of milk production. It is apparent that the productivity of milking cows is absolutely subjected to cattle feed and provision of water. In pastoral areas, it greatly varies during wet and dry seasons (peak supply during March to May, and low December to February). Such inconsistencies in the milk supply chain can severely affect the linkages and performance of the value chain actors. The problem can be curbed by availing supplementary feed (forage, legumes and/or addition of commercial supplements) and better access to water for milking cows during dry seasons to smoothen seasonal variations.
- **Improved public service:** Providing extension services focusing on market oriented husbandry system and commercializing of milk production and milk products.
- **Capacity building (training):** Pastoralists need to be trained on improved management of dairy cows/camels and better handling of the milk for quality supply.
- **Health care:** Improvement in animal health may lead to improved milk production. This can be achieved by providing timely vaccination, tick control and support to establish community based animal health workers. The youth should also be trained on how to identify the type of disease and the treatment needed among others.

5.3.6.2 Support the Improvement of Milk Market and Marketing

- **Improve market facilities and equipment:** To maintain the natural quality of milk, milk suppliers (informal group of pastoralists) need a number of equipment, for instance, a standard milk containers such as stainless steel bucket, safety market places (shades), low cost processing equipment such as simple milk churner, cream separator, lactometer and etc.
- **Enhancing the capacity of informal women marketing groups:** Strengthen the existing organized women groups and scale up the best practices in other areas where there is no such groups. Capitalize on the role of pastoral women in the milk business through marketing and business training, enabling access to credit and to engage them more extensively as milk value chain actor.
- **Promote private sector to engage in milk processing:** Motivating private traders and processors is always relevant. This will ensure the competitiveness and sustainability of the milk and milk products in the value chain enhancement of market linkages. There should be strong market linkages among value chain actors both formal and informal. These should then be strengthened. Milk marketing forum may be important in the creation of actors and opportunists, for value chain actors to dialogue on important issues and solicit solutions for them.
- **Technical support and training:** Key technical skills such as group management, business development and entrepreneurship are missing along the value chain actors. Therefore, it is important to provide full-fledged technical back-ups.

- Pastoralist, traders and processors all need to be well trained in business development services skill for milk handling and processing.
- Support pastoralists to form milk marketing groups.
- Promote the introduction of appropriate rural milk transportation infrastructure and lobby for the improvement of village/feeder roads.
- Facilitate raw milk trading modalities between milk collectors, milk processors and marketing groups with clear and legal agreement and market trust in place.
- Facilitating effective and efficient market information network that can be accessible by all actors in a way that fairly benefit the actors along the milk market channel.

5.4 Beekeeping: Marketing and Value chain Analysis

Beekeeping as a complementary livelihood has been identified as very important for pastoralists endowed with good vegetation cover, water resources, and better practical experiences. In this regard, the regions that came into the researcher's mind were South Omo (Ethiopia), West Pokot and Turkana (Kenya) and the whole Karamoja region (Uganda). The researcher visited pastoralists in the mentioned locations.

5.4.1 Honey and Beeswax Production

Beekeeping in pastoral areas has a good potential as a livelihood complementary especially in areas where bee fodder and water are available; that is, areas with good vegetation cover and has accessibility to water bodies. Nearly all pastoralists in Karamoja, West Pokot and some regions in Turkana and South Omo have a comparative advantage in honey and beeswax production. They use these to complement their livelihood and develop substantial domestic market. There are tremendous melliferous plant species in these areas which serve as forage for bees and hence suitable for honey production. *Acacia mellifera* is the best bee fodder that is widely available in the region. It should be noted that the species of the honeybees are also called *Apis mellifera*.

Due to bimodal rains, honey can be harvested at least twice a year. Apart from areas with extreme climatic conditions, beekeeping is more or less practiced in many pastoral villages as complementary economies.

However, the apiculture sector within the pastoralist communities is far from realizing its potential to complement their livelihood by generating income from beekeeping. From the estimation derived from key informants, less than 1% of the potential to tap honey has been utilized, and the commercialization of other bee products with high market value such as wax, pollen, propels and bee venom is non-existent.

Honey production by pastoralists is characterized by few beehives per household and low average yield per hive. It is estimated that less than 5 percent of pastoralist households are keeping bees for income generation using traditional beehives. However, there is exception with Karamoja

pastoralists through an audit which estimated that 30 percent of total households were involved in beekeeping. An individual owns seven (7) hives on average and approximately three (3) to 12 hives per a household. Keeping bees in forests using traditional hives is also predominantly practiced.



Figure 9: Traditional hive (left) and Improved Hive (right) at Turkwel, Loima, Turkana County

There are several beehive technologies available for pastoralists to use for honey production. Examples include; traditional, transitional intermediate (improved local), Kenya Top Bar (KTB) and Lang troth (modern frame). So far, pastoralists fully depend on their traditional hives. Beekeeping pastoralists own an average of 4 traditional beehives per household. However, some own as low as two hives while others as many as 10 hives. Consequently, there has been some efforts by the NGOs to introduce KTB but these have been widely rejected. The Local improved is under experimentation and is expected to be easily adoptable. However, the rest have not been properly introduced and are not under experimentation.

The productivity of KTB and Lang troth is incomparably much higher than the traditional hive, and the latter is nearly five times more productive. The Lang troth is very advanced and may be applicable to only innovative beekeepers. Yet one can imagine the potential for change in production and productivity using improved technologies. Table 7 below summarizes the average productivity of the different beehive technologies. There is a considerably large regional and seasonal difference. It is also evident from the table how much seasonal change is influential on honey production.

Beekeeping is entirely dependent on natural flora (bee forage). Therefore, beekeepers do not provide the bees with supplementary feeds even during dry periods. Other inputs such as colony bee wax, protective clothing, and beekeeping accessories are at a rudimentary stage. Honey harvesting facilities and equipment are noticeably absent. For beekeepers, procuring bee colonies

is generally not accessible. Lack of awareness and availability prevents the pastoralist from using high yielding beekeeping equipment and undertaking modern colony management. Some NGOs have been attempting to introduce improved beehives (such as Kenya Top Bar (KTB) but only in a few areas. Despite this, it has largely failed to take off due to inadequate training and follow up and people still continue to use their traditional log-hives.

An analysis of the productivity of beekeeping was based on the report from experienced traditional beekeepers and through interviews with the key informants (experts and NGOs). Honey production and productivity greatly varies with season. The seasons determine the availability of bee fodder and water. The major honey production season is from September to November and the minor season extends from March to June. The productivity of hives during the major season is 60 percent to 100 percent higher than in the minor season. Moreover, the quality of honey harvested during the major season is also said to be much better.

Table 7: Average Productivity of Different Types of Beehives by Season (Kg/hive)

Type of Hives	Major Season	Minor Season
Local (Traditional)	5	3
Local Improved	10	5
Kenya Top Bar (KTB)	14	8
Lang Troth	25	20

Source: Analysis is based on information from key informants in Karamoja and West Pokot

Men are responsible for preparing traditional hives and beekeeping because women by culture are not allowed to climb trees to place the hive. Traditional hives are made from logs which have been split into two then the centre hollowed out. Two logs are then put together to form a hollow tube which is then covered with grass. The hives are fumigated with herbs and aromatic plant to clean it and give it good smell to attract bee colonies. Finally, the hives are placed on or suspended on tall trees.

However, female pastoralists sometimes help their men during honey harvesting. They set up a fire to smoke the bees from the hive so that the men can easily collect the honey. These hives are relatively low in productivity and are unsuited for commercial production. Lack of awareness, inadequate knowledge and skill due to poor extension services especially in beekeeping and management, and lack of attention to apiculture by pastoralists in general are exhibited on the ground.

Findings from the focused group interviews with communities in all areas indicated that, despite the importance of honey in their livelihoods, there is a clear tendency to overlook these activities. Some NGOs such as Action for Development (AfD) and SoS-Sahel supported beekeeping in South Omo zone (in Hammer) and Kenya Industrial Research & Development/DANIDA in the lowlands of West Pokot. They have tried to introduce improved beekeeping technologies and honey processing facilities by forming cooperatives. Unfortunately, all the NGOs have failed to succeed mainly because the governance of cooperatives was challenged by lack of skill in group

management, leadership and unnecessary political interventions. Despite this, the experience shared by a local NGO in Ambi District of Karamoja seems encouraging. Under the Arid Land Development Program, it has been introducing and promoting modern apiary production. It has been reported that the NGO motivated pastoralists who were not beekeepers to enter into the practice through awareness creation, and enhancement of the production capacity of the already traditional beekeepers. This is being done through skill training and provision of modern beehives. Introduction of simple low cost honey processing technologies and creating market linkages are their big agendas. They have good experiences to learn from.

5.4.2 Honey Marketing and Value Chain Analysis

ETHIOPIA LIVESTOCK MASTER PLAN BACKGROUND PAPER

Honey is produced absolutely for the market, and the producers utilize less than 5 percent of their total harvest. Generally, there is a strong domestic market for honey. Majority of the buyers are private traders, cooperatives or self-help groups.

Of all the total honey produced in Ethiopia, roughly 70 percent is utilized by local brewers to brew 'Tej' (honey wine). The remaining honey is then sold either as table honey or semi-processed honey. Even though bee wax has high market value, it is generally not collected as a separate product by the beekeepers. In Ethiopia, both honey and wax is preferably demanded by the Tej brewers. The wax is also largely purchased by the Ethiopian Orthodox Church. In South Omo, the Hammer community use honey as an important part of bride price payments.

In addition to honey and beeswax, propolis and pollen can also be extracted. In the international market, these products are used in industries dealing in pharmaceuticals, cosmetics, polishes and varnishes as well as colors and dyes. Yet, most of the honey produced falls below international quality standards. This does not, however, stop the profitable domestic trade.

The honey market is rudimentary and is commonly practiced in the local market, villages and roadsides. In the view of pastoralists, beekeepers, honey collectors and retailers, the Tej brewers/processors are identified as the key actors in the value chain of the honey subsector. However, the wax is not collected and marketed, and no exporter is involved in the value chain. Thus, three principal channels were identified in the value chain of the subsector (see Figure 9). These are:

- Honey producers to direct local and passersby/traveler or commuter consumers channel
- Honey collection, processing and super market channel
- Honey collection and Tej brewery channel (only in Ethiopia)

Most of the harvested honey in pastoral areas of South Omo goes through the Tej brewery channel. Beekeepers directly sell their honey to local honey collectors (dealer or cooperatives) at district or zonal levels. They in turn directly deliver the honey to Tej brewery houses in their localities and/or transport it to the big honey dealers (verandah) for breweries in Addis Ababa. Some beekeepers who produce honey in large quantities also supply directly to Tej houses in their areas. Unlike in Karamoja, in South Omo zone of Ethiopia honey is said to be of superior quality, but honey production and marketing is yet to be developed. There is no defined channel as such. Most producers take the local markets and sell to local consumers. Only few collectors take it to

processors in the main towns. In exceptional cases like Amudat district in Karamoja, 70 percent of honey is largely traded across in Kenya while only 20 percent is locally absorbed.

Generally, the market channels in South Omo and Karamoja lack organized systems and formal linkages among the actors.

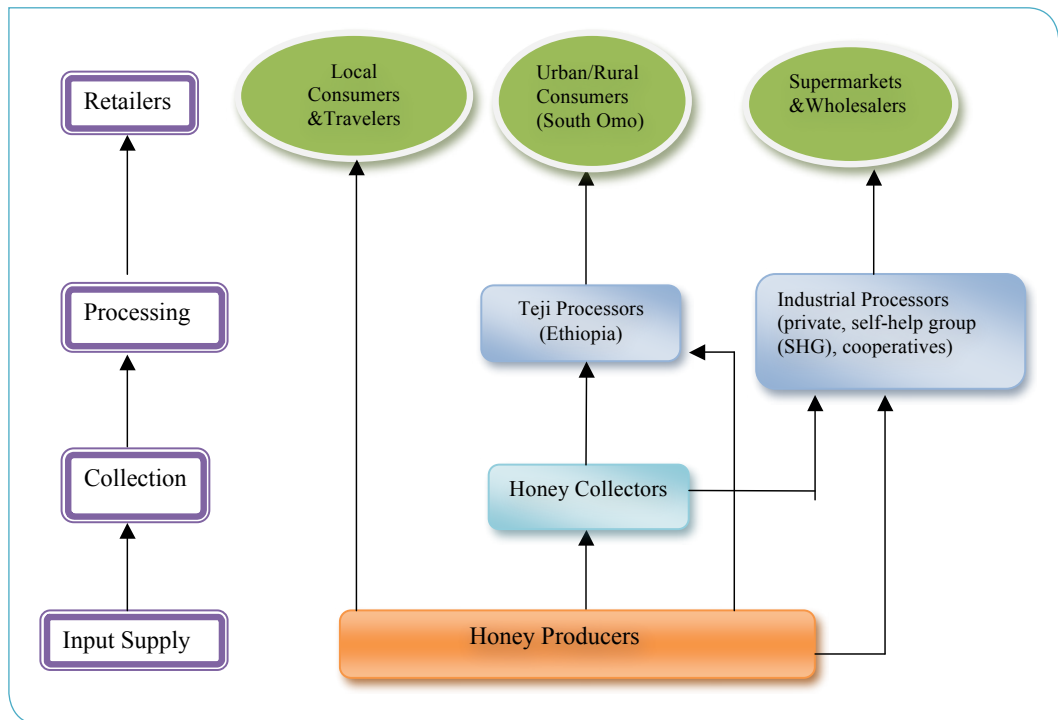


Figure 4: Honey market and Value Chain Map

The situation is much better in West Pokot. The honey collected from pastoralists in West Pokot partly goes to processors in Kapenguria, Kitale, Nakuru and then finally enters super markets in Nairobi. The assistance given by CABESI self-help group in Kapenguria should be appreciated. This group has established direct backward linkages with pastoralists who produce honey in West Pokot and offers them services in honey collection, training on apiary management, low cost processing, and supply of honey containers. CABESI has also established strong forward market linkages with big wholesalers and distributors in Nairobi such as ICIPE and Bio-Food Limited. In doing so, the self-help group has managed to balance the supply and demand for honey and amazingly connected the honey-producing pastoralists with supermarkets. However, the experience of Cooperatives in South Omo zone and West Pokot County are discouraging.

In West Pokot for instance, NGOs have formed cooperatives to collect and process honey, but they are not active. A case in point is a cooperative called “Kital Kapel” located approximately 45 km to the West of Kapenguria. It was established in the year 2012 with 80 members, and is supported by DANIDA Fund and Kenya Industrial Research & Development Institute (KIRDI). They formed a honey processing plant with a capacity of 1000 kg per day. However, they are

actually collecting and processing only 100 kg per day. This is only 10 percent of its production capacity yet there is ample supply of honey locally with an estimated production of about 2 tons per week. The main challenges to the cooperative are weak leadership, lack of skills to run the processing plant, lack of funds to support honey collection activities, and poor market linkages.

5.4.3 Pricing and Gross Margins

Gross margins are roughly derived and calculated from the opinions of the interviewed beekeepers and traders. Generally, the price of honey is highest in South Omo compared to all the other locations mainly because of the demand by Tej brewery which enjoys the highest gross margin per kg. Under all market segments, the gross margin is always positive and increases upwards towards the end of the value chain.

The result of the survey confirms that the prices of honey are steadily rising, and unlike agricultural products it does not show sharp seasonal fluctuations. The argument is, therefore, pastoralists can easily and quickly increase their income by increasing the number of traditional bee-hives in the short run, and make low cost processing. A summary of average prices of different qualities of honey in the selected study areas, based on information collected during the study period (July to August 2016), is shown in Table 8 below.

Table 8: Honey Prices and Gross Margins

Value Chain Actors	Unit Price	Average Gross Margin @
South Omo (Birr/kg)		
Crude honey-producers'	65	55
Tej brewers	-	115
Honey processors (semi)	100	30
West Pokot (KShs/kg)		
Cooperative market		
Crude- producer	175	125
Semi-processed –coop	400	100
Self-help market		
Crude - producers	150	145
Semi-processed- producer	350	155
Fully processed @ get	550	300
Supermarket– Nairobi	850	325
Uganda- Karamoja (UGX/kg)		
Crude - producers	5,000	4,500
Semi-processed	6,000	460
Fully processed @ get	10,000	3,000
Supermarket–Kampala	18,000	6,500

@: Gross Margin (GM)= Total Sales Revenue –Purchaser’s Production Cost–Processing Cost–Market Transaction Cost

5.4.4 Challenges and Recommended interventions

Honey production in the defined pastoral areas does have certain opportunities. These include:

- It has regional, international and local market demand as food and industrial input.
- It does not need intensive labour and space; women and children can easily be involved with modern apiary system.
- Honey in Karamoja and West Pokot is the best quality (pure organic) in East Africa – Acacia mellifera is the best bee fodder that is widely growing.

Apparently, until recently, support to the pastoral area has been very much limited or missed. Despite all the potential, except efforts of some NGOs, governments have never given attention to the apiculture sector in pastoral communities. The following are critical challenges and missed opportunities for which strategic interventions are recommended to improve the sector to complement the livelihoods of the targeted pastoral communities.

1. **Low production and productivity:** Despite the potential of beekeeping areas, only small proportions of pastoral communities are participating in production and marketing, mainly due to limited knowledge of apiculture. Moreover, production is very traditional and productivity per beehive is very low, resulting from poor management and technologies. Therefore, the following interventions are recommended:
 - Motivating and sensitization activities to engage as many households as possible in beekeeping business. More focus could be given to promoting youth and women in apiculture subsector through training and business plan development. Strategically, those who have never practiced beekeeping should first start with the traditional hives that they are familiar with and learnt in their neighbours. Starting with modern beehives with beginners may complicate the inexperienced individuals and subjected to associated risks.
 - Introduction of technologies such as improved local or transitional beehives, KTB and modern beehives management, particularly, focusing on those pastoralists who have already developed experience and are in the business. This could be done in collaboration with apiculture research stations, sector associations, NGOs and private investors.
 - Recommended hive transformation
 - Provide Local hive (for beginners) → improved local (for practitioners) → KTB (for advanced bee keepers) → Lang troth (for innovative bee keepers).
 - Number of hives to keep: 50 hives/households is an optimum number for an average bee keeper to properly manage and benefit from,
 - It is economically viable and sustainable if households make bee hives by themselves.
 - Intensive skill training for pastoralists in improved technologies and production systems by technical experts, sector associations and private sector.

2. **Lack of apiculture extension service:** A review of previous assessments reveals that there are inadequate extension services and training materials and guidelines for beekeepers, and lack of appropriate demonstration sites and extension packages. Apiculture extension services are not well organized and they lack a strategic and coordinated approach. With limited staff, even more limited budget, logistics and poor facilities, it is difficult to make impact. This needs serious government attention to revise its advisory strategies to support the pastoralists.
3. **Poor pre- and post-harvest management:** Pastoral beekeepers give no time to take care for the hives after hanging them on trees, and just wait for harvesting. Consequently, the hives are often attacked by predators. Harvesting is also traditional and severely damages the bee colonies with heavy smoke. Honey is collected in any container available to agro-pastoralists, which deteriorates its original quality. Important strategic interventions include:
 - Strengthening through training on improved apiary management; creating awareness on the market value and collection techniques of bee wax, pollen, propolis and bee venom. Practical training manuals should be developed in local languages and simplified version.
 - Introducing facilities and equipment for honey harvesting, low cost processing and packaging and sufficiently demonstrating and offering skill training on how to use them.
 - Service provider development, i.e. building the capacity of local technical consultants to render consultancy services on technical apiary management
 - Lobbying the local government to introducing mechanisms (rule and regulations) to regulate and monitor bush clearing and firing in favor of bee keeping.
4. **Lack of market linkages and information:** Pastoralists are generally not connected to honey markets. Even the meager amount of honey produced does not get adequate market. Therefore, there should be support to the honey value chain actors in the areas of:
 - Creating market linkages among the honey market chain actors within each and the cross boundary.
 - Developing an apiculture market price information system following local and international market prices.
 - Typifying the characteristics of pastoral organic honey, including a geo-referenced production map showing floral resources and honey production. Honey varieties should be described according to colour scale, as well as descriptive flavor profiles to introduce pastoral honey to the niche markets.

5.5 Aloe Vera Market and Value Chain Analysis

Using Aloe Vera plant for the production soaps and other cosmetics is untouched area of Complementary livelihood. Production is fully manual and requires an individual to have a short term training only (not more than 10 days) to gain moderate skill. The task is both gender inclusive,

and not time consuming as such, which mainly engage women in generating additional income. The business can be regarded as a small scale and easily manageable by pastoralists.

5.5.1 Complementary Use of Aloe Vera Plants

The Aloe Vera plant comprises of over 200 species and subspecies. The most commercially used is the cultivated Aloe Barbadensis Miller species and Chinensis that is presently only grown on a commercial scale in the United States, parts of Europe and in northern Tanzania, Kenya, Uganda and predominantly the Cape (South Africa) (SOS Sahel Ethiopia 2006). The Aloe gum is mainly used for antibacterial and antiviral products, hair enrichment, lotions, beverage additives, pharmaceutical products and tick repellents. Indigenous aloes have advantages of helping to reduce land degradation, providing bee forage and livestock fodder in the dry season, and enhancing biodiversity enrichment.

Aloe Vera as a native plant is massively found in the lowlands of West Pokot, Turkana around the Ugandan border, Marsabit in the border of Ethiopia, Karamoja along Turkana and West Pokot borders, many places of Borana and some in South Omo Zone. For many years, it has been valued for its ethno-medicinal qualities. Today, in those places it is locally used to treat malaria, flesh wounds, and eye infections and to moisturize dry skin, etc. Recently, however, the production and processing of Aloe Vera has been seen as a potential livelihood diversification complementary.



Photo: Aloe Vera planted by groups of the community in Lokichoggio, Turkana West

According to information acquired from the Key informants, in early 2000, some NGOs like ITDG Practical Action attempted to promote the production, processing and marketing of commercial Aloe Vera through establishing “Market Opportunity Group”. ITDG attempted to support producers (harvesters and boilers) in West Pokot bordering Turkana. However, the group was challenged by poor organizational set up in the production and processing as well as absence of market information.

Interestingly, since long ago, there are some Somali traders, who have been dealing with the Aloe Vera business in West Pokot, Turkana, Almudat and other parts of Karamoja. They hire many pastoralists to harvest Aloe-juice and to boil it. Women and girls are particularly contracted to harvest the Aloe juice while herding their livestock. They harvest the juice into Jerry cans and then

sell it to Somali traders through agents who collect into a big barrel. Then, the traders hire the male pastoralists to boil it after which the Aloe juice is dried in the sun to form deep black pieces of solid crystals. The Somali traders then collect the dried boiled crystals of Aloe Vera into sacks and transport it for export.

Box: Secret business Aloe Vera extraction at Kacheliba

Aloe Vera collection and processing at Kacheliba was visited; located at about 55 km West of Kapenguria in West Pokot County. Only Somali-Kenyans are involved. They kept the Aloe Vera business very secret. Nobody in the communities has information as to where these traders are selling the product and for how much. As the traders have never been licensed both in Kenya and Uganda, none of the government sectors knows about their business either. Today, the Somali traders are aggressively practicing the Aloe Vera business. Yet, their Aloe Vera business is not friendly to the environment. First, the harvest of the aloe-juice depletes plant population, and secondly boiling the juice emits dangerous smokes that pollute the environment for communities. To date, the plant has not been over exploited commercially. There is no specific policy or legislation that either gives special treatment or puts a limitation as far as the production and marketing of Aloe Vera is concerned.

Moreover, the prices of Aloe juice paid to the women/girls and the wages paid to pastoral labourers for boiling the aloe-juice are disappointingly very low. The price for Aloe-juice is 30 Ksh/litre (150 Ksh/Jerry can) for which a woman needs at least two days to collect - that is equivalent to a wage rate of 15 Ksh/labour day. Comparatively, the wage for the men boiling the Aloe-juice is about 300 Ksh/day.



Photo: Aloe-gum collection and Processing by Informal Traders

In the IGAD cluster areas, there are some NGOs attempting to introduce an innovative use of Aloe Vera plant – making soap and other detergents. For instance, Action for Development (AfD) has been working in Hammer (South Omo), SOS Sahel in Yabello (Borana), Practical Action in Loima

(Turkana). There are also experiences from self-help groups of women and men called “Massaya group”, in Baringo County of Kenya.

The present experience by the NGOs is that groups of women and men pastoralists, comprising of 15 to 20 persons are organized as a cooperative and operating together in the production and marketing of Aloe-soaps. The NGOs have organized groups of pastoralists, mixed of men and women, and introduced how to make different detergents and cosmetics such as aloe soap, shampoo, lotion, cream, and toothpaste, among others. In Ethiopia so far, SOS- Sahel and AfD managed to enable the groups of pastoralists to produce solid aloe-soap in Yabello and Hammar respectively. Currently the cooperatives in Hammar Woreda and Borana zones are engaged only in the production and marketing of aloe soap. Those groups of the pastoralists in Loima and Baringo have advanced in producing different kinds of soap (solid and liquid) and lotions. Though it is to be used at a small-scale level, Aloe Vera offers enormous scope for commercial enterprises and development, if intensive works are done to exploit.

5.5.2 Production of Aloe-Soaps

Based on available information from projects of SoS- Sahel and AfD, the key ingredients in Aloe-soap production are the juice of Aloe Vera plant, caustic soda, coconut/vegetable oil, and natural water. Other additives are sodium silicate, perfume and different coloring agents. Very important are molding and packaging materials.

While the Aloe-soap producing cooperatives in Turkana and Baringo buy all the ingredients from the suppliers in the nearest town, those in Borana and South Omo are supplied with through the local NGOs (SOS Sahel and AfD respectively), facilitated by their respective Unions. Vegetable oil is often supplied by consumer Associations (which in turn is government subsidy), but sometimes procured from the local open market. In all areas visited, the cooperative/group members collect the juice of the Aloe Vera plant from their surrounding as the plant naturally grows in the bushes. Interestingly, they have also started domesticating the Aloe Vera plant around their operation areas.

Members of the cooperatives actively participate in soap collection, making the solution, unmolding and curing soap. Aloe soap producers use plastic bowl to mix the solution, weighing scale to measure caustic soda, thermometer to measure heat of boiled oil and hydrometer to measure the mixing ratio.

Currently, the production of aloe soap is undertaken only at cooperative level; no individual trader or pastoralist has been engaged in this activity.

According to the information obtained from Senbele Cooperative in Hamar Woreda, in the production of aloe soap, the proportion of water, caustic soda and oil used are in the ratio of 7:2:14 respectively. To this compound, drops of juice of the Aloe Vera plant are added (technical details need to be consulted). There are certain procedures that have to be followed and these procedures are simple. According to SoS- Sahel, the steps to produce Aloe-Soap are as follows:

- Step 1:** Making Caustic soda solution/lye
- Step 2:** Heating edible oil for 65°C
- Step 3:** Mixing lye solution and oil
- Step 4:** Mixing with fragrance, aloe sap and dye (perfume and dye)
- Step 5:** Molding and curing



Photo: Aloe Vera products – taken from Kospirr, Loima, Turkana (top)

5.5.3 Marketing and Value Chain of Aloe-vera Products

In general, the production of Aloe- soap and marketing is at trial/infant stage, but the demand for the product is progressively rising. In Borana, the primary cooperatives produce and sell aloe soap directly to their union (Milki Union). The Union is the major market outlet through which aloe soap is sold to customers. The union also does important functions such as packaging, labeling and market promotion (such as through participation in exhibitions). The NGOs are strongly assisting to promote the market for the Aloe-soap. The producing groups (cooperatives) in Turkana and Baringo sell their soaps, lotions, and other products directly to the consumers. These customers are mainly the pastoralists in their community, villages and local markets. There are few institutions such as pharmacies or drugstores who also buy these products.

Production and marketing of the Aloe-products have not yet picked up as a private business by individual pastoralists or local traders. Thus, the Aloe-soap market and value chain is not well developed (see Figure 5).

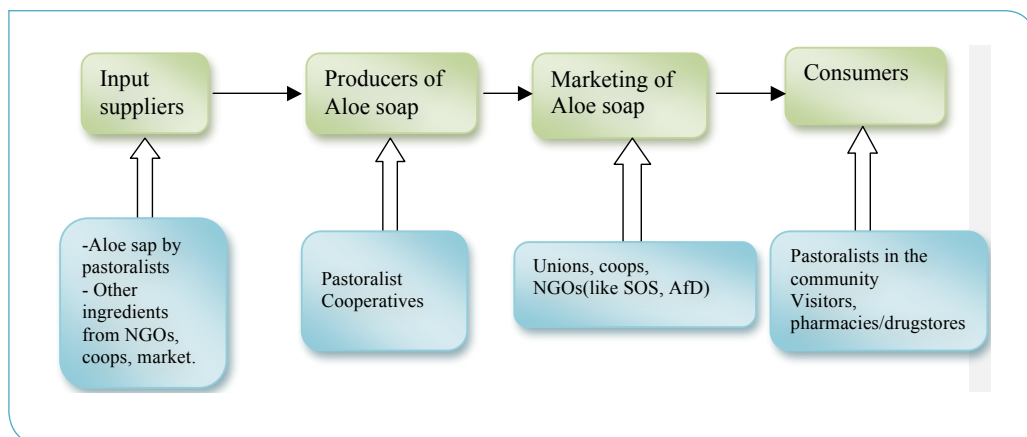


Figure 5: Market and Value Chain of Aloe-Products

Unfortunately, data on detail of unit costs could not be available with many of the Aloe-soap producing groups. The case in Borana has been documented by the supporting NGO. For a soap of 325 gm, the NGO has estimated the unit cost of production, prices and gross margins as indicated in Table 9. It is evident that the gross margins of 4 birr and 4.67 birr per a unit of soap respectively for the cooperative and Union are significantly high. The Unions gain such a high gross margin only by adding packaging and retailing the product, which seems unfairly too much, as complained by the cooperative members. The consumers also felt that the price charged by the union is too expensive. Because an individual or group of pastoralists can produce hundreds of pieces of soaps per day, both the cooperative and the union could generate more return by lowering the prices and selling large quantities.

Table 9: Gross Margin of Aloe-Soap, Borana

Description	Birr/piece of soap (325gm)
Sales Revenue for the Union	17.00
Sales Revenue for the Cooperative	13.00
Input Costs:	
Labour	1.36
Oils	4.90
Perfume & colour	1.02
Caustic soda	0.55
Others	0.50
Total production cost	8.33
Gross margin for the Coop (GMc)	4.67
Gross margin for the Union (GMu)	4.00

Source: Adapted from SoS-Sahel, Borana, Ethiopia (July 2016)

5.5.4 Opportunities of Using Aloe Vera for Soap

Aloe Vera has huge biological and commercial advantages.

- The Aloe Vera plant is widely available in ASAL, drought tolerant and grows throughout the year (i.e. not seasonal). This means that supply of the plant juice useful for soap manufacturing is not a limiting factor at any time. The plant can easily be domesticated in operation areas with little management.
- Production of soap and other cosmetics from Aloe Vera (with other ingredients) is technically simple and not tiresome; easily learnt by formally uneducated people; can be manufactured at household level with any members (by women, children, disables, elders).
- Production of aloe-soap and the other products is not capital intensive; it needs small capital and simple facilities to start the business.
- Unlike other industrial soaps, the aloe-soaps and lotions have medicinal value, particularly for skin diseases.
- Presently, the aloe-soap and other products do have high demand in the local market, though much has not been done with market promotion.
- The fact that the producers are pastoralists in deeply situated in rural areas means that buyers are pastoral consumers located in remote areas, hence have good opportunity to easily access the product in their villages and communities. Therefore, there is a dual benefit for both producers and buyers.

5.5.5 Challenges Associated with Aloe-Soap

Access to input determines the efficiency and volume of Aloe-soap production. While the Aloe Vera plant is abundant in many areas, some of the critical ingredients are scarcely available. These are described as follows:

1. **Water scarcity:** Water is naturally scarce in pastoral ASALs, and therefore access to clean water necessary for soap production is more problematic during dry seasons. In such a case, soap producers have to travel two to three hours to fetch water every day.
2. **Limited access to market for basic inputs:** Chemicals such as caustic soda, sodium silicate and vegetable/coconut are naturally required as input in large quantities. However, they are only available in big towns, such as Eldoret or Nakuru for Turkana and West Pokot agro-pastoralist producers; Addis Ababa for Borana and South Omo, and similarly for Karamoja. Suppliers of the chemicals are far from the Aloe-soap producers (more than 400 Km), which consumes a lot of transport cost and time. The problem is worse when they can afford to buy only small quantities of the chemicals due to shortage of working capital.
3. **Molding technology:** The present molding materials used for solid soap are sub-standard, although this is not a problem for liquid soap). First, it lacks the required quality, and second, there is only one for all which means no option to produce different sizes and shapes to meet the interest of different buyers.

4. **Weak cooperatives (group) management:** Until now, Aloe-soap producers have been organized in the form of groups or cooperatives. However, they are all challenged to manage the groups. Executive committees have many deficiencies including lack of managerial skills. Most are illiterate (lack numeracy) and hence weak in planning, decision making and poor in business entrepreneurship.
5. **Market promotion:** The pastoralists have limited capacity to involve in different opportunities to promote their aloe-products, including financial and skill limitations.

5.5.6 Recommendation for Intervention

Although Aloe-vera has a lot of potential and opportunities as a complementary livelihood product, there are also some challenges that need attention. Based on the observation and discussion with practitioner pastoralists and NGOs, the following are areas of intervention recommended:

1. **Creating opportunities to access basic inputs:** (i) develop water points (e.g. shallow wells) close to operation areas or establish operation areas closer to water points; (ii) create market linkages for chemical inputs (particularly for caustic soda, sodium silicate and oils) – by bringing the supply and demand side actors together and establish contractual agreements. Encouraging local traders to link the large suppliers of the inputs with the Aloe-soap producing pastoralists could also help much.
2. **Upgrading modeling technology:** The present modeling techniques is used for solid soap needs major modification. It should be comparable with industrial solid soaps in satisfying consumers with shape and size. Consulting individual experts and industrial researchers is compulsory.
3. **Qualities and types:** Strong technical support is required to enable participants to be competitive in order to easily enter into the market. These include ability to meet quality standards and be able to produce and supply products of different sorts in terms of size, colour and fragrance.
4. **Providing Training:** Use of the Aloe Vera plant as an industrial input of soap and other cosmetics is completely a new livelihood for pastoralists. Although one can easily learn how to make it (as mentioned above), skill training for all participants is imperative. Moreover, training on business development service, entrepreneurship and market networking are very essential.
5. **Introducing individual production (Cooperative marketing model):** In many cases, it was learnt that cooperative management is difficult with farmers and pastoralists who wish to engage effectively in the production of goods and services for business. (i) For Aloe Vera products, it is financially and technically simple for a household to make products at home using household members both female or male of any age participating and becoming productive. (ii) Cooperatives and unions have a comparative advantage in the promotion and penetration of niche markets. Agro-pastoralists can establish shops in the nearest town, involve in market product promotion activities, market intelligence and price information. Cooperatives/Unions are also useful in accessing improved technologies to

upgrade the qualities and quantities of their products in order to meet the dynamic demands of the consumers.

6. **Domesticating the plant:** Care must be taken not to over-exploit the resource. A monitoring and a sustainable management system would have to be put in place because these enterprises could be developed by other private sectors, ensuring the conservation of the resource for sustainable benefit of pastoralist communities is important. One way of overcoming the challenges is to grow the plant domestically.

5.6 Turkana Basketry Value-Chain Analysis

The basket sector has been singled out as an opportunity for complementary livelihood in Turkana County. Palm tree leaves are the key raw material for basketry in Turkana. There is a dense cover of palm trees abundantly growing near and along Turkana Lake and Turkwel River. In these areas, scarcity has never been a threat even during drought seasons, except that communities far from the water sources spend much time sourcing the palm, travelling on foot to collect it. Given the natural endowment of the palm trees in the communities, one can realize the potential for advancement in handicraft production as a source of complementary income generation whilst also preserving, promoting and invigorating the cultural heritage.

Since long, hundreds of households have been engaged in basketry, dominantly the women and girls, to complement their livelihoods. However, while the indigenous knowledge and the culture of basketry are well developed, the palm tree resource has never been fully utilized for basketry as a complementary livelihood, and thus the people still suffer from poverty and food insecurity.



Photo: Dense palm tree cover – taken from Turkana Lake shore (Kenya)

5.6.1 Basketry Production

Using the leaves of the palm tree as a raw material, particularly, pastoralists around the source areas have been engaged into the production of a range of baskets, milk carrying containers hut, mats, brooms and ornaments. There is no specialization as such; everybody produces some or

any of these products. The volume of production and timing is dependent on the accessibility (distance) of the household to the input and the market centres; that is, the more accessible one is to input supply and market centres, the more the volume and types of baskets she/he produces.

Further, such activities can be combined with childcare or while supervising tasks such as cooking or herding animals. The input (palm tree leaves) is freely collected mainly by women/girls, and sometimes by the men too. Where production that is more intensive has begun, women (and men) have been organized (or organized themselves) into groups to collect raw materials and to take their products to market (see figures- in the left pastoral women making the basket; in right, woman collector/retailer in Lodwar).



Photo: Basketry – taken from Kapua-Logole village (left) and Lodwar Basket market (right), Turkana Central

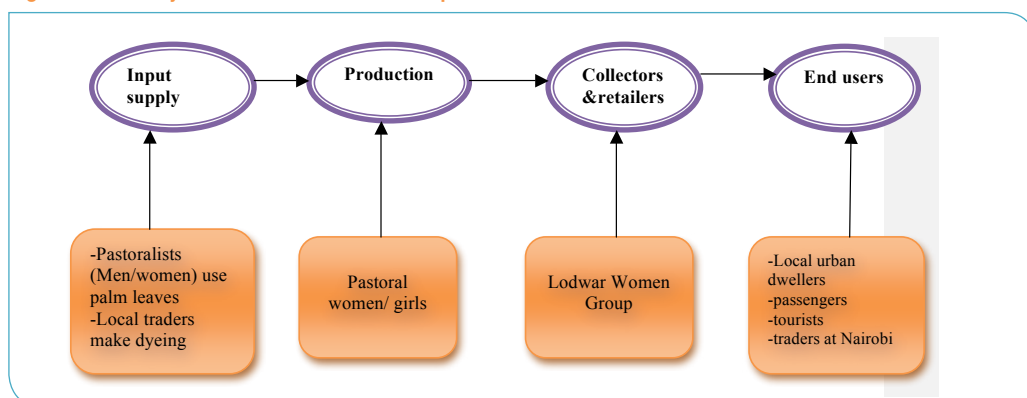
5.6.2 Marketing and Value Chain

The market for the basketry products in Turkana County is not developed. There is only one important market centre for the basketry, which is in Lodwar. In the middle of this town, a basketry market centre is located; it is freely provided to groups of women by the local government. The women collect the basketry from rural producers in bulk. They also produce and add some more products such as hut, mats, etc., sometimes even at better quality. These women are in groups just physically in the market shed, otherwise they buy and sell individually.

The main buyers of the basketry products are traders in Nairobi, including passengers, tourists and some local consumers. The producers are absolutely price takers, and thus the prices of the products are dominantly determined by the buyers or agents (i.e. the women group in Lodwar). The middlemen buy from the producers at a very low price and sell to traders and final consumers at very high prices, sharing the largest gross margin of the value chain.

As shown in Figure 6 below, the value chain map of basketry products is very simple, implying it is poorly developed. Basketry production absolutely depends on natural resources, with no technological input, little support services and informal marketing.

Figure 6: Basketry Market and Value Chain Map



5.6.3 Prices and Gross Margin Basketry

The prices of different types of basketry products were collected by interviewing the pastoralists who produce the items in the rural areas and traders at Lodwar. As stated above, the women group located at Lowdar – acting as collectors and retailers - determine the prices of the products giving no room for the producers to negotiate. Indeed, the poor have no power to negotiate. Except that they offer the products to the buyer in the Lodwar town, the women groups (retailers) add no value to the product. However, compared to the producers/prices, retail prices are double for shopping baskets, five times for the huts and brooms, etc. Such huge price margins are without (or few) middlemen, which has never been recorded in the literature. The price margin (difference) is almost the same as Gross margin since the retailers incur no cost and add no value, and put negligible transaction costs.

Table 10: Prices of different basketry products, August 2016

No	Basketry Product Type	Producers' price (Ksh/pc) (1)	Retail price at Lodwar(Ksh/pc) (2)	Price (Gross) margin @ - (1)
	Basket (kikapu)	700	950	250
	Shopping basket	400	800	400
	Hut	40	200	160
	Mat	100	250	150
	Brooms	10	50	40

@ Price Margin = Retail Price – producers' price

While there are so many opportunities in the basketry business in Turkana County, the result of the interview with the producers and market actors reflect that the basketry business has fundamental production and marketing problems.

5.6.4 Opportunities

Though there are significant challenges in the Turkana basket industry, there are also opportunities that will require relatively small investments. There are a number of factors that provide 'poor producers' with an advantageous competitive edge over other producers. The most important opportunities are:

- Freely accessible natural resources to be used for raw materials.
- Indigenous knowledge about the basket resource and about local markets, superior monitoring and protective control over the resources, that the managers are local people living close to resources they can access. If these are identified and action is directed at enhancing these factors, the low-income local crafters chances of success will be greatly improved.
- The Kenyan context: Kenya is one of the few African countries that has numerous experienced buyer agents, a strong network of international buyers, and efficient shipping options.
- In the international context, baskets are in high demand worldwide, experiencing strong sales. Turkana basket weaving skills are on-trend and in line with contemporary buying patterns. With appropriate inputs, producers can easily make highly marketable products.
- The Turkana people are skilled in harvesting, cutting and weaving Duom palm. Their local skills can be upgraded for new products that can be designed to meet international market demand.
- The new County Government structure has identified economic growth, in part through cultural products, as an area to be included in its funding priorities.
- Brooms, mats and trays are selling well in the local market, and are helping to keep the handmade sector alive in the region.
- The willingness of Turkana producers to learn new products and generate more income is a great motivator for growth.

5.6.5 Challenges in Basketry Business

Handicraft businesses however tend to stay small due to a number of constraints and challenges to their development. Lack of access to market, absence of product differentiation and weak business entrepreneurship skills are the major factors.

1. The primary weakness with Turkana baskets is their marketing and price point. While the initial producers' price is generally so low, the price at the end of the value chain is too expensive. Such parallel pricing is mainly due to lack of business-based cost and price analysis.
2. The producers lack access to markets, particularly markets that receive a constant flow of buyers who are willing to pay the 'true' value that reflects the skills, labour and efforts that have gone into making it. Outside the cities, producers must rely on local markets for their goods. Producers selling into the Lodwar market have to wait for days or weeks to get paid

for their products while the market agents and traders are enjoying high prices from the terminal markets.

3. Further to date, there has been a lack of consistency and quality in the handicrafts. Often they are poorly designed and decorated and not up to a standard. Since there is little product diversification, products capture only one small segment of the market. Often, handicraft makers will copy others and what they are selling. Rather than try out something new, they would prefer mounting sales campaigns to compete with their peers than risk no sale at all with a new product. This is a viable, but very limited market stream.
4. Women (and men) lack the entrepreneurial skills to build up handicraft businesses, as they tend to be started by those who lack skills to start other businesses. They may be illiterate, poorly organized and lack experience. They can lack basic education, accounting and computing skills to support business management including finance, marketing, promotions, maintaining linkages with markets/buyers through technology such as phone or email (if communication is available to them). Lack of business professionalism in Lodwar has led to low opportunities for market linkages. This includes the following: sound costing/pricing strategies, communication challenges, poor financial management, and little market knowledge.
5. Other constraints include not having a central place where the women (or men) can meet, price and display products, and a lack of money to advertise the products such as a sign outside the centre and/or a simple leaflet describing products and providing information on the producers and their way of life.
6. Handicraft producers rarely get assistance, and there is a lack of government support in the promotion of handicrafts for local sales or for export. Maybe a government might consider that handicrafts show a backwardness and entrenchment in 'the traditional'.

5.6.6 Recommendations

Supported by donors and development practitioners, the strengths in Kenya's handicraft sector can set the stage for a program that can greatly impact and transform the basket value chain in the Turkana region. In this regard, the following recommendations are forwarded:

(i) Product development

- **The greatest opportunity to increase markets is to have the right products at the right prices and to have a greater product variety and selection** – hence it is vital to exploit the professional designers doing new product collections. For instance, smaller baskets such as totes and small shelf baskets are highly marketable nationally and internationally. They take less production time, and cost less to ship so they can lead to volume sales. In addition, it is advisable to introduce new product designs that take less time to make and are easier to transport and hence reduce transport costs and lower prices through reduced labour costs.

- **Value-added elements can be low-cost:** Adding simple adornment will increase product value while not incurring significant costs. These can include raffia tassels, a dyed bone ornament, basic paint or beads.
- **Developing product differentiation:** different groups can be trained in a specific product range. This will result in stronger expertise in a given technique, efficient production methodologies, and efficient order fulfillment practices.

(ii) Capacity Building and Business Development

- A key for success for this value-chain is the ability of producers and agents to offer professional services to local or international buyers. The basketry value chain has the advantage of strong professionals in Nairobi that can provide expertise to producers and vendors in Lodwar.
- Introducing new designs: There must be a quicker way of making the baskets, easier to transport, and attain a price that markets can easily absorb. All design must take into account production efficiency, transport challenges, raw material procurement, and most importantly of all, overall costing/pricing in order to have products that will be competitive in target markets. A good design is only as good as its market share. Professional designers from the target markets can ensure that the new product designs embrace market trends.
- Appropriate training should be given and quality control and monitoring scheme be set up. Ways for producers to gain ongoing knowledge of the market and possible changes need to be developed. Exposure to new ideas and way of doing things could be achieved through learning visits to other producers in the country or to other countries where the handicraft trade is better established.
- Business skills should focus on market-driven needs - developing BDS training supported by key Kenyan handicraft professionals. Such training should cover business skills- production, packing, costing/pricing, quality control and other sector specific topics, there should be an ongoing coaching as orders increase, and new challenges arise.
- In Lodwar, there exists numerous entrepreneurs' sales agents, buying and selling baskets. These commercial agents can be playing a larger role in servicing the greater community of basket producers. They need training and coaching in business skills and a collaborative system which links them with Nairobi agents and to producers.
- Possible collaboration with the County Polytechnic School, Vocational Training Schools, and Ministry of Culture to advise on crafts training opportunities that will lead directly to sales and markets.
- Further groups will have to be established, developed or strengthened so that women and men can work together to access materials, markets, and provide checks on quality. Links can be made with organizations such as "Handicraft Marketing and Promotion Centre and/or other marketing outlets in big towns like Nairobi. The opportunities of setting up their

own pastoral handicraft centre should be considered in order to get opportunities for a more coordinated approach.

(iii) Fair Prices and Market Linkages

- Enabling the producers to be free from exploitation by traders and then get access to fair market prices for their products – establishing market groups and their own retail shops in Lodwar could help much.
- Expanding international market stratum-to international buyers - well-designed Turkana baskets could expand target market streams to include generic home décor, fashion accessories, office and storage markets, and interior design.
- Once producers have the right product at the right price for the target market, and once there are professional agents to service buyers, getting access to markets is easy. Kenya already has a community of highly experienced buyer agents. For the Turkana producers and agents to link into the existing system, they must realign products and prices to the market and streamline production and transport. Market linkage activities such as Mini-Expo in Nairobi with new Turkana product collections, Products Trade Show and Product Web Portal should be encouraged.

(iv) Sustainability

- Finally, it is important to consider that the basketry is made from leaves of the palm trees. Therefore, unless it is sustainably managed, the resource can be easily over-exploited and eventually destroyed. Therefore, within any intervention aimed at supporting basketry it is important to consider whether there is a system in place to ensure their sustainability or whether one should be introduced as common property regime or any other.

5.6.7 Conclusion

The Turkana basket industry should be recognized and valued as a viable and competitive business option for producers. Training and reinforcing business professionalism throughout the value chain can address the weaknesses faced by the Turkana basket industry.

The central challenge is that the baskets are over-priced for the market. Additionally, there is little variety of products or product categories in the Turkana region hence, there is little choice for buyers, and high prices. The key element for this value chain to grow is to change the product base. At the same time, it is essential to build producer capacity and professionalism, and this is the role of the production centres to offer a place for training, coaching, support, production and collection. Kenya has many professional buyer agents in Nairobi each with numerous international clients and valuable experience in export. The way to establish a path to scalable markets is to create new, on-trend products at market-driven prices.

Overall Conclusions and Recommendations

Livelihood diversification in pastoral communities is primarily meant for survival and some to complement their livelihood. Pastoralists are undertaking a number of complementary activities in Ethiopia, Kenya and Uganda. Income options vary by proximity to the nearest town and by gender and wealth classification of the pastoralists. Overall, the more the pastoralists are settled and the fewer the number of livestock they own, the greater the probability are they to involve in complementary livelihood activities. Yet, the challenges of entering income generation activities are many. People lack the necessary skills and knowledge to make the right choices and to identify the most successful income generation activity available. The other common problem is lack of access to markets due to the often-isolated nature of pastoral groups. The extent of support services provided by the government or NGOs greatly influences the degree of participation of pastoralists in complementary livelihood activities.

There are also impressive opportunities that should be exploited and capitalized for the transformation of the complementary livelihood activities. These include, among others, availability of a wide range of resources used as a foundation of the complementary livelihood, abundant indigenous knowledge and culture, a general increase in demand for the pastoral products and a recent change in the attention of governments towards the development of basic infrastructure in the pastoral areas.

The following points are a cross cutting issues to be carefully considered for any development interventions.

1. Selection of Complementary Livelihoods and Value Addition

One avenue that needs to be explored carefully is identification of the most important products and value-addition to the products. In Ethiopia, Kenya and Uganda, investment in the production and processing of fish, milk, honey, aloe vera and basketry should be viewed favorably. Where processing is necessary, it is vital to look for low cost and simple technologies manageable under the capacity of the pastoralists. Moreover, it should consider understanding local gender relations and the potential of women and men to participate and benefit, and care needs to be taken to set up a supportive environment.

Further, with any use of natural resources, it is important to consider the issue of indigenous knowledge and ensure that pastoralists are aware of and able to control use of their knowledge. The development of this knowledge into commercial ventures requires sensitization and appreciation, a process which to date has rarely benefited the local

communities. Furthermore, much needs to be invested to ensure a facilitating environment for business development; but should not necessarily require a large capital investment. It is also important to establish and support a right forum (such as groups, cooperatives or unions) for mobilizing pastoralists for active participation in complementary livelihood and fulfilling their different needs should be identified and supported. Finally, supporting sustainable diversification and income generation is not just about providing or facilitating the right capital, services or environment. It is also about cultural and attitudinal changes towards income generating business activities.

2. Attitudinal Change

Development intervention in the context of livelihood diversification in pastoral and agro-pastoral areas should primarily focus on attitudinal change. The vision for wealth creation is virtually non-existent in pastoral and agro pastoral areas. These communities seem to be content with subsistent mode of life. This calls for the need to transform their attitudes and gear their thinking towards entrepreneurship and wealth creation. Thus, training aimed at attitudinal change should take primacy over any other activity that is meant to enhance the livelihoods of pastoralists.

3. Gender and Commercialization

In most pastoral societies, access to and use of products is determined at least in part by gender. As such when supporting interventions, it is vital to understand gender relations and dynamics within households and communities, and to identify ways to support attitudinal change together with the socio-economic changes occurring. This means that recognizing women's roles and responsibilities in customary natural resource value chains is an essential first step. When the selected value chains products take on a more commercial character, one can clearly observe the differentiated impacts on women and men. Women in particular have been playing a central role: "The poorer the family, the more likely it became for food to be bought on a daily basis in exchange for whatever products women could sell locally or travelled long distance to towns". Thus, interventions targeting income generation for women should be seen as a process whereby they can attain gradual control over resources through the managing, financing and marketing of goods and services.

4. Savings and Credit

Pastoralists often face the problem of accessing financial capital to start up businesses and/or develop them. Interestingly, both NGOs and government are offering savings and credit schemes to pastoralists to assist them in establishing Complementary income generation activities and or developing their livestock trading. This study finds that the benefits are said to be significant across the countries under consideration. It is vital in diversifying their

livelihoods beyond a reliance on livestock and then to stabilize income and consumption. Experience shows that as participation in credit and savings schemes increases, pastoralists (particularly women) are more and more involved in petty trading, handicraft and other small business development. In other words, lack of credit is said to be a constraint to potential diversification and the starting up of income generation activities.

The pastoralists are also observed to be traditionally weak in cash saving, particularly worse with the fishers. Therefore, savings and credit scheme should be established along with the value chain development effort of the selected product to enable the pastoralists to better access to credit service for investment in the value chain business and, at the same time, to develop the culture of saving for further self reliant accelerated growth. In Appreciatively, women are seen to be more credit worthy, diligent and committed. Their experiences are exemplary and could be used as a model for the men. The relevance of suitable and targeted training should be emphasized including the development of business plans and continued support for entrepreneurial activities.

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Annex

Resilient Livelihoods – A Guiding Background

Working to increase poor people's income, consumption or other resources without addressing the risks they face will almost certainly fail to achieve sustained change. In pastoral communities, any livelihoods benefits they gain can be swept away instantly by drought, floods or other hazards, or gradually degraded as soil fertility declines or rainfall becomes increasingly variable.

Diversification of income sources: To establish long-term resilient livelihoods, development projects should incorporate, among many others, complementary income generation activities to diversify income sources and reduce risks. So, a resilient livelihood is one that enables people to feed, clothe, house, educate and take care of themselves and their households with dignity, build up savings and/or other resources, while also enabling them to prepare for and cope with shocks (whether posed by natural hazards, economic factors, resource degradation or disease), and adapt proactively to new and emerging threats and longer-term changes in their context (Christian Aid, 2012). See the characteristics of a resilient livelihood in the following box.

Box: Characteristics of a resilient livelihood:

Sustainability: The ways that women and men make a living involve developing systems that are environmentally sound, profitable, productive and supportive to social and economic development, enhancing rather than depleting natural, social and physical resources.

Profitable: Poor women and men are empowered to gain fair profits and increased value from their production and labour, leading to an increased, more predictable income.

Resource management: Poor and vulnerable women and men have more control over key livelihood resources (especially natural resources / ecosystems), and are empowered and supported to manage them sustainably and inclusively.

Risk reduction: Poor and vulnerable women and men are better able to manage incremental risks and cope with sudden shocks (including climate change, conflict, natural hazards and pressure on natural resources).

Voice: Poor and vulnerable women and men have more say in decisions that affect their livelihoods (at every level from the household to international policy).

Adaptability: Women and men are able to protect and/or transform the ways in which they make a living, respond to identified current and predicted future impacts of climate change and other threats, and have the capacity to adapt to these changes and 'navigate' the future.

These livelihood characteristics described here should be inter-related and complementary. Otherwise, a livelihood would not be resilient, for instance, if it is profitable but depends on over-use of the resource, limiting longer-term sustainability.

Markets and profit: Resilient livelihoods require access to markets. Buying inputs, selling produce/labor and/or accessing credit and financial services are at the heart of making a living. They also require equitable markets that are non-discriminatory, with more equal bargaining power, fair and transparent enforcement of rules. Equally important is how and how much value can be added to the product marketed. Therefore, understanding how markets function, the degree of value addition, the extent of prices and how they include or exclude poor women and men is an essential part of livelihoods analysis and to resilience building.

Table A1: Other Important livelihoods options proposed to be included by Validation Workshop Participants (Naivasha, 31 March 2017)

No.	Kenya	Ethiopia	Uganda
1	Gum and resins	Gum and Incense	Gum Arabic
2	Fodder production	Poultry production	Shea nut production
3	Cultured fish	Fodder and seed production	Art and crafts
4	Hides and skins	Fattening	
5	Ecotourism & conservancy		
6	Camel meat preservation		

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