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Article

Survey on beef cattle production system in Saylem Woreda, south west Ethiopia

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Abstract: In Ethiopia livestock production is an integral part of the Ethiopian agricultural system. Beef cattle production plays an important role in the economies and livelihoods of farmers and pastoralists. Saylem Woreda is one of the remote setting in Ethiopia were information about beef production system is not well studied. Hence, this study was conducted to assess beef cattle production system; marketing and avalable feed resources utilized by beef cattle producers and the factors affecing beef cattle production of the study area through questionaire survey in Saylem woreda, south west Ethiopia. A total of 80 households were interviewed about 78.8% (X^2=26.45; p=0.000) of respondents practiced beef cattle production was statistically significant. 93.8% (X^2=61.25; p=0.002) of the respondents use only grazing of field grass for beef cattle production. Beef cattle marketing in the study area function at primary markets 78.8% (X^2=2.645; p=0.963) of respondents had access to market information before sale was not statistically significant. Most of the respondents 81.2% (X^2=19.00; p=0.003) determined factors for price of beef cattle were color, age, weight and agreement of sellers and buyers was statistically significant**.** The main constraints complained by the respondents in the study area 96.2% had lack of road (transportation) to get market access; 92.5% had prevalence of beef cattle disease in the area and 31.8% had shortage of feed and water and lack of genetically improved beef for fattening. Beef cattle production and marketing systems in Saylem woreda have many levels of formal and informal traders. Therefore, administrative bodies concerned these issues should give priority to find solution for these problems facing beef cattle producing farmers in the study area.

Keywords: beef cattle; marketing system; production; Saylem Woreda; respondents

1. Background

Ethiopia, like most of the countries in sub-Saharan Africans heavily dependent on agriculture. The agriculture sector plays an important role in the national economy and it is the source of income and employment for the rural population (Nigusse, 2001). The agricultural sector in Ethiopia, engaging 85% of the population, contributes 52% to the gross domestic product (GDP) and 90% to the foreign exchange earnings (CSA, 2014). Livestock production is an integral part of the Ethiopian agricultural system. The subsector contributes 12 and 33% to the total Gross Domestic Product (GDP) and agricultural Gross Domestic Product (GDP), respectively, and provides livelihood for 65% of the population (LMA, 2001). Beef cattle production plays an important role in the economies and livelihoods of farmers and pastoralists (CSA, 2014). Livestock systems represent a potential pathway out of poverty for many smallholders in the developing world. The majority of the world's rural poor, and a significant proportion of the urban poor, keep livestock and use them in a variety of ways that extend far beyond income generation. In many cases, livestock are a central component of smallholder risk management strategies (Bailey *et al*., 1999). The economic contribution of the livestock sub-sector in Ethiopia is also about 12% of the total and 33% of agricultural Gross Domestic Product (GDP) and provides livelihood for

65% of the population. Livestock in Ethiopia provide draught power, income to farming communities, means of investment and important source of foreign exchange earning to the nation (Solomon *et al.*, 2003).

The beef cattle production systems are predominantly categorized as agro-pastoral system in the lowlands, and the mixed crop–livestock system in the highlands. Traditionally, fattening of animals in both systems concentrates on male animals and on females which are either infertile or have finished their reproductive cycle. In the lowland agro-pastoral system, grazing is the most common source of feed, with limited use of crop residues, whereas in the highland system, crop residues are the most important source of animal feed. During the wet season, when crop residues are scarce in the highlands, male animals are taken to the lowland areas for grazing (Elias *et al*., 2007). Beef cattle production ranges from the beef cow herds that typically graze on pastureland or graze the remaining residue on the land after grain harvest to growing and finishing young cattle in feedlots. The feedlot-housing systems used in beef cattle production typically varies by climate and can range from open earthen lots with very little shelter to open shed and lot or an enclosed confinement building. Manure handling and storage ranges from solid manure with bedding included, and runoff water from open lots to liquid slurry and treatment lagoon systems. Due to the increasing size of beef operations, the large volume of manure production, collection, storage and application to the land has presented challenges (Daniel, 2008).

In different parts of Ethiopia there was some survey works done to assess beef cattle production and marketing systems. But no works was done in Saylem woreda, south west Ethiopia. Therefore, this study was focused to :

- To assess beef cattle production system, marketing and avalable feed resources utilized by beef cattle producers in the study area through questionaire survey.
- To assess the constraints of the beef cattle production system of the study area through questionaire survey.

2. Materials and Methods

2.1. Description of the study area

The study was conducted from September, 2017 to June, 2018 in Saylem woreda of South Nation Nationalities Peoples Regional State, South West Ethiopia. Saylem Woreda is far 600 kms from Addis Ababa and located with a longitude 35^0 0’ 2” to $35^0$0’ 5" West and latitude 7^0 2' 1" to 7^0 4' 9" North and an altitude of 1800 to 2200 meters above sea level. Saylem woreda has received an average annual rainfall ranging from 3212.3 mm to 4159 mm and an average annual temperature ranging from 11.96 ^{0}c to 21.9^{0}c. The agro ecological zone is high land and the major economic activities of the population were depends on farming crops and livestock production. Saylem woreda is one of the highly potential areas in livestock resources, but a lot of constraints are wide spread for the reduction of animal’s production systems in the area (Saylem Woreda Livestock and Fishery Development Office, 2018).

2.2. Study design and sampling technique

A questionnaire survey was conducted from September, 2017 to June, 2018 on 80 households to assess the beef cattle production system, marketing and avalable feed resources utilized by beef cattle producers and also the major constraints of the beef cattle production system in the study area. During the study time, four study kebeles (namely Techib, Dino, Senteria and Qoci kebeles) were selected purposively based on maximum; medium and minimum beef cattle production practice takes place. Within each kebeles; the households were selected for interview by using simple random sampling technique. Hence, 20 households were selected from each kebeles and totally 80 households were participated in this study.

2.3. Methods of data collection

2.3.1. Questionnaire field survey on beef cattle producers

Questionnaire field survey was a primary data which were obtained through administered predesigned questionnaire to households from each selected kebeles. The objective of the questionnaire survey was explained to the participants before start of the interview. Questionnaire surveys with open and closed questions were used amongst the households and who were willing to participate in the survey. The owners’ or one from the member of the households were interviewed in their local language. The questionnaire was developed in English and translated into Kafigna language for participants. The questionnaire was basically divided in to five parts comprising: Background information of the respondents’; beef cattle production system practiced in the area; feeding and watering sources; marketing system and major constraints for beef cattle production in the study area. This questionnaire survey was conducted on simple randomly selected 80 households from four purposively selected kebeles (namely Techib, Dino, Senteria and Qoci kebeles). From these kebeles Techib

kebele is the highest or maximum beef production was practiced, in Dino and Senteria kebeles were medium beef production were practiced and finally the lowest beef production was practiced in Qoci kebele.

2.4. Data management and statistical analysis

The samples were collected based up on the appropriate sample collection methodology accordingly with the time frame work. All the collected data was entered through Microsoft Excel 2007 program and data analysis was performed with Pearson Chi-square (X^2) using SPSS version 16 statistical computer software. A *p-value* less than 0.05 were considered statistically significant with 95% confidence interval. Also descriptive analysis was employed for data analysis.

3. Results and Discussion

3.1. Demographic characteristic of the participants

General demographic characteristic results of the households participated in interview are summarized in Table 1. On average, there were 20 household in each kebele were participated in the study area. Totally 80 households participated, 86.2% were males and 13.8% were females. Age distribution of the participants were classified in to three: young (15-30 years old); adult (30-60 years) and old (above 60 years old) in this study and the result showed young 17.5%, adult 56.2% and old 26.2%. Education level of the household heads were Illiterates 31.2%; basic reading and writing 43.8%, only 11.2% of them enrolled in primary schools, and only 13.8 were attended secondary school. In this study the proportion of illiterates (31.2%) was less than reported by Daniel (2008) **(**70.7%) in Borena zone. This difference may be due to shortage of the access school. Income sources of the household heads in the study area, both crop and livestock production are the main sources of income and are closely linked to the social and cultural lives of the community.

3.2. Beef cattle production system

Questionnaire results of beef cattle production system are shown in Table 2. Beef cattle production refers to the producer stayed in cattle production activity. From producers' survey, it was found out that most of the producers had been in cattle production activities for ling time. Results of this study revealed that 78.8% of the respondents indicated that they were involved in beef cattle production, but 21.2% were not involved beef cattle production. From the respondents, 47.5% were reared beef cattle to generate cash income; 10% for farming only and 42.5% for both to generate cash income and farming purposes. 61.2% of the participants got technical support on health, feed, marketing and beef cattle utilization from office of agriculture and 15% from fellow farmers, but 67.5% responds the technical support is not sufficient. 96.2% of the respondents follow traditional beef cattle production system.

3.3. Feeding system of beef cattle production

Questionnaire results on feeding system of beef cattle production are shown in Table 3. According to the response of 80% households, they had sufficient grazing land for their cattle, but 20% of the respondents explained that the grazing land for their cattle is not enough. Accordingly, the results of this study showed that 45% households, there is feed shortage for their cattle in general and 17% households responded that the problem is there but it depends on the seasons, while the remaining 21% replied that there is no feed problem in their area. According by the study of Sintayehu *et al*. (2010) in the relatively wet highlands, available livestock feed (including grazing) is estimated to fall 40% short of requirement. Dry period or season is the most critical periods when feed shortage occurs and water resources decrease both in amount and quality, as indicated by the respondents. 96.2% of them do not store feed for their cattle, but only 3.8% of the respondents reported that they just store feed to the home for their cattle to use during dry season.

From the respondents, 93.8% were used field grazing system on natural pasture which is the most common practice for all species of animals in the Saylem woreda. Some of them used salt as a supplement. Those ready for sale are supplemented with salt as the producers strongly believe in that salt is helpful for conditioning their beef cattle before sale. Bruk and Tafesse (2000) obtained a comparable result that in pastoral areas, the natural pasture is the main source of feed for livestock and in order to utilize the resource properly. Only 6.2% were used some of the farm products and residues used as a source of feed to the different groups of cattle. Water resources in the study area are dominated by the rivers. Among the 80 respondents 52.5% of them indicated that there are problems with the water resources such as poor water quality, thus the rest reported that during the dry periods the water quality is poor and results in water borne diseases.

3.4. Beef cattle marketing system in Saylem Woreda

Results of beef cattle marketing system of the study area are shown in Table 4. Markets are an area where animals are exchanged weekly between the producers and traders for different purposes or sells in the primary markets. The current survey carried out on income generated from beef cattle production, 95% of the respondents replied that it was increasing. Market information is vital to minimize information gaps and uncertainties that exist in the agricultural sector. According to the results of this study on market information sources, the majority of the respondents, 78.8% get destination market information before they went out to sell their beef cattle. The primary marketing area was Yadota market is located 680 km from the capital, Addis Ababa, the capital of Saylem woreda. There are two market days, Saturday and Tuesday. Saturday, is the major market day for livestock. Regarding the marketing route, there are two main livestock-marketing routes (Jimma town and Mattu town) in the study area. From the respondents 76.2% were sold on Yadota market and 23.8% were on Techib markets. 83.8% of the respondents sold for traders, 8.8% for abattoirs and 7.5% for local butchers. In this study, 11.2% of the respondents replied that beef cattle marketing the price was depends color, 5% on age, 2.5% on weight and 81.2% depends on color, age, weight of the animal and the negotiation between the sellers/producers and the buyers. Prices also depend mainly on supply and demand, which is heavily influenced by the season of the year and the occurrence of religious and cultural festivals. Purchasing of live cattle at the markets is performed based on the requirements of the customers. Thus breed, sex, age, weight and sometimes color of the animal for the live export are the major criteria considered by the export abattoirs during purchase. Due to lack of weighing facilities, mostly cattle transaction is done ‘based on evaluation and assessing the body conditions, which tend to be highly subjective.

3.5. Major factors affecting for beef cattle production in the study area

Major constraints for beef cattle production are summarized in Table 5. The major constraints for the production of beef cattle in the study area assessed data showed that 68.8% had health problem of cattle, while 31.2% had a problem of shortage of feed and water and lack of genetically improved breeds of beef cattle in the area. National Bank of Ethiopia (2002) indicated that the problem of feed and water is much more pronounced during drought crises, which is a recurrent phenomenon in beef cattle producer areas. From the survey results on the prevalence of diseases problem in beef cattle indicated that 92.5%. This result is in line of agreement with Daniel (2008) reported 92.6% of the respondents there is cattle health problem in the study areas. Based on animal health services, 53.8 % of the respondents use veterinarians’ service while 16.3% used traditional medications only; indicated that the traditional medications are relatively cheaper than the modern one. But 30% used both modern and traditional medications. The frequent occurrence of livestock diseases in the area directly inflict a heavy loss on the economy of the society and further regaining of their market takes time.

In the study area, the producers 96.2% trek their animals by foot due to absence of road access in the area. Road networks provide the necessary links and access to services and markets for agricultural commodities among others. However, results of this study revealed that producers used traditional stock routes to move their animals to the markets. The results of this study revealed that 100% of the respondents trek their cattle to primary markets. This finding is consistent with the report of Aklilu (2002) stated that in Ethiopia, the supply of livestock to the primary, secondary and terminal markets is mostly done through trekking. The larger proportions of the producers trek their own animals to markets along with relatives or neighbors, and is aimed at minimizing costs. Lack of access to transport networks limits poor communities from market participation and constrains their economic opportunities and then contributing to inability to strengthen human capabilities and this agrees with results of this study.

Table 1. General demographic characteristic results of the households participated in interview.

Characteristics	No. of respondents	Percent (%)	X^2	P-value
Kebele:				
Dino	20	25	4.230	1.00
Techib	20	25		
Senteria	20	25		
Qoci	20	25		
Gender:				
Male	69	86.2	3.056	0.978
Female	11	13.8		
Marital status:				
Marriage	77	96.2	4.525	0.064
Single	2	2.5		
Divorced	1	1.2		
Age:				
Young	14	17.5	9.825	0.0011
Adult	45	56.2		
Old	21	26.2		
Educational status:				
Illiterates	25	31.2	2.600	2.034
Basic writing and reading	35	43.8		
Primary school	9	11.2		
Secondary school	11	13.8		
Sources of income:				
Crop production	5	6.2	16.002	0.001
Livestock production	5	6.2		
Wage labor	2	2.5		
Both crop and livestock production	68	85		

$X^{2=}$ Pearson Chi-square

Table 2. Questionnaire results of beef cattle production system.

Characteristics	No. of respondents	Percent (%)	X^2	P-value
Involved in beef cattle production:				
Yes	63	78.8	26.450	0.000
No	17	21.2		
Purpose of beef cattle rearing:				
To generate cash income	38	47.5	1.900	2.546
For farming	8	10		
Both for selling and farming	34	42.5		
From whom do you get support:				
Office of agriculture	49	61.2	6.900	1.873
Fellow farmers	12	15		
Administrative conferences	7	8.8		
From all	12	15		
Is the technical support is sufficient:				
Yes	54	67.5	19.800	0.020
No	26	32.5		
On what issue do you get support:				
On health of beef cattle	36	45	2.400	2. 523
On feed and marketing of beef cattle	10	13.6		
On beef cattle utilization	2	2.5		
On all aspects motioned above	32	40.1		
What production system do you follow:				
Traditional	77	96.2	28.450	0.031
Modern	3	3.8		

$X^{2=}$ Pearson Chi-square

Table 3. Questionnaire results on feeding system of beef cattle production.

Characteristics	No. of respondents	Percent (%)	Chi-square (X^2)	P-value
Do you have sufficient grazing land:				
Yes	64	80	4.800	2.641
No	16	20		
Is there feed shortage:				
Yes	36	45	6.775	0.521
No	27	33.8		
It depends on season	17	21.2		
When is feed shortage was critical:				
During dry season	71	88.8	48.050	0.020
During summer season	9	11.2		
Do you store feed for your cattle:				
Yes	3	3.8	68.450	0.000
No	77	96.2		
Feed resource utilized:				
Grazing of field grass	75	93.8	61.250	0.002
Crop residue	5	6.2		
Source of water for your cattle:				
Rivers	54	67.5	10.825	0.744
Mechanically assisted	26	32.5		
Is there problems regarding water::				
Yes	42	52.5	0.200	1.655
No	38	47.5		

Table 4. Results of beef cattle marketing system of the study area.

Variables	No. of respondents	Percent (%)	Chi-square (X^2)	P-value
Income you generating from beef cattle:				
Increasing	76	95	64.800	0.000
Decreasing	4	5		
Do you get market information:				
Yes	63	78.8	2.645	0.963
No	17	21.2		
Where do you sell your beef cattle				
Yadota	61	76.2	22.050	0.011
Techib	19	23.8		
To whom do you sell:				
Traders	67	83.8	19.525	0.023
Abattoirs	7	8.8		
Local butchers	6	7.5		
What factors determined its price:				
Color	9	11.5	19.000	0.003
Age	4	5		
Weight	2	2.5		
Color, age, weight and agreement of seller and buyer	65	81.2		

Table 5. Major constraints for beef cattle production.

Variables	No. of respondents	Percent (%)	X^2	P-value
Major constraints for beef production:				
Health problems	47	68.2	35.054	0.042
Feed and water, improved breed	33	31.8		
Is a problem of beef cattle disease:				
Yes	74	92.5	54.321	0.003
No	6	6.5		
Whom do you assist for health service:				
Veterinarians	43	53.8	7.500	1.683
Traditional medications	13	16.3		
Both veterinarians and traditional medications	24	30		
Is a problem of road (transportation):				
Yes	77	96.2	32.200	0.0043
No	3	3.8		

$\mathbf{X^{2=}}$ Pearson Chi-square

4. Conclusions

In the study area farmers practiced traditional beef cattle production system. The unbalanced beef cattle marketing supply and demand of the area is due to poor veterinary service; poor market extension services; poor infrastructure development; low prices and selling options and numerous weaknesses of livestock marketing system. The major constraints for the expansion of beef cattle production in the area were lack of awareness of the farmers to use modern system of beef cattle production; lack of road access in the area; shortage of veterinary services; shortage of quality feeds and clear water; lack of genetically improved breeds of cattle; the prevalence of cattle disease and poor management system of beef cattle. Based on this study, the following points are forwarded:-

- ✓ Administrative bodies concerned these issues should give priority to find solution for these problems facing beef cattle producing farmers in the study area.
- ✓ Improve animal health services delivery including vaccine for major diseases and drug supply system with close monitoring and supervision.
- ✓ Development of extension services in the areas in terms of beef cattle production, management and marketing systems.

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Conflict of interest

None to declare.

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