



**ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY
DEPARTMENT OF ECONOMICS**

**THE IMPACT OF LIVE ANIMAL EXPORT ON
MEAT AND LEATHER PRODUCTS EXPORT IN
ETHIOPIA**

(THE CASE STUDY OF CATTLE AND SHOAT)

**A THESIS SUBMITTED TO THE DEPARTMENT
OF ECONOMICS FOR THE PARTIAL
FULFILMENT OF MASTERS DEGREE IN
DEVELOPMENT ECONOMICS**

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ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY
FACULTY OF BUSSINESS AND ECONOMICS
DEPARTMENT OF DEVELOPMENT ECONOMICS

THE IMPACT OF LIVE ANIMAL EXPORT ON MEAT AND LEATHER PRODUCTS
EXPORT IN ETHIOPIA

A thesis presented to the School of Graduate Studies of Adama Science and Technology

University in partial fulfilment of the requirements for the Degree of Master of Science in
development economics

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Declaration

This is to certify that this thesis entitled “THE IMPACT OF LIVE ANIMAL EXPORT ON MEAT AND LEATHER PRODUCTS EXPORT IN ETHIOPIA” submitted in partial fulfilment of the requirements for the award of the degree of MSA., in Development Economics to the College of Business and Economics, Adama Science and Technology University, through the Department of Economics, done by Mr.Gebregziabher Girmay Gebremicael, ID.No. GSR/5835/06 is an authentic work carried out by him under our guidance. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of our knowledge and belief.

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APPROVAL

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DEDICATION

This thesis is for the memorization of my lovely mother **Letebirhan G/mariam and my father Girmay G/Michael**, who is concerned for me, has played a major role in nursing and educating me and sacrifices all things to me.

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Acronyms

ADF	Augmented Dickey-Fuller
DCs	Developed Countries
EMDIDI	Ethiopian Meat and Dairy Industry Development Institute
EPRDF	Ethiopian People’s Revolutionary Democratic Republic Front
ETB	Ethiopian Birr
FAO	Food and agricultural organization
FOB	Free on Board
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
IMF	International Monetary Fund
LDCs	Less Developed Countries
LLPs	Livestock and Livestock Products
LMA	Livestock Marketing Authority
LMP	Livestock Master Plan
LSIPT	Livestock Sector Investment and Policy Toolkit
LSA	Livestock Sector Analysis
MOFED	Ministry of Finance and Economic Development
MOTI	Ministry of Trade and Industry
MT	Metric Ton
NBE	National Bank of Ethiopia
SHOAT	Sheep and Goat
SPS	Sanitary and Phytosanitary
USD	United States Dollar

Abstract

The livestock sub-sector plays a significant role in the Ethiopian economy at the national level. Its contributions to both agricultural value-added and national GDP are substantial. In addition Ethiopian livestock and livestock product exports include finished leather, skins and hides, leather products, live animals and meat. But the sector contributes little to exports as compared to the potential and the output from the sector is underutilized. The emphasis of this study is assessing the impact of the live animal export on the Meat and meat products export and leather products export. Ethiopia is suffering from import ban by the usual importers; the Middle East market. In addition, Ethiopia's meat export is overly dependent on demand from just two countries: Saudi and Dubai. New markets in Africa and Asia should be explored and pursued aggressively. In order to do this impact assessment, The data used in this study are all secondary and are mainly obtained from Ministry of Agriculture Livestock Development Sector, Ministry Of Industry, Ethiopian Meat and Dairy Industry Development Institute (EMDIDI), National bank of Ethiopia, Ethiopian Customs Authority, Food and Agricultural Organization, World bank and Economy Watch. The data generated from secondary sources was analysed using descriptive analysis and it was fit in multiple regression models to assess the impact of live animals export on the meat and meat products and leather products export. The first thing in time series analysis is get a view of the time series plot of the variables in the analysis. The main findings of the study are summarized as follows: When compared of live animal export in volume meat export was highly reduced for the last two years. There is a decreasing growth rate of value of live Animal export in USD, while the value of meat export growth rate is relatively constant. If live animal export increase by one unit, there is an impact of decreasing by 4.9 % in meat export. There is high export of live animals compared to the export of skin and hide, meat and its products, leather and its products. The study proved that any meat and leather products export should be done after a proper work of value addition to each product.

Key Words: Export, Industries, Leather, Meat, Livestock Products, Value

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Ethiopia has one of the largest livestock populations in Africa with the estimated total livestock population's 56.7 million cattle, 29.3 million sheep, 29.1 million goats, 1.16 million camels, 56.86 million poultry, 5.89 million Beehives and 9.86 million Equines (CSA, 2014/15). This livestock sector has been contributing considerable portion to the economy of the country, and still promising to rally round the economic development of the country. Livestock plays an important role in providing export commodities, such as Meat and meat By-products live animals, hides, and skins, finished leather products and leather products to earn foreign exchanges to the country.

Most of the livestock produced by pastoralists, agro pastoralists, and smallholder mixed crop–livestock farmers. It is estimated at around 35 million tropical livestock units (TLU), which includes 30 million heads of cattle, 42 million heads of sheep and goats, about 7 million equines, one million camels, over 53 million chickens, 10 million bee colonies, and 40 thousand ton annual harvestable fish (Azage et al., 2009) in the country. Consistent with structural adjustment policies of the World Bank and IMF, Ethiopia has undertaken far-reaching policy and institutional reforms beginning in 1992, when the domestic currency (the birr) was drastically devalued. Trade liberalization constitutes one of the key components of the on-going policy reforms in the country. Trade liberalization is characterized by export –oriented and outward looking policies that would result in increased foreign currency, increased productivity, promote growth and employment, and ultimately reduce poverty (Dejene et al., 2007).

Turning to commodity structure of Ethiopian exports, coffee accounts for the lion's share of total exports while livestock is the second most important item (Kinfu, 2001). Livestock products, including live animals, meat, and leather goods, are a major source of foreign exchange. As one of its economic objectives, the government of Ethiopia is pursuing a policy of maximizing revenues through meat and live animal exports. In the past few years, Ethiopia's volume of meat

exports has been rising steadily, though its live animal exports have varied due to external factors that include trade bans by importing countries(Fact sheet: livestock Ethiopia, 2010).

Hides, skins, leather & leather products are the most widely traded commodities in the world with their total export value of US\$ 44 billion. These products combined rank first in important exportable agricultural commodities like, meat, rubber, cotton, coffee, tea, rice & tobacco (FAO, 2001). The value takes 41% of the combined export values of these commodities. Ethiopia being one of the countries with large livestock base in the world has been one of the suppliers of hides and skins to different consumers for nearly a century. Products exported from this origin are known to have unique characteristics in compactness in fiber and utilizability for different leather products. During the last 100 years of export experience, different development interventions have been made by the Government of Ethiopia to enhance the improvement of the raw material quality and increase the volume of products entering the formal market chain. As a result the volume of products collected by the tanning industries have increased and gradual improvements in products handling, and hence in quality, observed.

At the same time, export volume has increased corresponding with the number and total soaking capacity of tanning industries. The marketing process, on the other hand, follows more of the traditional way without showing any significant change towards modern marketing practices.

The hide & skin industry faces numerous intricate challenges in its development. The problems can be classified into organizational, supply side, demand side, promotional and informational.

This paper reviews available published and gray literature to show the potential the country has and the challenges the hide and skins industry faces, and based on this, develops specific recommendations.

Hides & skins from the highland areas of the country are preferred to those of the lowlands in the foreign market, because these are known to have unique characteristics of compactness and utilizability for different end products for sportswear, garments, gloves, shoes and hand bags for ladies. The average share of livestock, livestock products and by-products over the years 1997/98-2000/01 of total export earning was 11% with hides & skins alone accounting for 90%of these. During the year 2000/01 leather & leather product sub-sector was the second

foreign currency generator with an export value of US\$ 74.1 million (Export Promotion Agency, 2001). Generally, hides, skins and leather represent the major source of foreign currency for the country accounting for 14-16% of the total export revenue. Export of raw hides and skins started about 1900. Privately owned tanneries were established in the first quarter of the century which afterwards was nationalized by the socialist government of Ethiopia. They processed mainly hides for the domestic market. Until 1975, only some quantities of hides & skins were processed into leather and leather products, exclusively for domestic use. Following liberalization of the economy after the 1991 change of government, private companies have established substantial numbers of tanneries. These companies export mainly semi-processed products. (Export Promotion Agency, 2001). Export of finished products is negligible. Traditional tanners also absorb substantial quantities of hides & skins for processing and manufacture of traditional household articles including farm implements, furniture, saddles and traditional musical instruments. In Ethiopia annual per capita consumption of food of animal origin, particularly of meat is very low (7.4 kg). However, this is assumed to grow with the improvement in income per head and population growth, leading to increased slaughter of animals and hides & skin production. In addition, the following favourable conditions provide opportunities for the development of the sector to exploit the export market. Conducive policy environment to promote export of such commodities, Availability of cheap labour force for the leather industry, Availability of preferential access to the European market, Close proximity to export markets in the Middle East and neighbouring African countries, Capacity of tanneries for expansion which can be used for further production of finished leather products by making some technological adjustments, Establishment of different institutions that can have direct impact on the production and marketing of quality hides and skins.

Livestock markets in Ethiopia function at three levels: primary, secondary and terminal markets. Primary market: village level markets, with generally less than 500 head of cattle sold per week. Farmers and pastoralists sell animals to traders, other farmers (replacement animals) and sometimes to consumers and local butchers. Generally there are no facilities for weighing, watering and feeding. Secondary markets: middlemen, trader and butcher dominated markets, with a turnover of 500 – 1000 animals per week consisting of finished, breeding and draught stocks and located mainly in regional capitals. Secondary markets serve the local butchers and

feed the terminal markets. Terminal markets: located in the large urban centers. Medium to large-scale traders dominate these markets (Quick scan of the livestock and meat sector in Ethiopia, 2006).

Focusing on three key livestock classes—cattle, sheep, and goats, and undertakes three tasks: (1) it provides a characterization of the livestock subsector,(2) it assesses livestock and livestock product value chains based on primary data, and (3) analyzes the trends in marketing and trade of live animals and animal products. The processing of livestock may help in overcoming problems of transportation, whilst adding to their value. The tasks associated with the slaughter and cutting of livestock may be seen as the first steps in the processing to produce meat for consumption. The marketing problems associated with the perishable nature of livestock products, such as meat, may be alleviated by chilling and hanging of meat and processing of by-products.

Following the same line of reasoning Terefe, 2008 suggested the export of processed livestock products as compared to livestock export. Regarding the contribution of each livestock category; the export value of processed meat, the highest proportion about 68 percent is obtained from goat followed by sheep (28%). Cattle generate the least amount of value only 4%. Sheep and goats contribute a quarter of the domestic meat consumption; about half of the domestic wool requirements; about 40% of fresh skins and 92% of the value of semi-processed skin and hide export trade. It is estimated that 1,078,000 sheep and 1,128,000 goats are used in Ethiopia for domestic consumption annually. There is also a growing export market for sheep and goat meat in the Middle Eastern Gulf States and some African countries. At optimum off take rates, Ethiopia can export 700,000 sheep and 2 million goats annually, and at the same time supply 1,078,000 sheep and 1,128,000 goats for the domestic market. The current annual offtake rate of sheep and goats is, however, only 33 and 35%, respectively (Adane and Girma, 2008).

The major Constraints of Sheep and Goat Production in Ethiopia as indicated in Adane and Girma, 2008 are summarized below.

Scarcity of feed: The feed resource base for sheep and goat production in Ethiopia is natural grazing and crop residues. The quality and supply of these resources is seasonally variable. Grazing resources in the highlands are diminishing due to increases in cropping land. Bush

encroachment and overgrazing have reduced grazing resources in the pastoral areas.

Lack of infrastructure: Infrastructure necessary to transport livestock or livestock products from remote rural communities, where production is concentrated, to urban markets is lacking. Sheep and goats are generally trekked long distances for marketing, often without adequate water and feed points.

High mortality rates: About one-half of all lambs/kids born die due to various causes. This is a very important constraint limiting productivity. Annual mortality in all classes of stock averages 23% for sheep and 25% for goats in the central highlands.

Inadequate veterinary coverage: This results in high mortality and morbidity. Certain disease conditions are also causing Ethiopian animals and products to be banned from export markets.

Long marketing channels and lack of market information: Producers do not have access to market information. The system lacks market orientation, which would have been an important driving force for increased production.

Low product quality: Poor quality of live animals and small ruminant meat and meat products prevents penetration into many export markets.

Absence or inadequate provision of credit services: Livestock owners have difficulty obtaining credit to begin or expand production, purchase inputs, increase stock, etc.

Low average reproductive rates: Typical reproductive rates average as low as 55 lambs and 56 kids born per 100 mature females per year in the central highlands.

Much of the previous studies on Ethiopian livestock provide less attention for the demand side constraint. But, it is necessary to take care about all aspects for the development of the livestock export sector; both an improvement in supply conditions and better access to international markets. As indicated earlier Ethiopia is one of the top ranking countries in Africa and among the first ten in the world in terms of livestock resource. However, livestock contributes little to exports as compared to the potential and given the stated internal constraints, the sector's contribution to the economy can be enhanced if the problem on the demand side is resolved. This is the main theme of the study.

1.2. Statement of the problem

Ethiopia is endowed with a large number and diverse livestock resources. The country is using its rich endowment to little advantage. For many years, livestock production and processing in Ethiopia was seen as a poor investment for development. Nevertheless, in few recent years, livestock issues are beginning to be put back on Ethiopia's development agenda.

As it is stated in the Growth the livestock sector and Transformation Plan (GTP), a due emphasis is given to the development of the livestock sector. The livestock sector is expected to be promoted through expansion of processing and value adding activities. Livestock and livestock products are the major foreign exchange earning sources of Ethiopia, with hides and skins contributing the most. However, with its huge livestock resources development potentials, the contribution of value added livestock products towards the economic development of Ethiopia is still at its infancy stage. One of the frequently mentioned reasons for the low level export of value added livestock products to the international market is the export of live animals both legally and illegally among others. Although exporting value added livestock products is the focus of Ethiopian Government to earn the best possible foreign exchange from our Livestock resources, the export of Live animals make a considerable contribution to Ethiopian economy in terms of export Earnings, a large number of the country's ruminants have been traditionally smuggled to neighbouring countries. Reports from custom and Inland Revenue shows that illegal sale of livestock is practice with the neighbouring countries of Somalia and Kenya, and Sudan and Djibouti.

According to Aklilu, 2008 in relative terms compared to neighboring countries like Kenya, Ethiopia has been exporting large number of animals. According to him the potential to increase live animal exports from Ethiopia is constrained by a number of internal weaknesses varying from poor infrastructure to SPS (sanitary and phytosanitary standards) and the recurrent ban imposed by the importing countries of the Middle East. Regarding Ethiopian export destination, meat and live animals exports is overly dependent on demand from just two countries: Saudi and Dubai. The Middle East countries are Ethiopia's traditional destinations for meat and livestock exports.

Thus, if Ethiopia's livestock is to compete successfully in the export market, it requires understanding the problems and opportunities in the export market. In the first place knowing elasticity of Ethiopian exports to foreign income, relative price and other parameters is important since there is an opportunity to export to other countries as there is a growing demand and it may help in exploring new markets. Besides, the loss due to the ban by the usual importers; Middle East economies can be minimized if the market outlet is diversified. As mentioned before there is also a need to increase the export volume as the livestock export sector remains underutilized. Given the development potential of the livestock resources of Ethiopia, boosting foreign currency earnings through the export of value added livestock products is vital for economic development of Ethiopia. However, the legal and illegal export of live animals shelters the live stock value adding industries (Meat and Leather exporting industries) by reducing the availability of the desired raw materials (inputs) to those industries. Given the fore mentioned issues, it is worth to study and quantify the impact of the live animal export on meat export and leather industries in Ethiopia to consider the lessons what it tells us about the nature of industries which engaged in the production and export of livestock value added products in Ethiopia during the analysis period.

1.3. Objectives

Given the untapped potential of the livestock resource, it is important to establish relationship between export demand and its determinant factors to reap more benefits from the sector. Thus the main objective was to identify the Impact of live animals export on meat export and leather products export with the following specific objectives,

- To assess and quantify the impact of exporting live animals on the export of meat and leather products in terms of hard currencies earning and value added.
- To examine the factors that affects Ethiopian live animal and meat export.
- And finally to draw recommendations based on the results obtained to improve the sector's performance.

1.4. Research Hypothesis

H1: meat and meat products export is better than live animal export. Ceteris paribus the

Predicted/estimated mean of meat export foreign currency should be significantly greater
Than the mean income of live animal export

H2: leather and leather products export gain is better than live animal export, finished leather
And raw hides and skins export gain.

H3: Raw hides and skins export gain is better than live animal export gain. The estimated mean
Of raw hides and skins export should be significantly greater than the mean of live animal
Export gain.

H4: finished leather export is better than raw hides and skins export. The estimated mean of
Finished leather should be significantly greater than the mean of raw hides and skins export.

1.4. Significance of the study

Nowadays, Ethiopia is experiencing rapid growth through agricultural exports; which are susceptible to price fluctuation in the world market. Thus, this study will help provide information to policy makers to enable them come up with the appropriate policies regarding the growth of the sector. In order to sustain the current growth and even add on it, broadening the understanding of the increasing importance meat and leather product is great significance. Consequently At aggregate level there were studies on Ethiopian export determinants, but the present study is useful for the following reasons:

-  This study was more specific than existing studies on impact assessment that pursue policy interventions that will improve the performance of meat and leather export
-  The result of this study was show the impact of live animal export on meat and leather export and the trends.

1.5. Scope of the study

Though Ethiopian livestock and livestock product export includes skins and hides, leather, live animals and meat the study was limited to the impact of the live animal export for the Ethiopian meat exports and Leather products export. The analysis was focus exclusively on the impact side and incorporating analysis from the supply side may further enhance the usefulness of the study for policy makers to boost the earning from the sector.

1.6 Description of the study area

1.6.1. Brief description of Ethiopia

The official name is Federal Democratic Republic of Ethiopia (FDRE) with Total area of is 1.14 million square kilometres (CSA, 2014).

Political Administration: The Political System of Ethiopia is Federal System with multi-party democracy. It has 9 regional states and two City administrations.

The Regional States /City Administrations: are Tigray, Oromia , Amhara, Afar, Southern Nations, Nationalities and Peoples Region, Benshangul Gumuz, Harari, Gambella, Addis Ababa City Administration, Dire Dawa Administrative Council. The capital city of Ethiopia is Addis Ababa.

Language - Ethiopia is a multi-ethnic state with diverse languages. Amharic is the working language of the Federal Government. English is widely used in business transactions, and as a medium of instruction in secondary schools and higher educational institutions.

Location - Ethiopia is Located in the north-eastern part of Africa, commonly known as the Horn of Africa, at the cross-roads between Africa, the Middle East and Asia. The country has a relatively stable political and economic environment.

Weather - Ethiopia is endowed with abundant natural resources. Altitude in Ethiopia ranges from 125 meters below sea level in the Danakil depressions of the Afar region to 4,620 meters above sea level in the Amhara region. Thus the country has 18 major and 49 sub agro-ecological zones, each with its own agricultural and biological potential. It possesses one of the largest and most diverse genetic resources in the world. Besides, it has the soils and the climate suitable for the production of a variety of food crops.

Labour - Ethiopia has abundant supply of skilled workers in various fields at internationally competitive rates. Wages and salaries vary on the type of profession and level of skill required. They are determined by agreement between the employer and the employee.

Economy - The Ethiopian economy is based on agriculture, which accounted, in 2009/10, for about 42 percent of the gross domestic product (GDP), 75.9 percent of foreign currency earnings. Generally, the; overall economic growth of the country has been highly associated with the performance of the agriculture sector.

Top ten reasons to do business in Ethiopia

Political and social stability;

Macro-economic stability and growing economy;

Adequate guarantees and protections;

Transparent laws and streamlined procedures;

Ample investment opportunities;

Abundant and trainable labour force;

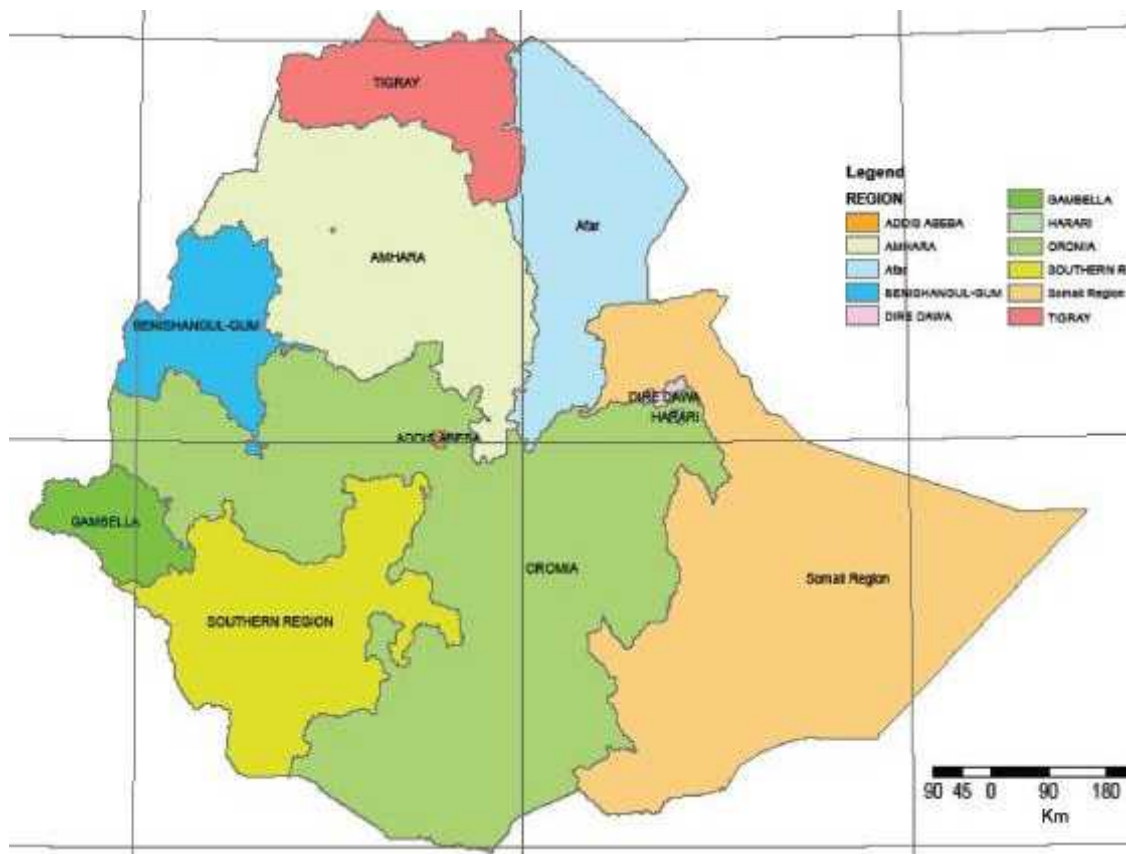
Wide domestic, regional and international market opportunity;

Competitive investment incentive packages ;

Welcoming attitude of the people to FDI; and

Pleasant climate and fertile soils.

Figure 1: Map of the study area



1.6. Limitation of the study

There was data limitations domestically/in Ethiopia; lack of consistent data and inadequacy of external data. However, since the purpose of this study is not forecasting but only to know the impact assessment of exports, the researcher believes a short time span of the data may not pose a serious problem. In addition, as the econometric analyses employ a single equation, problems associated with a single equation approach are inevitable and can be cited as the drawback of the model used in the study. To fill this gap an attempt was made to review the factors.

CHAPTER TWO

LITERATURE REVIEW

2.1. Theoretical Review

The role of trade as one of the main deterministic factors of economic growth goes as far back to the classical economic theories by Adam Smith and David Ricardo, who argued that international trade plays an important role in economic growth, and that there are economic gains from specialization. It was also recognized that exports provide the economy with foreign exchange needed for imports that cannot be produced domestically.

Demand for livestock and livestock products (LLP) is growing rapidly in both developed and the developing world. This is what is termed as Livestock revolution. Despite these large livestock population, the contributions of the livestock subsector in the country at either the macro or micro level is below potential. This might be due to lack of necessary technical and managerial production skills, poor resource allocation, lack of commercial fattening and holding facilities, lack of marketing support and information, limited credit services, absence of efficient producers' organizations .

Hence, a need for analyzing the Impact for livestock producers in general and market/export oriented cattle fattening farms in and around urban centers in particular. Therefore, this research is generally intended to assess the potential for productivity gains through a more efficient use of existing resources particularly among urban and peri-urban export-oriented cattle-fattening farms in the study area. The research also investigates various sources of inefficiency differentials among the producers in the study area. Livestock and livestock products are the major foreign exchange earners for Ethiopia, only second to coffee, with hides and skins contributing the most (Ayele et al., 2003).

However, compared to its livestock resources, the volume of Ethiopia's export market for live animals and meat exhibited non-uniform pattern showing both ups and downs for a long time. For example, the share of live animal exports in total livestock and livestock products

export earnings have been declined in 1990's. This is particularly the case for the export of live animals, which showed a general downward trend. According to Ayele et al., 2003, increased domestic demand due to population growth and stagnant or declining production in the early 1990s might lead to major decrease in exports during the time.

However; According to Getachew et al., 2008 the main reason for the decline in export was not increased domestic demand but an import ban by some importing countries on imports of live animals from six countries in the Horn of Africa and Nigeria due to an outbreak of Rift Valley fever, in September 2000.

It was suspected that in Ethiopia increased domestic demand due to population growth and stagnant or declining production in the early 1990s might led to major decrease in exports. It was predicted that because of a 2.9% population growth rate, official exports were absorbed by domestic consumption, and an increase in productivity was recommended to prevent the decline in export levels (FAO 1993). This was based on the premise that increased population growth coupled with increased urbanization and income would significantly increase demand for meat while, in the absence of productivity growth, increased domestic demand would be met by reducing export. However, the main reason for the decline in export in the following year was not increased domestic demand but an import ban by some importing countries.¹ The impact of import ban on the local economy is not only manifested as reduced export but also as an increased illegal trade (Ayele et al, 2003).

According to Fact sheet: livestock Ethiopia, 2010, Ethiopia has achieved considerable economic growth over the past five years, driven mainly by exports of agricultural products. Livestock sector has been contributing considerable portion to Ethiopia's economy, and still promising to rally round the economic development of the country. Livestock sector contributes about 43.5% of the GDP and 61% of total export. Industry contributes to 13.4% and services 43.1% of GDP. Kinfe, 2001 pointed out that the livestock is the second strong foreign exchange earner, only next to coffee. The livestock sector is under exploited. He suggested investors should thus be encouraged to utilize this untapped potential by engaging in the productive sector.

¹ <http://www.ilri.org/InfoServe/Webpub/fulldocsWP52/Livestock.htm>

Despite the impressive growth rates, Ethiopia's meat and live animals exports is overly dependent on demand from just two countries: Saudi and Dubai. The Middle East countries are Ethiopia's traditional destinations for meat and livestock exports and the exports to these countries have been increasing over the years.

Table 1: Meat export to different destinations (July 2004-June 2005)

Destination	Products in MT				
	Chilled shoats meat	Chilled beef	Offal's	Total	Share (%)
Saudi	3565	-	39	3604	43.4
Dubai	3978	446	37	4461	53.7
Yemen	155	16	2	173	2.1
Congo Bra.	13	33	3	48	0.6
South Africa	14	-	-	14	0.2
Total	7725	495	81	8301	100.0
Share (%)	93	6	1	100	

Source: Fact sheet: livestock Ethiopia, 2010

In this regard, given their high income and the consumer preferences for Ethiopian products and the proximity to these countries, there is high possibility to boost export. New markets in Africa and Asia should also be explored and pursued aggressively (Fact sheet: livestock Ethiopia, 2010). To do so, knowing sensitivity of exports to foreign income, to relative prices and others parameters is a must to decide where to choose as there is a need to expand market.

2.1.1. Trade as an engine of growth

The theory of trade as an engine of growth is founded on the premise that there exists a stable, mechanical relationship between economic growth in developed countries and export growth in developing countries. Thirwall(2000) noted the role of trade as an important engine of growth for countries at different stages of development, not only by contributing to a more efficient allocation of resources within countries, but also by transmitting growth from one part of the world to another. Not all countries, however, necessarily share equally in the growth of trade or its benefits. This will depend on: the production and demand characteristics of the goods that a country produces and trades; the domestic economic policies pursued, and the trading regime it

adopts. There are static but there is nothing in the theory of trade that says that the gains are equitably distributed.

Heckscher-Ohlin's theorem is similar to what is termed as static gain from trade by Thirlwall. Accordingly, the static gains from trade stem from the basic fact that countries are differently endowed with resources (natural and acquired) and because of this the opportunity cost of producing products varies from country to country. On the other hand, the essence of dynamic gains is that they shift outwards the whole production possibility frontier by augmenting the availability of resources for production through increasing the productivity of resources and increasing their quantity. One of the major dynamic benefits of trade is that export markets widen the total market for a country's producers. If production is subject to increasing returns, export growth becomes a continual source of productivity growth.

In this regard generally there are two opposing views; Helleiner (1972) noted that the pro-trade economists rest their arguments on conventional comparative advantage theory which states that economies should produce and export that commodity which are relatively most suited to produce. In contrast anti-trade economists have pointed out the possible detrimental effects upon development that can accrue from participation in the world economy with the arguments that the effect of such participation by LDCs has, on balance been negative (Heilner, 1972 as cited in Alhajhoj, 2007).

2.2. Empirical Review

Export led growth paradigm has received attention following the highly successful East Asian export-led growth strategy during the 1970s and 1980s. Empirical studies have been undertaken on the causal relationship between exports and GDP growth, the direction of causality may run from exports to growth and vice versa. Tanning industries buy raw hides & skins from slaughterhouses and suppliers or they make their own purchases by deploying authorized collectors during big holidays. They supply semi-processed and finished leather to external markets. They also supply part of their products to local leather industries. Each of these tanneries has its own suppliers in different regions of the country. There are 19 tanneries in

operation now and 3 others are under construction. In addition to these, 18 new investors have taken licenses to construct their own tanning industries (Export Promotion Agency, 1999).

One includes those investigating the hypothesis that export expansion is attributed to a country's economic performance. The other includes those attempting to prove the hypothesis that economic growth may be driven by export growth. But, there is no conclusive evidence on the causal relationship between exports and GDP growth.

Darrat (1986), worked on four Asian (Hong Kong, South Korea, Singapore, and Taiwan) countries, found no evidence of uni-directional causality from exports to economic growth in all the four economies. In the case of Taiwan, however, the study detected unidirectional causality from economic growth to export growth.

Ullah et al (2009) investigated Export-led-growth by time series econometric techniques for Pakistan. In this paper, the results reveal that export expansion leads to economic growth. They also checked whether there is uni-directional or bidirectional causality between economic growth, real exports, real imports, real gross fixed capital formation and real per capita income. It is shown that there is uni-directional causality between economic growth, exports and imports. Ethiopia's track record on using trade for development is not exactly encouraging. Different trade strategies have been used in the past, including import replacement/protection for infant industries during the Imperial period, state-managed trade during the military government era, and a more market-oriented liberalized approach supported by much trade-related technical assistance in the most recent period. Ethiopia has a low share of trade in GDP, its exports continue to have limited diversification, and its trade deficit has widened significantly (Ciuriak and Preville, 2010).

Trade in Ethiopia has shown a significant change in recent years with increased exports both in volume and type. A report by the National bank of Ethiopia (NBE) (2005/06) states that total share of exports in GDP increased to 7.7% in 2005/06 from 6.2% in 2003/04. During the same period total share of imports in GDP also increased from 26.6% to 33, 9%, which resulted in a trade balance as a percentage of GDP of -26.2% in 2005/06. As in many developing countries

Ethiopia exports primary and semi-processed product and imports capital goods, intermediate and final consumption commodities (Dejene, Belay and Sinidu, 2007).

Turning to the trade in livestock in Africa, the huge potential of an untapped livestock revolution may be somewhat overblown. It is not as if livestock trade does not already exist. The problem is that much of this is illegal, informal and beyond the clutches of customs officials, tax collectors and veterinarians. In areas where such markets operate (for instance in parts of Kenya, Ethiopia, Somalia and across the Sahel), marketed off take is high already (Scoones and Wolmer, 2006).

Although live animals make a considerable contribution to the economy in terms of export earnings, a great number of the country's ruminants have been traditionally smuggled to neighbouring countries. The ban on import by Middle Eastern countries has led to increased illegal sale of livestock through Somalia and Kenya, and to a lesser extent, through Sudan and Djibouti. Studies have tried to estimate losses from illegal export and also generated other widely variable estimates. Among the studies that have tried to estimate losses from illegal export one is an estimate by 'concerned ministries' in 1983, indicated losses of 1.1 million animals excluding camels valued at US\$ 136 million (CIF) or US\$ 120 million (FOB). Similarly, estimation by others show 225,450 cattle and 758,200 sheep and/or goats were illegally exported in 1983/84 causing the country to lose ETB 94,959,540 (US\$ 51 million CIF or US\$ 44 million FOB) in revenue (Ayele et al, 2003).

2.3. Overview of Ethiopia's economic reforms in the early 1990's

The first phase of the structural and economic reform program was undertaken during 1992/93-1994/95. The program focused on economic stabilization and structural reform measures, particularly in the financial sector, public enterprises and civil service areas (IMF, Ethiopia; Economic reforms, 1998 as cited in Kinfu, 2001).

Berhanu and Kibre (2002) have made an interesting study of competitiveness in the Ethiopian leather sector. For the tanning sector, they have concluded that the main factors affecting competitiveness are:

Low capacity utilization in the tanning industry;

The poor economic infrastructure: inefficient infrastructure and inefficient bureaucratic structures significantly raises the transaction costs of firms, making it difficult to compete nationally or internationally;

The technology employed is not updated regularly, in particular the lack of learning in production management;

The lack of hard currency to purchase spare parts and inputs;

The relative lack of export support and/or promotion services

For the leather footwear firms, the main factors affecting competitiveness are the poor quality of domestic leather, and the high cost of (imported) inputs. They conclude that resource endowment is not enough for competitiveness, and that, similarly, the availability of cheap and abundant labour by itself does not seem to be sufficient to compete internationally.

These measures were also aimed at removing price distortions, improving market related incentives, promoting private enterprise and exports, progressively liberalizing the economy and reducing the role of public sector.

The policy Framework paper, prepared by the Ethiopian Government in collaboration with the IMF and the World Bank in September 1998, lists the reforms that were undertaken during the period quoted above as follows:

1. The Birr was devalued by 58.6 percent in US dollar terms;
2. An auction system was introduced to determine the exchange rate applicable to most transactions;
3. Procedures for export and import licensing were streamlined;
4. A new interest rate structure was introduced and positive real rates of interest maintained;
5. A number of tax policy reforms and other government revenue enhancement measures were introduced;
6. Public expenditure was rationalized; public sector salaries were adjusted upwards and ceilings on public sector salaries were removed;
7. Some old public enterprises were sold;
8. New investment, labour and public enterprise laws were enacted;

9. Direct price controls were virtually eliminated, and internal marketing, transport, and trade were decontrolled;
10. In the internal area, restrictions on payments for invisible transactions were considerably liberalized;
11. The maximum tariff rate was reduced from 230 percent to 80 percent;
12. Treasury bills auctions were introduced;
13. An easing of market entry for new privately owned financial institutions took place; and
14. A market oriented land lease system was introduced in urban areas (Ibid).

2.4. Factors affecting external trade in livestock products

Natural factors, such as the drought in West Africa, have affected intra-regional as well as extra-regional trade. They have influenced livestock supply and have led to subsequent rises in imports or declines in exports. In West Africa the oil boom in Nigeria has substantially contributed to the enormous increase in the sub region's high import bill in the 1970s. These factors can only provide a partial explanation for the overall situation in sub-Saharan Africa, and there are some sub regions which have not been affected at all, or only to a smaller extent, by these factors. There have been other factors, perhaps with a longer-lasting effect, which have contributed to the situation (Addis, 1984).

The internal prices for meat and milk and their ratios with respective world market prices determine the extent of external trade in the products. In the last decade domestic prices for food commodities in general were set at relatively low levels in many sub-Saharan African countries. Producers therefore had too little incentive to meet the food demand of a fast-growing population with increasing income at its disposal. At the same time world market prices, in particular for milk and beef in most years, were also at depressed levels, to a great extent due to the protectionist policies (Tangermann and Krostitz, 1982).

Thus the growing gap between production and demand of livestock products in sub-Saharan African countries could be filled by imports at relatively favourable prices. Additionally, food aids in the form of milk powder and butter oil as well as commercial imports were available for many countries. Both these categories of imports must have had adverse effects on domestic production, thus generating increased demand for imports (Ibid).

According to Addis (1984) besides these basic interactions between domestic and international supply, demand and prices, there are other factors which can be described at this stage only qualitatively.

The last but rather important point to be made relates to national government policies. Apart from setting domestic prices at relatively low levels, governments have used various policy instruments and have thereby directly or indirectly influenced external trade. These instruments include direct interference in trade by way of import and/or export taxes, quantitative restrictions and exchange rate policies, as well as indirect influences that may result from marketing activities, various subsidies and other policy measures introduced at the domestic level. Although no detailed quantitative assessment of the impacts of these factors is yet available, one has to bear in mind that these factors can substantially alter the basic effects of the price mechanism and therefore require much more attention than has been given to date.

2.5 The live animal, meat and leather products export policies in Ethiopia

Currently manufacturing industry's share in Ethiopia's Gross Domestic Products (GDP) is close to 19% and the economy is dominated by the service sector, which contributes slightly over 43% to GDP. In its vision of transforming the country to a middle income nation by 2025, the government of Ethiopia envisages to increase the share of manufacturing sector to 27%. Providing incentives for investors in agro-processing sector and other labour-intensive industries is among the strategies pursued by the government in order to reduce the current share of agriculture, which stands at about 37% through value addition such as shifting from live animals export to processed meat, shoes, bags and gloves. The incentives range from providing 70% loan the initial investment capital to duty free import of machineries and exempt from export tax. In addition, the government has been establishing sector-focused institutes to support the development of its priority manufacturing sectors. Leather Industry Development Institute (LIDI) is one of them that have been helping the technology and knowledge transfer to upgrade production, quality leather products and marketing required for international exposure.

The policy implication that could be inferred from the findings of the study is summarized. Ethiopia has a comparative advantage in a number of agro-industries due to its favourable

climate, proximity to European and Middle Eastern markets and cheap labour. This industry is expected to be the epic-centre of the transformation of Ethiopian agriculture towards industrialization. However, the volume of export has not been up to the expected growth level. Hence, it is clearly observed that though there is high potential for meat industries, the country is not benefited from the opportunity. Yet, Ethiopia has still potential to increase the volumes and values of domestic and export sales of meat and meat products. This could be achieved by upgrading the country's meat and its product export to the importing countries standard market requirement with quality improvement, expanding commercialization of production and marketing of livestock, diversifying into other products such as the processing of sausages and other similar types of meat.

The Government of the Federal Democratic Republic of Ethiopia (GFDRE) recognizes livestock as one of the country's key economic resources. The government's policy aims to increase in country value addition by encouraging meat exports over live animal exports. And encompass technology packages for meat production, the establishment of disease-free zones and a standardized sanitary and phyto-sanitary (SPS) system.

Ministry of Industry has established different institutes that support the industry, especially in technology advancement. Among these, Meat and Dairy Industry Development Institute of Ethiopia is one of the public Agencies that work for the achievement of such industrialization, in the case of which the Institute is playing its own part in helping the country add values to its "animal" cattle resources and subsequently draw optional advantage out of the sector through the provision of all-round supports and assistances to the respective meat exporting abattoirs, dairy and feed processors.

Limited effort for coordinating value chain structures: In livestock marketing, the system operates without partnership and linkages — an alliance in which different market agents in the value chains (from producers to processors) agree to work together and commit themselves for a common goal, share the risks as well as the benefits, review and revise the relationship and agreement regularly.

As the Ministry of Agriculture Livestock Resource Development Sector (2007 E.C) of growth and transformation of the livestock master plan identifies the marketing and processing challenges and its solutions are presented below: Marketing and processing challenges are:

- Absence of quality based pricing
- Lack of holding area and feedlot space
- Knowledge lacking on meat cutting and grading
- Poor links to export abattoirs

Challenges can be addressed by:

- Building the capacity of meat technology training staff in the Ethiopian Meat and Dairy Industry Development Institute (EMDIDI)
- Increase training of meat processing staff
- Promote forward contracting of feedlots and abattoirs
- Investments are made in export infrastructure for animal holding and quarantine, as well as programs to ensure food safety and animal health through disease surveillance, monitoring of abattoirs, animal identification and traceability, etc.

Policy challenges that require special attention include:

- Lack of meat quality standards control and enforcement, grading, and pricing policies,
- Absence of breeding policy,
- Land policy related to land acquisition for feedlot investment,
- Land policy for feed production,
- Feed quality monitoring and controlling,
- Feed lot establishment incentives (including land access in appropriate feed surplus locations, linkages with export market, and infrastructure –road access, power and water supply),
- Promotion of domestic production of oil seed to replace importation of cooking oil and stopping export of oil seeds that affect availability of concentrate feeds,
- Promotion of domestic production of grain flour to replace importation of flour that affect availability of energy concentrate feeds that are by-products of the grain milling industries,Animal welfare and protective trade policy.

Over the last 20 years transforming the livestock sector has been a priority in all GOE strategies, policies, and plans, continues to be a priority in the current Growth and Transformation Plan (GTP I), running thru 2015 (MOFED, GTP I, 2010). Livestock development will also be a priority in the coming GTP II (2015-2020). The ex-ante impacts of the LMP roadmaps demonstrate that investing in the development livestock sector during the GTP II can reduce poverty and improve the food security of rural people, as well as make livestock an increasing contributor to national income growth (GTP), and also increase exports and foreign exchange earnings.

In summary, As the Ministry of Agriculture Livestock Resource Development Sector (2007 E.C) of growth and transformation of the livestock master plan identifies the priority technology interventions for investment during the GTP II were found to be:

Promotion of fodder production and trade through policy changes that encourage establishment of a forage seed industry, making land available for investors for forage seed and forage production, and promotion and enforcement of outsourcing contracts for forage production

Policy measures to rationalize public and private sector roles in the provision of veterinary services, leading to transition to private provision of clinical services wherever feasible

Improvements in productivity of local breed animals for meat and milk through investments in animal health to reduce young and adult stock mortality (YASM), and making critical vaccinations and parasite control available in all livestock systems

Public investments in rehabilitating range and pasture lands to improve feeding and animal management to complement genetic and health improvements

Importation and dissemination of improved semi-scavenging poultry breeds by the private sector and/or through PPPs, combined with improved private animal health services to provide critical vaccines, while the GOE extension services promote improved feeding

Promotion of the establishment of additional flour and oil mills by the private sector for additional feeds from agro-industrial by-products through policy protection against flour and oil imports and incentives on land leasing rates and/or taxes

Promotion of feed efficiency through the removal of the VAT (15%) and duty (currently 53%) on feed mill ingredients combined with the introduction of quality control

Promotion of exports to more remunerative markets through the introduction of a practical and affordable system of animal ID and traceability, as well as programs to ensure food safety and animal health through monitoring of abattoirs and disease surveillance

Furthermore, careful consideration of the above list of priority interventions, which are supported by the LMP analysis and results, is crucial to achieve success during GTP II; and this will require attracting and enabling very substantial private investment in livestock product production and processing. Thus, the investment environment in Ethiopia must be improved dramatically (far less bureaucracy in setting up all types and aspects of businesses), and the policy environment will also need to be made far more attractive for private investment (including through incentives such as subsidized land leasing rates, low interest loans, tax holidays, etc.).

Making the required policy changes to attract and ensure sustainable growth in private feedlots – land availability, reduction in feed ingredient taxes, tax holidays, etc.

Establishment of new feedlot operations takes into account the spatial distribution of sugar cane factories, agro-industrial processing plants, and milling industries.

To facilitate and promote formal exports of live animals and meat, investments are made in export infrastructure for animal holding and quarantine, as well as programs to ensure food safety and animal health through disease surveillance, monitoring of abattoirs, animal identification and traceability, etc.

Linkages are established for a viable stocker feeder program where the young male stock from the lowland grazing systems is channelled to feedlot operations, thus reducing the grazing pressure.

2.6 Botswana's livestock experience

LIVESTOCK MARKETING AND TRADING

Livestock supply chains

The entire supply chain in Ethiopia is characterized by numerous intermediaries /actors namely: brokers, collectors, agent's animal trekkers, small, medium and big traders; wholesalers, abattoirs, butcheries, exporters, local authority and Department of Veterinary Services. This makes the supply chain unnecessarily long with increased transaction costs and without significant value added activities (Negassa and others, 2011).

Based on Mulale (2008), Botswana's livestock, particularly cattle, are sold through a range of marketing outlets, including the Botswana Meat Commission (BMC) which has the monopoly of beef exports (69.7 per cent), local butcheries (8.2 per cent), traders (7 per cent), auction (6.7 per cent) and other farmers (8.2 per cent, figure 5)). The participation of traders in the supply chain is minimal compared to Ethiopia where the majority of sellers at the terminal markets are traders (66 per cent) followed by farmers (23 per cent) and butchers (7 per cent), and at the same market, the majority (40 per cent) of buyers are butchers followed by traders (34 per cent) (Ayele Solomon, and others, 2003).

This shows that the supply chain/terminal market in Ethiopia is dominated by livestock traders (both sellers 66 per cent and buyers 34 per cent) more so than in Botswana (figure 5). The dominance of livestock traders at terminal/secondary markets in Ethiopia suggests that agro- pastoralists/pastoralist (farmers) participation at terminal markets is minimal (Negassa and others, 2011) compared to Botswana's smallholder farmers who enjoy full participation at markets and accrue more benefits from the sale of their animals using different outlets at their disposal.

Live animals, meat and by-products exports

The formal export values for Ethiopian meat and live-animal exports stagnated from 1996/1997 to 2004 with a gradual/sharp rise from 2005/2006 to 2011, with live-animal exports showing dominance over meat exports (figure 6). This trend is similar to that reported by the Intergovernmental Authority for Development (IGAD) and the Livestock Policy Initiative

Report (1999), which showed that formal live animal export levels stagnated at a low level between 1991 and 2004 and then grew rapidly from 2005 to 2008, exceeding the meat exports. In recent years, official export values for Ethiopia have been declining while illegal export values have been increasing (Ayele Solomon and others, 2003), a trend which is likely to continue and accelerate if measures are not taken to reverse the situation. The total value for meat exports (\$14, 148,148.00) was extremely low between 2007 to 2010, probably as a result of increased informal /illegal cross-border trade of 6.8 million live animals (24.51 per cent cattle, 31.93 per cent sheep, 35.31 per cent goats and 62.25 per cent camels), worth \$1,043,575,571 in the same period.

A grand total of \$1,221,155,351.00 was raised between 1996 to 2011 through formal exports and cross-border trade, out of which 85 per cent was attributed to informal/illegal live animal cross-border trade, 9 per cent to formal live animal exports and 6 per cent to formal meat exports. The US\$ value of illegal live animal exports is much higher than the combined values of both official live animal and meat exports. About 90 per cent of the illegal live animal exports originate from the pastoral areas and although illegal, this is a major source of income for pastoralists who sell their animals to traders or smugglers.

Although live animals make a considerable contribution to the economy of Ethiopia in terms of export earnings, a great number of the country's ruminants have been traditionally smuggled to neighbouring countries of Djibouti, Somalia, Kenya and the Sudan, using illegal trade routes. Unlike Ethiopia, Botswana does not experience informal cross-border trade for slaughter animals but for many years has been consistent in exporting high-value chilled and frozen beef to the EU market, although it faces heavy competition from Brazil, New Zealand, Argentina, Uruguay and Chile which are highly competitive in terms of quality of beef, price and large economies of scale. The huge difference in export values is attributed to inadequate value added by Ethiopia, most probably as a consequence of the broken-down market and processing/slaughter infrastructure, and lack of coordination and regulatory framework which simply enhances informal or illegal live animal cross-border trade and further hinders value added initiatives across the value chain. According to Ayele Solomon and others, 2003, the ban on imports by Middle Eastern countries and excessive regulations

involving several ministries and agencies and related fees have also largely contributed to the increase in illegal sale of livestock through Somalia, Kenya, the Sudan and Djibouti. The growth in demand in COMESA and in the EU is for processed livestock products but Ethiopia loses value added through official exports of live animals and rampant informal live-animal cross-border trade. As a result, the country lost more than \$40 million for raw hides/skins by exporting live animals and would have earned an additional \$95 million if the same number of hides/skins were processed into finished leather and exported in that form.

Hides and skin production, processing and export in Botswana and Ethiopia

Botswana and Ethiopia generate various livestock by-products, but the major ones of economic relevance are hides and skins. Other livestock by-products include bones, blood, hoofs and offal which are used in the manufacturing of stock feeds. Botswana produces about 280,937 hides and 48,150 skins per annum, while Ethiopia produces larger quantities. In Ethiopia, small ruminants account for the largest production, followed by cattle and camels while in Botswana cattle account for a larger proportion than small ruminants. Ethiopia, therefore, has a more diversified and resilient resource base, which is able to sustain the leather and manufacturing sectors.

The largest proportion of hides and skins is generated from backyards and slaughter slabs, followed by municipality slaughter houses and export abattoirs, while in Botswana most hides and skins are generated from the BMC abattoirs, local authorities and private abattoirs. In Ethiopia, hides and skins enter the Leather Value Chain through 21 tanneries for processing into finished leather and these are further channelled to 850 leather enterprises for manufacturing of leather products (shoes, garments, belts, etc.). However, Ethiopia experiences cross-border trade of about 4,925,000 pieces of hides and 10,870,000 pieces of skins into Djibouti, Kenya, the Sudan and Somalia through informal routes.

Currently, Botswana is exporting about 85-90 per cent of hides/skins to South Africa in their raw form, suggesting that the tanneries, foot wear and leather goods manufacturing sector are not well developed. The major concerns in the production of hides and skins in Botswana, Ethiopia and in most countries across COMESA/SADC are inappropriate animal

husbandry practices, lack of flaying tools, unskilled flayers and lack of technology across the value chain, which compromise the quality of raw hide/skins (COMESA Leather Chain Strategy, 2011).The conclusions are:

The promotion and enhanced value added to tradable commodities such as livestock, livestock products (milk and meat) and livestock by-products (hides and skins); and the access to domestic markets and further integration of their participation in regional and international markets.

However, in Ethiopia, studies have shown that the majority of sellers at terminal markets are traders (66 per cent), followed by farmers (23 per cent) and butchers (7 per cent). At the same market, the majority (40 per cent) of buyers are butchers followed by traders (34 per cent).

This indicates that farmers' participation in the supply chain is minimal while livestock keepers in Botswana seem to enjoy full access to the domestic market by selling their animals through a range of marketing outlets including the BMC, which has the monopoly of beef exports (69.7 per cent), local butcheries (8.2 per cent), traders (7 per cent), auction (6.7 per cent) and other farmers (8.2 per cent). This further shows that in Ethiopia, the supply chain is dominated and controlled by many middlemen/brokers at primary, secondary and terminal markets making it impossible for pastoralists to fully participate in domestic and export markets due to lack of market information.

2.7 Research gaps

The potential to increase live animal exports from Ethiopia is constrained by a number of internal weaknesses varying from poor infrastructure and the current ban imposed by the importing countries of the Middle East. Regarding Ethiopian export destination, meat and live animals exports is overly dependent on demand from just two countries: Saudi and Dubai. The Middle East countries are Ethiopia's traditional destinations for meat and livestock exports.

Thus, if Ethiopia's livestock is to compete successfully in the export market, it requires understanding the problems and opportunities in the export market. In the first place knowing elasticity of Ethiopian exports to foreign currency and other parameters is important since there is an opportunity to export to other countries as there is a growing demand and it may help in exploring new markets. Besides, the loss due to the ban by the usual importers; Middle East economies can be minimized if the market outlet is diversified. As mentioned before there is also a need to increase the export volume as the livestock export sector remains underutilized. Generally, boosting foreign currency earnings through export especially from potential areas like livestock is vital for economic development. Based on the mentioned issues the research seeks to examine and analyze the effect of possible major determinant factors that hinder the growth and the overall performance of meat export demand. But there is no sufficient information in the country in this regard and Studies aren't conducted sufficiently. So there is a knowledge gap on the issue.

CHAPTER THREE

Data and Methodologies

3.1. Data

Both qualitative and quantitative research approaches were used. Because mixed research approach is helpful to capture the best of the qualitative and quantitative approaches. The researcher was used document analysis to collect the required information. Qualitative research approach was used to analyze interviews, observations and document analysis. To analyze the data quantitative research approach and descriptive static analysis were employed as it is best preferable. The research used descriptive type of research design. Descriptive type of research employed because that was helpful to identify the constraints faced the export activity. Case study and survey research strategies used to collect the information from the selected offices using informal interview, observation and document analysis. Time series static data design selected as the time dimension of the study. In order to get relevant and adequate information the researcher was employed secondary data collection methods.

Documentary analysis (research) documents such as environmental policies and plans, reports, audit reports, rules and regulations related to Meat and Leather exports. mainly obtained from National bank of Ethiopia, Ethiopian Customs Authority, Food and Agricultural Organization, World bank and Economy Watch. The yearly data that have been obtained and used includes,

- The value and volume of Ethiopian meat and live animals export,

- The export value and volume of meat from each category(sheep, goat and cattle meat)

- The value and volume of Ethiopian leather products export,

- The value and volume of Ethiopian Raw hides and skins and finished leathers export.

In addition, To assess the impact of live animal export for Ethiopian meat export and leather products export in Ethiopia secondary data from year 1991 to year 2006 E.C were collected from various sources.

As it is well known the Ethiopian economy has been transformed since 1991. It has made progress in reducing the anti-export bias in its trade policy. Taxes on exports have been reduced significantly and the foreign exchange market is liberalized. That is why, the study covers the

period after the policy shift as the change began to bear its fruits, and thus, annual data was collected for 16 years (1991 – 2006 E.C). From this analysis, basic findings were obtained.

3.2. Data Analysis

Data assessment starts with descriptive analysis on live animal export, finished leather export; Raw Hides and Skins export as well as meat and leather product exports. However, due to the aforementioned data problems and especially since the processing of livestock in the form of meat and other products may generate improved revenue adding to their value whilst helping in overcoming problems like transportation and bans; which is more serious in the case of live animals as proved by Terefe (2008). Hence, the researcher believes knowing the trend is sufficient and no further econometric analysis is made upon the export of live animals. This means, for meat exports both descriptive analysis and econometric analyses were employed to estimate the magnitude of the effect of each of the impact assessment factor. Interpretation of the data calls for a variety of analysis techniques. The data for background information and markets is analyzed with descriptive method, and the data for empirical modeling is analyzed systematically with the help of an up-to-date econometrics software package (STATA 12) that can handle relatively recent innovations such as the Johansen cointegration procedure. Through examining how changes in one or more variables would affect another variable, regression models are used to analyse the relationships between dependent variables and independent variable for each statistical model. In the process of building model for Ethiopian Export of Meat and Meat and Ethiopian Export of leather and leather Products, the possible potential Problems in Multiple Regression Analysis (Autocorrelation, Serial Correlation, Stationary, Heteroskedasticity, cointegration, and Multicollinearity) were Diagnostics, tested, their consequences were identified and the possible remedies were set.

As missing on testing for the stationarity of the variables was result in false/spurious relationship between the dependent and explanatory variables, the first thing is to check whether a series is stationary or not before any other econometric works. Graphical inspection is the first step and used as a starting point of more formal tests of stationarity. But the use of graphical evidence is unreliable in making inference about the presence of unit roots, and formal tests are applied. Furthermore, despite being individually non stationary, a linear combination of two or more time series can be stationary, In the language of time series, this means co integration. Co

integration of two (or more) time series suggests that there is a long-run, or equilibrium, relationship between them. In literatures, the most commonly used methods to test for co integration are Engle Granger and Johansen's approach.

The superiority of Johansen approach is that it gives information that helps not only to determine whether the variables are co integrated but also to know the number of co integrating vectors. But as the objective of this study is to estimate a long-run export demand function, what important is that co integration takes place and not the number of co integrating vectors. On this ground for this study the Engle Granger method is utilized. As indicated earlier co-integration test is designed to check for the existence of co-integrating relationships between non-stationary variables. To do so, after undertaking the conventional regression, testing the stationarity of the residual term makes the test for the presence of co-integration.

i. Dickey-Fuller Test

The distribution of $\hat{\rho} = 1$ is not standard. Although $\hat{\rho}$ is a consistent estimate of ρ , it does not follow a standard t-distribution. This is where the Dickey-Fuller distribution comes in. This distribution is right-skewed meaning that t-statistics will tend to be large and negative. It also means that we will tend to over-reject the null hypothesis of non-stationarity i.e. $\rho = 1$. In other words, we may conclude that our series is stationary when it really isn't if we use a t-test. In effect, the Dickey-Fuller test for a unit root amounts to estimating $\hat{\rho}$ and doing a standard-looking t-test for $H_0 : \rho = 1$ but using a non-standard set of critical values.

The null hypothesis is that the series has a unit root.

If t is greater than the critical values, then the series is stationary (no unit root).

If t is less than the critical values, then the series is non-stationary (unit root)

ii. Testing for Serial Correlation and Autocorrelation

To explore autocorrelation, which is the correlation between a variable and its previous values, use the command corrgram. The number of lags depends on theory, AIC/BIC process or experience. The output includes autocorrelation coefficient and partial correlations coefficients used to specify an ARIMA model. Autocorrelation is the correlation between a variable and its previous (lagged) values. The number of lags depends on theory, AIC/BIC process or

experience. The output includes autocorrelation coefficient and partial correlations coefficients used to specify an ARIMA model. There are a variety of tests for serial correlation. We are going to focus on two: (i) Durbin-Watson d-test and (ii) Breusch-Godfrey or Lagrange Multiplier (LM) test.

iii. Co-integration test

Co-integration refers to the fact that two or more series share a stochastic trend (Stock & Watson). Engle and Granger (1987) suggested a two-step process to test for cointegration (an OLS regression and a unit root test), the EG-ADF test. The issue of cointegration applies when two series are $I(1)$, but a linear combination of them is $I(0)$; in this case, the regression of one on the other is not spurious, but instead tells us something about the long-run relationship between them. Co-integration between two series also implies a particular kind of model, called an error correction model, for the short-term dynamics. In the cointegrating regression, the static estimation implies that all short-run dynamics is pushed into the residual process.

3.3. Model specification

Countries engage in international trade for two basic reasons, each of which contributes to their gains from trade. First, countries trade because they are different from each other. Nations, like individuals, can benefit from their differences by reaching an arrangement in which each does the things it does relatively well. Second, countries trade to achieve economies of scale in production. That is, if each country produces only a limited range of goods, it can produce each of these goods at a larger scale and hence more efficiently than if it tried to produce everything. In the real world, patterns of international trade reflect the interaction of both these motives. We therefore have an essential insight about comparative advantage and international trade: Trade between two countries can benefit both countries if each country exports the goods in which it has a comparative advantage. The model of international trade originally proposed by the British economist David Ricardo, who introduced the concept of comparative advantage in the early 19th century, in which international trade is solely due to international differences in the productivity of labor, is known as the Ricardian model.

There are two main reasons why international trade has strong effects on the distribution of income. First, resources cannot move immediately or without cost from one industry to another—a short-run consequence of trade. Second, industries differ in the factors of production they demand. A shift in the mix of goods that a country produces will ordinarily reduce the demand for some factors of production, while raising the demand for others—a long-run consequence of trade. For both of these reasons, international trade is not as unambiguously beneficial. While trade may benefit a nation as a whole, it often hurts significant groups within the country in the short run, and potentially, but to a lesser extent, in the long run. The specific factors model was developed by Paul Samuelson and Ronald Jones.¹ Like the simple Ricardian model, it assumes an economy that produces two goods and that can allocate its labor supply between the two sectors. Unlike the Ricardian model, however, the specific factors model allows for the existence of factors of production besides labor. Whereas labor is a mobile factor that can move between sectors, these other factors are assumed to be specific. That is, they can be used only in the production of particular goods.

If labor were the only factor of production, as the Ricardian model assumes, comparative advantage could arise only because of international differences in labor productivity. In the real world, however, while trade is partly explained by differences in labor productivity, it also reflects differences in countries' resources. Canada exports forest products to the United States not because its lumberjacks are more productive relative to their U.S. counterparts but because sparsely populated Canada has more forested land per capita than the United States. Thus a realistic view of trade must allow for the importance not just of labor, but also of other factors of production such as land, capital, mineral, and other natural resources. To explain the role of resource differences in trade, this study I examines a model in which resource differences are the only source of trade. This model shows that comparative advantage is influenced by the interaction between nations' resources (the relative abundance of factors of production) and the technology of production (which influences the relative intensity with which different factors of production are used in the production of different goods). That international trade is largely driven by differences in countries' resources is one of the most influential theories in international economics. Developed by two Swedish economists, Eli Heckscher and Bertil Ohlin (Ohlin received the Nobel Prize in economics in 1977), the theory is often referred to as the

Heckscher-Ohlin theory. Because the theory emphasizes the interplay between the proportions in which different factors of production are available in different countries and the proportions in which they are used in producing different goods, it is also referred to as the factor-proportions theory.

Each models of international trade makes different assumptions about the determinants of production possibilities. To bring out important points, each of these models leaves out aspects of reality that the others stress. These models are:

1. **The Ricardian model:** - Production possibilities are determined by the allocation of a single resource, labor, between sectors. This model conveys the essential idea of comparative advantage but does not allow us to talk about the distribution of income.
2. **The specific factors model:** - This model includes multiple factors of production, but some are specific to the sectors in which they are employed. It also captures the short-run consequences of trade on the distribution of income.
3. **The Heckscher-Ohlin model:-.** The multiple factors of production in this model can move across sectors. Differences in resources (the availability of those factors at the country level) drive trade patterns. This model also captures the long-run consequences of trade on the distribution of income.

When I analyze the impact of live animal export on meat and leather products export in Ethiopia, I want to base my insights on a mixture of these models. For example, in the last two decades one of the central changes in Ethiopian foreign trade was the rapid growth in exports from Livestock subsectors. These subsector experienced rapid productivity growth; to discuss the implications of this productivity growth, I may want to apply the Ricardian model. The changing pattern of trade has differential effects on different Livestock subsectors in the Ethiopia; to understand the effects of increased trade on the Ethiopian income distribution, I may want to apply the specific factors (for the short-run effects) or the Heckscher-Ohlin (for the long-run effects) models.

In spite of the differences in their details, our models share a number of features:

1. The productive capacity of an economy can be summarized by its production possibility frontier, and differences in these frontiers give rise to trade.
2. Production possibilities determine a country's relative supply schedule.

3. World equilibrium is determined by world relative demand and a world relative supply schedule that lies between the national relative supply schedules.

The conventional econometric regression model requires that all the series included in a model be stationary and the disturbance term is assumed to have zero mean and constant variance. A variable is said to be covariance (weakly) stationary if the mean and the variances of the variable are constant over time and the covariance between two periods depends only on the gap between the periods, and not the actual time at which this covariance is considered (Gujarati,2004).

i. Model specification for Ethiopian Export of Meat and Meat Products.

The general model for the impact of live animal export on meat export is specified as a Meat Export function:-

$$\ln MY_t = \beta_0 - \beta_1 \ln laexn - \beta_2 \ln laevusd + \beta_3 \ln mmvausd + \varepsilon_t \dots \dots \dots (3.1)$$

Where

$\ln MY_t$ = The natural logarithm of Meat and Meat Products Volume (in Metric ton) in Million

$\ln laexn$ = the natural logarithm of Live Animal export in number

$\ln laevusd$ = the natural logarithm of Live Animal export value in USD in Millions

$\ln mmvausd$ = the natural logarithm of Meat and Meat Products Value (in USD) in Millions

β_0 = The constant term of the model

β_1, β_2 and β_3 = The coefficient of the parameter exported live animals, live animal and meat export value a time t

ε_{it} = The normally distributed error term across time t

The signs before the coefficients denote prior signs of the estimated coefficients. Based on economic theory

ii Model specification for Ethiopian Export of leather and leather Products.

The general model for the impact of live animal export on leather products export is specified as a leather products Export function:-

$$\ln LY_t = \beta_0 - \beta_1 \ln laexn - \beta_2 \ln laevusd + \beta_3 \ln flvausd + \beta_5 \ln rhsvausd + \varepsilon_t \dots (3.2)$$

Where

$\ln LY_t$ = the natural logarithm of Leather Products Volume (in Metric ton)in Millions

$\ln laexn$ = the natural logarithm of Live Animal export in number

$\ln laevusd$ = the natural logarithm of Live Animal export value in USD in Millions

$\ln flvo$ = The natural logarithm of Finished Leather Volume (in Metric ton) in Millions

$\ln rhsvo$ =The natural logarithm of Raw Hides & Skins Volume (in Metric ton) in Millions

β_0 = The constant term of the model

$\beta_1, \beta_2, \beta_3$ and β_4 = The coefficient of the parameter exported live animals, finished leathers, raw hides and skins a time t

ε_{it} = The normally distributed error term across time t

The signs under the coefficients denote prior signs of the estimated coefficients. Based on economic theory

CHAPTER FOUR

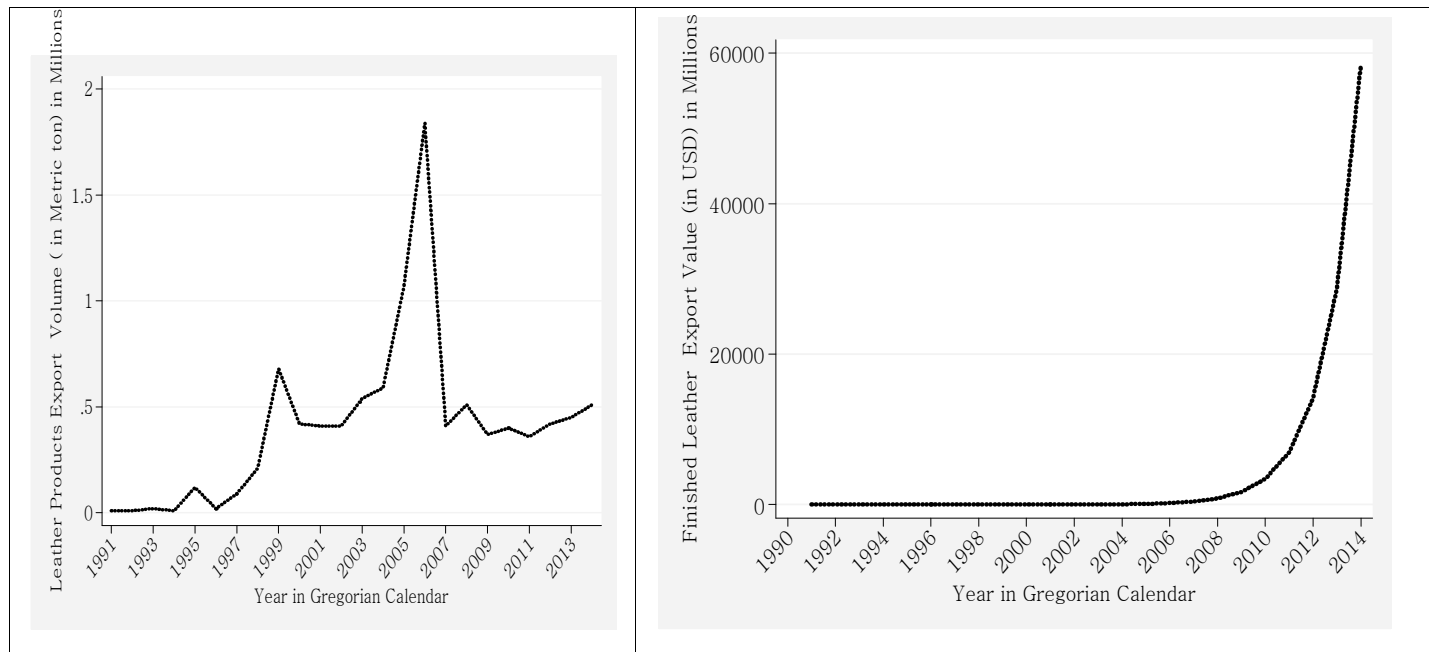
Results and discussions

4.1. Empirical Analysis

Leather products and live animals export trend value in millions of USD

The official statistics from Ethiopian Revenue and Customs Authority shows that the total leather product export still about 73% is earned from finished leather, which had the potential to be converted to other value added products such as shoes, bags, gloves or garment. On the contrary Ethiopia is still importing a huge amount of shoes and leather plastic products from across the world spending millions of hard currency annually. In addition as almost most of shoe making and leather products' accessories such as synthetic sewing thread, plastic linen, shoelaces, zippers, buckles and the like are being imported, the country is a long way from substituting imported shoes and other leather products fully. The relationship between live animal and leather products exports; and their trend through time is presented in figure 2. There should not be such correlation and it is unexpected. But it may support the fact that Ethiopian livestock resource is underutilized.

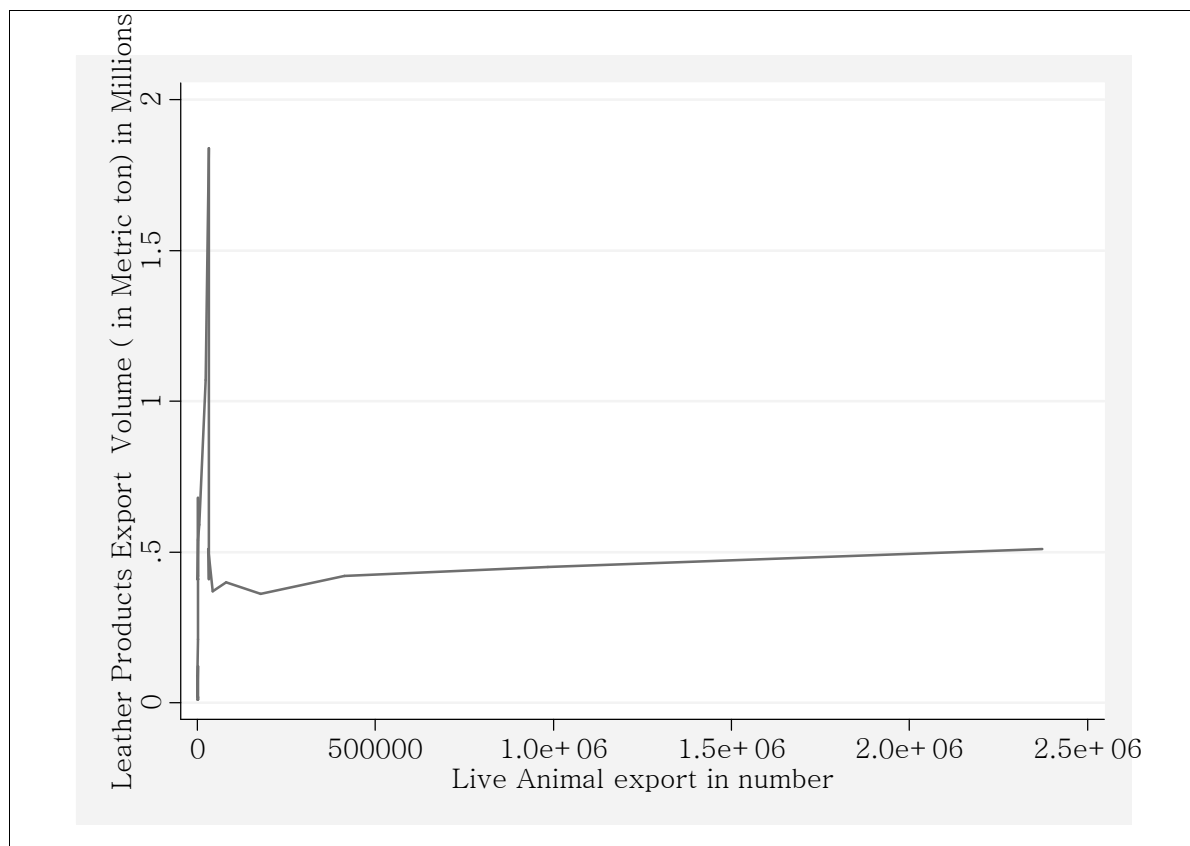
Figure 2 : leather products export volume in tones and finished leather export value in USD



Source: Stata output on the basis of secondary data, (2015)

As the graph shows, since 1997 – 2006 there was an increase in both the finished leather and leather products and reaches its highest level in 2005-2006 especially volume of leather products steeply increased in 2006. Regarding hard currency gained since 1990-2008 the amount of USD was gone relatively constant but, from 2010-2014 it was highly increased even though the amount of leather products exports remains constant due to the increment of price.

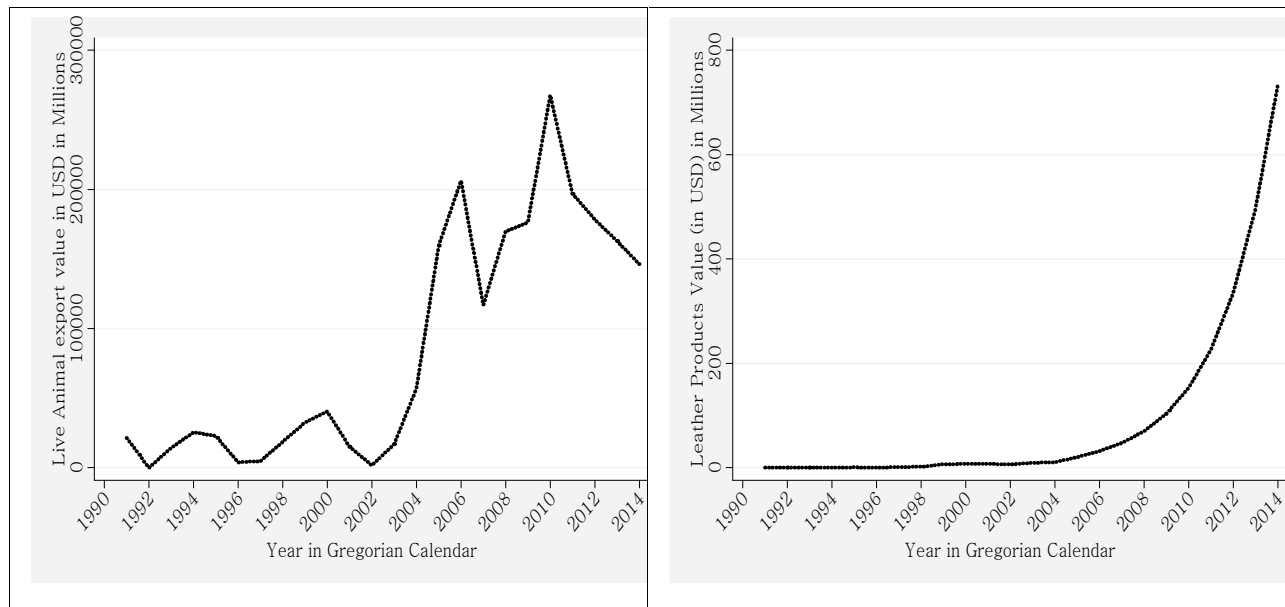
Figure 3 : Two way graph for the Volume of leather products export in tones and live animal export in number



Source: Stata output on the basis of secondary data, (2015)

As figure 3 indicates that; the export of leather products export in metric ton increases when the export volume of live animal export increases whereas it shows constant.

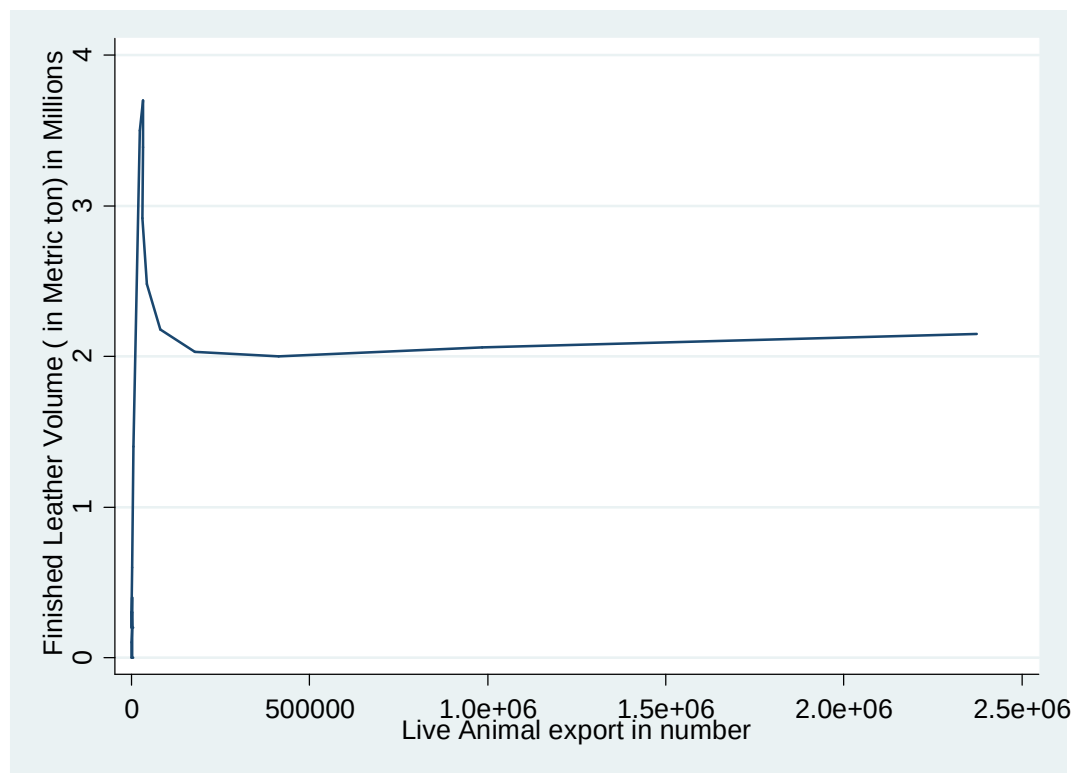
Figure 4: Value of Ethiopian live animal and finished leather export in millions of USD



Source: Stata output on the basis of secondary data, (2015)

The amount of USD earned from live animal export throughout the sample period was relatively increased but, it shows ups and downs and reached its highest level at 2010. On the other side value of leather products was static since 1990-2004 But; it was rapidly increased since 2006-2014 and reached its maximum level at 2014.

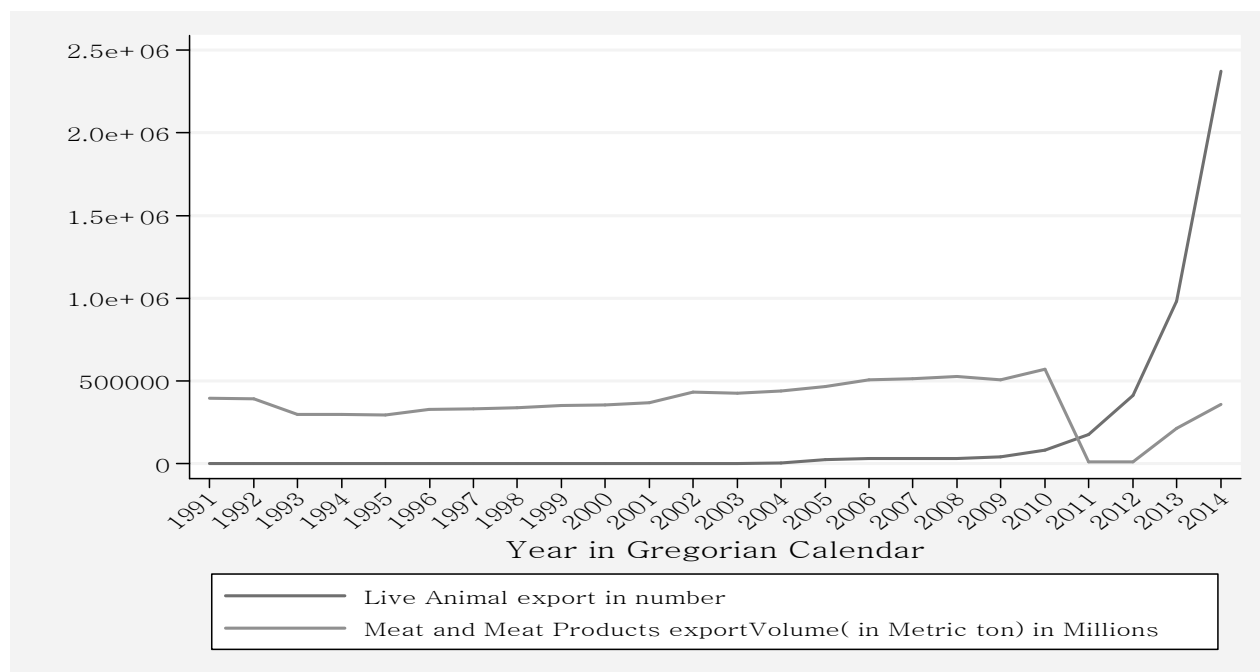
Figure 5 : Two way graph for Volume of live animal and finished leather export



Source: Stata output on the basis of secondary data, (2015)

As this figure shows there is an increase of export both in live animal and finished leather and starts to boom up. The major problem identified in this study was shoe industry is the lack of raw materials in terms of finished leather. While the total demand of leather in the country is 40 million pieces per annum, we are only producing 21 million pieces (fact sheet, 2014). So, our factories are operating under half their production capacity. So the government must be solving this problem. Official statistics from the Ethiopian Revenue and Customs Authority show that of the total leather products export, still about 73 per cent is earned from finished leather, which has the potential to be converted into other value added products such as shoes, bags, gloves or garment. On the contrary, Ethiopia is still importing large numbers of shoes, leather and plastic products from across the world, spending millions of hard currency annually. In addition as most shoe making and leather products' accessories such as synthetic sewing thread, plastic linen, shoelaces, zippers, buckles and the like are being imported, the country is a long way from fully substituting imported shoes with other leather products.

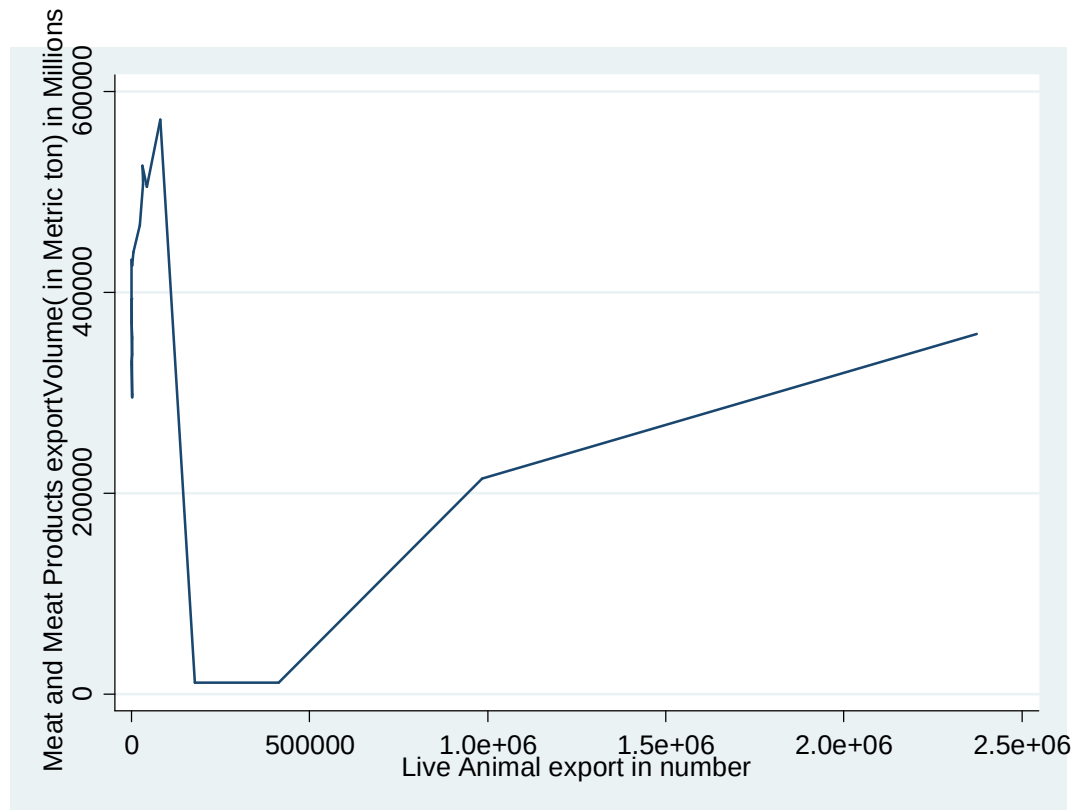
Figure 6 : The Volume of live animal in thousands and meat export in million tones



Source: Stata output on the basis of secondary data

Regarding unit value one can argue that in recent years meat exports are preferred to live animal exports. In most cases, there is correlation between the trend in unit value of live animal and meat exports over the period under consideration. Figure 3 indicates when a positive growth in live animal unit prices is recorded, meat exports unit value also rises and vice versa. For the stated period aforementioned correlation does not exist. The sharp increase in unit price during those years can be attributed to excessive demand pressure due to import ban at the time.

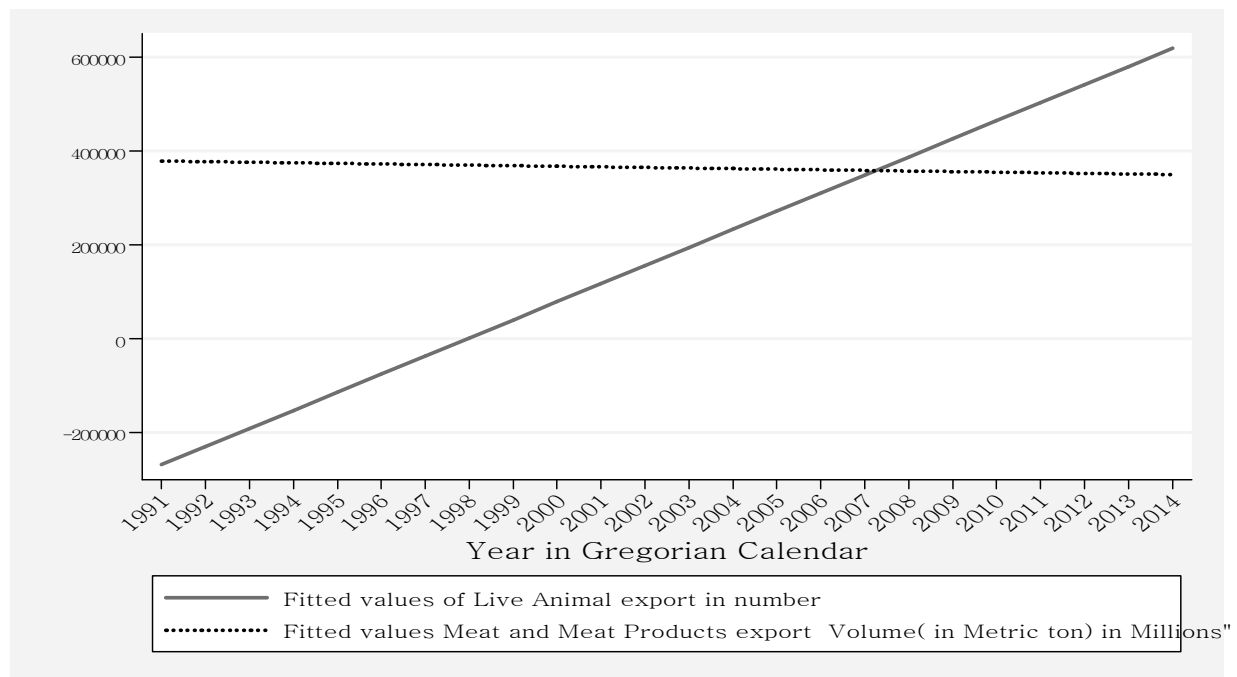
Figure 7 : Two Way Graph for the Volume of Ethiopian live animal in thousands and meat export in million tones



Source: Stata output on the basis of secondary data

As the above figure indicates that the meat export is at its maximum volume which accounts 18 million ton in 2012 but it reduces to 15 and 10 million in 2013 and 2014 respectively. On the other hand the export of live animal is at its highest level in 2012 similarly this also reduced in 2013 and 2014 as it accounts 676 and 648 thousands respectively. When compared these two variables the meat export was highly reduced the last two years.

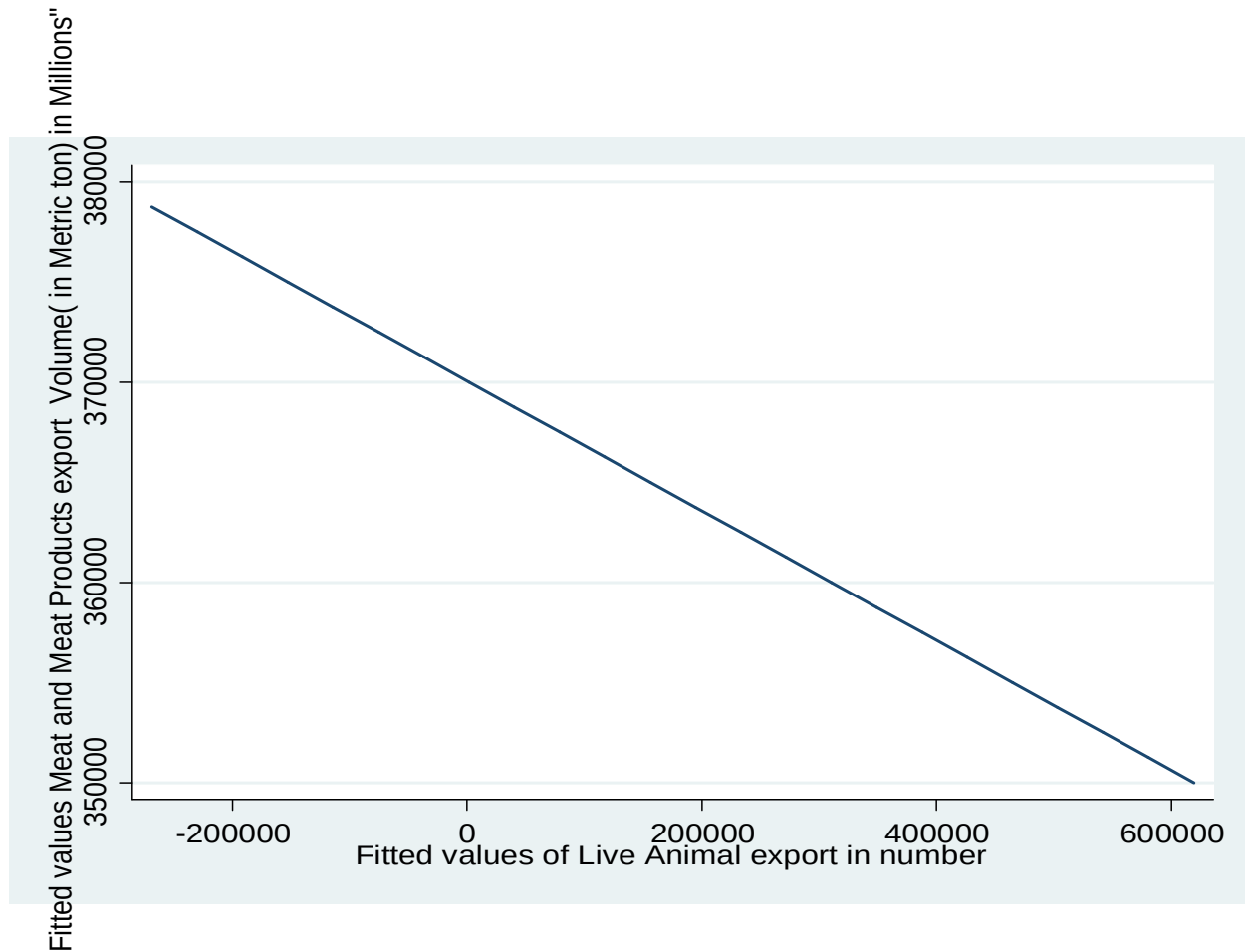
Figure 8 : The trend of the live animal and meat export values of the growth rate



Source: Stata output on the basis of secondary data, (2015).

This figure describes the decreasing growth rate of value of live Animal export in USD, while the value of meat export growth rate is relatively constant. This indicates live animal export to be discouraged and encourage value added products.

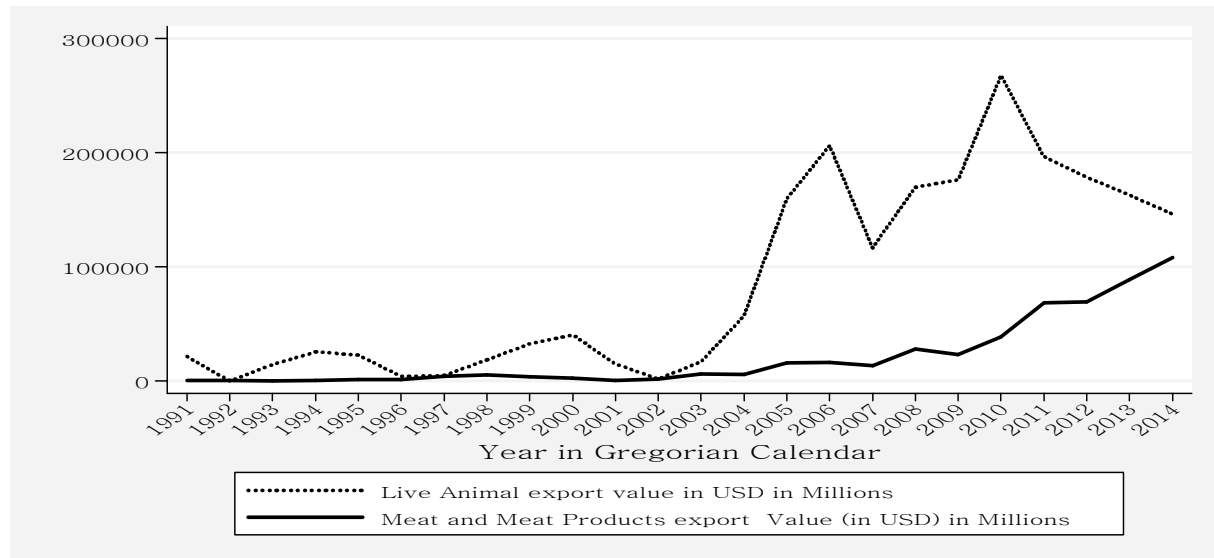
Figure 9 : Two Way graph for the trend of the live animal and meat export values of the growth rate



Source: Stata output on the basis of secondary data, (2015)

As the figure shows there is a decreased volume of meat products export when live animal export increase. This shows that both have inverse correlation if live animal export increases meat export should be decreased. the graph indicates that the correlation is due to inefficient use of the available resources.

Figure 10 : The Value of live animal and meat export in millions of USD



Source: Stata output on the basis of secondary data, (2015)

The relationship between live animal and meat exports; and their trend through time is presented in figure 10. The two bar graphs show the relationship between the value of live animal exports and meat exports on time, What we see is that they tend to have similar patterns. From 1991 onwards live animal exports tend to rise when meat exports rise. Otherwise, in the post 2005 period live animal exports seem to grow faster as the gap between the two starts to widen. As shown below in volume terms live animal and meat exports seem to be move together. When meat export increases, the same applies to live animal exports. There should not be such correlation and it is unexpected. But it may support the fact that Ethiopian livestock resource is underutilized and meat exports do not affect live animal exports. The value of foreign currency gained from the export of Meat and live animal increased since the beginning time 1995 up to 2004. But, it starts to decline in 2005 and 2006 especially in the meat export. The exceptional condition shown on the live animal export in 2006 which is the quantity of exported animal was reduced while the foreign currency was increased. This may resulted as the market access of meat is only limited on two countries (United Arab Emirates and Saudi Arabia) only and fixed price for many years. But the market for live animal has many destinations.

4.1.1. Stationarity and unit root test result

Stationarity is essentially a restriction on the data generating process over time. More specifically, stationarity means that the fundamental form of the data generating process remains the same over time.

This is indicated in the moments of the process. For example, mean stationarity means that the expected value of the process is constant over time. In testing we have the following three possibilities.

1. $|\rho| > 1$ Series is non-stationary and explosive. Past shocks have a greater impact than current ones. These situations are uncommon and I am not looked at how to deal with them.
2. $|\rho| < 1$ Series is stationary and the effects of shocks die out exponentially according to ρ . The series reverts to its mean. We have already seen what to do with these.
3. $|\rho| = 1$ Series is non-stationary, shocks persist at full force, and the series is not mean-reverting. This is the random walk model and as we saw, the variance increases with t and so we have the infinite variance problem.

Typically, I am interested in determining between the last two scenarios i.e. $|\rho| < 1$ or $|\rho| = 1$. The question is whether we have a unit root or not (also known as a random walk) i.e. $|\rho| = 1$? The first thing in time series analysis is get a view of the time series plot of the variables in the analysis. This helps to identify if there exists a non stationarity problem in our data, as most of time series variables possess the problem. The main findings of the study are summarized as follows:

When compared of live animal export in volume meat export was highly reduced for the last two years. There is a decreasing growth rate of value of live Animal export in USD, while the value of meat export growth rate is relatively constant. If live animal export increase by one unit, there is an impact of decreasing by 0.24% in meat export. There is high export of live animals compared to the export of skin and hide, meat and its products, leather and its products. Volume of leather products export becomes increased especially on 2014.

To estimate the long-run relationship of the variables of the model, the researcher plotted the behaviours of the variables over time. However, since graphical inspection is not sufficient to address the issue at hand, the unit root characteristics of the data are examined using the Augmented Dickey-Fuller (ADF) test. The result of the Augmented Dickey-Fuller (ADF) test as illustrated in the table 12, at levels since the computed ADF value in absolute terms is less than the 1%, 5% or 10% critical values disregarding the sign, it implies that the time series variables are non-stationary. But, as can be seen from the same table it is the first differences of the series that make them stationary. All the variables are stationary in their first differences, implying they are integrated of order one [I (1)]. Therefore, the first-differenced series can be used in the time series analysis. If one non stationary time series is regressed on another non stationary time series, the results are likely to be spurious. However, if the two series are co integrated, the regression results would not be spurious. As mentioned in Gujarati (2004), combining two or more time series that are integrated of different order may result in biased estimates.

Table 2 : Result of augmented Dickey-Fuller test for stationarity and unit root, without constant lags (1).

Variables	t- Statistic	1%	5%	10%	Decisions
Lnlaexn	2.312	-2.660	-1.950	-1.600	Reject H_0 at 10%
lnmmvo	-0.210	-2.660	-1.950	-1.600	Reject H_0 at 10%
Lnflvo	-2.209	-2.660	-1.950	-1.600	Reject H_0 at 5%
Lnlpvo	-2.196	-2.660	-1.950	-1.600	Reject H_0 at 1%
lnrhsvo	0.070	-2.660	-1.950	-1.600	Reject H_0 at 10%
lnlaevusd	0.301	-2.660	-1.950	-1.600	Reject H_0 at 10%
lnmmvausd	1.419	-2.660	-1.950	-1.600	Reject H_0 at 10%
lnflvausd	5.652	-2.660	-1.950	-1.600	Reject H_0 at 1%
lnlpvausd	0.538	-2.660	-1.950	-1.600	Reject H_0 at 10%
lnrhsvausd	-0.288	-2.660	-1.950	-1.600	Reject H_0 at 10%
$H_0 = \text{the series has a unit root}$ (non-stationary)					

We may believe that there is non-stationarity for other reasons than a unit root. One reason is that there may be drift. It is possible to test for both a unit root and drift with the following model.

Table 3 : Result of augmented Dickey-Fuller test for stationarity and unit root, constant (drift, No trend) lags (1).

Variables	Coef.	t-Statistic	P> t	[95% Conf. Interval]	
Lnlaexn	.0633481	0.90	0.377	-.083372	.2100682
lnmmvo	-.5109109	-2.69	0.014	-.9061729	-.1156489
Lnflvo	-.1509733	-2.03	0.058	-.3076176	.005671
Lnlpvo	-.236479	-2.12	0.046	-.4680938	-.0048643
lnrhsvo	.4155518	7.42	0.000	.2990543	.5320494
lnlaevusd	-.2235185	-1.54	0.139	-.5268016	.0797646
lnmmvausd	-.0506755	-0.61	0.548	-.2233875	.1220366
lnflvausd	.0525842	1.78	0.093	-.0097164	.1148847
lnlpvausd	-.0497952	-0.77	0.449	-.1841309	.0845405
lnrhsvausd	-.5368623	-2.78	0.011	-.9381535	-.1355711
$H_0 =$ The series has a unit root and drift (non-stationary) with no linear time trend					

Instead of there being a drift, we may have a series with a deterministic trend

Table 4 : Result of augmented Dickey-Fuller test for stationerity unit root (constant and Time trend) lags (1).

Variables	Coef.	t- Statistic	P> t	[95% Conf. Interval]	
Lnlaexn	-.2392365	-1.75	0.098	-.527131	.048658
lnmmvo	-.5657741	-2.76	0.012	-.9932329	-.1383154
Lnflvo	-.2043316	-1.55	0.141	-.4837892	.075126
Lnlpvo	-.3722432	-2.16	0.043	-.7320647	-.0124218
lnrhsvo	.3867574	4.22	0.000	.1953976	.5781172
lnlaevusd	-.524706	-2.53	0.021	-.9596069	-.089805
lnmmvausd	-.545708	-2.79	0.011	-.9535078	-.1379081
lnflvausd	-.1011915	-1.37	0.191	-.2583241	.0559411
lnlpvausd	-.9545864	-4.26	0.000	-1.421585	-.4875875
lnrhsvausd	-.5582694	-2.85	0.010	-.9675045	-.1490343
$H_0 =$ The series has a unit root and drift (non-stationary) with no linear time trend					

4.1.2. Co-integration analysis and Error Correction Model

Export volume is regressed on the value of meat and meat product export, export volume of live animals and dummy of import ban and the residuals from this regression were subjected to unit root test. The Phillips Perron test statistic is higher than the absolute value of MacKinnon critical value at 5% level; meaning the residual is stationary. Co-integrating regression Durbin Watson test (CRDW); which could be used as a quick approximate result, is also applied to check whether long run relationship exists between the variables. The results suggested that there is a co-integrating relationship in the long run export volume of meat and meat products export equation. The value of F – statistic shows all the independent variables are non-zero. Furthermore, Durbin Watson (D.W.) statistic reveals the existence of autocorrelation.

Having established a long run relationship among the variables in equation as a means of reconciling the short-run behaviour of an economic variable with its long-run

behaviour it is appropriate to formulate Error Correction Model (ECM). According to Engle and Granger (1987) the mathematical formulation of error correction model for Ethiopian exports is as follows: Considering Enders, 1995 argument, the last step in the estimation of error-correction models is checking of models adequacy. After running the conventional OLS regression, its assumptions need to be tested. Assumptions like residual normality, homoskedasticity, and no multi-co linearity must be fulfilled for the model to be valid. In addition, link test is made to test for specification error; whether we need new variables in our model. In practice when heteroscedasticity is believed to exist, to deal with the problem heteroscedasticity –robust standard errors is recommended. This is applied to the long run model. Generally, the implications of these results is that both the short run and long run export demand models of Ethiopia are correctly specified and can be predicted using the specified independent variables.

Table 5 : Vector error-correction model Export of Meat Products

	$\Delta \ln laexn$	$\Delta \ln laevusa$	$\Delta \ln flvo$	$\Delta \ln rhsvo$
Constant	0.3949589	0.2888176	.2528405	-.0474822
	(0.226976)	(0.3397781)*	(0.1496464)	(0.0266464)*
_ce1 L1.	0.0948615	-0.0613044	-0.0505258	0.1471205
	(0.1077446)*	(0.1612914)	(0.0710366)*	(0.012649)*

*indicates that rejection of the null hypothesis at 5% level of significance

Table 6 : Vector error-correction model for Export Leather products

	$\Delta \ln mmvvo$	$\Delta \ln laexn$	$\Delta \ln laevusa$	$\Delta \ln mmvvausa$
Constant	-0.0068857	0.4179328	0.1009454	0.201789
	(0.252197)*	(0.1808724)	(0.2288824)*	(0.1305853)*
_ce1 L1.	.0173422	-.051829	.0105444	.102662
	(0.0649086)	(0.0465516)	(0.0589081)	(0.0336091)

*indicates that rejection of the null hypothesis at 5% level of significance

After fitting a VAR, we may want to know whether one variable “Granger-causes” another (Granger 1969). A variable x is said to Granger-cause a variable y if, given the past values of y, past values of x are useful for predicting y. Common methods for testing Granger causality is to regress y on its own lagged values and on lagged values of x and test the null hypothesis that the

estimated coefficients on the lagged values of x are jointly zero. Failure to reject the null hypothesis is equivalent to failing to reject the hypothesis that x does not Granger-cause y .

For each equation and each endogenous variable that is not the dependent variable in that equation, `vargranger` computes and reports Wald tests that the coefficients on all the lags of an endogenous variable are jointly zero. For each equation in a VAR, `vargranger` tests the hypotheses that each of the other endogenous variables does not Granger-cause the dependent variable in that equation.

Table 7 : Granger causality Wald tests for Meat Products Export model

Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
lnmmvo	lnlaexn	.23394	1	0.629
lnmmvo	lnlaevusd	.50802	1	0.476
lnmmvo	lnmmvausd	.22299	1	0.637
lnmmvo	ALL	1.4526	3	0.693
lnlaexn	lnmmvo	.17643	1	0.674
lnlaexn	lnlaevusd	4.3892	1	0.036
lnlaexn	lnmmvausd	7.5137	1	0.006
lnlaexn	ALL	12.435	3	0.006
lnlaevusd	lnmmvo	1.7236	1	0.189
lnlaevusd	lnlaexn	.3364	1	0.562
lnlaevusd	lnmmvausd	6.0821	1	0.014
lnlaevusd	ALL	11.913	3	0.008
lnmmvausd	lnmmvo	1.6365	1	0.201
lnmmvausd	lnlaexn	10.079	1	0.001
lnmmvausd	lnlaevusd	9.6185	1	0.002
lnmmvausd	ALL	11.216	3	0.011

The null hypothesis is ‘lnlaexn, lnlaevusd, and lnmmvausd does not Granger-cause lnmmvo’. In the majority cases, we can reject the null that each variable does not Granger-cause the other

Table 8 : Granger causality Wald tests for Leather Products Export model

Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
lnlaexn	lnlaevusd	.9277	1	0.335
lnlaexn	lnflvo	1.1247	1	0.289
lnlaexn	lnrhsvo	.1964	1	0.658
lnlaexn	ALL	4.0804	3	0.253
lnlaevusd	lnlaexn	.89458	1	0.344
lnlaevusd	lnflvo	3.409	1	0.065
lnlaevusd	lnrhsvo	.66507	1	0.415
lnlaevusd	ALL	8.736	3	0.033
lnflvo	lnlaexn	.76123	1	0.383
lnflvo	lnlaevusd	.20978	1	0.647
lnflvo	lnrhsvo	.89443	1	0.344
lnflvo	ALL	5.2667	3	0.153
lnrhsvo	lnlaexn	5.8052	1	0.016
lnrhsvo	lnlaevusd	.12352	1	0.725
lnrhsvo	lnflvo	24.003	1	0.000
lnrhsvo	ALL	24.667	3	0.000

The null hypothesis is ‘lnlaevusd, lnflvo, and lnrhsvo not Granger-cause lnlaexn’. In the majority cases, we can reject the null that each variable does not Granger-cause the other

Table 9 : Summary meat and meat products export statistics of variables

. su lnmmvo lnlaexn lnlaevusd lnmmvausd

Variable	Obs	Mean	Std. Dev.	Min	Max
lnmmvo	24	12.57157	1.01668	9.351796	13.25742
lnlaexn	23	8.84659	2.805061	5.056246	14.68004
lnlaevusd	23	10.685	1.448106	7.428927	12.4979
lnmmvausd	24	8.63437	1.880525	5.420712	11.59337

Source: Stata output on the basis of secondary data (2007 E.C)

Table 10: Static time series model for the Export of Meat Products Volume (in Metric ton)**In Millions**

. reg lnmmvo lnlaexn lnlaevusd lnmmvausd

Source	SS	df	MS	Number of obs = 23		
Model	3.95943206	3	1.31981069	F(3, 19) = 1.27		
Residual	19.7136841	19	1.03756232	Prob > F = 0.3123		
				R-squared = 0.1673		
				Adj R-squared = 0.0358		
Total	23.6731162	22	1.07605073	Root MSE = 1.0186		

lnmmvo	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnlaexn	-.2244392	.2052432	-1.09	0.288	-.6540182	.2051397
lnlaevusd	.2577168	.3011272	0.86	0.403	-.3725496	.8879833
lnmmvausd	-.0459324	.2409788	-0.19	0.851	-.5503067	.4584419
_cons	12.19163	2.30403	5.29	0.000	7.369243	17.01402

Source: Stata output on the basis of secondary data

$$\ln MY_t = \beta_0 - \beta_1 \ln laexn - \beta_2 \ln laevusd + \beta_3 \ln mmvausd + \varepsilon_t$$

When we substitute the coefficients by the regression analysis result it becomes as:

$$\ln MY_t = 12.192 - 0.224 \ln laexn + 0.258 \ln laevusd - 0.046 \ln mmvausd + \varepsilon_t$$

This shows that if live animal export value increase by 1% there is impact on meat export 0.24 % decrease i.e. leather products export is inelastic to the value of live animal export.

Table 11: Correlation coefficient among various independent and dependent variables

	lnmmvo	lnlaexn	lnlaev~d	lnmmva~d
lnmmvo	1.0000			
lnlaexn	-0.3660	1.0000		
lnlaevusd	-0.2285	0.8671	1.0000	
lnmmvausd	-0.3362	0.8716	0.7624	1.0000

Source: Stata output on the basis of secondary data

As the stata indicates there is a low correlation among the dependent and independent variables of the value of Meat and Meat Products and live animal exported.

Table 12: Summary leather and leather products export statistics of variables

```
. su year laexn mmvo flvo lpvo rhsvo laevusd mmvausd flvausd lpvausd rhsvausd
```

Variable	Obs	Mean	Std. Dev.	Min	Max
year	24	2002.5	7.071068	1991	2014
laexn	24	175186.3	514173.7	0	2373895
mmvo	24	364391.4	139342.9	11519.5	572300
flvo	24	1.275417	1.280757	0	3.7
lpvo	24	.4116667	.3977837	.01	1.84
rhsvo	24	143369.8	204154.2	57600.9	1014271
laevusd	24	85689.61	84523.25	0	267773
mmvausd	24	21032.29	31065.16	226.04	108376.6
flvausd	24	4798.317	13123.98	0	58499.12
lpvausd	24	94.5561	183.6383	.05	733.6696
rhsvausd	24	17274.06	13740.23	1991	47051

Source: Stata output on the basis of secondary data

During the analysis period our country exports on average number of all live animal export 175186.3 and 0.4 million tons of leather and leather products is exported. In addition, minimum, maximum values and their standard deviation are also shown in the table.

Livestock Products: Ethiopia offers a wide range of processed and semi-processed hides and skins to the world market. Some of the products, such as Ethiopian highland sheepskin, which has gained international reputation for making gloves, are well-known for their quality. The high quality Ethiopian hides and skins exports include: Pickled sheep skin, wet blue sheep skin, crust sheep skin, wet blue goat skin, crust goat skin, crust cow hides, finished garment leather, finished glove leather, lining/upper leather, suede leather, full grain leather, corrected grain leather, embossed leather and patent leather. The export of finished leather and leather products (such as leather garments, foot wear, gloves, bags and other leather articles) is also highly promising.

Export of leather and leather Products model specification

The general model for the impact of live animal export on leather products export is specified as a leather products Export function:-

$$\ln LY_t = \beta_0 - \beta_1 \ln laexn - \beta_2 \ln laevusd + \beta_3 \ln flvausd + \beta_5 \ln rhsvausd + \epsilon_t$$

$\ln LY_t$ = the natural logarithm of Leather Products Volume (in Metric ton) in Millions

$\ln laexn$ = the natural logarithm of Live Animal export in number

$\ln laevusd$ = the natural logarithm of Live Animal export value in USD in Millions

$\ln flvausd$ = The natural logarithm of Finished Leather Value (in USD) in Millions

$\ln rhsvausd$ = The natural logarithm of Raw Hides & Skins Value (in USD) in Millions

β_0 = the constant term of the model

$\beta_1, \beta_2, \beta_3$ and β_4 =

the coefficient of the parameter exported live animals, finished leathers, raw hides and skins

ϵ_t = The normally distributed error term accross time t

Table 13: Static time series model for the Export of leather Products Volume (in Metric ton) in Millions

. reg lnlpvausd lnlaexn lnlaevusd lnflvausd lnrhsvausd

Source	SS	df	MS	Number of obs = 20		
Model	109.242015	4	27.3105036	F(4, 15) =	29.78	
Residual	13.755656	15	.917043733	Prob > F =	0.0000	
				R-squared =	0.8882	
				Adj R-squared =	0.8583	
Total	122.997671	19	6.47356161	Root MSE =	.95762	

lnlpvausd	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnlaexn	-1.123318	.4401402	-2.55	0.022	-2.061455	-.1851812
lnlaevusd	.3622954	.3037172	1.19	0.251	-.2850624	1.009653
lnflvausd	1.480641	.3131984	4.73	0.000	.8130744	2.148208
lnrhsvausd	.1125082	.2467238	0.46	0.655	-.4133711	.6383875
_cons	.9064396	2.920761	0.31	0.761	-5.319016	7.131895

Source: Stata output on the basis of secondary data

$$\ln LY_t = \beta_0 - \beta_1 \ln laexn - \beta_2 \ln laevusd + \beta_3 \ln flvausd + \beta_5 \ln rhsvausd + \varepsilon_t$$

When we substitute the coefficients by the regression analysis result it becomes as:

$$\ln LY_t = 0.906 - 1.123 \ln laexn + 0.362 \ln laevusd + 1.481 \ln flvausd + 0.113 \ln rhsvausd + \varepsilon_t$$

This shows that if live animal export value increase by 1% there is impact on leather products export 1.123 % decrease i.e. leather products export is inelastic to the value of live animal export.

Table 14: Correlation coefficient among various independent and dependent variables

```
. corr lnlpvausd lnlaexn lnlaevusd lnflvausd lnrhsvausd
(obs=20)
```

	lnlpva~d	lnlaexn	lnlaev~d	lnflva~d	lnrhsv~d
lnlpvausd	1.0000				
lnlaexn	0.8461	1.0000			
lnlaevusd	0.7132	0.8501	1.0000		
lnflvausd	0.9150	0.9739	0.7959	1.0000	
lnrhsvausd	0.3254	0.4617	0.3775	0.3989	1.0000

Source: Stata output on the basis of secondary data

CHAPTER FIVE

5. CONCLUSIONS, POLICY IMPLICATIONS AND RECOMMENDATIONS

This paper has tried to explore impact assessment of live animal export to meat and leather export in Ethiopia. A time series econometric analysis has been applied to determine the significance factors.

Livestock for slaughter were collected from different places of the country. The livestock suppliers are small and large traders and livestock marketing unions. The infrastructure development is very poor to facilitate the supply. The quality of livestock is not consistent as there is no market oriented production system. Livestock shortage is common in rainy seasons. The presence of strong quarantine system and stations at strategic places are very essential to control animal diseases and ensure that only healthy animals could be slaughtered. In spite of this fact, there are no as such standard and approved quarantine facilities to deliver the required service.

In general, it is commonly observed that there is no sustainable livestock supply for these abattoirs. The livestock marketing system is also very poor. The factories lack well equipped and managed Ranch, holding area, feedlots, and quarantine services. They lack perimeter fence, skilled manpower, feed supply, etc. This has again serious implication in the factories capacity utilization and performance in general which should be implemented to gain foreign currency.

Currently, abattoirs and other processors in Ethiopia are found in different status. Some of them are non-functional and others are under construction. Even, the functional abattoirs are working under their capacity (on average about 34%). Moreover, despite the increase in the number of abattoirs and corresponding capacities, the value addition has not proportionately increased due to the reason that none of the current functional meat processing industries and export abattoirs produced semi processed and processed meat products. The slaughter houses in the country have inadequate facilities for processing, thus not performing value addition for incurring cost. Out of meat produced, there is little or no meat converted into value added products. In order to increase the value added.

The main findings of the study are summarized as follows:

When compared of live animal export in volume meat export was highly reduced for the last two years.

There is a decreasing growth rate of value of live Animal export in USD, while the value of meat export growth rate is relatively constant.

If live animal export increase by one unit, there is an impact of decreasing by 4.9 % in meat export.

There is high export of live animals compared to the export of skin and hide, meat and its products, leather and its products.

Based on above findings the following conclusions were made. The study proved that any meat and leather products export should be done after a proper work of value addition to each product.

Like the previous study made by Terefe (2008), meat exports are suggested rather than exporting live animals as the impact of ban is more clearly manifested in live animal exports resulting in more volatility as illustrated in the descriptive analysis. And there has been a remarkable increase in live animal's unit price in some years which is believed to be due to the excessive demand in the years of ban. Raw hides and skins are marketed as judged by visual appraisal without quality grades to pay for better quality. Market participants and professionals need training to upgrade their product handling and marketing skills. Information is vital for sustainable developments, in fact it is even considered as the power of quick progress.

The findings that support the result of some other studies were also obtained. At the outset, it is stated that Ethiopian livestock sector is operating at a sub-optimal level and this is confirmed by the present study. The evidence for this is the positive correlation between live animal and meat exports.

Live animal prices have been increasing over past 5 years. The average price of live animals on the formal markets has been continuously escalating for the last five years (between 60 and 200 percent increase). The continuous increase in the prices paid for live animal is attributed to various factors including illegal trade across borders leading to a shortage of supply to domestic markets, increasing price of inputs to feedlots including rapid increases in the price of feed and overall inflationary pressures. Even with the increased price of live animals, however, the volume of animals formally exported has increased from 10,372 in 2002/2003 to 472,041 in 2010/2011(ERCA, 2012).

5.2 Recommendations and policy implications

Based on the findings, a series of recommendations were identified and are presented below:

Ethiopia should be to invest in modern abattoirs and meat processing industries of international standard with all the necessary facilities to qualify for exporting processed and further processed meat products.

The government plans to fully utilize these resources through value addition to create more jobs, and boost export. As part of the plan, the leather industry sub sector is identified as one of the strategic investment areas, which can be done with relatively less amount of initial capital using agricultural product (livestock) as its input. Such investments by foreign or local or joint venture are well supported by the government mainly because they are in line with the country's plan of adding value to its agricultural products, create more jobs, substitute import and generate hard currency for the country. Even The objective of the trade incentive scheme is to improve the foreign currency reserve of the country by enhancing export trade and to enable exporter access inputs at world market price so that they will be able to compete on equal footing with their competitors. In general, the Ethiopian government allows the incentives to the exporters should not stand together & work efficiently in order to achieve high export value.

Development and promotion strategies should be designed not just for end products, but also for raw materials that go in to the marketing system.

Institutions like The Ministry of Industry and Ethiopian Leather Institute should take primary responsibility to undertake comprehensive market study for the leather products industry to identify marketing gaps.

Attempt has been made to show live animal, meat and leather products, hides & skins export marketing problems in Ethiopia. Alleviation of these problems will enable the country to rationally utilize the potential resource it has. Therefore, the following ideas are pin pointed so that all concerned bodies give attention for their implementation.

Establishing efficient and accessible market information system and comprehensive market information should be delivered to all stakeholders.

Establishing holding grounds in lowlands and carrying out uninterrupted livestock purchases to maintain sustainable and adequate livestock supply.

Strengthening the local conflict resolution institutions and enforcing government rules and regulations and implementing uniform pricing system, developing standardized units of

measurements for the animals traded (like body weight, animal height, age, etc); price will be set based on the developed standards, and bidders will compute accordingly.

Developing and disseminating research output which helps to increase productivity through improving reproductive efficiency and improving nutrition and management practices.

Developing and disseminating research output on slaughter management and chilling techniques for highland shoats.

Creation of demand for highland livestock in the export market: This is practically associated with lack of knowledge about problems of meat discoloration which prevent the exploitation of highland shoats.

There is low technological output (improved breeds and associated animal husbandry practices) to increase productivity of shoat in major livestock production areas. So the country should improve ranching system and animal breed.

There is abundant lack of an efficient and effective livestock marketing system that is responsive to domestic and international market signals. Technical and policy support is needed to help transform the dominant traditional livestock marketing systems into collaborative marketing system that engage producers and all other market actors involved in the supply chains.

The Informal trade or informal outflow of the livestock resources can be minimized if the domestic formal markets absorb the resources and pay competitive prices. However, to minimize the impact of such trade and change the directions of the livestock flows towards the domestic markets, the following actions shall be taken:

Minimize the domestic trade barriers such as service charges and levies at market places and along the transit routes including market service fees; transit fees; sports and hostels construction levies etc.

Provision of essential commodities from within the country to the peripheral areas and strengthen commercial and economic ties with the interior;

Introduce livestock movement permits as that of hides and skins trade;

Strictly control the operations of the foreign traders and brokers and give special incentives for buying animals from the remotest peripheral areas.

The researcher suggests that the investment of animal ranch of improved animals' breeds through large scale commercial farms. These include Cattle, Sheep, goats, camels and special species of cattle, sheep, goats and camels for rearing.

In order to realize the available export potentials, the various supply problems and marketing should be understood so as to devise measures. Further, the external challenges need to be overcome through need assessment and promotional activities.

The following are measures required to achieve the anticipated results.

Supply Resource assessment:-

For effective planning, the country's livestock resources should be studied in detail. So that the type, breeds and their geographical distribution could be known.

Disease control:-

In order to avoid the frequently imposed bans and increase supply, major diseases should be controlled by strengthening the present veterinary service through vaccination and availing veterinary medicine at reasonable prices. Especially the pastoral areas should be disease free zones as they are source of export animals.

Creating Market Awareness among Pastoralists

The traditional marketing system where cattle are sold only when need arises should be developed into market oriented production system that takes into account market demand and profits.

Revitalizing the Private Sector

Irrespective of Government initiatives to strengthen investment and trade, the number of participants and their entrepreneurial capacity is inadequate to promote production, and exports. Therefore, especial attention is required to study the weakness and formulate policies to create a capable private sector that can handle the productive, transportation, processing and export activities effectively.

Control of contraband trade

Based on recent study of LMA, illegal cross-border out flow is estimated at 325,800 cattle, 1.2 million goats and 16,000 camels annually. A conducive legal channel needs to be developed so that the foreign exchange loss could be stopped. These requires development of market infrastructure and service facilities along borders, development of banking and transit services and implement strategies with neighboring countries for legalizing trade along their borders.

Livestock Breeding Policy

The present livestock breeds need to be studied so as to identify their merits and the breeding system need to be directed in improving productivity in a systematic way. The ruminant

livestock development policy and strategy of the Ministry of Agriculture can be a good starting point for this activity.

Infrastructure Development

Efficient marketing requires improved infrastructure that allows efficient flow of livestock, processing and marketing. The major infrastructures for livestock marketing include livestock routes and transportation facilities, improved slaughters houses, livestock resting sites, and storage and quarantine facilities at required sites. This further requires development of regulation on standards and procedures and encouragement for the private sector.

Improve Market Research and Information System

The existing livestock markets are loosely integrated due to lack of sufficient market information. Thus, a market information system is required that allows stakeholders to get information on quantity and price, both on the domestic and foreign markets.

Further, market research needs to be undertaken to identify problems and constraints in the marketing system and to know the requirements of the external market. This allows us to design policies and regulations that allow to have effective production and marketing system internally and to match supply with the external demand.

Market Promotion

Modern marketing requires effective promotional activities designed to acquaint products with potential buyers. This can be done through different ways. The most important are workshops, seminars, brochures, and mass media, trade fair both locally and abroad by involving all concerned (stakeholders, public institutions and foreign embassies, etc)

Enhance Grading and Standardization

Grading and standardization reduces marketing costs and enhances communication between buyers and sellers. Thus, the development of grades and regulation for livestock and meat marketing is an important facilitating factor, especially for exports.

To sum up, achievements of potential growth can be promoted by making exports competitive by understanding external market access problems.

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Appendix

```
. vec lnlaexn lnlaevusd lnflvo lnrhsvo, lag(1)
```

Vector error-correction model

```
Sample: 1998 - 2002                                No. of obs   =           5
                                                    AIC          = -28.39071
Log likelihood = 81.97678                            HQIC         = -30.69682
Det(Sigma_ml)  = 6.75e-20                            SBIC         = -29.24995
```

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_lnlaexn	2	.310688	0.6153	4.797981	0.0908
D_lnlaevusd	2	.255942	0.8032	12.24324	0.0022
D_lnflvo	2	.322959	0.8051	12.3952	0.0020
D_lnrhsvo	2	.524992	0.6015	4.528945	0.1039

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
D_lnlaexn						
_ce1						
L1.	.7186446	.4818529	1.49	0.136	-.2257698	1.663059
_cons	.1879439	.1409071	1.33	0.182	-.0882289	.4641168
D_lnlaevusd						
_ce1						
L1.	.3577401	.3969458	0.90	0.367	-.4202593	1.13574
_cons	.3695869	.1160779	3.18	0.001	.1420784	.5970954
D_lnflvo						
_ce1						
L1.	1.59033	.5008849	3.18	0.001	.6086133	2.572046
_cons	.1423616	.1464726	0.97	0.331	-.1447194	.4294425
D_lnrhsvo						
_ce1						
L1.	1.147605	.8142227	1.41	0.159	-.4482419	2.743452
_cons	-.4301852	.2381012	-1.81	0.071	-.8968549	.0364846

Cointegrating equations

Equation	Parms	chi2	P>chi2
_ce1	3	39.33794	0.0000

Identification: beta is exactly identified

Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
_ce1						
lnlaexn	1	.	.	.	.	.
lnlaevusd	-.3357105	.4728629	-0.71	0.478	-1.262505	.5910837
lnflvo	-1.093326	.4659111	-2.35	0.019	-2.006495	-.1801568
lnrhsvo	.0070528	.5188067	0.01	0.989	-1.00979	1.023895
_cons	-5.821341	.	.	.	.	.

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