The beef value chain in Kilosa and Gairo districts: features and weak links

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SUMMARY

A value chain analysis of beef sub-sector was carried out in Kilosa and Gairo Districts in order to address weak-links in the chain. Stakeholder mapping and analysis, baseline data collection and stakeholders' workshop were conducted. Results indicate that the beef value chain has various actors among them: pastoralists and agro-pastoralists, service providers, small, medium and large livestock traders and live animal transporters. Others are market masters, slaughterhouse operators, meat transporters, meat shop operators and consumers. Mobile phone service was noted to effectively link various actors along the value chain. The producers in Kilosa and Gairo are feeding into within the district, region, Dar es Salaam; and the export market. There are relatively few female actors along the beef value chain, mostly in processing and retail offal business, input supply and one case in Dar es Salaam where three women are operating a slaughter slab. Feeds and water availability particularly during the dry season; and animal diseases were reported as major production constraints impacting on quantity and quality of beef produced. Analysis of value chain governance revealed that retailing butcher shops are receiving relatively a larger share (30%) of the overall price compared to the rest of actors in the strand. Furthermore, findings show that the supply chain is characterized by low value addition among the pastoralist and high value addition among the feedlot operators and large scale processors. Weak links that require immediate attention include: animal diseases and non-use of standard weight measures during selling of live cattle.

Key words: Actors, agro pastoralist, pastoralist, producers, supply chain, traders

INTRODUCTION

Livestock production under the pastoral and agro-pastoral systems is the mainstay of the economy of Kilosa and Gairo districts. The districts rank first in Morogoro region as main producers of cattle mainly for beef. The cattle population in Kilosa and Gairo districts is high consisting of 215,040 cattle which is 32.1% of the Morogoro cattle population (KDC, 2010; URT, 2012). However, the cattle production value chain is faced with many set-backs which entail calves, replacement stock, parent stock, service providers, land issues, markets, governance, value addition and many other determinants. For many years, the success of cattle production by pastoralists in dry lands has centered on many determinants. The most obvious are profitability determined by income offsetting costs associated with milk and beef production, use less productive indigenous breeds dominated by the Tanzania Short horn Zebu (TSZ) as the results affects profitability directly through level of milk production per cow per day and quantity of beef (Robinson *et al.*, 2011). Furthermore, the increase in household income of Tanzanians has changed the market pattern and resulted into upsurge in demand for quality beef and milk products (URT, 2010, Robinson *et al.*, 2011). Therefore issues of value chains and stringent animal health standards on beef and milk have become critical. This paper presents an overview of the beef value chain in Kilosa and Gairo districts with focus on pastoral and agro-pastoral production systems.

MATERIALS AND METHODS

Study areas

This study was conducted in Kilosa and Gairo districts (Figure 2). The two districts have a land area of around 19,056 Km^2 (26.1% of Morogoro region) and a human population amounting to

631,186 (Census, 2012). The two districts have 22 are predominantly pastoral) and 1,030 Hamlets.

Study design, data collection and analysis

The study involved collecting primary and secondary data from various actors and stakeholders in the chain through focused group discussion and use of structured questionnaire, which covered 25 wards and 37 villages in the three zones of the two districts (Table 1). Purposive sampling that targeted pastoral and agro-pastoral villages in the traditional livestock sector was used. Of the 37 villages, 22 were pastoral while 15 were agro-pastoral in setting. Face to face interview was carried out in selected household (targeted sampling population) with the aid of baseline questionnaires. A total of 220 pastoralists and agro-pastoralists, nine cattle fattening entrepreneurs and 44 key informants in Kilosa and Gairo districts were interviewed during baseline data collection.

The study used the Participatory Value Chain Analysis (PVCA) tool to carry out key beef value chain assessments. Important stakeholders in the beef value chain were invited in a two-day workshop conducted in Kilosa town in March 2012. The PVCA activities that participants were required to carry out in their groups and report back in the plenary included – mapping; economic analysis; strengths, weaknesses, opportunities and challenges (SWOC) analysis; and identification of weak links in the chains, and identify and prioritize required upgrading interventions. Data were analyzed using descriptive methods to obtain information on frequencies, means, percentages and Gross Margins (GM) of different actors along the supply chain.

RESULTS

The beef value chain is relatively underdeveloped compared to the dairy value chain and simple involving mainly one major strand: nine Divisions, 46 Wards, 164 Villages (of which Pastoralist>>>trader>>>transporter>>>Butcherer >>>Butcher shops>>>Consumers (Figure 1). It was noted that there are a number of production constraints including land scarcity, inadequate pasture, livestock diseases, water scarcity and lack of market channels. Shortage of land and land conflicts are prevalent in areas that are allocated for the crop production but at the same time pastoralists use them as stock routes for accessing pasture and water. The common animal health problems are tick and tick-borne diseases mainly due to inadequate dips and limited dipping practices among pastoral communities. The other problem is Foot and Mouth Disease (FMD) which is epidemic in the two districts. Water is another constraint affecting livestock production in which there is no enough water for the livestock as most of the pastoralists depends on seasonal rivers and charcoal dams.

The services offered to the pastoralists at the production node of the beef value chain include extension and hired labour supply. The extension services come mainly from the public and private sectors. The public sector entails veterinary officers and technicians employed by the government at district council. The private dealers in animal drugs from whom pastoralists procure the medicines are also involved in extension. Pastoralists sell their cattle for beef to the traders normally at the auction marketplaces taking place periodically on weekly cycles. On average, about 8,000 kg/week of cattle equivalent, i.e. 100 cattle each weighing an average of 80 kg are sold to traders in Kilosa and Gairo districts. The average price per animal is around Tsh 300,000 which is equivalent to Tsh. 3,750/kg of beef. It was also noted that most of the pastoralists lag behind on farmer group's formation as 72.7% of the respondents reported that they did not belong to any farmers' groups or associations while only 24.1% are aware and active members of the farmers group that exist in their area. It was further noted that only 12.4% of the respondents indicated that there was an external organization that had promoted collective action in the area.

Table 1. Wards and corresponding villages in which a survey and stakeholders mapping were done

District	Ward	Village
Kilosa	Mkwatani	Mkwatani
	Magomeni	Magomeni
	Chanzuru	Ilonga
	Rudewa	Rudewa Batini
	Kimamba	Kimamba A
		Parakuyo
		Kimamba B
		Twatwatwa
	Madoto	Mbwade
		Madoto
	Msowero	Msowero Godes
	Kitete	Mabwegere
	Dumila	Kwambe
	Masanze	Changarawe
	Mabwerebwere	Malangali
	Kilangali	Kivungu
	Tindiga	Malangali
		Tindiga
	Ulaya	Ilakala
		Ulaya Kibaoni
		Ulaya Mbuyuni
	Malolo	Malolo A
	Kisanga	Kisanga
	Kidodi	Rumango
	Mikumi	Ihombwe
		Mikumi
Gairo	Berega	Berega
	Magubike	Magubike
	Iyogwe	Chogoali
		Kinyolisi
	Rubeho	Rubeho
	Gairo	Mkalama
	Chakwale	Chakwale
		Kitaita
		Ndogomi
		Leshata
	Msingisi	Msingisi

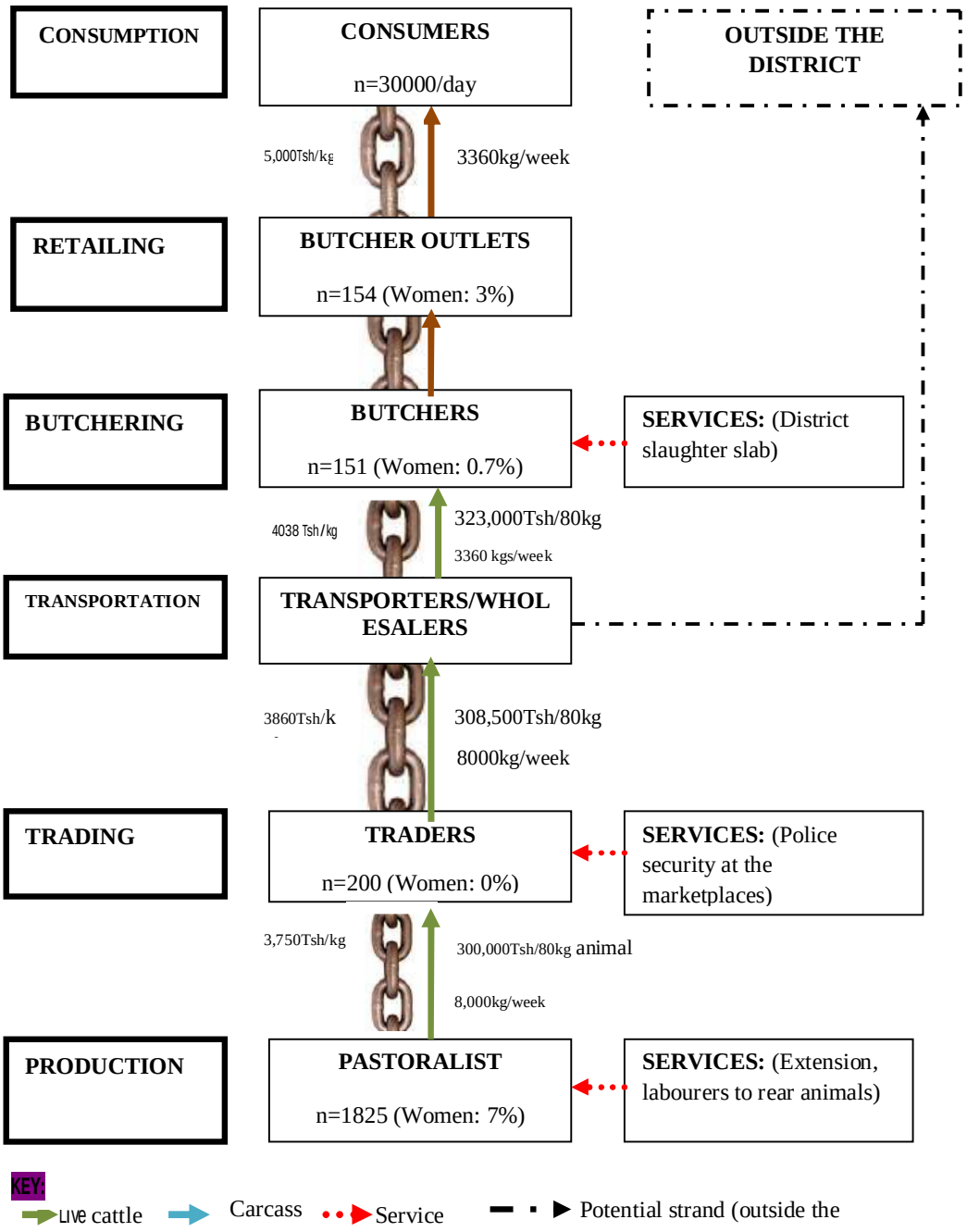

Figure 1. Participatory Beef Value Chain of Pastoral Livestock System, Kilosa and Gairo Districts

At the traders' node it was observed that the average price per animal weighing about 80 kg was around Tsh 308,500 equivalent to Tsh. 3,860/kg. It was further observed that wholesaling and transportation are integrated at this node. The wholesalers use either own or hired trucks to haul the animal from the auction markets to their terminal markets. Only 42.0% of the animals procured from the district based auction marketplaces are traded within the district. The remaining 58.0% are exported outside the district. It was noted that Transporters buy from traders at Tsh 308,500 and sell to butchers at Tsh 323,000 per animal. Women are currently excluded from the transporters' node. Butchers and butcher outlets are an integrated node in the beef value chain. Butchers also own the retailing butcher

outlets. However, a few butcher outlets owners are not involved in butchering; they just purchase meat carcasses from the butchers. Less than one percent women are involved in butchering and 3.0% of butcher outlet owners are women (Figure 1). The butchers buy animals for slaughtering from transporters/wholesalers at Tsh 323,000 per animal or Tsh. 4,038/kg and earn a margin of Tsh 962/kg by selling to final consumers at Tsh. 5000/kg. There are about 154 butcher outlets in the district. Consumers buy from the butcher shops.

The beef value chain is simple and is transparent with relatively equitable spread of price shares (Table 2). At pre-production node an availability of plentiful land which is demarcated among farmers and pastoralists was identified as the major strength (Table 3). Possession of many livestock was the strength reported at the consecutive production, trading and butchering nodes as it ensures supply of animals for slaughter in the beef value chain. The stakeholders expressed another weakness to be poor enforcement of utilization of demarcated land. They reported frequent interferences in the use of the land.

Table 2. Price spread: pastoralist>trader>transporter/wholesaler>butcher/butcher shop/consumers

Serial No.	Name of actor in the value chain	Buying/selling price	Share of terminal price %
1	Pastoralist	3750	23
2	Trader	3860	23
3	Transporter/wholesaler	4038	24
4	Butcher/butcher shop	5000	30
	Total	16648	100

At the production node it was observed that the existing animals were poor for a viable and profitable beef sector. In addition the beef related livestock trade was reported to be less profitable mainly due low producer price particularly during severe droughts. At the butchering node, the slaughtering slabs are poor in design and hygiene and lack important facilities such as hide/skin sheds. Furthermore, there were no specialized meat vans and thus the pickups are being used to carry meat. Retailing butcher outlets are in poor conditions and the operators lack state of the art technologies in meat cutting. On the other hand, consumption related weaknesses include the trade seasonality and inflation. The main export markets include Zanzibar and Comoro Islands.

The major threats envisaged in the pre-production stage include the land invasions, poor enforcement of land laws and poor local participation in land governance. The administration of demarcated land is weak and ineffective. The conflicts still exist between pastoralists and farmers, and even among incoming pastoralists from other places who are not eligible users of the allocated pasturelands. Proliferation of animal diseases and climate change were the threats at the production node. The threat of banditry prevails at the trading and transportation nodes. Theft practices were reported to be a problem at the slaughtering slabs. The stakeholders reported the threat related to lack of trust leading to unscrupulous behaviour where some sick animals and stolen animals are slaughtered. At the butcher outlets frequent power cuts is the problem that interrupts effective use of deep freezers in areas that are connected to the National Electricity Grid, causing meat spoilage. The linkage between production and trading the major weaknesses include animal diseases and non-use of standard weight measures during selling. For trading to transportation the weakness features include disease epidemics and high costs of transportation. The major weaknesses faced by the final link between butcher outlets and consumers include poor meat cutting practices, user of insecticides sprays to kill flies inside the butcher shops, and lack of trust by meat sellers who tempers with weighing devices.

Table 3. SWOT analysis results of beef value chains

SWOT element	Pre-production	Production	Trading	Transportation	Butchering/ transportation	Butchers (retail)	Consumption
STRENGTHS							
	Plenty of land demarcated among farmers and pastoralists	Many livestock	Huge supply of animals	Allowable transportation of animals	Many livestock	Meat supply	Readiness to eat meat
WEAKNESSES							
	Allocation of large land holdings to a few private investors	Poor livestock	Poor coordination of traders	Lack of compliance to recommended practices	Poor slaughtering slab	Poor butcher outlets	Trade seasonality
	Land demarcation did not match land needs	Less profitable livestock		Poor roads	Lack of skin sheds	Lack of cutting technologies	inflation
	Not harvesting the animals		Lack of using weight measures during selling		Lack of meat quality standards	Lack of meat quality standards	
	Poor enforcement of utilization of demarcated land				Lack of meat vans (meat transportation not profitable)		
OPPORTUNITIES							
	Availability of technologies and expertise	Existing livestock can be improved	Existing trade communication network	Export and domestic markets	Markets	Markets (there are buyers)	Consumer demand
		Availability of experts	Traders are creditworthy				
		Livestock field school	Export and domestic markets				
THREATS							
	Land invasions	Animal diseases	Banditry	Banditry	Theft of meat at the slaughter	Power problems	Informal meat outlets (uninspected)
	Poor enforcement of land laws	Climate change			Lack of trust and unscrupulous behaviour	Competition from white meats	
	Poor local participation in land governance				Buying stolen animals	Increasing consumer concern on red meat	
						Competition from informal meat chains	

DISCUSSION

This work has revealed that breeds of cattle found in Kilosa and Gairo districts have high potential in the production of beef (UNIDO 2012). However these potential advantages are masked by production constraints that the livestock keepers face. Land use conflicts stand out among the limiting factors that impact on beef production and productivity. The problem is exacerbated by rich farmers who are increasingly acquiring fertile land that would otherwise provide pasture and water sources. Pasture is one of the main constraints for livestock productivity and considered to be due to climate variability. Most of the pastoralists migrate from their areas in search of pasture and water with their livestock.

Relocation (transhumance) of animals during periods of feed shortage has always resulted in high losses through animal death, diseases, loss of the market channels as well as the social activities. It is clear that there is need for pasture establishment and corresponding fodder conservation skills in such villages in order to stop pastoralists from annual migration during the dry season in search of pasture.

The production node of the beef value chain is seriously affected by a number of animal health problems among them tick and tick-borne diseases. Worse still the available dip-tanks are not functioning/in use. A typical example is in Ihombwe village, Mfilisi hamlet where there is a dip-tank but it's not in use and most pastoralists are practicing partial spraying of the acaricides of their cattle whereby only the easily accessible parts of the body are sprayed or just select few animals to spray. The upgrading of the beef value chain will surely benefit if the weak link emanating from animal health challenges are addressed.

The market channels for beef are neither clearly defined nor transparent, despite their value in enhancing pro-poor livelihood improvement. The average live weight of 80 kg per animal is low as this weight would be increased twofold or more within the existing pastoral system mainly with breed improvement, proper husbandry and improved nutrition (UNIDO, 2012). There is a need to intervene in upgrading the animals to improve their live weights at sale as has been the practice in other countries in the region (Mapiye *et al.*, 2007; Umar *et al.*, 2008). There are two types of traders that buy animals from pastoralists at the district based auction markets. Firstly, a few traders coming from outside the district visit the periodic auctions to buy the animals and transport them to the either regional terminal markets within the country or for export mainly to Zanzibar and Comoro Islands where around 2,542 pass through that channel annually (NABC, 2012). Secondly, pastoral traders that are involved in both animal production and marketing activities. Within the pastoral system, the animal marketing business is growing mainly involving youth. This is realized through some strategic decisions; for example buying young animals at lower prices (around Tsh 40,000/=) and raise them to maturity for certain period before they are sold at a much higher price of around Tsh700, 000/= (Mapunda, 2011). Another related opportunity it to buy animals at a throw away price during critical droughts and supplement them with feed and fodder (Mapiye *et al.*, 2007). The profit is guaranteed as the animals are raised within a relatively low-input, hence low cost pastoral system. To undertake such businesses the pastoralists use either own capital or borrow from banks and Microfinance Institutions (MFIs). Farmers' organizations would have helped in addressing key production and marketing constraints affecting the beef value chain. This is therefore an area that requires researchers and other service providers need to address as one of the strategies for upgrading the beef value chain.

During trading at the auction market places the assured security is the major service required. This service is provided by the armed government police. As the cattle trading that involves big scale money transactions takes places in remote areas, there has been incidence of armed robbery. The concentration of traders at the trading node is around 200 and women are entirely excluded in this business. The traders sell to transporters who also integrate wholesaling function with transportation. The existence of some market for cattle within the districts as well as ample market outside the districts is an opportunity that needs to be fully exploited by various players in the beef value chain. This trend has also been reported elsewhere in Tanzania (Pica-Ciamarra *et al.*, 2011). Transporters were noted to buy from traders at Tsh 308,500 and sell to butchers at Tsh 323,000 per animal. This price level gives them the gross marketing margin of Tsh 14,500 per animal in comparison to the price at the preceding node. The number of transporters/wholesalers operating within Kilosa and Gairo districts is 50 (KDC, 2010). Women are currently excluded at this node. These sell to butchers that operate at the slaughtering slab owned by the municipal council (Pica-Ciamarra *et al.*, 2011).

The major meat product traded is the meat with bone. Value addition practices involving special cuts are non-existent (MLFD, 2010).

Also, improvement in hygiene within the butcher shops is required. Most of the butcher shops rarely meet the Tanzania Food and Drugs Authority (TFDA) standards. Price spread analysis was used to quantify the share of different functionaries of the value chain in the terminal price. It indicates roughly the proportion of earnings as compared to the risks and efforts put in by different players including smallholder pastoralists. It can also be used to evaluate progress made by comparing the data before and after or with and without the intervention in the value chain upgrading. As expected the retailing butcher shops was noted to be receiving relatively a larger share of the overall price compared to the rest of actors in the strand. Transparency and equity are desirable features for a sustainable and pro-poor value chain.

The decision by the government to allocate large land holdings to a few private investors was regarded as the weakness. It is regarded as the weakness because, apart from the central government, the local government which is among the key stakeholders in the pastoral production system is a key player in the land administration decisions. The opinion of pastoralists was to allocate the land to them for grazing and even establishing mini-ranches in the quest of modernizing the pastoral system. For example, Mvomero district has embarked on a modernization initiative of the pastoral production system by demarcating the defunct Dakawa public ranch into 50 acre mini-ranches to pastoralists. The Kilosa and Gairo districts would have followed the footpaths of Mvomero district. District

The tendency of not harvesting the animals for sale was sought by stakeholders to be an internal weakness within the pastoral system. This thinking from the pastoralists themselves is a commendable attitudinal change. Pastoralists have been regarded conservative and anti-change. Some pastoralists are now embarking on strategic harvesting from their herds for sales. The earned money is invested into other ventures including commercial buildings such as guest and rental houses in towns.

The stakeholders expressed another weakness to be poor enforcement of utilization of demarcated land. Interferences in the use of the land potentially culminate into land conflicts not only between farmers and pastoralists but also among pastoralists (Baha, 2008). At the production node the existing animals were regarded to be poor for a viable and profitable beef sector. Primarily, the low genetic potential for beef production does not allow rapid growth and weight gain. The beef related livestock trade was reported to be less profitable mainly due low producer price particularly during severe droughts.

Poor coordination of traders and use of eye-estimate instead of standard weight measures were the weaknesses at the trading node. The traders referred to here are peer pastoralists mainly youths who integrate into livestock marketing. Regarding transportation the weakness include lack of compliance to recommended practices and poor road infrastructure. Movement of animals is governed by enforceable regulations such as diagnosis of transmittable diseases and avoiding trekking. However, incompliance to such regulations is not uncommon.

The standards of meat transportation are specified by TFDA but the level of compliance is very limited. This problem has a negative impact in that such products cannot penetrate the lucrative markets that are available in supermarkets in major cities within and outside the country. Contrary to dairy products, meat products lack legislated domestic standards (TFDA, 2011). Some TFDA hygienic standards that are not widely complied with by most of the butcher shops are specific to the premises where the meat is handled but not for the meat itself. Retailing butcher outlets are in poor conditions and the operators lack state of the art technologies in meat cutting. Consumption related weaknesses include the trade seasonality and inflation. The seasonality effect is that the pattern of meat consumption is seasonal inclined towards festival months and peak months of agricultural harvests. In January and July when schools are resuming the meat consumption goes down as much of expenditure at the households is directed to meeting educational expenses. Inflationary meat prices also limit the level of meat consumption and this has been reported in other parts of the country (MIT, 2010).

The main opportunity in relation to pre-production stage includes availability of technologies and technical expertise. The technologies are available within the national agricultural research and development systems (NARDS). The stakeholders felt that the existing pastoral herds are improvable in terms of both genetic upgrading and improved management. Though inadequate in numbers, livestock experts from whom pastoralists can learn are available. At the trading node, the pastoral traders have an informal communication network through which they exchange market information. Such traders involved in livestock marketing are creditworthy hence can access credit from commercial and Microfinance Institutions (MFIs). Domestic and export markets exist for the livestock. The market opportunity is also listed across the butchering and butcher outlets nodes. At consumption level the consumer demand exist and is expected to expand with urbanization and income growth. Increasing preference for white meat was seen as a threat to the beef sector. The competition also comes from informal meat chains that normally involve suspicious meat involving dead and stolen animals that escape the inspection requirement.

Value chain development is concerned with addressing the limiting features at various value chain links. A value chain link connects two nodes. The connection of different value chain links creates the value chain map with different value chains strands. This section actually consolidates more or less similar aspects presented a weaknesses and threats in the previous SWOT analysis. The added advantage is that here stakeholders extended the discussion to suggest some upgrading strategies. The linkage between production and trading the major weaknesses include animal diseases and non-use of standard weight measures during selling. Interventions to address these weaknesses as suggested by the stakeholders include education to pastoralists on disease management, development of an efficient disease surveillance system and enforcement of quarantine in cases of epidemics, and promote the use of standard weight measures during animal selling.

For trading to transportation the weakness features include disease epidemics and high costs of transportation. The check-ups system has to be strengthened to ensure the animals traded and transported in the chain do not spread disease in other places. Improvement of rural roads would reduce costs of hiring trucks to transport the animals. Between transportation and butchering the weaknesses include poor infrastructure at the slaughtering slab and lack of clear animal routes for reaching the slaughtering slab. The suggested action is that the slaughtering slabs must be improved to ensure hygienic conditions and easy accessibility. Transportation of meat to the butcher outlets is highly constrained by high transportation costs and poor hygiene of the transport facilities. The carcasses are carried in open picks or with usual public transport vehicles. The upgrading interventions would be to enforce the use of recommended meat transport facilities, i.e. meat vans.

Poor meat cutting practices, user of insecticides sprays to kill flies inside the butcher shops, and lack of trust by meat sellers who tempers with weighing devices are weaknesses that have implications on the performance of the beef value chain in the two districts and beyond. The use of insecticides has serious health risks to consumers due to chemical contamination. The upgrading strategies suggest to address such problems were: monitoring of hygiene of meat handlers and premises by district's health officials, recommend the use of special bags for storing meat, improve the butcher shops in conformity to standards and promote modern meat cutting technology.

The strategies required to enhance value chain coordination were discussed by the stakeholder in the plenary. The major strategy which came up is to form an inclusive network of pastoralists in Kilosa and Gairo districts. This will serve as a platform for coordinating various activities and policy lobbying that will contribute to the development of the milk and beef value chain. However, no concrete action plan was worked out. As a result, the Stakeholders led by the Beef and Milk value Chain project might be in position to champion the process.

The participatory value chain analysis is an effective tool that brings together value chain actors and service providers to analyze the binding constraints and existing opportunities, and highlight value chain upgrading strategies (Alemayehu, 2011). The pastoral milk and beef value chains have potential for growth and competitiveness, and if developed can help to address market access to pastoralists to address income poverty (Wim, 2004). Pro-poor development of the pastoral milk and beef value chains would also serve as a stepping stone for modernization of the pastoral livestock system. The Tanzanian livestock sector is pre-dominantly pastoral; therefore commercial transformations in the pastoral system are necessary for a vibrant pro-poor livestock sector.

ACKNOWLEDGEMENTS

We thank the EPINAV Programme, Sokoine University of Agriculture for funding this work. We are grateful to the Kilosa and Gairo District Development Directors and staff in the two local government authorities in the project's catchment area for providing a good working environment. All the stakeholders at all levels along the beef value chain are thanked for willingness to participate in the project. Lastly but not least we thank the anonymous reviewers for their useful comments on the manuscript.

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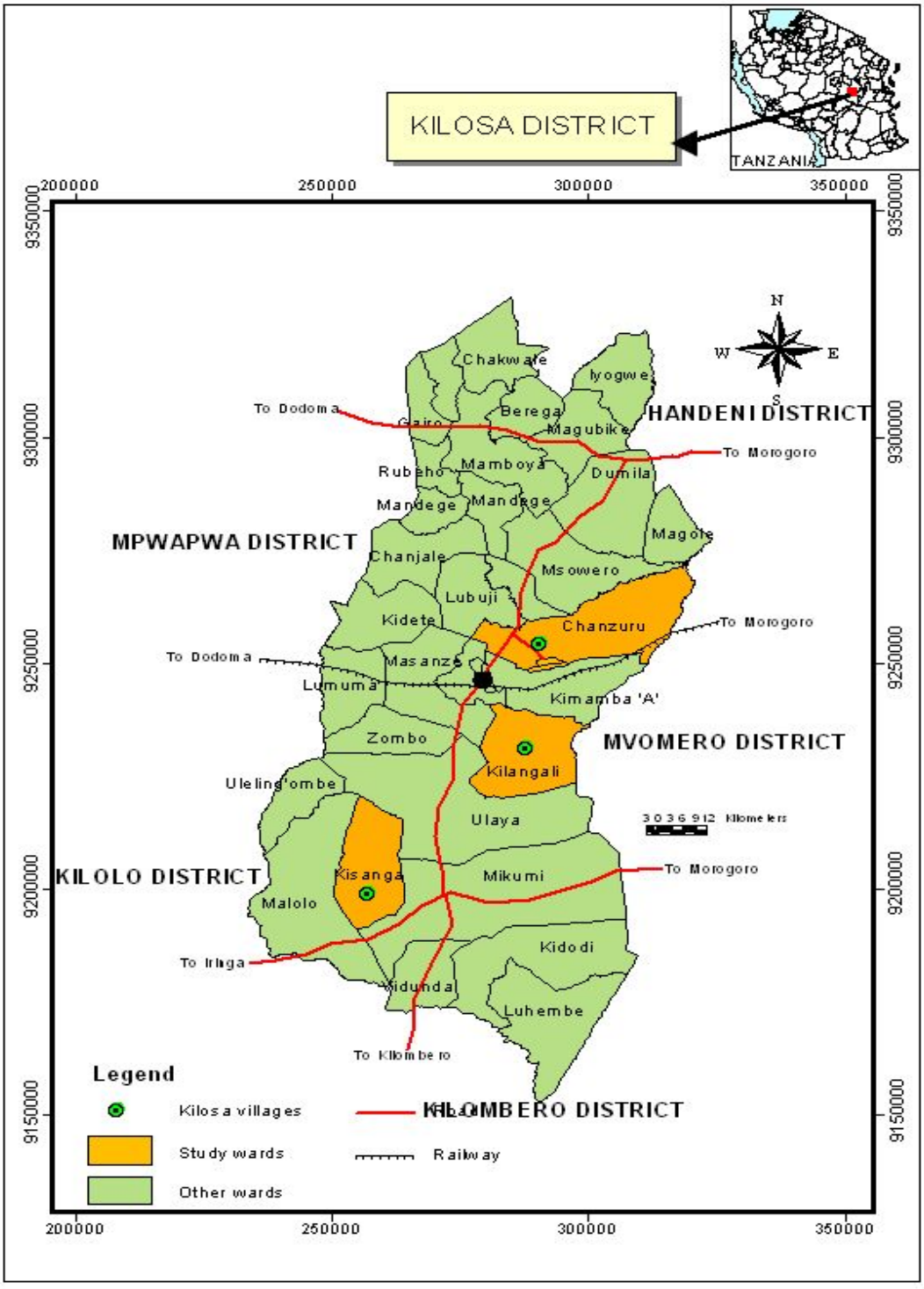

Figure 2. Map showing Kilosa district (before it was divided into two districts i.e. Kilosa and Gairo) showing the study wards shaded yellow in colour. Insert map of Tanzania with red dot indicating the relative location of Kilosa district.