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Manoeuvring through difficult terrain: How local traders link pastoralists to markets

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ABSTRACT

Trade in livestock is the major source of income for pastoralists, traders, brokers, transporters and other actors in pastoral meat supply chains. Projects to 'link pastoralists to markets' in rural northern Kenya, place an emphasis on pastoral producers without adequate understanding of other inter-related actors whose activities and relations make up the connection to primary, secondary, regional and terminal markets. In this article, sheep and goat supply chains originating in Marsabit South are analyzed as a human activity system composed of the actions of supply chain actors and shaped by the relations between them. The geographically confined areas from which local markets receive the supply of sheep and goats are conceptualized as a "producer catchment area" depicted as finely branched tributaries through which livestock are moved towards terminal markets. A stakeholder analysis resulted in the identification of six categories of local traders who connect with other actors in both local and long distance supply chains to sustain the movement of sheep and goats to markets. The categories of traders are distinguished by different demands in travel, labour, working capital, risk exposures, and relations with other actors. In order to deal with variable and uncertain supply, local traders harness their social relations with other actors in the supply chain. However, local traders are at the highest risk for loss due to fluctuations in demand at the terminal market, as they depend on market information through brokers and lack relations to clients at the terminal market. This research demonstrates how systematic analysis of activities performed by actors, the interconnected activities linking them, and their relationships can offer insight for improved supply chain coordination.

1. Introduction

Rural northern Kenya is part of the Arid and Semi-Arid Lands (ASALs) where communities rely on pastoral livestock production for their livelihoods. With intimate knowledge of their rangelands, the pastoral communities manage their landscape to enhance livestock production, through strategic mobility to take advantage of patchy and ephemeral rangeland resources (Wario et al., 2016; Krätli et al., 2013).

The importance of livestock trade in light of poverty reduction and food security goals has attracted considerable academic research in northern Kenya, particularly from the 1990s onwards (Kerven, 1992; Ensminger, 1996; Barrett et al., 2006; Barrett et al., 1998; McPeak and Little, 2006; Barrett and Reardon, 2007; Mahmoud, 2008; Iruata et al., 2015; Rich et al., 2011; Bailey et al., 1999).

Although well-functioning livestock markets can offer opportunities for better returns and reduced vulnerability among pastoral households, this is not without challenges. Multiple structural issues affecting livestock trade have been identified such as high transaction costs (Barrett et al., 2006; Bailey et al., 1999; Ensminger, 1996), information asymmetries and weak physical infrastructure (Bailey et al., 1999; Barrett et al., 2006), and weak livestock marketing policy (McPeak, 2006). Recommendations include better market coordination through improved market information on

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animal-characteristics (Stuth et al., 2006; Radeny et al., 2006) and timing of market days or auctions (Green et al., 2006).

These challenges and various government and international development interests to resolve them, gave way to development projects in northern Kenya to 'link pastoralists to market', particularly, in recent context of shifting donor priority away from food aid and direct-cash transfers. An example of a project with activity in northern Kenya is a USAID-sponsored development program (worth 20 million USD) launched in 2013, "Resilience and Economic Growth in the Arid Lands—Accelerated Growth".[1]

However, the success of these projects to link pastoralists to markets remains limited. They tend to fail in both 'macro' and 'micro' dimensions; from the macro due to limited contextualization of how the livestock supply chain functions in the broader political economy, and from the 'micro' due to lack of understanding of the specific activities of actors and relations between pastoralists and local traders who shape the supply chains. The emphasis on marketization must be embedded within the broader social context in which both formal and informal exchange create an interplay of social and material practices that ultimately constitute economic processes within pastoral systems (Gertel and Le Heron, 2011).

Livestock traders play a key role in linking the communal subsistence and market economy in pastoral areas (Konaka, 2001, p.63). In the past, livestock traders in Kenya were mainly from the Somali ethnic group, operating in both the Northern and Southern rangelands. Only more recently, members from the local ethnic groups became traders, such as Maasai traders in Kajiado (Van Ufford and Zaal, 2004, p.128). Based on a historical review, Van Ufford and Zaal (2004) found that shared ethnicity and social group among the Maasai traders are used as social and cultural capital to build cattle trade networks based on trust. Similarly, based on empirical research with Burji cattle traders in Moyale, Marsabit County, Mahmoud (2008, 2011) found that trust is leveraged in social relations to enable them cope with diverse trade risks. He identified trust-based relationships, individually-based trading partnerships, informal cash transfer systems and membership in livestock trader associations as strategies used by the traders. Based on anthropological fieldwork with Samburu traders, Konaka (2001) differentiated market traders who are mainly from the Kikuyu ethnic group and local traders from the Samburu. Among four strategies for profitability identified by the local traders, was a temporal shift between the herding and trading activities to minimize losses during different climatic seasons and varied market conditions (Konaka, 2001). Most studies of pastoral livestock traders focus on the cattle traders, including the recent study of (Little et al., 2014). With specific attention to sheep traders in Kajiado, Mtimet et al. (2014) evaluated decision-making and found that breed was considered to be the most important attribute for profitability. In their conclusions, they asserted that, "traders role is vital in the development of the value chain" (Mtimet et al., 2014, p. 71).

Previous studies in pastoral regions of Kenya have focused on either a specific market or on a segment of the pastoral livestock supply chain without considering the connections of the entire chain. To address this gap, the aim of this paper is to examine the activity system of traders and to differentiate the roles of different types of local traders in linking pastoralists to markets. We identify activities performed by different categories of traders and their relationships with other actors that facilitate and sustain the activities. This study shows how the chain is currently functioning and reveals key challenges identified by different chain actors.

2. Theoretical framework

For our action research to be scientifically grounded, we needed a theoretical framework that place an emphasis on the views of the people with whom we would collaborate in order to identify improvements that they considered actionable in their specific context. We chose an actor-oriented approach to systems theory with an emphasis on the activities and relations that link different supply chain actors into a functioning system.

Systems theory is used to analyze the interactions between parts in order to understand the relations that form an entity (Von Bertalanffy, 1972; Chikere and Nwoka, 2015). Checkland (1985), described a human activity system as composed of interacting activities performed by individuals and groups of individuals. Human activity systems are established and maintained by human actors through their activities (Argyris and Schön, 1978; Mingers, 2006; Kaufmann et al., 2013). Human activity systems specific to professions in the livestock supply chain include livestock rearing (i.e. the activity system of a livestock producer), trading (i.e. the activity system of a trader) etc. A supply chain represents a complex network of business entities linked across production and consumption boundaries (Liu and Guan, 2014) spanning across rural and urban areas. When considering such business entities as an activity systems, the supply chain can be analysed as a human activity system (Vrijhoef and Ridder, 2007; Rigby et al., 2000).

An actor-oriented perspective lends itself to bringing forward the views, interests and values of the actors involved in a system and to identify the room of manoeuvre that they perceive within the structure. According to Giddens (1984), actors draw from specific structural rules and resources to produce social systems. Within these, we find, for example business networks composed of actors and sets of political-economic structures that influence market rules. Building on Giddens' argument, Long (1990, 2001) combined structural and actor perspectives to develop an actor-oriented approach, with a focus on the agency of the involved actors. An actor-oriented approach places emphasis on the central role of human action and understanding of the "lifeworlds of different social groups" (Long, 2001, p.23), thereby drawing attention to: i) how actors are organized in social groups and networks (Long, 2001), ii) actor strategies and ways to interpret choices in complex negotiations between individuals and groups with different interests (Long, 1990), iii) the structural factors that constrain or enable choices pursued by actors (Long, 1990 in Long, 2001). In the supply chain, each actor has a specific social-economic position, function and interest such as in their production and marketing activities (Osei-Amponsah and Visser, 2016). Drawing on stakeholder theory, we have differentiated actors into primary actors whose activities directly constitute the system (these actors have their hands on the product) and secondary actors who influence the room of maneouvre of the primary actors.

However, each actor operates in connection with others to create a network that defines the types of relationships and exchange that emerge (Long, 2001). Håkansson and Snehota (1995) connected the activity system with closely related aspects of the actor relationship across business networks. They conceptualized markets-as-networks by integrating actors and activities for

[1] http://acdivoca.org/our-programs/project-profiles/kenya-resilience-and-economic-growth-arid-lands-accelerated-growth, Accessed May 13, 2016.

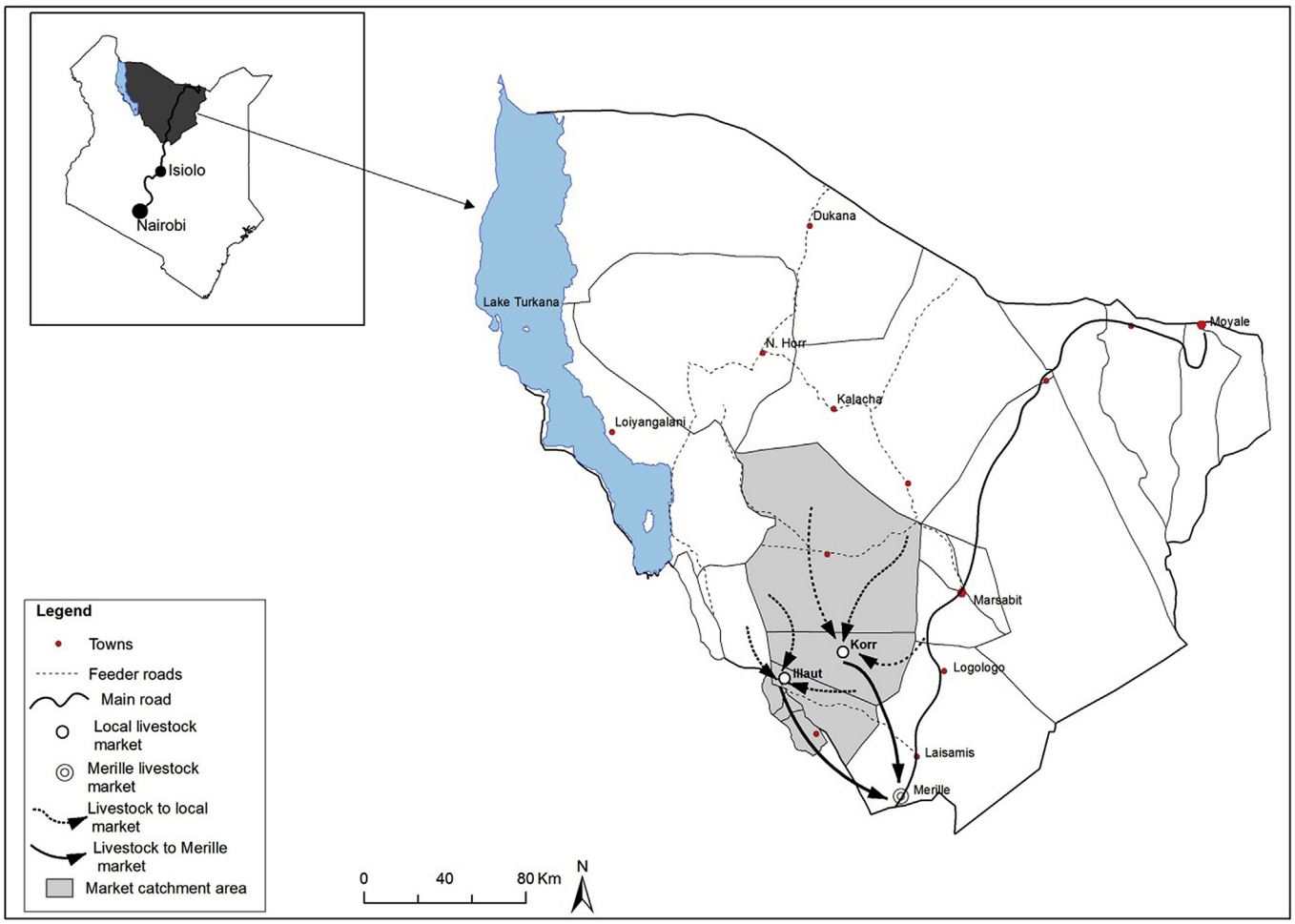


Fig. 1. Study area.

analysis of business relationships, as three layers: activity links, resource ties and actor bonds. Their emphasis is on the importance of understanding the interconnections between the different layers to explore the possibility for developing more economically effective links, ties and bonds (Ibid, p. 34).

Human activities can be analyzed as relationally embedded within social and institutional contexts (Muller and Perret-Clermont, 2016; Klein and Juhola, 2014). As a purposive system, human activity systems bring to the forefront actions undertaken by people within a particular context with specific motives and goals (Restrepo et al., 2016; Argyris et al., 1985). Activity system analysis conducted with participatory tools can lead to a learning process in which involved actors evaluate their practices and identify ways that they can change their work to meet their goals (Yamagata-Lynch, 2010; Restrepo et al., 2016). Hence, the outcome can be applied to improve practice. As activities are constitutive of systems, transformations can result from actors modifying and creating new practices (Scribner, 1997, p. 16 in Yamagata-Lynch, 2010; Kaufmann and Hülsebusch, 2016). The approach also enables an understanding of the systemic contradictions and tensions which are embedded in social-cultural practices which can be difficult to identify and describe with other methods.

Against this theoretical background, understanding a supply chain requires research on a specific business context, the involved actors, and how and when various activities are performed. These activities are shaped by the interdependencies between activities and the relationships among actors.

3. Material and methods

3.1. Study area

This research was carried out in northern Kenya, located in the lowlands of Laisamis sub-county, in the southern part of Marsabit County bordering Samburu County (Fig. 1). The climatic condition in Marsabit County is characterised by bimodal rainfall, leading to four seasons: the short and hot dry season, starts in January and ends when the long rainy season begins from March to May; the long dry season commences in June and lasts until November; followed by the short rainy season until the end of December. However, the seasonal patterns have become more erratic leading to frequent failure of rainy seasons. The area experiences an annual average temperature of 20.1 °C (County government of Marsabit, 2013).

The new highway linking Marsabit and Isiolo towns will ease the movement of livestock to regional and terminal markets. However, the lowland roads remain unpaved and impassable

during rainy seasons, especially for non-four-wheel drive vehicles. Towns along the Marsabit - Isiolo highway, have more economic activity and are better connected to mobile network coverage than other towns in the lowlands.

Laisamis sub-county has a land area of 20,290.5 km^2 and is home for Rendille and Ariaal (bilingual in Samburu and Rendille) pastoralists who rely on livestock production. Compared to other areas in Marsabit County, the population of sheep and goats in Laisamis sub-county is relatively high with more than 458,172 (County government of Marsabit, 2013, p.69). Sheep and goats are mainly traded in local markets for income to meet regular household needs. Because of relatively vibrant local markets in Laisamis sub-county (Chabari and Njoroge, 2015, p. 36), the Rendille have high livestock sales compared to other pastoral groups in Marsabit. However, until ten years ago, most livestock trade in the area was done by traders from the Burji ethnic group and so the increase in Rendille local traders has changed the social relations in a process that is still unfolding and will be further explained in our results and discussion.

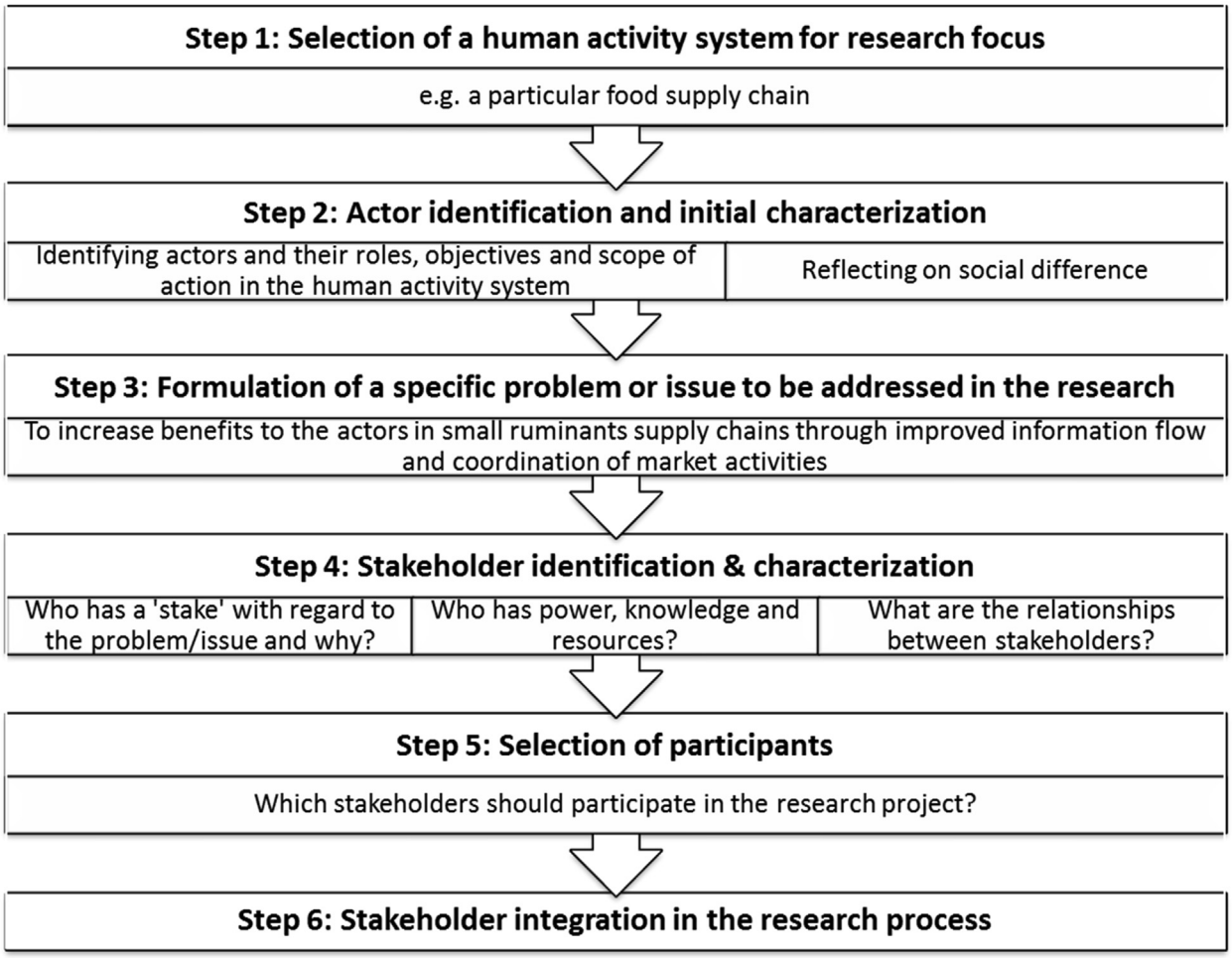


Fig. 2. Stakeholder analysis steps, adapted from Lelea et al. (2014), p. 4.

3.2. Data collection

We collected information on the type of actors, their activities, and the relationships between them. We started with data collection required for a stakeholder analysis (Lelea et al., 2014). We followed the steps in Fig. 2, starting with selection of the sheep and goats supply chain on which our study focuses, followed by identification and characterization of primary actors who perform specific functions in the supply chain. In this second step, we commenced with the literature review from which we identified an initial list of 83 individuals and 19 organizations working in the sheep and goat supply chains.

During exploratory research, July-August 2014, the names and contact details of individuals in different actor groups were gathered starting with observation and initial contact at the markets. A snowball technique was used to investigate other connected actors. Stakeholder identification along the supply chain started from upstream, i.e. the pastoral producer areas and then followed downstream up to the terminal market in Nairobi. In order to see whether important actors were omitted, one multi-stakeholder meeting with 28 participants that included livestock producers, local traders, local butchers, local brokers and representatives from livestock marketing groups, county government and non-governmental organisations was conducted.

In the third step, intra-stakeholder[2] meetings were conducted

[2] Intra-stakeholder groups consist of participants from one stakeholder category only (e.g. traders).

with traders (8 meetings) and producers (14 meetings) to identify problems related to specific actor category. Thereafter, secondary actors with an interest and influence on the problems in livestock marketing were identified. After the identification of the stakeholders, the finals steps were the selection and integration of participants in the research collaboration.

Through this process, we identified 14 preliminary actor categories, including pastoral producers, local traders, brokers (livestock & lorry), transporters, research institutions, financial institutions, county governments, Non-Governmental Organizations (NGOs), butchers, meat distributors, market committees, meat processors, meat exporters and consumers.

From June 2015 until January 2016, we collected qualitative data on traders' activities and relationships. Field observation was done on 36 market days, including Korr (20), Ilaut (9), Merille (3) and Nairobi (4) markets. During the visits, observations were made about trade practices, interactions between actors and the collaboration between different traders in undertaking their activities. The informal talks with traders also helped us to understand traders' recent sales experience and any other development in the market. These observations and conversations were registered in field notes at the end of the market days.

Through these regular visits to local markets, we established rapport with a number of traders who provided information to generate a list of 30 active local traders in the study area. We began our interviews with full time long-distance traders (Table 1) who were recognized in their pastoral community for having a high frequency of trading activities. At a later stage, information was collected from other categories of traders with whom they are linked. Overall, 20 interviews were conducted with different categories of traders (Table 1).

Interviews made were of narrative structure (Schuetze, 1977). With this method, we learned the respondent's trading history as they recounted important events in their trading life from the day they started the trade. Thereafter, follow-up questions detailed their routine activities and relationships with other actors along the chain.

These individual interviews were complemented by three focus group discussions (FGD) which brought together different traders, market officials, local brokers and livestock producers at their respective chains in Ilaut and Korr town. In these groups, they discussed livestock marketing activities, problems and relationships in their supply chains. All group sessions and interviews were audio-recorded and 15 interviews were fully transcribed. A thematic coding scheme was developed with three categories relating to our research: actors, activities and relationships. Each category further contains sub-codes. This coding framework was applied to the transcripts and all written materials using RQDA® qualitative data analysis software.

4. Results and discussion

4.1. Characterizing sheep and goat supply chains in Marsabit South

The aim of this section is to describe the current sheep and goat supply chains in study area. Within Marsabit South, two types of supply chains can be distinguished i) local chains which include the local markets and their corresponding producer catchment areas and ii) long distance chain which connects local markets to the terminal market in Nairobi. The structure of these supply chains are similar to those in other pastoral areas with poor connections to urban areas (Nunow, 2000; Turner and Williams, 2002). In our research, we categorized livestock markets based on geographical location, starting in livestock production areas with the local markets that are differentiated as primary and secondary markets. Regional and terminal markets are located away from these producer areas.

4.1.1. The local chains

As established from the interviews, local traders may purchase goats directly from producers at homesteads in villages, at water points and grazing areas. The three local markets within the administrative boundary of Marsabit South include two primary markets in Ilaut and Korr, and one secondary market in Merille. The primary markets are part of a 'tributary' within the producer catchment area and can serve as first selling points for pastoral producers and as collection points for local traders. The secondary market in Merille draws sales from a wider area in Marsabit South.

These local markets differ by livestock species traded. In Korr market, sheep and goats are exclusively traded while the Ilaut market predominantly has small ruminants, although, occasionally there are also cattle and camels. Cattle or camels are usually bought by pastoral producers for herd reproduction and, in a few instances; local traders will acquire them to barter sheep or goats in future. At the secondary market in Merille, cattle, camels, small ruminants and donkeys are traded. Merille serves as a collection point for external traders who originate outside Marsabit South to purchase and transport livestock to other regional markets in Isiolo, Meru and Archers Post (within a radius of 300 km) or to the terminal market in Nairobi (600 km).

The local markets in Ilaut and Korr are held on different days, accommodating the itineraries of local traders and improving the number of participating producers. The market day in Ilaut is every first Tuesday of a fortnight while in Korr it is every Saturday.

4.1.2. The long distance chain

In contrast to the traders who commonly trekked "on the hoof" (which is the term used when livestock and accompanying herders walk long distances) to local markets or occasionally to markets in a neighbouring county, traders taking livestock to a market requiring long distance travel usually do so by truck. These traders must then have enough sheep and goats to fill a truck (150 are indicated on the movement permit needed for trucking), as there is a fixed price for the permit and the lorry, irrespective of the number of animals.

The secondary market in Merille is used by both local traders from the producer catchment area, as well as by external traders and is an important last point in which trucks must be filled before making the 600 km journey to Nairobi. Merille has a strategic location resulting in high number of animals transacted at the market because i) it is easy to access with lorries along a major north-south road connecting to Isiolo and then further south to Nairobi and ii) is situated at the confluence of two counties (Marsabit and Samburu) and in proximity to the dry season grazing areas.

4.1.3. Categorizing local traders

The movements of sheep and goats between markets are facilitated by different categories of local traders (Table 1). These traders are differentiated based on the distances covered and their purchasing and selling points, as well as by the amount of working capital required and risk exposure influencing their strategies (Table 1).

Table 1
Categories of local traders.

Trader category	Purchasing from	Selling to	Strategy
Itinerant traders (I)	Pastoral producers at homesteads, water points or grazing areas	long-distance traders at primary markets or external traders at the secondary market	Trek across vast areas in groups to take advantage of price differentials between local markets and pastoralist homesteads, villages or water points. In Korr and Ilaut, there are about 6–8 itinerant traders associated with each market. They also engage in barter trade when they meet a herd owner who may want to exchange, for example, a donkey for goats.
Rearing traders (II)	Pastoral producers at homesteads, water points or grazing areas	External traders who originate outside Marsabit South	Buy similar sizes of immature goats at an average price during dry seasons and rear them for a period of time to sell either once or twice a year after they gain weight and are mature.
Butcher traders (III)	Pastoral producers at local markets	Households, schools and restaurants	Buy relatively few but reliable numbers of sheep and goats every market day. The 5 butchers in Korr share premises and slaughter in an organized rotation, with each butcher allocated a specific day.
Stationary traders (IV)	Pastoral producers at local markets	Long-distance traders	Purchase animals very early on market days and resell them at a later hour in the same market. When they fail to recoup their purchase prices, they may graze the animals for a week or two before selling again in the same market.
Inter-local market traders (V)	Pastoral producers at local markets	External traders at either the Merille market or other regional markets	Take advantage of price differences between local markets. They link pastoral producers to external traders mostly in the Merille market or at the Lolguniani and Latakwen market in Samburu County.
Long-distance traders (VI)	Pastoral producers at local markets and directly from traders I, IV & V	Nairobi traders and clients via broker (at the Kariobangi market in Nairobi)	Depending on the season, participate in taking about 2-4 trucks per month to Nairobi. Of the total 14 long-distance traders, most work in groups of 3-4, while only 3 work alone.

Source: 20 interviews with 14 long distance traders, 1 rearing trader, 3 itinerant traders and 2 inter-local market traders.

Although long distance traders may choose to employ strategies associated with other categories of traders, the converse is difficult because of higher working capital required to enter the long distance trade. Examples of how long distance traders mix categories include, i) using the strategy of an itinerant trader when price differences between villages and local markets are attractive, ii) buying sheep and goats to rear as part of their herd like the rearing traders and iii) operating butchery as second business line. Such combinations of trading strategies are important for long distance traders, because of the precarity.

Local traders are part of an activity system that requires sequential coordination (Håkansson and Snehota, 1995, p. 5). They move animals while purchasing them at specific locations (markets, water points, and homesteads) and at certain times (market days or agreed time at fixed points), thus concentrate a spatially dispersed supply. The different transactions carried out by a variety of traders at the village level, local markets and the onward movement of sheep and goats to regional and terminal markets, is represented in Fig. 3. The finely branched net shows the point at which each trader is active and the broadening thickness of the tributaries depicts the increase in volume of the flow of animals from primary to terminal markets. Nevertheless, these varied connections are typically abstracted as a linear chain in most livestock marketing literature (IIRR, 2014; Juma et al., 2010; Pavanello, 2010).

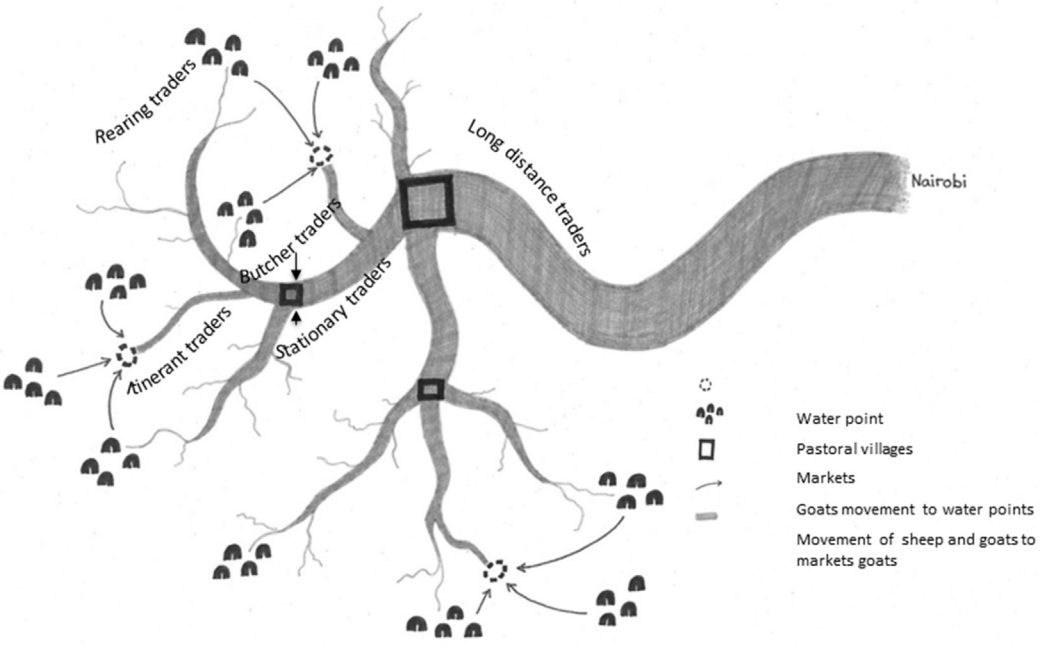


Fig. 3. Movement of sheep and goats from producer catchment areas to primary, secondary and terminal markets.

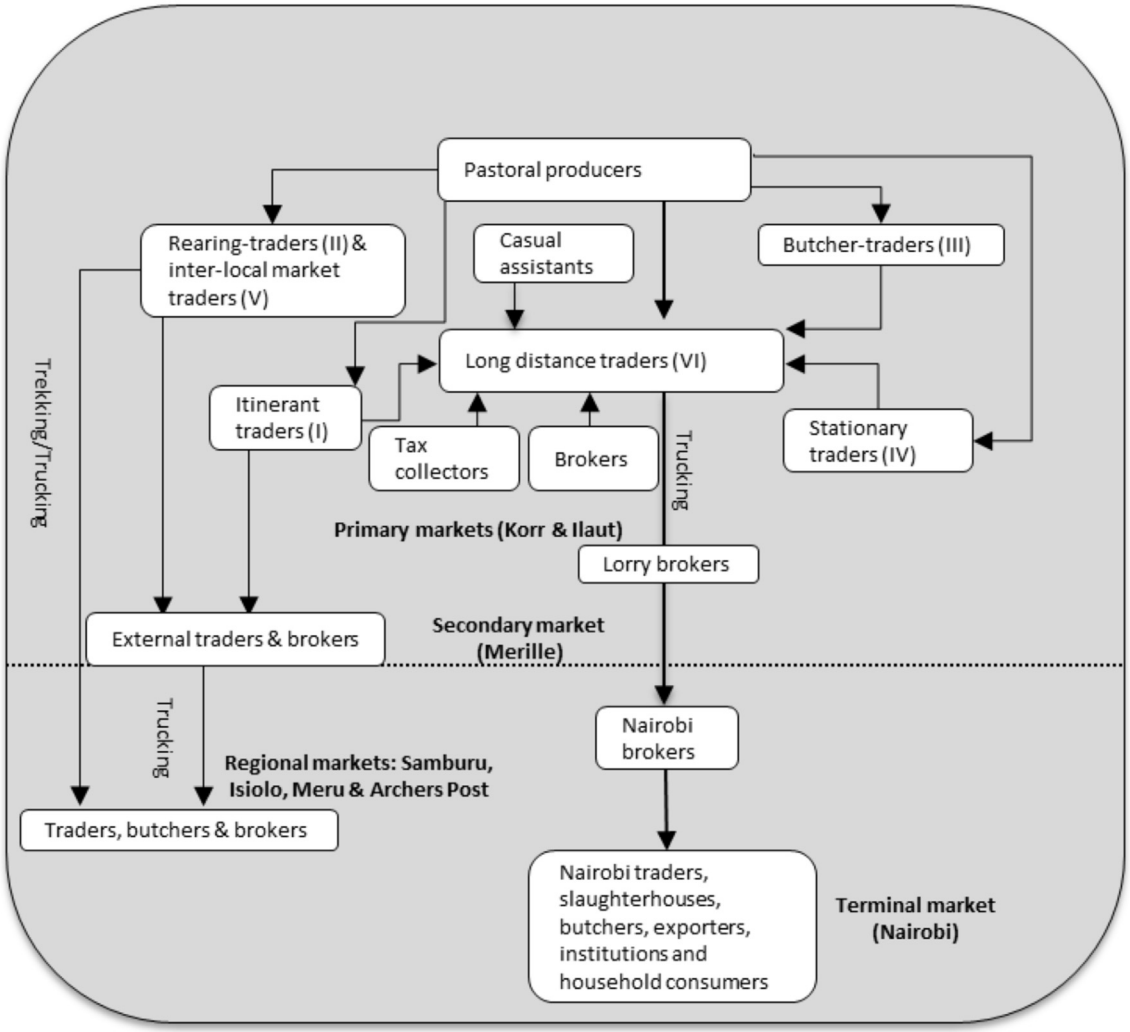


Fig. 4. Sheep and goat supply chains in Marsabit South.

4.1.4. Central role of local traders in the sheep and goat supply chains

Local traders mobilize sheep and goats from producers to consumers hence play an important role. Fig. 4 is illustrative of connections between actors in the primary, secondary, regional and terminal markets.

It shows the positions of different traders and their connections to other actors. The information in this figure complements the findings presented in Table 1. Pastoral producers interact with all categories of traders. A long-distance trader commissions a lorry broker to organize transportation. Upon delivery, a Nairobi-based broker organizes the final sale to different clients. However, the situation differs when pastoral communities have better connections to urban consumers. For example, the Maasai pastoralists from Kajiado who are relatively near Nairobi have more transportation options including refrigerated trucks and links to butchers and abattoirs (Zaal and Ton, 1999).

4.2. Activities of local traders

In this section, we present common activities undertaken by the six categories of local traders and highlight differences among them. The activities are listed according to the stages of their tasks and sub-activities are explained using quotes from the traders (Table 2).

Activities of local traders are linked to those of other actors in the supply chain. Primary actors are presented along with interconnected activities (Table 3) that are embedded in the wider activity pattern spanning several actors (primary and secondary) in the supply chain while the secondary actors, whose activities influence the primary actors are indicated in third row of the table. The activity links show both sequential and parallel activities that can be explored as part of a larger series of activities necessary to enhance supply chain coordination (Håkansson and Snehota, 1995). Activity linking can be strengthened through reciprocal adjustment of activities to strike an economically advantageous position (Håkansson and Snehota, 1995, p. 60).

Currently, coordination of activities are formalized by trading at agreed upon locations and times on market days. Other additional and strategic coordination is not institutionalized, but mainly depends on personal arrangements of individual actors. However, according to traders, linking purchasing activities with sales would improve their decision making at purchase, because prior knowledge of the requirements of clients at the terminal market help them to undertake their activities efficiently and more profitably.

In the absence of fixed contracts, there is short time validity of market information due to day to day price fluctuations at the terminal market. As it takes a minimum of five days to amass

Table 2
Description of the activities of local traders.

Stage of Activity	Description of Sub-Activities	Trader Categories
Purchase	Choosing the purchase area: "*When I purchase, I talk to people to get the information I want, when I hear that there is a Manyatta [village] that doesn't have food and would likely sell their goats*[a], *I rush there*" (IT81, Ilaut).	I&II
	Assessing the quality and quantity of goats on offer: *"First, I make a market lap and get the information…"* (IT81, Ilaut).	I-VI
	Selecting sheep and goats: *"I usually look for the goats I want, assess their sizes, collect them together and call the owners to agree on the price"* (IT81, Ilaut).	I-VI
	Bargaining: "*I bought my first goat from a lady seller with an opening offer of 2,700 shillings. but I offered 1,700, and then I moved up to 1,800, and then she also dropped to 2500. Then I moved up again to 2000 for my final offer but she was not content. I told her I will add 100 on top and I walked away. Then she called me back and I bought the goat at 2,100*" (L45, Korr).	I-VI
	Branding the animal and leading it to a separate pen in the market: *"We mark the goats as we purchase them…"* (L45, Korr).	III-VI
	Paying tax collectors.	I-VI
Movement & herding	Trekking on the hoof to a collection point: "*… My colleague buying in the Ilaut market engages a herder who will trek the goats for one day to reach Korr and we pay him an agreed sum for the service on arrival*" (L45, Korr).	I, II, V & VI
	Herding and watering at the collection point, awaiting market days or transportation: *"As I buy, there is a herder who grazes them in the fields until we fill the lorry"* (L46, Korr).	I, II, V & VI
	Trekking the sheep and goats to the markets in Merille and Samburu County: *"After getting the required number of goats, I sometimes trek from Latakwen to Merille … which is 4 days of walking."* (IT81)	I, II & V
Transport	Contacting a Marsabit based lorry broker: *"The lorry broker organises for us by telephoning the lorry owner or driver who just returned from their trip"* (L45, Korr).	VI
	Contacting end buyers or brokers, *"We have a common broker and every trader communicates with him so he knows when they are on their way for prior arrangements"* (L47, Korr).	VI
	Acquiring transit and health permits for the transportation: *"We ask the lorry owner to get the permit for transporting the goats to Nairobi and also pay for the health permit issued by the veterinary officer"* (L45, Korr).	VI
	Hiring sand loaders: *"When the lorry arrives, we engage two people who will put a small amount of sand in the lorry and we pay them a fixed amount for the labour"* (L45, Korr).	VI
	Calling a Nairobi based broker to inform him about travel plans.	VI
	Engaging a 'specialized' herder to watch over the animals in transit: *"There is a herder who will be with the goats until we reach Nairobi market. We usually pay him fixed amount"* (L45, Korr).	VI
Sale at the Merille market	Contacting buyers in Merille prior to travel: *"I sell my goats directly to one client in Merille, a Burji trader. I call him and when he says, Yes, I make a personal visit to the market to cross-check prices and also to show the sizes of my goats to him. Then I come back and trek to Merille"* (RT11).	I, II & V
	Assembling goats in one location supervised by traders.	I, II & V
	Negotiating with buyers and concluding the sale (occasionally through a local broker).	I, II & V
	Paying tax collectors.	I, II & V
Sale at the Nairobi market	Paying market entry fee	VI
	Engaging a broker: *"After offloading the goats at the Nairobi market, we have a broker who helps us sell them. We pay him a fixed amount after the final sale"* (L45, Korr).	VI
	Organising with the broker to hire a herder: *"If we haven't sold the goats by evening, we get a shelter where we pay an overnight fee per goat and the following day the goats have to be grazed by a paid herder"* (L45, Korr).	VI
	Reconciling accounting with the broker and confirming payment of funds prior to return travel: *"After I have counted the total sales, I sit with my broker to know my expenses, and then I give the broker and any person I have traveled with, their respective cash until I am through with all the deductions. After that, I either deposit my balance in M-Pesa or travel back with it"* (L46, Korr).	VI

[a] The pastoral producers and traders use the term goats to refer to both sheep and goats.

sufficient goats to fill a lorry along with the necessary permits, local traders are subject to risk.

Despite the vast area, varying and unreliable offers, fluctuation of profits and additional uncertainties and risks (such as droughts, epidemics and insecurity), the local traders manage to up-hold their trading activities, which is effectuated by relationships they have with other actors. However, their ability to continue is threatened by the strain of price, demand and supply fluctuations.

> "*I go and find there are no buyers in the market, so I am forced to sleep several days around the marketplace incurring costs, such as paying accommodation fees at the lodge, grazing charges for animals to stay overnight, animal feed while waiting for the market and so many other petty costs. In such a situation, the expenditure is high. I was saying to myself, if I could have any other option, such as another job, I could have left this business. But this is the only option I have so I am still in this business …*" (L47, Korr).

The strength of activity links directly influences the performance of the overall supply chain. As the efficiency of two actors (companies) in a relationship are inter-dependent, it influences their profit margins (Håkansson and Snehota, 1995), in the example of local traders, tightening either transportation or information exchange links could lead to mutual benefit. Therefore, the aim of Table 3 is to establish activity interlinkages between the actors in the supply chain. This is an important step for improving the room of manoeuvre of the involved primary actors.

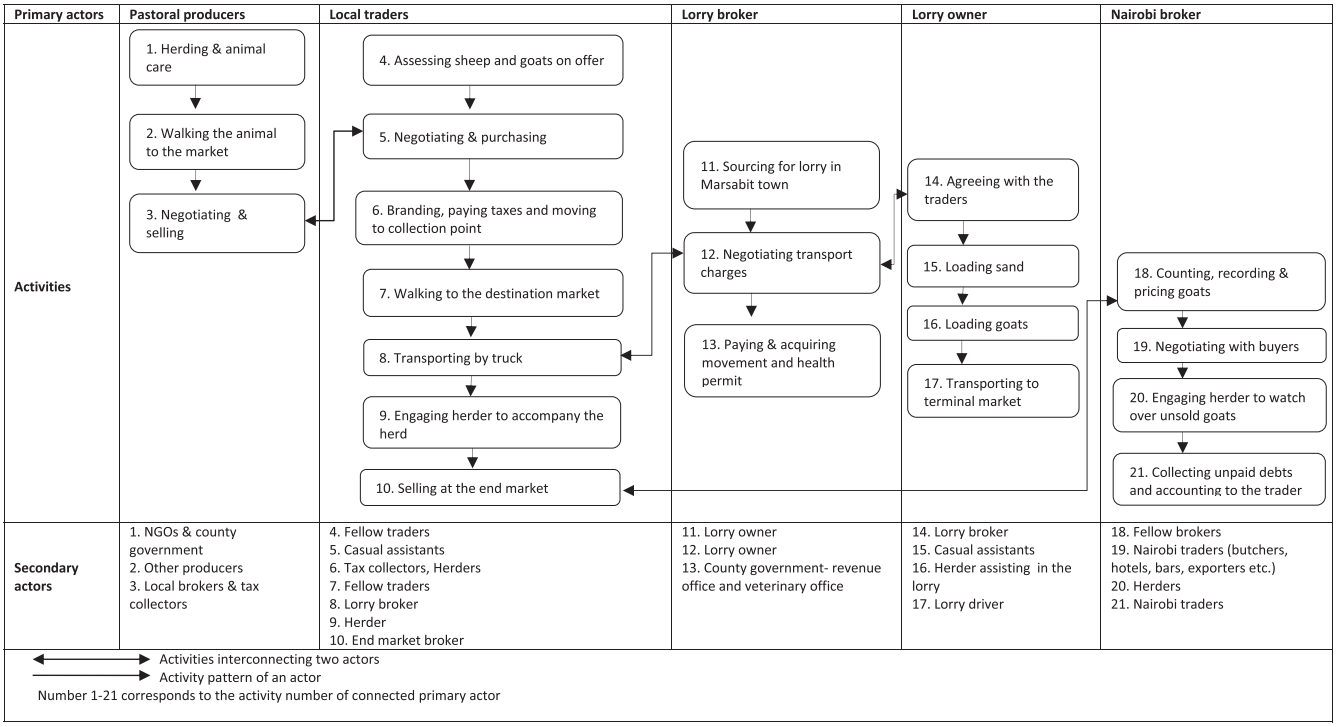
4.3. Actor relationships

In this section, we analyze the relationships between different local traders and actors in the sheep and goat supply chains. The interconnected activities (Table 3) span those in the producer catchment area until the Nairobi brokers. Respective relationships are built over time and its strengths have an implication on the quality of interconnected activities. Below, the different relationships between local traders and other actors are explained.

4.3.1. Local traders – pastoral producers

The relationship between a local trader and a pastoral producer may start on a market day with a bid, counter bid and final offer. Since most producers repeatedly come to the same market over the course of a year, they develop contacts with particular traders. Relationships might develop such that on a market day, a pastoral producer might contact a particular local trader to be considered for an early sale. Outside market days, this relationship is used by

Table 3
Activity pattern of the sheep and goat supply chains.



the traders when sourcing for more goats to fill a truck. This relationship can be vital in a context of a spatially dispersed goat supply and scarce supply information.

This relationship can go beyond a market transaction when other types of 'emergency support' are offered. When a strong relation is developed, a trader can advance credit to a pastoral producer. This applies when the producers have their herd located in distant grazing areas. In such circumstances, the trader might lend the producer cash to be reimbursed later with an equivalent number of sheep or goats. Due to close clan or tribal ties, such borrowing is based on trust and may involve clan elders to assure recovery.

> "*In the past, we used to only sell to external traders [from non-Rendille ethnic groups], often with many challenges - language barriers, limited room for bargaining better prices. Now, with the entry of Rendille traders, we have leeway to push them to give us better offers since they understand our background situations. Even in the case that our animals are far away and we have pressing need, like medical, we can get a loan from traders from our village and pay them back later. This was not possible before" (FGD with producers, Namarei).*

In the local chain, pastoral producers and different categories of traders share ethnic identity. This is a rather recent development, as up to around the year 2005, trade in the area was dominated by Burji traders from Marsabit central. The change is explained by local traders as now being able 'to benefit their own people', a sign of ethnic-based solidarity. Belonging to the same community also increases the options for recourse when a problem arises. The practical possibility of connections from the actors' networks combined with a strong bond based on common ethnic identity helps them to manoeuvre in the challenging terrain. For instance, long distance traders draw on relationships with itinerant traders and producers to deal with supply uncertainty and with the broker in Nairobi to deal with demand uncertainty. Ethnicity and trust were also central to traders' livestock trading strategies in other research (Van Ufford and Zaal, 2004; Van Ufford, 1999).

However, relationships are not always positive despite shared ethnicity. Some producers describe the local traders as manipulative in terms of prices at local markets. Recently as the number of local traders increased, external traders ceased coming to the Ilaut and Korr markets.

> *"During wet seasons, we have the choice of postponing sales but in dry seasons, we are under pressing need to sell. In such situations, there is naturally a high supply of sheep and goats in the local market, with only few local traders. This results in traders giving low prices … or declining to buy from us altogether. Since we have a pressing problem that cannot wait, we finally sell at the terms favourable to local traders …"* (Producer, Namarei)

4.3.2. Long distance traders – itinerant traders

Long distance traders develop relationships with itinerant traders who sell high number of sheep and goats in the local market or at their homestead. Establishing relations with itinerant traders is beneficial to long distance traders because they can quickly amass the required animals and thus reduce the effort and time needed to fill a lorry. Long distance traders seldom depend on brokers at local markets for information on who is willing to sell. Maintaining regular contacts with a group of itinerant traders, results in established relations whereby the long-distance traders can contact the itinerant traders before market day to view the animals and make early purchases. This is common, especially when the latter has a reputation for selling high quantity of quality goats. Through this relationship, the long distance traders can pass information regarding the types of goats to be bought by the itinerant

trader for a subsequent market day. However, the increase in number of local markets and organized market days has reduced the reliance on itinerant traders. Itinerant traders also prefer selling on market days to improve chances of profitable sales by choosing between different traders rather than routinely sell to one long distance trader.

4.3.3. Long distance traders – butcher traders

Long distance traders have established reciprocal relationships with butcher traders who slaughter sheep and sell to pastoral households in and around towns. For instance, when a long distance trader learns that there are low prices in the terminal market, he may chose to leave some animals with the butcher to slaughter and receive the money after the meat is sold. Also, in a situation where an animal has been injured during loading and is unlikely to reach the terminal market alive, the long distance traders will sell through the butcher. The butchers can benefit from this relation by occasionally asking long distance trader to transport sheep and goats to the Nairobi market and sell them on their behalf. This is done to diversify butcher's business.

4.3.4. Long distance traders – casual assistants

Some activities of long distance traders require casual labour, such as assistance in the market, when loading the animals and during transportation. These assistants can be recruited through relatives (or extended kinship), other traders, producers or tax collectors. The level of trust required to select a suitable person depends on the task. For instance, selecting the person to trek animals from primary market to the collection point of a trader requires a high degree of trust. In such a case a member of the extended family or someone from the same clan is selected. In contrast, when activities are performed in the presence of traders such as in the markets, then a lower degree of trust is required and the person can be recruited from any available assistants at the market. Generally, the ease of building relationships at the local chains between different actors and the long distance traders ease traders purchase activities.

4.3.5. Long distance traders – lorry brokers

Long distance traders must establish and maintain relations with lorry brokers or lorry driver who are important links to lorry owners in Marsabit town. All long distance traders establish relationships with the lorry brokers who performs paid specialized services such as providing information on available lorries, relay information on transport fees, lorry drivers and then establishes prior agreements with lorry owners to organize transportation from the local market to Nairobi. The lorry broker may also organize for the required movement and animal health permits when this is not organized through the lorry owner.

> *"First I purchased goats from the Korr market and the number was insufficient to fill a truck. So I went to the Ilaut market to buy more. After I had acquired the number that is equivalent to one truck, I communicated with a lorry broker in Marsabit town to order a lorry and permit to transport the goats"* (L47, Korr).

Alternatively, some long distance traders establish relationships with the lorry driver after repeated engagements, a relationships that gives the traders an organizational advantage to respond in time when information about 'good prices' is communicated by brokers in Nairobi.

4.3.6. Long distance traders – Nairobi brokers

The Nairobi brokers mediate transactions between sellers and buyers. They act as an intermediary to negotiate the sale of animals directly with the clients, i.e. without active involvement of the trader. This relationship offers the following advantages, i) the wide client base of Nairobi broker to realize fast sales and thereby avoid additional costs to the trader, ii) follow up on debts in a situation where some customers only pay the deposit for the sale and the balance is to be remitted later.

> *"Even when he gives some goats to a buyer before they are paid, that is none of our business, and it is him to deal with it because there are some buyers who fear carrying money to the market. They will agree with the broker and the money will eventually reach me"* (L47, Korr).

The importance of broker in establishing creditworthiness or reliability of the customer is also documented in other studies (Mahmoud, 2008; Cohen, 1965; Hill, 1966). Cohen (1965) describes broker as both insurer and risk taker in complex cattle markets, characterized by variability in buyers. They guarantee eventual payment, because even in situations of default by the buyer, they will take responsibility for paying the traders. Furthermore, interacting with multi-ethnic clients can pose language barriers and expose traders to greater risks because they are outside of their regional network.

Therefore, for majority of long distance traders, it is currently inconceivable to sell sheep and goats without engaging a broker in Nairobi because the buyers in Nairobi are simply 'faceless' to the traders from the study area. All long distance traders from Marsabit South recruit the same broker because the contact is passed through positive referral from one trader to another. This broker from Marsabit County is given preference because he 'shares a common region of origin'. When a long distance trader visits the market for the first time, they prefer to be accompanied by an experienced trader who will make an introduction to the broker.

4.3.7. Local traders – secondary actors

The regulatory requirements associated with the long distance movement of livestock expose long distance traders to secondary actors such as law enforcement officers and tax collectors. Transportation of sheep and goats with the lorry is always done during the night. However, in Kenya, livestock transportation between 6pm and 6am is forbidden by law, under legal notice 119 of 1984. If animals would be transported as per the law, the arrival time would be outside the market hours and, combined with more than 10h of travel and high day-time temperatures, sheep and goats could become weak or some might even die. As it is better to offer the animals for sale in Nairobi during the more vibrant early morning market because it is better to sell the animals while they are still 'fresh', before their appearance is diminished due to different climatic conditions and lack of proper forage. The traders are therefore obliged to pay bribes of non-negotiable sums to police at multiple road checkpoints in an 'institutionalized' manner. The prohibition of night transport is an important factor contributing to losses and systematically disadvantages traders from Marsabit. This practice is aptly described by a trader as, "libations for the grave", ascribing a kind of inevitability to the cost, by associating it with the Rendille belief that an offering is necessary whenever you walk by the ancestral graves. Although almost every long distance trader transporting livestock to Nairobi expressed being burdened by the bribery costs, it is generally acknowledged that so far, it is the most feasible option until the law is changed to allow night travel. Also Mahmoud (2008) identified police tipping at all checkpoints as a salient cost facing long-distance cattle traders.

> *"We start our journey, when we reach the first police checkpoint, we have to pay something small at the barrier, from that place*

onwards we have to pay that amount at each barrier we encounter …" (L45).

The number of pastoral producers selling regularly at the local markets has increased. This change has led to the emergence of other secondary actor, the Livestock Marketing Associations (LMAs) which is a committee that manage the local markets. The committee collect tax on sheep and goats sold and remit 70% of the tax to the county treasury, while the county government provides necessary travel permits to transport goats to Nairobi or to other regional markets. According to local traders and pastoral producers, the amount of tax imposed by the LMA and the county government are disconnected from the reality of shifting cycles of profit and loss that characterize their trade. The nearly unilateral imposition of tax per animal exchanged by sellers and buyers at local markets, in addition to the high fee for issuing travel documents, is not connected to price fluctuations that make the sheep and goat trade precarious. The centralized way in which the issuance of these documents are organized further deepens the weak relationships between local traders and county government departments.

4.3.8. Collaboration between local traders

Trader to trader collaboration plays an important role in the organization of the sheep and goat trade. Whereas the purchase activities at the local markets are performed by traders individually, the movement of animals to a long distance market is mostly done jointly. The collaboration is established out of practical convenience and necessity such as in case of limited working capital. Organizing the sale of sheep and goats in Nairobi market requires that a long distance trader has a working capital between 400,000 and 500,000ksh (approximately 4000-5000 Euros) per trip. Since sheep and goats are usually bought on a cash basis, this working capital is typically raised jointly by 2-4 traders per lorry.

"We still need other traders to help us fill the lorry … [because] the transportation is costly and hard on us … so we increase the capacity to 160, 170, 180 goats … if there are fewer goats, it becomes costly" (L48, Korr).

Through collaboration between traders, the costs which must be paid in advance, such as a deposit for the lorry and the salary for the herder who will supervise the goats *en route*, can be shared. In such arrangement, traders share costs according to the number of sheep and goats they contribute to a lorry. Joining efforts to purchase animals reduces the time needed to fill a lorry.

The traders also collaborate by sharing market information. They might call each other from the Nairobi market to share information about the number of lorries in the market, prices and the demand situation. This is then used to cross-check the information obtained from the Nairobi broker. Traders also help each other at the local market by offering 'peer review' to estimate buying prices for sheep or goat, in order to avoid over pricing that would increase their likelihood of selling at a loss in the terminal market.

In the study area, the new traders who are constrained by limited working capital, but aim to trade in the Nairobi market, seek mentorship from experienced long distance traders. Such a trader, can add his goats to the herd of an experienced trader. In such collaboration, the new trader benefits from the contacts, experiences and knowledge of the established trader, while they provide assistance during transportation so that they can share the costs. This is similar to cattle traders from northern Kenya, where larger traders partner with new entrants who begin as apprentices and help procuring cattle. The new trader benefits from guidance and trading tips from the experienced trader (Mahmoud, 2008, p. 571).

Among itinerant traders, collaboration is mainly sought when goats are trekked to the secondary market, which usually involves 3-4 days of travel. Combining their animals eases trekking and also reduces risks related to predators and robbery along the way. Secondly, they also collaborate to boost their bargaining power by strategically selling their goats together in the market to attract buyers interested in large sales.

4.4. Gaps in relationships and implications for producers and local traders

Because of the intermediate role of Nairobi brokers discussed above, long distance traders have no direct link to end buyers. This gives the brokers a powerful position. A similar finding was highlighted by Watson and Binsbergen (2008) who argued that because of the dominance of the brokers, the Nairobi market is difficult to penetrate by traders from pastoral regions. The missing relationship between the long distance traders and the clients in Nairobi results in a lack of knowledge regarding supply specifications, such as i) the range of prices for different types and sizes of goats or sheep ii) available buyers and their demand specifications iii) specifications regarding the type of goats, sizes and other attributes preferred by end consumers and iv) alternative market outlets in Nairobi or other urban centres.

Currently, this knowledge is partly with Nairobi brokers who never divulge it to local traders because of the obvious implications to their businesses. Due to this gap, a mismatch between the types of sheep and goats delivered by traders and the demand of the market are likely to happen. To hedge themselves, long distance traders often revert to transporting a mix of different types and sizes of sheep and goats. While this is an important buffering strategy to save them from severe losses, it simultaneously limits potential profits.

The second gap is between the local traders and Non-Governmental Organizations (NGOs) that conduct projects on 'linking pastoralists to markets'. Most investments are channeled to building market structures, offering financial grants and capacity building to the market committees for effective management of the markets. However, the local traders articulated that they are not informed about upcoming projects with potential benefits to their business.

The third gap is between local traders and the County government. The department of agriculture livestock and fisheries executes projects to improve livestock marketing. A recent example is the establishment of a slaughterhouse near Marsabit town as part of a strategy to supply meat to both, national and international markets. Despite their central role in the supply chain, local traders and producers were not adequately consulted in the planning stages, meaning that the perspectives of those actors currently active in the system get overlooked.

5. Conclusion

As rural livelihoods in northern Kenya depend on the trade of sheep and goats, local traders perform a vital function to link pastoral producers to markets. This analysis shows that trade is sustained by a diverse set of local traders who play different roles in the finely-branched supply chain that streamlines the supply towards different primary, secondary, regional and terminal markets. In this marginalized vast rural area characterized by fluctuations in sheep and goat supply; local traders harness their relationships to both the primary and secondary actors to up-hold their trading activities in uncertain ecological and economic contexts.

Our analysis revealed activities which can be considered for improving supply chain coordination. Currently there are no

established contracts with agreed upon prices between the traders and end buyers and there is also lack of prior information about the types and numbers of animals demanded at the terminal market. This means that the traders have to manoeuvre in a terrain characterized by uncertainty in profit margins and potential high operating costs. Given that animals have a 'limited shelf life' in the urban environment, major losses occur when they cannot be sold immediately. After being taken out of their rearing environment, the appearance of the animals diminishes due to different climatic conditions and lack of proper forage reducing their potential sale price. Simultaneously, their up-keep in Nairobi leads to high costs.

In order to make quick sale, local traders rely on their relationship with Nairobi brokers who has a broad client base. However, in the absence of alternative contacts, they are at the mercy of this brokers. A high extent of collaboration between local traders with regard to organizational, informational and financial issues as well as their attitude of ethnic solidarity, leverage some advantage but may not be enough to continue fulfilling their role of linking pastoralists to the market in the long term. Therefore, what is required is an arrangement that negotiate for more beneficial agreements for the local traders through linking them to clients at the terminal market, so that the traders could move from current spot market transactions to contractual arrangements, where prices and the demand specifications are clearly established prior to buying and moving animals to the market.

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