

Value Chain Analysis of Beef Cattle in Selected Areas of Northern Bangladesh

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Abstract: *The study was conducted in Pabna and Sirajganj districts of Bangladesh during the period 2013-2014 to examine the beef cattle value chain focus on actors, understanding relationships, opportunities, and bottlenecks and suggesting the specific areas of intervention to develop the value chain. In total 220 respondents comprising 180 producers, 18 traders, 6 brokers, 3 butcher shops, 2 supermarkets, 2 meat processing companies, 3 hotel owners, and 6 consumers were interviewed. The study followed GTZ, ACDI/VOCA, and M4P value chain analytical framework but only mapping value chain analytical technique was used because of its clear understanding of the sequence of activities and the key actors and relationships involved in the value chain. This analytical is carried out in qualitative and quantitative terms through graphics presenting the various actors of the chain, their linkages and all operations of the chain from pre-production (supply of inputs) to meat processing and marketing. The researcher found that beef cattle value chains improve livelihoods, increase incomes and promote economic growth by supporting development of domestic industries, improving local markets, and expanding export opportunities and also identified areas within the value chains where strategic policy and institutional reviews need to be undertaken to address specific constraints affecting the overall performance of the value chains. The researcher recommended promoting the beef productivity and competitiveness, it can be enhanced by improving fodder production, processing and preservation, breed and provision of animal health extension services, credit facilities, technology transfer through established in demonstration beef fattening farm, campaigns vaccination and de-worming and market linkage. The study recommends intervention in the area of linking actors in*

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the value chain to prospective markets for them to benefit from the various activities.

Key words: Beef cattle, Value chain analysis, Actors, Mapping

1. Introduction

The study focused on beef cattle value chain analysis of Shathia and Raigonj char areas under Pabna and Sirajganj districts respectively because of hinterlands of beef cattle. The indigenous beef cattle in the study areas comprise rich livestock resource base on creating opportunities for additional employment and alternative source of income and cattle population. It can also provide food security, as draught animal and liquid assets for mitigation the family risk and need. On the other hand, in our country beef cattle has high demand but supply is always short. Fattened beef cattle has a high demand during various Muslim's Festivals particularly *Eid-ul-Azha* in every year. The study aimed at analysing the value chain structure of the beef sub sector in char areas where hinterlands of beef cattle supply is increasingly becoming important.

The specific objectives of the study are to identify primary actors in the value chain while pointing out their roles and interrelationships and to identify associated challenges and opportunities for improving the value chain.

2. Materials and Methods

2.1 Conceptual Framework of Value Chain Analysis

The objective of value chain analysis (VCA) is to increase the valuation of the materials at every stage of the value addition chain, from the farm level to the marketing of the finished products. According to Fearn et al.,(2012), VCA assists in identifying strategic and operational misalignment as well as misallocation of sources and it provides an opportunity for improvement by creating value, environmental and social responsibility. In addition, Sharma et al., (2010) indicated that VCA creates a sustainable competitive advantage, particularly when there is a diversification of value added activities, which includes a strong supply of raw materials and established connection within and outside the business units. Value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production, delivery to final consumers and final disposal after use (Kit et al., 2006, Kapslinky and Morris, 2000). Value chain promotion is an effective way of fostering rural-urban linkages and the concept provides a useful analytical framework for market and sub-sector analysis (ECAPAPA, 2006). The concept of Value chain is discussed from three distinct traditions: the French 'Filière concept', Porters concept and Wallerstein's concept of Global commodity chain (Raikes et al., 2000). The Filière is used to describe the flow of physical inputs and services in the production of a final product and is essentially similar to the modern value chain

concept (Melle et al., 2007). Value chain approach presents a good picture of the process of creating value. Value chain analysis helps in understanding of connection among actors in the chain and the way trade takes place. An agricultural value chain is considered as an economic unit of analysis of a particular commodity or group of related commodities that encompasses a meaningful grouping of economic activities that are linked vertically by market relationships (Getachew, 2012). The first step in value chain analysis is mapping of the core processes and activities in the chain (Mmasa and Msuya, 2011). Value chain mapping is the process of developing a visual depiction of the basic structure of the value chain. Value chain map illustrates the way the product flows from raw material to end markets and presents how the industry functions (McCormick and Schmitz (2001). Visualizing networks will give a better understanding of connections between actors and processes in a value chain, demonstrate interdependency between actors and processes in the value chain and create awareness of stakeholders to look beyond their own involvement in the value chain (Michael et al., 2010). The philosophical important of the categorization that was described above was based on the need to identify primary activities that were core in order to gain the competitive advantage and secondary activities that would be the drivers to attaining these advantages, such as competencies and assets (Sanchez & Heene, 2004). Nevertheless, the value chain model by Proter (1985) was critiqued for excluding important aspects such as market creation, strategy, customer service and distribution from the main activities (Morden, 1999). Moreover, Morden (1999) further suggested that procurement of goods should be the core activity in any value addition. Other highlighted that the entire process is important given the complexity of generating internal and external data such as gaining competitive advantage (Partridge & Perren, 1993; Hergert & Morris, 1989).

Based on the above discussion on conceptual framework of value chain analysis only mapping value chain analytical technique is used in this study.

2.2 Study Area: The study was carried out in Pabna and Sirajganj districts under the northern Char areas of Bangladesh. The zone was chosen because of its status as one of the major cattle growing areas in the country. Large volume of beef cattle is traded in urban centers located in the zone. Also, the prospect for value addition is promising due to the presence of emerging processing industries.

2.3 Sources and types of data: Primary data were utilized for this study. Primary data were obtained through the use of pretested questionnaire and focus group discussions. Primary data were collected from actors of the value chain including producers, marketers and processors. The primary data were collected include: quantity of plantain produced, marketed, processed, flow of the product, volume of product in the flow, as well as associated constraints and opportunities in the chain. Researcher followed the five steps to determine the sample size;

- i) Basing on the availability of budget, timescale, performance to decide the sample size;
- ii) Elect the representative regions for beef cattle production in two areas that located in supply hinterlands/ areas.
- iii) Select representative communes that located in these districts
- iv) Select farmers, arrange annual surveys and carry out face to face interviews
- v) Select local collectors, middlemen, slaughter houses and enterprises

The sample is distributed as follow;

- 180 beef cattle farmers households;
- 34 different value chain actors;
- 4 slaughter house; and
- 2 meat processing companies

2.4 Analytical Procedure: Collected data were analyzed using descriptive statistics such as frequency, percentage and tables. Value Chain mapping was analyzed using functional analysis. The core processes, actors involved, flow and quantity of product at each node of the value chain were determined. A flow chart was used to represent the activities in the value chain. Analytical frameworks were proposed by international organizations such as GTZ, ACIDI/VOCA, M4P (Market for Poor) and were applied because these frameworks are according context of research.

3. Results and Discussion

The results of the present study are represented in this section. The results are presented under the following sub-headings;

3.1 Beef Value Chain Actors, Functions and Relationships

Key players of beef cattle in selected char areas comprise a number of participants or actors. The value chain analysis of beef cattle production in study areas consists of a complex network of stakeholders, who work within specific stages from farm to plate. The chain integrates beef cattle producers, traders, butchers, wholesalers and retailers. The beef cattle are moved from farmers to traders, then to butchers who slaughter animals and convert them into marketable products. The products finally reach consumers through wholesalers and retailers.

3.1.1 Input Suppliers: Input supply for beef production consists of the supply of animals for fattening, provision of animal health services, feed and provision of credit services. The present study found that there were 5 (five) types of main

inputs supplying actors of beef cattle sub-system agribusiness of northern Bangladesh. The primary actors in the cattle value chain include the following: a) Calves supplier, b) Beef Cattle feed (grass, legumes, concentrate feed, mineral mixtures) supplier, c) Medicine and veterinary support provider, d) Tools, Technology and other equipment (equipment needed for slaughtering and butchering, ropes, etc.) supplier, and e) Support service actors

3.1.2 Cattle Farmers/Producers: The smallholder producers in the study areas are the major suppliers of beef cattle for domestic consumption and meat processing for the Bengal Meat Processing Industries Limited (BMPIL) along Pabna Meat Company. Particularly the smallholder cattle farmers supply fattened beef cattle to the terminal markets of Gabtoli cattle market all year-round. The producers of these areas have a strong tradition in which 3-4 head of beef cattle are tethered and managed by stall feeding. In this production system, the farmers usually use beef cattle after the final phase of their primary purposes leading to very high cost of production at the final stage of fattening period.

3.1.3 Traders: These market agents usually operate in the primary beef markets, buy up to 5-8 animals on a given marketing day using their own capital or big traders' money and they have trade ties with affiliated large traders. These traders have detailed knowledge of the production system and related environs in cases where disputes arise with regard to transactions.

3.1.4 Collectors and transporters: These market actors serve as mediators between buyers and sellers in the livestock market. They are usually expected to link buyers with sellers and facilitate the terms of exchange.

3.1.5 Processors/slaughters: The primary processing work is done at abattoirs including: de-hiding, quartering the whole carcass and transport to clients (butchers, hotels, and/ supermarkets, etc.). Supermarkets also further process the meat for their retail outlets. and hotels process the meat into different retail food commodities.

3.1.6 Butchers: Butchers are those who are engaged in selling of cattle meat to consumers. They are found in rural as well as in urban areas. They usually buy cattle from primary and secondary markets before slaughtering them and selling the meat to various consumers. They may prepare standard cuts of meat for sale in retail or wholesale food establishments. That is because they require fleshy animals, since raw cut meat is becoming a popular product in larger towns. Butchers serve both raw and processed meat to individual consumers and institutional buyers. Two types of butchers are found, one is roadside butcher who slaughtering cattle in a traditional way in villages and do not use slaughter houses and the second one is employed butchers.

3.1.6.1 Roadside butchers of beef: Roadside and market stall butchers account for 75-80 percent of all retailed meat and are the backbone of the meat supply

chain. They have no cooling facilities and therefore only stock meat that can be sold within the day. Processing by these butchers is minimal and there is unhygienic handling of meat at this level. Modern butcheries and supermarket butcher stands meet a higher standard of hygiene and food safety and cater for the premium segment of the meat market. There is use of standard equipment, such as displays, and freezers. A range of processed meats and products are made available. Prices are at a steep premium to mainstream market prices.

3.1.6.2 Employed butchers: The employed butchers are employed by supermarkets, grocery stores, butcher shops, City corporation and other agribusiness actors. They only slaughter cattle as per their requirement. Sometime they charge wage per cattle and took hides and sell to other party.

3.1.7 Distributors: Pabna and Sirajganj districts are beef cattle supply hinterlands of Bangladesh. Conventionally many cattle markets in these areas are categorized into primary market, secondary market and terminal market. The basis of such classifications is mainly the number of animals that attended the market per market day and the number of market participants in the market. In terms of number of animals, primary, secondary and terminal markets are those in which less than 200 heads, 200–500 heads and greater than 500 heads of animals attend the market per day, respectively. In terms of market participants, primary markets are those in which the main sellers are producers and the main buyers are local assemblers and secondary markets are those in which the main sellers are local assemblers and main buyers are big traders. In terminal market the main sellers are traders and main buyers are butchers and restaurants.

Though various routes /channels, beef cattle are brought into Gabtoli terminal market at Dhaka for trade. The actors like bepany/traders purchase these beef cattle from farmers of different areas, town, and villages and transport them via trucks, mini trucks, Votboti and- Nosimon, etc. The distribution system of beef cattle includes the following main factors:

- i) Farmers sell their animals to the local butchers and bepany by carrying them in small local markets;
- ii) Bepany/traders purchase directly from the farmers at source/farm level to transport them to the main market of Dhaka city for further trade;
- iii) Local bepany of local market purchase these animals to further sell to butchers;
- iv) Traders purchase animals from Irshordi, Sirajganj, Pabna and Aronkhola market also supply cattle to Dhaka; and
- v) Wholesalers purchase cattle to further sell to small butchers after slaughtering.

3.2 Distribution Network: The company regular distributing their beef products in their target market including restaurants, lounges, hotels, and mega shops like Agora, Nandan and Meena Bazar as they have a huge demand for frozen beef products to cater the never ending demand of their customers. Now, Bengal Meat Industry regularly supplies to five star hotels like Radisson, Westin, Pan Pacific Sonargaon and 25 butcher shop (like Dhali Super Store, Lavender, Bengal Meat Butcher Shop, Non Stop Mega Shop, Saad Musa City Center, Pick & Pay, Carre Family, Daily Super Shop, Western Bazar, Family Needs Ltd etc.) in Dhaka. High quality conscious individual customers who are high income level and lives in urban areas buy meat from butcher shops as per their requirements.

3.2.1 Supermarket butcher stands:

Dhaka city accommodates a number of shopping malls and large super markets constructed and equipped according to international standards: Agora, Nandan and Meena Bazar, are malls that accommodate supermarkets with dedicated Asian style butcher stands. Prices for processed meat in supermarkets don't vary much due to the dominance in the market by the leading processing company "Quality Cuts" that caters for this higher income segment of the population. The prices are typically significantly higher in comparison to those in road side butchers. The consumer with a higher income prefers meat that is offered in a hygienic and attractive way, with a broad variety of retail cuts on offer and is apparently able and willing to pay much higher prices for that type of product. According to the operators of butcher stands in supermarkets, minced beef is the best seller among beef products indicating that there are many consumers, irrespective of income levels, prefer to purchase minced beef in supermarkets rather than roadside butchers. This is an indication that consumers are willing to pay more for meat that has been processed in a hygienic manner and offers opportunities for expansion in the meat processing and packaging sectors.

3.2.2 Retailers: They buy cattle from large and small-scale traders before selling them on to individual consumers, butchers and hotels and restaurants at terminal market. Some of them own or rent holding centers for animals and use supplementary feeding. These retailers have better financial capacities than small-scale traders and wholesalers. Retailers play an important role in determining the market price of cattle at farm gate, roadside and at other primary and secondary market places.

3.2.3 Consumers: They are the end value chain actors in the study area. Beef consumers as mentioned above are domestic consumers who buy either processed meat from butchers and supermarkets or who, as a group, buy beef cattle to slaughter and then share the meat. In the study, two types of consumers found actively such as:

3.2.3.1 Hotels and Restaurants: These are the final actors in the value chain.

Hotels are supplied with carcasses as per their specific requirements by butchers, The hotels and restaurants prepare dishes such as beef curry, brown meat, beef masala biryani, beef tehari, beef nehari, kababs, koftay, paya curry, noodles, hotdogs, pizzas, burgers, soup, sandwiches etc. and sell them to their customers. Hotels and restaurants in Pabna, Sirajganj and other smaller towns can buy beef cattle from producers, collectors and small-scale traders. However, those in larger towns and cities, like Dhaka, Chittagonj, rely on retailers and large-scale traders and meat processing company to supply slaughter animals for their purposes.

3.2.2.2 Individual consumers/Household consumers: Individual consumers are market actors who buy directly from any butcher shop that satisfies their needs for household consumption. During certain holydays of the year groups of individual consumers come together and buy beef cattle to slaughter and to share the meat. They buy from the retailers. Meat quality and quantity aside, there is prestige in slaughtering fattened and sterile cattle. However, most low-income consumers buy mid-aged cattle, since they cannot afford the price of younger ones.

3.3 Beef Value Chain Map

The information gathered during the study enabled the longitudinal mapping of the beef cattle value chain in the study area as presented in Figure 1. The value chain map illustrates the way in which beef cattle and their products flow from production areas to end markets and how the overall beef cattle sector operates. It is a visual representation of the structure of the value chain and its main characteristics or “a narrative description of the main characteristics of the value chain”(UNIDO, 2012). In the value chain map (Figure 1) the marketing functions are represented on a vertical axis on the left hand side of the diagram and the existing actors are represented using boxes with solid outlines, which may encompass several vertically integrated functions. The product and/or service flows between nodes are represented by arrows; for example, from production to wholesaling, from wholesaling to retail or export, or from primary wholesaling to secondary wholesaling (in the case of a series of ‘actors’). The movement of a good or service between nodes implies that value is added to the product. The end market segments are placed at the top of the diagram and represented by ellipses. There are several channels, or ‘strands’, in the value chain. These are denoted by numerals at the top of the diagram and defined by product types, routes to market and end market segments. The number of actors in each segment, the flow volumes and profit margins constitute an important input to the value chain. Based on quantitative data interesting findings are emerged from the mapping which are presented below;

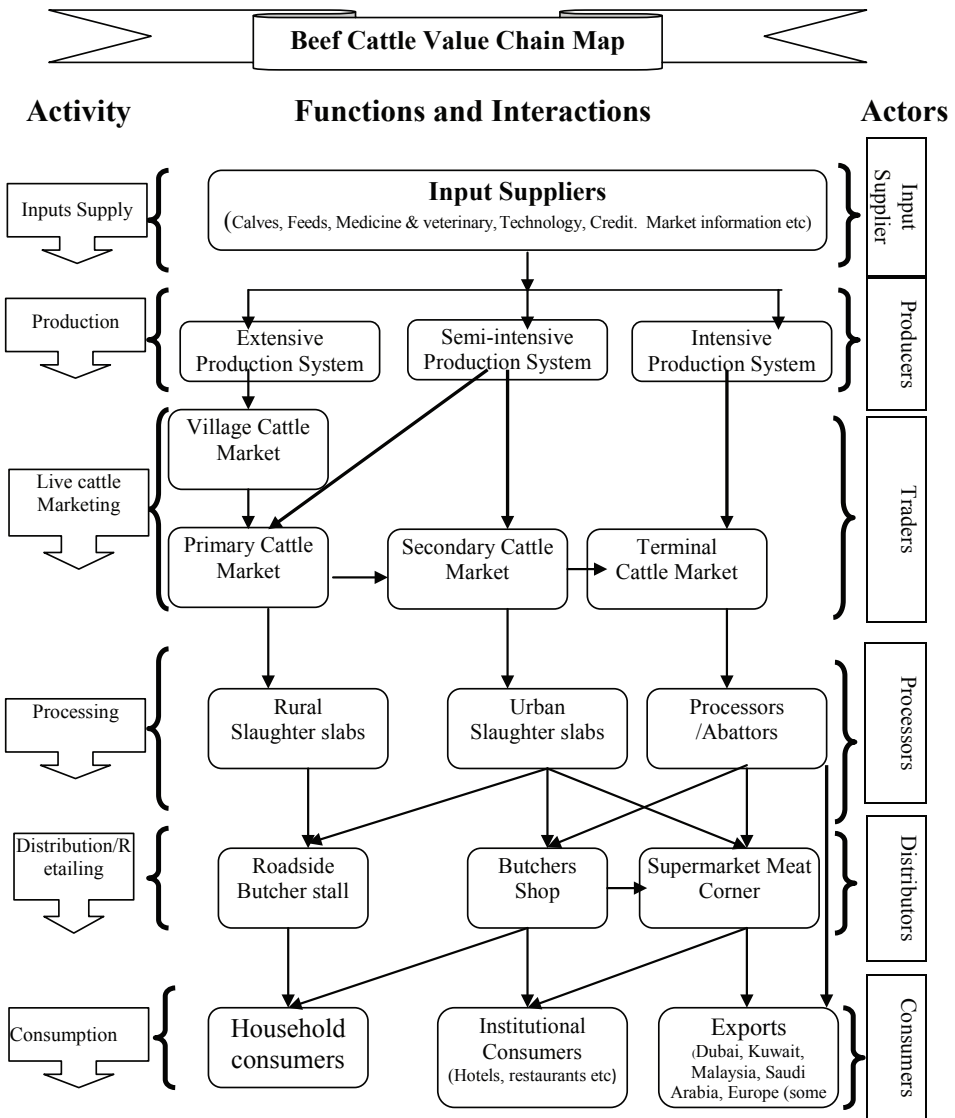


Figure 1. Beef Value Chain Map

Source: Authors' illustration 2014.

3.4 Cost and returns at different stages of beef value chain

Table 1 presents the cost and returns at different stages of beef value chain. In the rearing stage, farmers' contribution is 49.36% of cost of value addition and received net margin only 21.58% which is lower than cost in the value chain. In the live animal trading stage, trader contributes 9.50% to costs of value addition and received 21.37% of net margin. On the other hand, butcher, processing company and hotel or restaurant owner incurred cost at 4.39%, 6.50% and 29.71% and

received net margin at 14.19%, 17.25% and 25.61% respectively. The traders, butchers and meat processing companies were more benefited in the chain. To make businesses sustainable initiatives should be taken at farmer's level by facilitating support services and development market linkage.

Table 1. Distribution of value addition across different stages of the value chain (in BDT/Cattle)

Actors	Purchasing Price of cattle	Purchase of additional materials and services	Total costs	Total return	Net margin
	<i>a</i>	<i>b</i>	<i>c=a+b</i>	<i>d</i>	<i>e=d-c</i>
Farmer	29138.76	11319.29 (49.36%)	40458.05	50747.61	10289.56 (21.58%)
Meat trader	50198.33	2177.62 (9.50%)	52375.95	62568.71	10192.76 (21.37%)
Butcher	62568.71	1129.42 (4.39%)	63698.13	70465.11	6766.98 (14.19%)
Meat processor	62568.71	1490.63 (6.50%)	64059.34	72285.05	8225.71 (17.25%)
Hotel and restaurant owner	76423.55	6812.85 (29.71)	83236.4	114320.31	12214.62 (25.61%)

Note: Figures within parenthesis indicate percentage of cost and value addition and net margin in the chain
Source: Field Survey 2014

The contributing costs in the value chain are by farmers (49.30%), traders (9.50%), butcher (4.39%), meat processors (6.50%) and restaurant owners (29.71%). The highest profit captured by farmer (21.58% in 3 to 5 months) followed by traders (21.37% in 7 to 10 days), butchers (14.19% in 2-3 days), meat processors (17.25% in 2-7 days) days and restaurants' share was 25.61% during the value adding activities. Among the actors, the butchers and meat processors captured more profit in terms of time involvement in the chain. Butchers, smaller traders, hotel and restaurant owners and larger traders are earning higher net margins than beef cattle producers who are doing all work of producing the beef cattle and bearing the associated risks.

3.4 Bottlenecks and Intervention of Beef Cattle Value Chain Development

Table 2 summarizes the challenging/ bottlenecks and possible strategies focus on overcome the problem to develop beef cattle value chain in the study areas.

Table 2. Major bottlenecks and intervention for development of beef cattle value chain

Bottlenecks/ Challenges	Level	Possible intervention and Strategies
i) Inadequate access to calf, feed and veterinary services. ii) Lack of grazing land.	Input Supplier	i) Linkage between cattle producers and input sellers ii) Facilitate development of entrepreneurs in input sector. iii) Provide feed processing techniques for preservation cattle feed iv) Allotment of Khas land to actual users

<ul style="list-style-type: none"> i) Lack of access to market information and appropriate fattening technologies. ii) Lack of capital iii) Low productivity. iv) Lack of support services. 	Producers	<ul style="list-style-type: none"> i) Promotion of market information & production technologies by DLS and NGOs ii) Provide easy access to finance to farmers for purchase of inputs and other related services. iii) Facilitate introduction and adoption of crossbred calves and fattening technologies that will improve productivity iv) Development of cattle producers group, contractual arrangements and needs advocacy for support services
<ul style="list-style-type: none"> i) Poor access to market information and transportation. ii) Lack of access to finance of cattle traders. iii) Illegal highway toll or market toll. iv) High risk to carry cash during the marketing. v) Lack of market infrastructures. 	Live Animal Traders	<ul style="list-style-type: none"> i) Establish MIS and disseminate information on price, demand-supply situation & road conditions through SMS & national media. ii) Provide specialized cattle transport vehicle. iii) Provide credit to traders without land grantee . iv) Establish low and force. v) Explore possibility of extension banking hour during the <i>hat</i> day. vi) Develop cattle market infrastructures including cattle holding space, drainage, and water supply etc.
<ul style="list-style-type: none"> i) Importation of beef processing equipment ii) Lack of sustainable beef cattle supply iii) Lack of easy access to <i>Hallal</i> Certificate iv) Lack of investment in establishment of meat processing firm v) Lack of hygienic cattle slaughtering slab 	Processors	<ul style="list-style-type: none"> i) Tax free import of beef processing equipment. ii) Linkage development with contract farmers and Processing plant / wholesale beef traders iii) Smoothing the process of issuing certificates by veterinary surgeon and Islamic foundation iv) Encourage establishment of meat processing firm through public-Private partnership model v) Establish and use hygienic cattle slaughtering slab.
<ul style="list-style-type: none"> i) Unwilling to pay for quality beef ii) Lack of hygienic beef retail place iii) Lack of transportation iv) Buffalo meat mix with beef 	Distributors/ Retailers	<ul style="list-style-type: none"> i) Awareness development among the customer about safe and quality beef and price ii) Develop hygienic retail store and beef packaging system. iii) Arrange transportation facilities to carry beef from slaughterhouse to store in the market iv) Monitoring and provide punishment of dishonest beef seller.
<ul style="list-style-type: none"> i) Lack of fresh, hygienic and <i>Hallal</i> beef. ii) Lack of quality iii) High price 	Consumers	<ul style="list-style-type: none"> i) Provide training to butcher for ensuring fresh, hygienic and <i>Hallal</i> beef. ii) Dissemination of information about safe and quality beef iii) Ensure supply of quality beef by following govt. rules iv) Promotion of consumerism.

Source: Field survey, 2014.

4. Conclusion

The value chain analysis is very crucial issue facing the agribusiness sector of the country economy as the Char agribusiness has been noted for the sale of live animal production and marketing is one of the major livelihood options in study areas. The beef cattle value chain actors are producers, collectors, brokers, traders, butchers, processors and retailers. Value chains provide an excellent framework for assessing opportunities for poor people in livestock markets. They allow focus on the individual components of production and marketing chains that need to be improved, as well as the benefits of different institutional arrangements, needed public investment and enabling policies and regulations. Scope exists for up scaling of activities at different stages in value chain. They generate income, and employment for farmers, traders, service providers, butchers, processors and

exporters, etc. There is a very strong interest in the development of branded meat products that can be supported by certified production and processing protocols that are subject to investigations. A number of different forms and opportunities can be expected to arise. Initial support and the provision of expertise will facilitate this development.

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