

Assessment of Supply Chain Management Practices in Live Animal Export: The Case of Gurage Zone, Ethiopia

Ayal Adamu (MBA)¹ Samuel Gemechu (MBA)²

1. Department of Management, Injibara University, Wolkite, Ethiopia

2. Department of Management, Wolkite University, Wolkite, Ethiopia

Abstract

The main purpose of this study was to assess supply chain management in live animal export. In order to meet the objectives of the study, a descriptive survey design was employed. Both secondary and primary data sources were employed. Primary data sources include questionnaire, interview, and focus group discussion were used. The target population of the study is livestock producers in some selected Woredas, firm exporter and livestock traders in the two target towns were selected by purposively sampling method. From the total population of 1500 household livestock producers⁷ and 50 employees of exporter firms, 315 household livestock producers and 44 employees of exporter firms were randomly selected for this study. Finally, the data collected from the respondents were analyzed quantitatively and qualitatively by using descriptive Statistical Analysis Such as frequencies, mean values, standard deviations and t-tests. The information obtained through document, open-ended questionnaires, focus group discussion and the interviews were qualitatively analyzed to supplement the quantitative data. The findings revealed that the livestock producers, traders and exporters were the main actors of the supply chain. These actors were did not establish strong and effective mutual relationships cooperation, integration and coordination rather they all operate their respective business independently and traditionally. The current live animal traders practice in Gurage Zone seems to be the traditional linking with the producers. All live animal supply chain participants were used traditional way of gathering marketing information like personal observation. Therefore, it is recommended that serious awareness creation, workshops on livestock production, marketing and export regulation, policies and strategies have to be conducted to the supply chain participants and stakeholders of the sector that aimed to create conducive conditions for export trade.

Keywords: supply chain management, live animal, export

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1. INTRODUCTION

The best companies around the world are discovering a powerful new source of competitive advantage. It's called supply-chain management and it encompasses all of those integrated activities that bring product to market and create satisfied customers (Handfield, 1998). As a result, supply chain theory, and practice have developed to the extent that supply chains, rather than single companies, are now see as units of competition (Handfield, 2002). Nevertheless, Supply chain management is still not well understood conceptually, and nor are future trends (Slone, 2004). The increment in livestock products is evident as many research results have showed that in both developed and developing nations there is a focus to improve this sector in order to gain significant economic and social benefits. The livestock sector in Europe has major opportunities to contribute to a more sustainable, climatically suitable and the sector gives more space for competitive Europe and ensure responsible European animal production in a changing global world (EU, 2013).

Others further study indicate that, the international market for live animals and meat is becoming increasingly competitive, and relevant actors must adopt improved practices in production, handling, fattening, transportation, processing and packaging of products to maintain and increase market share, to meet market requirements and maximize the benefits from the growing meat and live animal export trade (Amha, et al, 2011). These Market opportunities are increasing at a rapid rate for livestock products, fuelled by rising incomes, globalization, urbanization, and particularly in the developing world. At the same time, these opportunities bring increased complexity in the supply channels in marketing, distributing, organizing and governing high-value products (McLend and Sutherland, 2012). According to McDermott, et al (2014), these opportunities ask for the questions on the ability of smallholder producers to contribute to this complex process. The smallholder participation in emerging and growing livestock markets is very crucial to make the supply chain to be more cost effective. Due to the potential opportunities that livestock provides, it can be observed that major development efforts made on livestock sector in both developed and developing countries are increasing (Nauman, 2014).

Naturally endowed with different agro-ecological zones and suitable environmental conditions, Ethiopia is a home for many livestock species and suitable for livestock production. Ethiopia is believed to have the largest livestock population in Africa (CSA, 2013/14). Recently Ethiopia's livestock market structures and characteristics showed that, many of the livestock markets in the country are categorize into primary market, secondary markets and terminal market. Furthermore, the basis of this classification as they indicated is that,

mainly number of animals that attended the market per market day and the number of market participants in the market. 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 butcheries and restaurants (Getachew, et al, 2008).

Gurage Zone is one among naturally endowed agro-pastoral regions of the country in terms of livestock population availability. Moreover, the Zone has a comparative advantage with its proximity to the Addis Ababa for its livestock export markets than other regions similar sectors.

Therefore the study assesses the supply chain management practice in live animals export and their major opportunity and challenges in selected Woredas, export firms in Butajira and Wolkite towns.

2. OBJECTIVE OF THE STUDY

- To identify the current status of live animal export supply chain management practices of the zone.
- To scrutinize major opportunity and challenges in the live animal export supply chain management of the study area.

3. METHODOLOGY OF STUDY

Descriptive research designs have been used in this study. The target population of the study is livestock producers in some selected Woredas, firm exporter and livestock traders in the two target towns were selected by using purposive sampling method. According to Gurage office of Rural and Agricultural Development and its branch offices in (Meskan, Abeshge, Cheha, Enamor, and Esha) Woredas were indicated that, there are total 1500 household livestock producers who supply livestock in primary market, and 50 employees of export firms were currently worked in two town administration (35 employees are in Mohammed Nuri export firms at Butajira town and 15 employees are in Tofik Agizow export firms at Abeshege Woreda). Six individual traders were included as the interview response. Again the five branch Woredas of Rural and Agricultural sectors coordinator were included on the focus group discussion.

From the total population of 1500 household livestock producers' and 50 employees of exporter firms, 315 household livestock producers and 44 employees of exporter firms were randomly selected for this study. Finally, the data collected from the respondents were analyzed quantitatively and qualitatively by using descriptive Statistical analysis such as frequency, percentage, mean values, standard deviations and t-tests. The information obtained through document, open-ended questionnaires, focus group discussion and the interviews were qualitatively analyzed to supplement the quantitative data.

4. DATA ANALYSIS AND DISCUSSION

4.1. The Business Experience of Live Animal Producer

Table 1: Type of market in which live animal sold and level of producer's beneficiaries

Items	Variables	n=265	
		Frequency	%
Previous business	Agent	18	6.8
	Trader	76	28.7
	Broker	32	12.1
	Livestock Producer	108	40.8
	No response	31	11.7
	Total	265	100.0
Have formal market	Yes	116	43.8
	No	149	56.2
	Total	265	100.0
Which market	Primary market	163	61.5
	Secondary market	59	22.3
	Terminal market	43	16.2
	Total	265	100.0
More beneficiaries	Producers	47	17.7
	Local traders	135	50.9
	Agents	12	4.5
	Trading	62	23.4
	Export firms	9	3.4
	Total	265	100.0

(Source: survey, 2017)

From Table 1 the above, the researchers can observe that out of the 265 live animal producers, 40.8% of them practices live animal producers in previous their life, 28.7%, 12.1 % and 6.8 % were practice in their previous life traders, brokers and an agent respectively. Regarding to item 2 from the same table, more than half of respondents said that there is no formal market for live animal product at live animal’s producer’s environment. Similarly, 61.5% of producer were sold their product at primary market, 22.3%, and 16.2 % were sold at secondary and tertiary market respectively. It’s better to conclude that the majority of live animal producer were limited to within primary market. Regarding the level of beneficiary, 50.9 % of the beneficiaries are local traders. 23.4%, 17.7% and 3.4% of beneficiaries are lager traders, producers, and export firms respectively. In the same way, data obtained from the interview made with local traders, and focus group discussion made with animal health bureau heads and their branch confirm that there is unsecured balances of benefits from live animal marketing practices.

4.2. Accessibility of Market Information in Live Animal producer Supply Chain

Table 2: Live animal’s market information availability

Items	Variables	n= 265	
		Frequency	%
have well organized source of information’s	Yes	116	43.8
	No	149	56.2
	Total	265	100.0
Center for market information	Government agency	44	16.6
	Non-governmental agency	32	12.1
	Informal from local trader	36	13.6
	No Response	153	57.7
	Total	265	100.0
Sources of information on live animals market price	From Dagu	12	4.5
	Personal observation	24	9.1
	Other producer	192	72.5
	Agents	20	7.5
	Brokers	14	5.3
	If other specify	3	1.1
	Total	265	100.0
level of satisfied with information	Highly satisfied	8	3.0
	Satisfied	30	11.3
	Moderately satisfied	108	40.8
	Unsatisfied	119	44.9
	Total	265	100.0
Have a linkage with buyers	Yes	128	48.3
	No	134	50.6
	Total No Response	3	1.1
	Total	265	100.0

(Source: survey, 2017)

Table 2 regarding the well-organized source of information in live animal marketing shows that 56.2% and 43.8% of the respondents were said that yes and no respectively. Regarding the center of marketing information, 57.7% of respondents were not giving response. 16.6%, 13.6 %and 12.1% of respondents were said that government agency, informal local trader, and non-government agency respectively. Hence, this indicates that the majority of the respondents in the live animal’s producer were not giving response showing that the unclear formal centers of marketing information for live animal’s producer.

The above table 2 also shows that 44.9% of the respondents were unsatisfied with marketing information’s. This indicates that there is no enough marketing information for live animal’s producer. Regarding the live animals producer strong relation with buyers, 50.6 % of the respondents have weak relationship. This shows that almost half of the respondents have not strong relation with live animal’s product purchaser. In addition, data obtained from both the interview and focus group discussion revealed that there is poor supply chain management regarding the updating formal market information for live animal product.

4.3. Management and Marketing Practice in Live Animal Supply Chain

Table 3: The Extent of Management and Marketing Practice in Live Animal Supply Chain

Items	Mean	SD	Test Value = 3				
						95% Confidence Interval	
			t-value	p-value	Mean Difference	Lower	Upper
Good management practice on Live animal safety, health, weight, and age	2.77	1.399	-2.635	.009	-.226	-.40	-.06
Strong mutual relationships with livestock trading	2.56	1.160	-6.195	.000	-.442	-.58	-.30
Relations among supply chain actors	3.04	1.376	.447	.656	.038	-.13	.20
Certainty of market price of live animal	2.89	1.238	-1.489	.138	-.113	-.26	.04
Availability of update market information	2.98	1.261	-.292	.770	-.023	-.18	.13
Distance approach to market	3.15	1.310	1.828	.069	.147	-.01	.31
Clear government policy regarding live animal market price.	2.89	1.582	-1.165	.245	-.113	-.30	.08
Balance benefits for all supply chain actors.	2.65	1.425	-3.966	.000	-.347	-.52	-.17

(Source: survey, 2017); significant at $\alpha 0.05$ level, t -critical value (1.96) $df= 264$

It can be seen from table 3 Item 1; respondents were asked to give their levels agreement regarding good management practice in live animal safety, health weight, and age. The mean score of live animal's producers is 2.77. The t -test result with p -value of $0.009 < 0.05$ indicates that there is statistically significant difference from moderate level towards the item. This shows that the management practice in live animal safety, health weight, and age was below moderate level of agreement. Regarding item 2 and item8 in the above table, the levels of mutual relationships with livestock trading, cooperative and exporters, and balance benefits for all supply chain actors was also rated by live animal producers of the respondents. The average agreement level of mean scores of the respondents was 2.56 and 2.65 respectively. The t -test result with p -value for both Items $0.000 < 0.05$ shows that there is statistically significant difference from moderate levels of agreement respondents towards the item.

4.4. Accessibility of Market Information in Live Animal Export Supply Chain

Table 4: Source of information for live animal exports

Items	Variables	n=30		
		No	%	Valid %
Well-organized source of information	No	30	100.0	100.0
	Total	30		
The way getting information on the price of live animals	Personal observation	30	100.0	100.0
The way getting information on the supply of live animals	Personal observation	23	76.7	76.7
	Agents	3	10.0	10.0
	Brokers	4	13.3	13.3
	Total	30	100	100
The way to get information on the demand of live animals	Contact office	4	13.3	13.3
	Contact person	26	86.7	86.7
	Total	30	100	100

(Source: survey, 2017)

Response results from Table 4 about the existence of well-organized markets information indicates, 100% of respondents were replied that there is no well-organized source of market information concerned with live animal trading practice. Thus, exporters and employees of export firms had been used other means of access to markets livestock price and live animal supply information as responses indicates, 100% of respondents got information through personal observation. Similarly, the data obtained from Traders though the Interview reveals that the market information related to Livestock price was not centralized, and the livestock product supply to the market also seasonal.

Table 5: level of management practices in live animal export supply chain

Items	Mean	SD	t-value	p-value	Mean Difference	95% Confidence Interval	
						Lower	Upper
There are good management practice on Live animal safety, health, weight, and age in supplied to the export markets	2.87	.629	-1.161	.255	-.133	-.37	.10
There are strong mutual relationships with livestock trading cooperatives or producers.	3.47	.900	2.841	.008	.467	.13	.80
There are closed relations among supply chain actors.	3.50	.731	3.746	.001	.500	.23	.77
There is a certainty of market price of live animal in any time	2.60	.855	-2.562	.016	-.400	-.72	-.08
There is availability of update market information.	1.87	.973	-6.378	.000	-1.133	-1.50	-.77
There are balance benefits for all supply chain actors.	2.97	.890	-.205	.839	-.033	-.37	.30

(Source: survey, 2017); significant at α 0.05 level, t-critical value (1.96) df= 29

The export firms have an average agreement level of mean 2.87 regarding of the good management practice on live animal safety, health, weight, and age in supplied to the exporter markets. The t-test result with p-value of $0.255 > 0.05$ indicates that there is no significant difference from the moderate level of agreement.

Regarding strong relationship among supply chain actors by mean, the mean score of export firm's respondents were 3.47, and 3.50 respectively. The t-test result with p-value of 0.008 and $0.001 < 0.05$ respectively indicates that there is statistically significant difference from moderate level of agreement towards the two items. Similarly, 95% Confidence Interval of the Difference mean of the two Items are 0.33-0.080 and 0.23-0.77 respectively indicates that there is no the chance of the mean of the two Items are zero value. This proves that the respondents of live animals export firms have the above moderate level of the agreement towards the Items.

The Item4 and Item5 from the above table5 deals with the availability of live animals market information. The live animal's export firms have average agreement level of mean 2.60 and 1.87 respectively. The t-test result with p-value of 0.016 and $0.00 < 0.05$ respectively indicates that there is the statistically significant difference from moderate level of the agreement toward the Items. Similarly, 95% Confidence Interval of the Difference mean of the two Items are -0.72 up to -0.08 and -1.50 up to -0.77 respectively indicates that there is no the chance of the mean of the two Items are zero value. This proves that the respondents of live animals export firms have below moderate level of the agreement towards the Items.

4.5. Major Challenges in Live Animal Export Supply Chain

Table 6: External factors affecting the performance of live animal's exporter firms

Items	Test Value = 3						
	Mean	SD	t-value	p-value	Mean Difference	95% Confidence Interval	
						Lower	Upper
Shortage of financial access	2.57	.774	-3.067	.005	-.433	-.72	-.14
Lack of business experience	4.23	.430	15.703	.000	1.233	1.07	1.39
limited market information	3.83	.379	12.042	.000	.833	.69	.97
Legal and policy constraints	3.03	1.326	.138	.891	.033	-.46	.53
Available of infrastructures	2.33	.758	-4.817	.000	-.667	-.95	-.38
Location of market	2.57	.774	-3.067	.005	-.433	-.72	-.14
Shortage of livestock during high demand	2.33	.758	-4.817	.000	-.667	-.95	-.38
Lack of technology	3.93	.640	7.992	.000	.933	.69	1.17
Insecurity of the routes	3.67	.758	4.817	.000	.667	.38	.95

(Source: survey, 2017); significant at α 0.05 level, t-critical value (1.96) df= 29

It can be seen from Table 6 Item 1, Item5, Item6, and Item7 that the live animal export firms have an average agreement level of mean 2.57, 2.33, 2.57 and 2.33 respectively. The t-test result with the p-value of 0.005, 0.000, 0.005 and 0.000 respectively less than 0.05 indicates that there is a significant difference from the moderate levels of the agreement. This implies that the live animal export firms have the below moderate levels of agreement regarding the external factors affecting the performance of live animal export firms.

From the above Table 6, Item4 that exporters have an average agreement level of mean 3.03. The t-test result with p-value of 0.891 > 0.05 indicates that there is no significant difference from the moderate level of agreement. This means the live animal's export firms have the moderate level of agreement towards the legal, institutional and policy constraints related to the live animals trade.

Regarding the Item2, Item3, Item8, and Item9 from Table 6 the live animal export firms have an average agreement level of mean 4.23, 3.83, 3.93 and 3.67 respectively. The t-test result with p-value of the four Items is 0.000 less than 0.05 indicates that there is a significant difference level of agreement from the moderate level of agreement. Because of the 95% of the confidence interval of mean difference for the all Items located into the positive domain, the export firms have above moderate level of agreement for external factors. This revealed that unavailability of business trainings provided by concerned government agencies, limited market information, Lack of technology and Insecurity of the routes are the major external factors currently affecting the live animal export firms.

Table 7: Internal factors affecting the performance of live animals exporter firms

Items	Test Value = 3						
	Mean	SD	t-value	p-value	Mean Difference	95% Confidence Interval	
						Lower	Upper
Lack of managerial skills	2.83	.913	-1.000	.326	-.167	-.51	.17
Quality Disputes	4.23	.430	15.703	.000	1.233	1.07	1.39
Quantity Disputes	3.73	.868	4.626	.000	.733	.41	1.06
Bureaucratic	3.13	.571	1.278	.211	.133	-.08	.35
Health and inspection problems	2.97	1.245	-.147	.884	-.033	-.50	.43
Location of firm	2.57	.774	-3.067	.005	-.433	-.72	-.14
linkage with supply chain actors	2.87	1.196	-.611	.546	-.133	-.58	.31
Over extension of credit	2.87	1.279	-.571	.573	-.133	-.61	.34
Lack of Employees Satisfaction	3.10	.960	.571	.573	.100	-.26	.46

(Source: survey, 2017); significant at $\alpha 0.05$ level, t-critical value (1.96) $df = 29$

It can be seen from Table 7 item 6 that export firms have an average agreement level of mean 2.57. The t-test result with p-value of 0.005 < 0.05 shows that there is a significant difference from the moderate level of agreement. This indicates that exporters have below moderate level of agreement for Location of exporter firms which is one of the internal factors that is affecting the performance of live animal's export firms.

As it is indicated on Item 1, Item4, Item5, Item7, Item8 and Item9 in Table 7, the computed mean scores from respondents of live animals export firms were 2.83, 3.13, 2.97, 2.87, 2.87 and 3.10 respectively. The t-test result with p-value of 0.326, 0.211, 0.884, 0.546, 0.573, and 0.573 respectively, greater than 0.05 indicates that the respondents do not significantly vary in their average agreement from the moderate level of agreement towards the items. These shows that exporters have moderate level of agreement for the elements of internal factors such as lack of managerial skills, over extension of credit, lack of employees satisfaction and bureaucratic across the firms that is affecting the performance of live animals export firms.

Regarding the Item2 and Item3 in Table 7, the computed mean scores from respondents of live animals export firms were 4.23 and 3.73 respectively. The t-test result with p-value of the two Items 0.000 less than 0.05 indicates that there is a significant difference level from the moderate level of the agreements. Due to the 95% of confidence interval of mean difference were located with the positive domain of the interval shows that there is no the probability of zero value of mean items realizing that the exporters have the above moderate level of agreement.

4.6. Major Challenges in Live Animal producer Supply Chain

Table 8: challenges of live animal producer in exports of supply chain

	Number of YES responses	n = 265	
		%age	Rank
Price dispute	176	66.4	3
Quality dispute	175	66.0	4
Quantity dispute	110	41.5	16
Health and inspection problem	169	63.8	6
Location of market	180	67.9	1
Shortage of live stock	170	64.2	5
Skill/knowledge of producer	122	46.0	13
Government policy	121	45.7	12
Transportation	163	61.5	7
Lack of supporting technology	118	44.5	11
Competitors	125	47.2	15
Disease	117	44.2	9
Illegal traders	162	61.1	8
Routes insecurity	142	46.4	14
Local tax	117	44.2	9
Unsatisfactory marketing system	178	67.2	2

(Source: survey, 2017)

As shown in Table 8 above, six high factors such as quantity dispute, competition from illegal traders, insecurity of trade channel in supply chain, skill and knowledge of producers, government policy, lack of supporting technology, local tax and disease were 58.5%, 52.8%, 53.6%, 54%, 54.3%, 55.5%, 55.8%, and 55.8% yes scored respectively. This shows that live animal producers were more challenging with quantity dispute, competition from illegal traders, insecurity of supply chain, skill and knowledge of producers, government policy, lack of supporting technology, local tax and disease in the export supply chain.

Further, as expert key informants focus group discussion at both zonal and district levels indicated that the major challenges for controlling the live animal export in Gurage Zone are competition from illegal traders, insecurity of trade channel in supply chain, skill and knowledge of producers, weak government policy, lack of supporting technology and disease.

5. CONCLUSION AND RECOMMENDATION

Live animal producers and live animal export firms were limited to within primary market structure only. The alternative market opportunities available for live animal trade were not advanced.

The benefits obtained by the live animal producer and live animal export firms from live animal trade in Gurage were not equivalent with local traders and larger traders. There were unbalanced benefits among live animal supply chain participants. This indicates that animal health bureau heads and Woreda branches were not secured the balance benefits from live animal trade.

In live animal trade, live animal producer and live animal export firms were not got update marketing information's. Currently, marketing information's was obtained through personal observation. This indicates that live animal producers and export firms were used traditional ways of gathering marketing information as well as undeveloped marketing system. The distribution channels for live animal export system were less safety, poor infrastructure as physical network of plants and distribution be structured, informal third-party logistics capabilities, unfixed transportation services can best link together the network of facilities which are affects cost-service performance and establishes the boundaries within which the supply chain must operate which is meet business goal and customer needs.

Animal health bureau heads and Woreda branches were not established the core supply chain processing activities like manufacturing, integrated demand planning, procurement, cycle-time compression, linkages with their suppliers and customers, dynamic deployments which are driving the business activity. The formal live animal supply chain was not organized which is the success factors of cohesion, harmony, and integration across their business entities. This shows that supply chain management practice in live animal export were not effective and efficient.

The major challenges in live animal producers were quantity dispute, competition from illegal traders, and insecurity of trade channel in supply chain, skill and knowledge of producers, standard government policy, and lack of supporting technology, local tax and disease in the export supply chain. This indicates that live animal producers were challenged by a numbers of factors.

The major challenges in the live animal export supply chain among external factors were Lack of business

experience, limited market information, Lack of technology and Insecurity of the routes affecting the performances of live animal's exporter firms. Quality disputes and quantity disputes were the two major internal factors challenging the live animals export supply chain. This revealed that unavailability of business trainings provided by concerned government agencies, limited market information, Lack of technology and Insecurity of the routes, quality disputes and quantity disputes were the major external and internal factors currently affecting the activity of live animal export firms.

Based on the finding, the following recommendations have been given:

- The study revealed the benefits obtained by live animal supply chain participants from live animal trade were not balanced. Thus, concerned government bodies (animal health bureau heads and Woreda branches) should secured the balance of benefit among the live animal supply chain participants such as producer, traders, and export firms to keep the real business practices.
- The study shows that the core supply chain processing activities like manufacturing, integrated demand planning, procurement, cycle-time compression, linkages with their suppliers and customers, dynamic deployments which are driving the business activity were not established. Animal health bureau heads and wareda concerned government bodies should have to establish effective marketing linkages between producers and live animal export firms in particular and improve the existing marketing linkages with livestock traders that drive to achieve functional excellence and integration across all major business processes.
- The study revealed the all live animal supply chain participants were used traditional way of gathering marketing information of personal observation. Awareness creation interventions should be conducted by concerned government bodies to increase the mutual relationships between livestock producer and their chain partners as well as to keep constant marketing practices among the supply actors.
- The major challenges in live animal producers of the study area are quantity dispute, competition from illegal traders, insecurity of trade channel in supply chain, skill and knowledge of producers, standard government policy, and lack of supporting technology, local tax and disease in the export supply chain were faced should be overcome by implementing legal measure formulated from government bodies.
- The major challenges in the live animal export supply chain of the study areas and the region in general are, such as lack of access to market information, lack of business support service provisions by concerned government institutions, lack of technology, insecurity of the routes, quality disputes and quantity disputes were faced by chain actors should be avoided by creating conducive administrative measure with all chain participants trends and concerned government bodies engaged in the sector in general.
- Serious awareness creation workshops on livestock production, marketing and export regulation, policies and strategies have to be conducted for the supply chain participants and stakeholders of the sector that aimed to create conducive conditions for export trade.

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