# The Contribution of Crops and Livestock Production on Somali Export: Regression Analysis using Time Series Data

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**Abstract**

The purpose of this study is to investigate the contribution of crops and livestock production on Somali exports, data found from world development indicators1980-2010 and analyzed in regression using OLS method in EViews7 Software. The study found that crops and livestock production have positive relationship with Somali exports, so an increase in crops and livestock production increases Somali exports and vice versa.Somalia since the collapse of central government had only an export of agriculture sector including livestock. While they account more than 65% of the country's GDP and more than 50% of the Somali export the productivity of crops and livestock is very important for the country's economic growth.

**Keywords:** Crop production, Livestock, Export, Somalia

## 1. INTRODUCTION

In the last two decades the crop and livestock production contributed the exports of Somalia, According to Dr. Solomon Munyua et al(2009) studies show the Somalia's economy, one of the poorest in the world, is an agricultural one based primarily on livestock and, to a lesser extent, on farming. Livestock accounts for about 40% of GDP and a large percentage of export earnings, mainly from Saudi Arabia; bananas are the main cash crop and account for nearly 50% of export earnings. Other crops produced for domestic consumption are cotton, maize, and sorghum. There are plans to develop the fishing industry. Northern Somalia is the world's largest source of incense and myrrh. There has been little utilization of mineral resources, which include petroleum, uranium, and natural gas. Since 1990, the economy has been a dump, the effect of drought and of protracted civil strife which has left the country without central authority. By early 1992, virtually all trade, industrial and agricultural activities had stopped, large numbers of people were forced from their homes, and more than six million people were at risk of starvation. In 1993, donors pledged $130 million toward Somalia's reconstruction. The aid, together with good rains and increased stability, helped ease the food situation and few communities were at risk of widespread famine in 1997; however, the lack of rains in spring 2001 caused major food shortages in the south of the country. Continued fighting and the lack of a central authority in 2003 prevented significant improvements in economic conditions. The UN through its various relief agencies is the country's largest employer.

Somalia has a traditional livestock sector based on nomadic pastoralism and a growing private sector led export industry (partly as a result of the disappearance of the central government). The livestock sector dominates the economy, creating about 60% of Somalia's job opportunities and generating about 40% of Somalia's GDP and 80% of foreign currency earnings. Despite many problems including insecurity, political instability and bans by some major importing countries over the past 18 years, the number of animals and meat exported has grown steadily thereby boosting the economy and livelihoods in rural areas. Somalia currently exports 3 million sheep and goats, 176,000 cattle and 11,000 camels per year, plus varying quantities of carcasses from between 340,409 (2005) through a peak of 718,903 (2006) and a low of 377,395 (2008). This has been largely due to the resilience of the livestock sector and the entrepreneurship of the private sector, supported by substantial diaspora contributions and external donor funding. The private sector has also shown its strength and resilience in legal, quasi–legal or overtly illegal livestock marketing and export of live animals and products of animal origin. The private sector led export industry has helped to alleviate the impact of state collapse and war on the Somali people. Exports are used to exchange for imports of cereals, as the country has a significant cereal deficit. The livestock sector and exports therefore has a major impact on the country's food deficit and overall food security, which has worsened recently and therefore the need for increased growth of the livestock sector, is even more pressing.

Since the beginning of the civil war in the early 1990's, levels of food production have generally been low. Adverse weather and a lack of seeds for cultivation, compounded by insecurity and population displacement, has further hampered farming in south central Somalia. Successive crop failures have also denied farmers any surplus production for the purposes of seeds. A lack of pest control and other agricultural extension programmers' has resulted in the proliferation of crop destroyers, notably armyworms, stalk-borers and birds.

The majority of agriculture in the region takes the form of subsistence grain production, providing the bulk of household income in the inter-revering communities, especially along the Shabelle and Juba Rivers. Cereal produced in the south and central region accounts for 70-75% of the total food produced in the country (FEWS/FAO 2002). Sorghum and maize are the major staple crops, grown mostly on unreliable land with

uneven rainfall distribution. Along the major rivers of Shabelle and Juba, small farmers, using motorized pumps and gravity flow, are able to irrigate a substantial area of land, estimated at 30% of total planted area. Maize, cowpeas, bananas, beans, groundnuts and vegetables are the major crops grown under irrigation. The most important cereal producing regions have been contested areas under the conflict and, consequently, production of staple crops is below 50% of pre-war levels. The main objective of this study is to examine the major role of crop production and livestock production to the export in Somalia between the periods 1970 and 2010, applying the ordinary least square. In order to achieve this broad objective, this paper is specifically designed:

**Conceptual frame work**
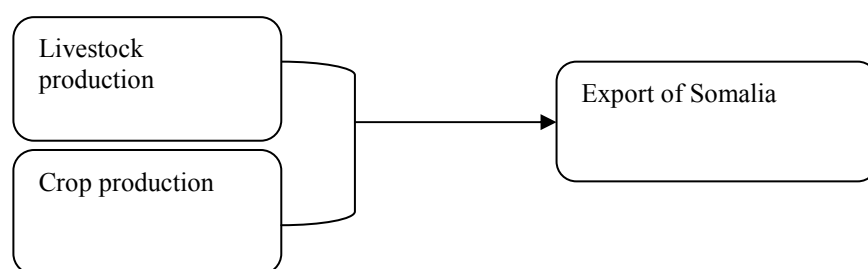


## 2. LITERATURE REVIEW

Trends of increasing agricultural trade, increased attention of livestock production systems, and increased human consumption of livestock products influence the distribution of nutrients across the worldwide (Schipansk and Bennett, 2012).

According to (FAO 2008a); International trade in agricultural products has increased at a faster rate than global crop production over the past 50 years. This caused agricultural products to be one of the large export goods involve in the world.

Bananas were the most important export crop before the war, with annual exports exceeding 120,000 metric tonnes. Unfortunately, both production and exportation collapsed during the war. Commercial banana plantations, once prevalent throughout the river valleys of lower Shebelle, lower Juba, and parts of Middle Shebelle and Middle Juba, are today confined primarily to the lower Shebelle region.

Irrigated banana plantations that were established before the Somali state's collapse, have either been destroyed or taken over by individuals. A range of other cash-crops were also grown in areas along the rivers. These cash crops are currently sold in main urban markets, especially in Mogadishu. Crops available in the markets include grapefruits, lemons, melons, papayas, tobacco, onions, other vegetables and mangoes. Without a central authority providing farmer subsidies, most subsistence farmers invest their limited resources in cash crop production. Farmers prefer cash crops for their quick turnaround time of 90 days from sowing to harvest, their quick liquidity and the fact that they generate much needed income for farmers in the region, (CRD Somalia, 2004).

The livestock sector dominates the economy, creating about 60% of Somalia's job opportunities and generating about 40% of Somalia's GDP and 80% of foreign currency earnings. Despite many problems including insecurity, political instability and bans by some major importing countries over the past 18 years, the number of animals and meat exported has grown steadily thereby boosting the economy and livelihoods in rural areas (Cardno Agrisystems Africa Ltd, 2009).

## 3. METHODOLOGY

The statistical technique employed in this study is Ordinary Least Squares (OLS) econometric technique using a time series secondary data from 1980-2010, which were obtained from the world bank special world economic indicators statistical bulletin.

## 3.1 STATEMENT OF HYPOTHESES

The main arguments of the study were synthesized into the following hypotheses and the analysis was carried out based on them:

H0: Livestock production does not determine the real export.
H1: Livestock production is determine the real export.
H0: Crop production does not determine the real export.
H1: Crop production is determine the real export.

## 3.2 MODEL SPECIFICATION

This section examines the contribution of livestock and crop production on Somalia exports, between1980 to

2010. The export which is the dependent variable was measured as a function of independent variables which are livestock and crop production. This statement is written in functional form as;

EXP = F (LIV, CRP)

EXP =                    LIV          CRP      μ

        he intercept or the constant,

EXP= Export of Somalia,

LIV= Livestock Production of Somalia,

CRP= Crop  Production of Somalia.

μ = Error Term (Other explanatory variables not mentioned in the model).

## 4. DATA  ANALYSIS

The variables presented below include exports, livestock production and crop production in Somalia covering a period of 20 years (1990 to 2010). The model specified was estimated using the Ordinary Least Square (OLS) estimation.

**4.1 Interpretation of Results**
**Ordinary Least Square Estimation**
**Table1: OLS when logged**

| Variable | Coefficient | Std.Error | t-statistic | Prob | R-Squ. | Adj R-squ | D.W |
|---|---|---|---|---|---|---|---|
| LLIVESTOCK | 1.493554 | 0.540979 | 2.760833 | 0.0134 | 0.52 | 0.4647 | 1.000170 |
| LCROP | 0.431910 | 0.431910 | 1.286102 | 0.2156 | | | |
| C | 6.247834 | 2.139472 | 2.920269 | 0.0095 | | | |

Table1 shows a relationship between the dependent variable (export) and the explanatory variables (livestock and crop production). export and the other variables were logged as a result of good figures recorded. From the table above, it shows that R-squared and adj. R-squared are rather a good fit. As a result, The Durbin Watson value corrected which is 100% implies that there is no presence of first-order positive or negative autocorrelation.

**4.2 Hypothesis Test**
The livestock production is a significant variable and has large relevant effect on the Somali export.
        The crop production is a significant variable, and has medium effect on the Somali export.
        The result shows that livestock production is significant and has a t-statistic of 2.760833and a P-value of 0.0134 so it's not reject null hypothesis that is, the (H0) livestock production has relative impact on the export of the Somalia. This shows that livestock is significant to the export of Somalia.
        The crop production is a significant, and has a t-statistic of  1.286102 and P-value of 0.2156 so it is not reject null hypothesis that is, the (HO)  crop production has relative impact on the export of the Somalia. If all the independent variables are held constant at zero, Export will be 6.247834
        On the basis of the individual significance of the parameter estimates. Most of the slope coefficients are individually statistically significant except exchange rate that is insignificant and their t-values were 1.493554 and 0.555481.
        The coefficient of determination (R2) from our result is 0.521029 while adjusted R2 is 0.464680. It shows that about 52.0% of systematic variation in the endogenous variable can be explained by changes in all independent variables.

## 5. DISCUSSION OF THE RESULTS

The main objective of this study was to examine the contribution of livestock and crop production on exports of Somalia. Annual time-series data for the period of 1980-2010 were employed. The diagnostic tests carried out for all variables were all satisfied, that is, no serial correlation  was observed, implying that the estimates are reliable and therefore can be relied upon.
        The methodology employed in this study included the regression analysis to examine the contribution of livestock and crop production on exports of Somalia, the stationary test was carried out using the Augmented Dickey-Fuller technique. The results of unit root suggested that both variables in the model were stationary after first difference. The results from regression analysis revealed that livestock and crop production had positive

impact on the exports of Somalia. This indicates that increasing the productivity of livestock and crop in Somalia is good for exports of Somalia and hence good for economic growth. Correlation coefficient and co-integration technique were employed to establish the relationship between livestock, crop production and export of Somalia. Results revealed that there is statistically significant positive relationship between livestock, crop production and export of Somalia.

In early October 2003 the study made show the Somali human population, equivalent to about 0.8 percent of the whole of Africa living, lives on an area equivalent to only 2.1 percent of the continental landmass but possesses about 3.3 percent of the continent's livestock, including nearly half of the one–humped camels and almost one tenth of goats and sheep combined. In 1990 about 55 percent of Somalis were directly engaged in the rearing of livestock and another large segment was employed in ancillary activities. The livestock sector accounted for at least 40 percent (some sources consider it to be more than 50 percent — agriculture as a whole contributed 65 percent) of Gross Domestic Product (GDP) and provides the main source of Somali livelihoods. Exports of livestock and their products account for 80 percent of exports in normal years. Livestock exports have, however, been periodically interrupted by bans imposed by importing countries mainly on the grounds of livestock disease and including especially during the 1990s Rift Valley Fever (RVF). The most recent ban in this series was imposed by the Kingdom of Saudi Arabia (KSA) in late 2000 and was yet to be lifted by Saudi Arabia — which has traditionally taken up to 95 percent of Somalia's livestock exports.

Crops contributed 38 percent to GDP, forestry 10 percent and fisheries 1 percent before 1990. The principal food crops are sorghum, maize, sesame, cowpeas, sugar cane and rice. Cultivated commercial crops include banana, citrus (mainly grapefruits and lemons), vegetables and cotton. The natural resins frankincense and myrrh are important in the life support system. Prior to 1991 bananas contributed 10 per cent to exports with fish, frankincense and myrrh together providing 10 percent of export revenue.

## 6: PRACTICAL POLICY IMPLICATION

The results of this study have a number of policy implications: First: while the is positive relationship between livestock, crop production and export of Somalia, the government should imply policies to increase the production of livestock and crop to make large export to the world which causes Somalia to receive hard currency that post economic growth of the country.

## 7: RECOMMENDATIONS AND FURTHER STUDIES

Since the production of livestock and crop has a positive relation with the export of the country we recommend the government to make policies to help livestock and agriculture sectors.
While we have not seen a similar study in Somalia only this study is not enough in the area and we recommend father research on the relationship between livestock, crop production and export of Somalia**.**

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