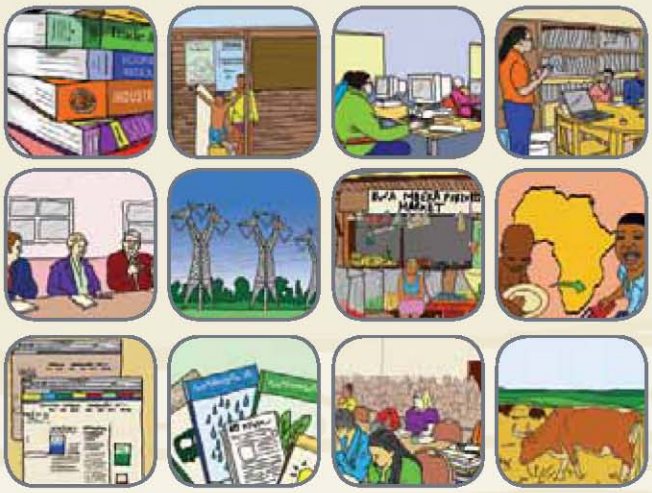
TRADE & INDUSTRIAL POLICY STRATEGIES



Services Sector Development and Impact on Poverty

Thematic Working Group

The Effects of the European Union (EU)-Imposed Livestock Identification and Traceback System on Botswana's Beef Exports, Revenue and Rural Poverty

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indigenous **growth**

The Effects of the European Union (EU)-Imposed Livestock Identification and Traceback System on Botswana's Beef Exports, Revenue and Rural Poverty[1]

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Abstract

About 70-75 percent of Botswana beef exports are consumed in the European Union (EU) beef market. In 1997, the EU introduced a directive which made it mandatory for beef exported to the EU to be identifiable and traceable from farm to fork through a computerized system. Botswana then introduced the livestock identification and trace-back system (LITS) in 1999 to fulfill the EU export requirements and maintain the much needed EU market access. We believe the EU-imposed LITS may pose as a non-tariff barrier to Botswana beef trade with the EU. We use a two-period causal comparative approach to examine the effects of the EU-imposed LITS on Botswana's beef exports, revenue and poverty. The EU-imported de-boned meat requirement of individual identification of cattle and traceability of beef products has imposed an extra financial burden on government almost the size of the current budget for social safety net programmes in Botswana. Both fresh or chilled boneless beef and frozen beef exports to the EU and the real value of total boneless bovine meat exports have declined significantly over the study period. The incidence of poverty in the rural areas was more than double that experienced in urban areas. However, the majority of cattle were owned by poorer rural households. Cattle income constituted 62 percent of gross income for poorer cattle-owning households. Thus, an increase (decrease) in income from cattle is likely to have a positive (negative) impact on the incidence of poverty in the country. Any circumstance that negatively (positively) impacts trade in the cattle industry will have a negative (positive) impact on poverty in Botswana. Livestock development support programmes that target cattle-owning households to improve cattle off-take in the rural areas will positively and significantly contribute towards poverty reduction in the country.

INTRODUCTION

According to the latest population census of 1991, Botswana has a human population of 1.7 million, whereas the national cattle herd is estimated at about 3 million. Statistics on ownership of cattle in Botswana show that 80% of the national herd is owned by people with 1-20 cattle. These cattle are extensively managed in open grazing areas. About 70% of Batswana live in the rural areas and are dependent on agriculture for their livelihood and employment (MFDP, 2003) Since Botswana gained her independence in 1966, traditional cattle farming has been and is still the highest contributor to agricultural gross domestic product (GDP) and total exports (BoB, 2008).

Botswana beef is primarily produced for export markets (BMC, 2005). More than 80 percent of the beef is exported. The Botswana Meat Commission (BMC) holds a monopoly on beef (and beef by-products) exports, the only exported agricultural commodities from Botswana since independence. Botswana is one of the ACP countries that benefited from the beef protocol under the Africa, Caribbean and Pacific (ACP) countries / European Union (EU) Preferential Trade Arrangement (Lome Convention). Under this arrangement, Botswana exported beef to the EU under a tariff-quota system that allowed her a quota of 18,916 tonnes of beef exports to the EU per year and granted her exemption from 90 percent of EU import levies. Currently, about 70-75% of the de-boned beef exports are consumed by European Union (EU) countries (Fanikiso, 2009).

The heavy reliance on the EU export market makes Botswana vulnerable to any unfavourable change in, say, EU market requirements and consumer demand, both of which are likely to affect Botswana beef exports and export revenue significantly. For instance, traditionally, Botswana used a manual branding system to identify cattle at herd level with the owner. In 1997, the EU introduced a directive which made it mandatory for beef exported to the EU to be identifiable and traceable through a computerized system (Fanikiso, 2009). This new regulation had a bearing on Botswana's beef export to the EU. The government of Botswana then introduced the livestock identification and trace-back system (LITS) in 1999 to fulfill the EU export requirements and maintain the much

needed EU market access. Thus, the new EU requirement forces beef exporting countries to set up and maintain a database on the production, distribution, processing and sale of meat products. Thus, this study was carried out to answer the major research question "what are the effects of the European Union (EU)-imposed livestock identification and traceback system on Botswana's beef exports, revenue and rural poverty?" The broader objective of the study was to find out how the on-going European Union export requirement of individual identification of cattle and traceability of beef products (LITS) has affected trade in the cattle subsector and the livelihood of Batswana dependent on this subsector. The specific objectives of this study were: (1) to estimate costs associated with implementing the EU-driven LITS project in Botswana, and (2) to determine the effects of the LITS on Botswana's beef exports to the EU market, government's export revenue from the beef sub-sector and on cattle producers' incomes and rural employment in the cattle industry.

How Can One Measure Incidence of Poverty in a Given Society?

Srinivasan and Dreze (1997) examined the relationship between widowhood and poverty in rural India based on national sample survey data on consumer expenditure. Kam et al. (2005) determined the spatial variation of rural poverty in Bangladesh by estimating household income using a predictor model based on a nationally representative sample of household income and expenditure survey data.

Studies on poverty have employed a number of techniques to measure incidence of poverty in a given economy. A closer look at the techniques used suggests that economists prefer income (or consumption) based measures of poverty. Following Foster et al. (1984) the Foster-Greer-Thorbecke (FGT) class of poverty measures take the following form:

$$P_\alpha = \left(\frac{1}{\sum w_i}\right)\sum w_i \left(1-\left(\frac{x_i}{z}\right)\right)^\alpha$$

where P_α is the FGT poverty measure given parameter α, x_i is the per capita expenditure for those individuals with weight w_i who are below the poverty line and zero for those

above; z is the poverty line and Σw_i is total population size (Elbers et al, 2004;2007). There is high regard for FGT family of poverty measures because it satisfies all the axioms desirable in income-based poverty measures. The FGT class of poverty measures contains a parameter, α, that can be set to 0, 1, or 2 depending on society's sensitivity to the income distribution among the poor. When α = 0 the FGT measure produces a headcount index, which measures the incidence of poverty as the percentage of the population that is below the poverty line (commonly known as P_0). However, the headcount index, though used widely for general poverty comparisons, it is criticized largely for its insensitiveness to differences in the depth of poverty in a given society or population. When α = 1, the FGT measure gives the poverty gap (commonly known as P_1), a measure of the average depth of poverty. One may interpret P_1 as the aggregate shortfall of the poor's expenditure from the poverty line, expressed as a ratio of the poverty line. Thus, the poverty gap is based on the aggregate poverty deficit of the poor relative to the poverty line. When α = 2, the FGT measure (commonly known as P_2) produces the squared poverty gap, a measure of poverty that is sensitive to the distribution of expenditures amongst the poor. Thus, the P_2 weights heavily income inequality among the poor and gives most weight to the poorest people in the society or population (Forster et al., 1984; Elbers et al, 2007).

The three measures of poverty (P_0, P_1, and P_2) require the definition of a poverty line. This may be defined as that level of income that is sufficient to afford the minimum necessities of life. Any person whose income falls below that specified line is classified as poor (CSO, 2008). Baker and Grosh (1994) emphasized that a poverty line is calculated on the basis of disaggregated data (either household level, or aggregated for a few groups such as quintiles). They further suggested the use of mean GDP per capita when disaggregated income data are not available.

METHODOLOGY

This is a two-period causal comparative research study conducted to examine whether or not there were significant differences in Botswana's beef exports, revenue from beef exports, cattle producers' income and rural poverty given the before-and-after the EU-imposed LITS scenario in Botswana. The before-LITS period refers to prior-to-1999 era while the after-LITS period means period after 1999 to present. The study relied on secondary data from relevant private and government institutions. Some data on Botswana meat exports and their destinations were obtained from the Trade Statistics Unit, Central Statistics Office (CSO) and various Botswana Meat Commission (BMC) annual reports. Meat and cattle prices as well as BMC throughput were obtained from various BMC annual reports. The study also analyzed the impact of the EU-imported de-boned beef requirement on rural poverty in Botswana. Implementation costs of the LITS project were determined based on data obtained from the Department of Veterinary Services, Ministry of Agriculture. We then examined the impact of this extra financial burden to Botswana government on government transfers to poor households through the existing social safety nets (SSNs) programmes.

Estimation of Household Level Expenditure Model

A methodology developed by Elbers et al. (2002, 2003) and applied by CSO (2008) was used. A regression model of a log of per capita expenditure was estimated using household income and expenditure survey data for 2002/2003. The household logarithmic per capita expenditure model can be generally specified as follows;

$$\ln Y_{ch} = X_{ch}\beta + u_{ch} \qquad (1)$$

$$u_{ch} = \eta_c + \varepsilon_{ch} \qquad (2)$$

where Y_{ch} is the household level expenditure for household h in location c; X_{ch} is a set of independent variables; u_{ch} is the error term; η_c is the location effect and ε_{ch} is the individual component of the residual term.

Determination of the Poverty Datum Line

We followed CSO (2008) approach whereby the poverty datum line is the value of a basket consisting of five broad categories of consumer goods: food, clothing, personal items, household goods and housing. CSO (2008) chose the types and quantities of the constituent items in each category as the minimal essentials for the maintenance of physical health, personal hygiene and human dignity. Therefore, the total poverty line of household type h in the region r was obtained by adding the poverty lines for each of the five components as follows:

$$PDL_{hr} = \sum_{p=1}^{11} F_{pr} \times n_{ph} + \sum_{q=1}^{7} C_{qr} \times n_{qh} + \sum_{a=1}^{5} PI_{sr} \times n_{sh} + H_r + S_{ur} \qquad (3)$$

where PDL_{hr} is the PDL for household h in region r; F_{pr} is the cost of the food component for persons of age type p in region r; n_{ph} is the number of persons of age type p in household h; C_{qr} is the cost of the clothing component for person type q in region r; n_{qh} is the number of persons of type q in household h; PI_{sr} is the cost of personal items for person type s in region r; H_r is the cost of household items in region r; and S_{ur} is the cost of housing for household type u in region r.

Determination of Proportion of Population Living Below the Poverty Line

In this study, consumption expenditure was used as the welfare measure. Three poverty indices were derived to determine the proportion of population or households with incomes or consumption expenditure below the poverty line. The Head Count Index (P_0), Poverty Gap Index (P_1), and the Poverty Severity Index (P_2) were derived based on the following Foster et al.(1984) poverty measure expressions:

$$P_\alpha = \frac{1}{n} \sum \frac{(z_i - y_i)^\alpha}{z_i}$$

Where $\alpha = 0, 1, 2$, n is the total number of households in the population; z_i is the poverty line for household i, and y_i is the total consumption expenditure of household i. The Head Count Index (P_0), Poverty Gap Index (P_1), and the Poverty Severity Index (P_2) would be obtained when $\alpha = 0$, 1, and 2, respectively.

For comparison purposes, the country was divided into seven major regions comprising of South East, North East, North West, South West, Gaborone, Francistown, and Other. The PDL and incidence of poverty were calculated for each of these geographical regions.

Social Safety Nets (SSNs) in Botswana

The 2002-2003 household income and expenditure survey (HIES) data was used to describe the poverty situation in Botswana. We relied on earlier work by BIDPA (2007) which summarized the 2002-03 HIES sample household data and provided expansions to total households in Botswana. In their work, BIDPA (2007) classified 6,053 households in the HIES sample data according to whether or not they received government transfers through SSNs. They further classified all SSN beneficiary households into poor and non-poor households using per capita consumption expenditure quintiles based on poverty datum lines constructed by the CSO (BIDPA, 2007). This study adopted that classification and applied it to determine the effects of the EU-imposed LITS requirement on poverty in Botswana.

RESULTS

Botswana's Bovine Meat Exports to the European Union Countries

Figure 1 shows Botswana's fresh or chilled boneless meat and frozen boneless meat export to the European Union countries. Over the entire period, frozen boneless meat exports to the EU were more than fresh or chilled boneless bovine meat exports to the same region. As seen from Figure 1, the amount of frozen boneless bovine meat exports decreased from about 8,500 tonnes in 1998 to about 3,500 tonnes per year in 2008. This represents a decrease in frozen meat exports to the EU by approximately 59 percent. A similar trend can be observed in the case of fresh or chilled boneless bovine meat exports to the EU. The amount of fresh or chilled boneless bovine meat exports decreased from about 6,000 tonnes in 1998 to roughly 4,200 tonnes per year in 2008. This constitutes a 30 percent decrease in fresh or chilled meat exports to the EU in that same period. Despite this decline in boneless bovine meat exports to the EU over time, the BMC

continues to consider the EU beef market as the best in terms of returns for their fresh or chilled and frozen meat products. Over 80 percent of Botswana beef is produced for export markets. Of these, about 75-80 percent is exported to the EU, while 10-15 percent goes to the Republic of South Africa. Domestic beef consumption accounts for about 8 to 11 percent of BMC beef output (Machacha, 2003; BMC (various)). We should note here that Botswana exported beef to the EU under a tariff-quota system that allowed her a quota of 18,916 tonnes of beef exports to the EU per year. However, Botswana's beef exports have often fallen short of the quota.

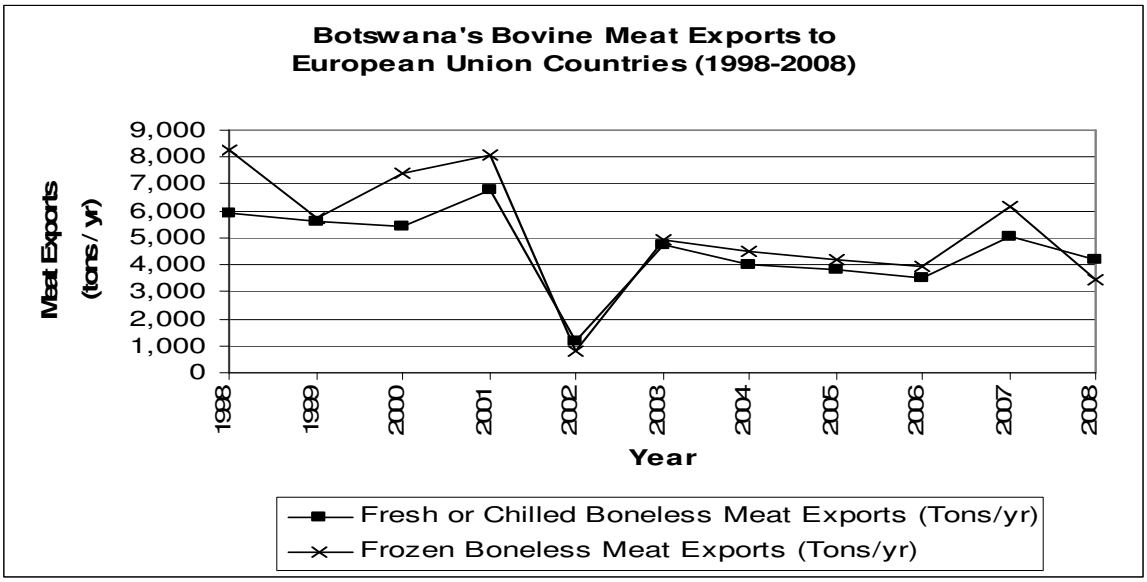

Fig. 1 Botswana's Bovine Meat Exports to European Union Countries: 1998-2008
Source: CSO (Various).

Botswana's Bovine Meat Export Earnings from European Union Countries

Figure 2 shows Botswana's bovine meat export earnings from European Union countries. Two contrasting scenarios emerge when export earning are analyzed using current and constant 2000 prices. When current prices were used, the total value of boneless bovine meat exports increased from about P240million in 1998 to P310million in 2008. This represents an increase in value of bovine meat exports to the EU by approximately 29 percent in the 1998-2008 period. On the other hand, if constant 2000 prices are used, as can be seen from Figure 2, we see a downward trend in the real value of bovine meat exports to the EU. The total value of boneless bovine meat exports fell from about

P250million in 1998 to P130million in 2008. This represents a decrease in real value of bovine meat exports to the EU by approximately 48 percent. It is interesting to note that the difference between current and constant price values of meat exports to the EU were insignificant in the period prior to 2002. However we observed ever-increasing and significant divergence between current and constant price values of meat exports to the EU from the year 2002 onwards.

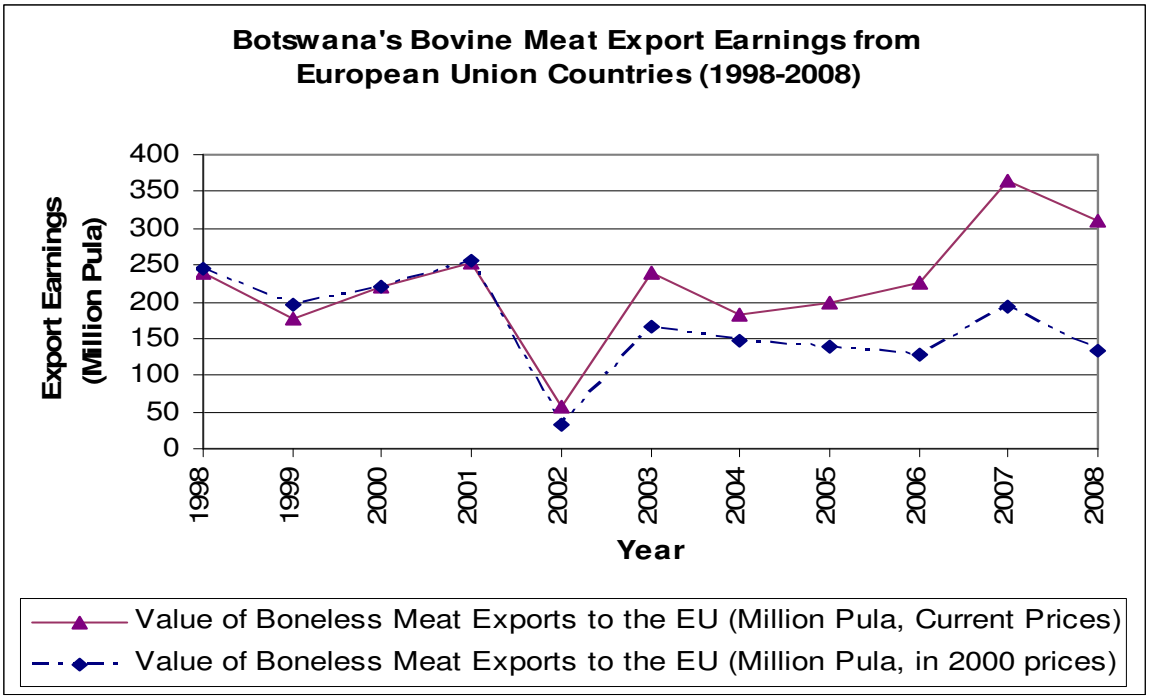

Fig. 2 Botswana's Bovine Meat Export Earnings from European Union Countries: 1998-2008
Source: CSO (Various).

Cattle Population and Throughput at Botswana Meat Commission (BMC)'s Abattoirs

Figure 3 presents total cattle population in Botswana for the 1979-2004. Results indicate that for the entire period, cattle numbers in a given year ranged between 2 and 3 million. We believe that the number of cattle per year were still in that range even well after 2004. The variation in cattle population from one year to the other has been attributed to a number of factors, among which disease outbreaks, drought and cattle prices were frequently cited (BIDPA, 2006;) However, as can be seen from figure 3, total cattle population in Botswana decreased from about 285 million in 1979 to about 220 million

cattle in 2004. This represents a decrease in total cattle population in the country by approximately 23 percent.

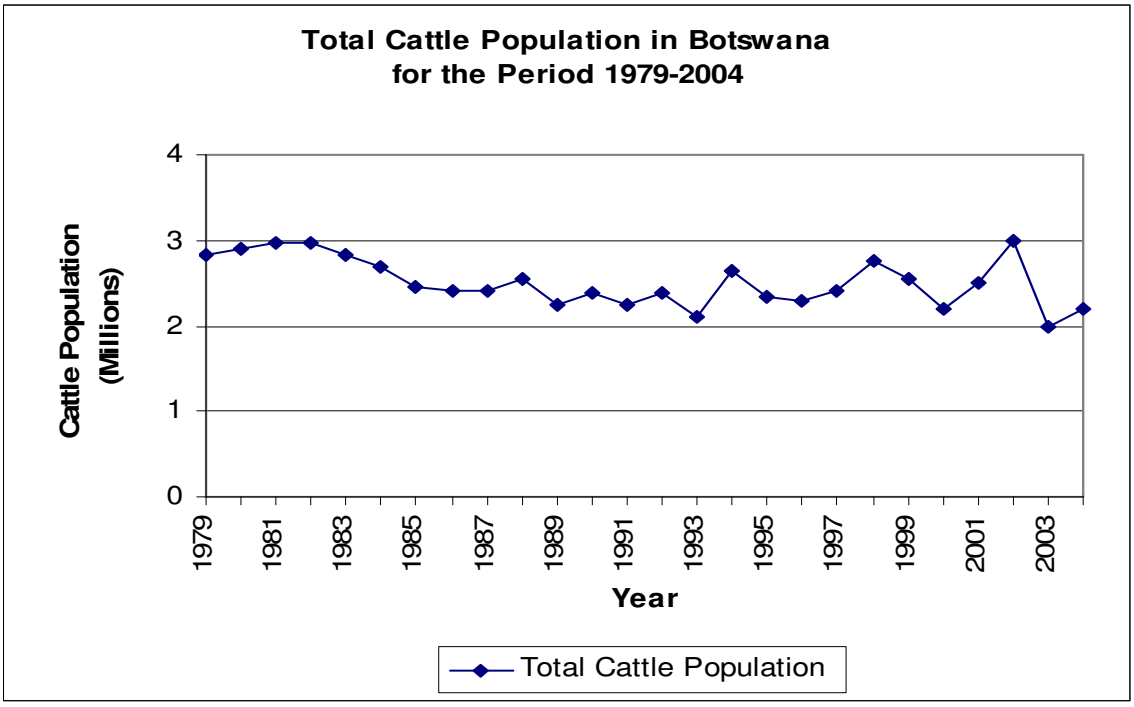

Fig. 3 Total Number of Cattle in Botswana by year: 1979-2004

Source: CSO (Various).

Figure 4 shows number of cattle slaughtered by the Botswana Meat Commission in the period 1998-2008. Cattle throughput at the BMC ranged between 110,000 and 180,000 over the entire study period. Assuming average cattle population of 2 million a year, the BMC throughput represents about 6-9% off-take rates. The BMC has the capacity to slaughter 260,000 cattle per year. However, average BMC capacity utilization since 1998 has been 55 percent (or 143,000 cattle per year). Normal off-take rates in Southern Africa range between 20 and 22%, which is equivalent to slaughtering 500,000-575,000 cattle per annum in Botswana (Machacha, 2003). This shows how Botswana's cattle production system is lagging behind on the regional scene. Furthermore, a general downward trend in BMC throughput can be noticed on Figure 4. It declined from about 160,000 cattle in 1998 to 120,000 in 2008, a decrease in throughput of about 25 percent. It is worth noting that the increase in BMC throughput between 2005 and 2007 is largely attributed to the

fact that BMC increased cattle prices by 40 percent in January 2006 and removed the penalty for measly beef, which used to be discounted at 70 percent of the original value. In addition, the BMC introduced a new grade (the Sound Prime) to motivate cattle producers to change production systems from the oxen production to the weaner / feedlot system (BMC, 2005; 2006).

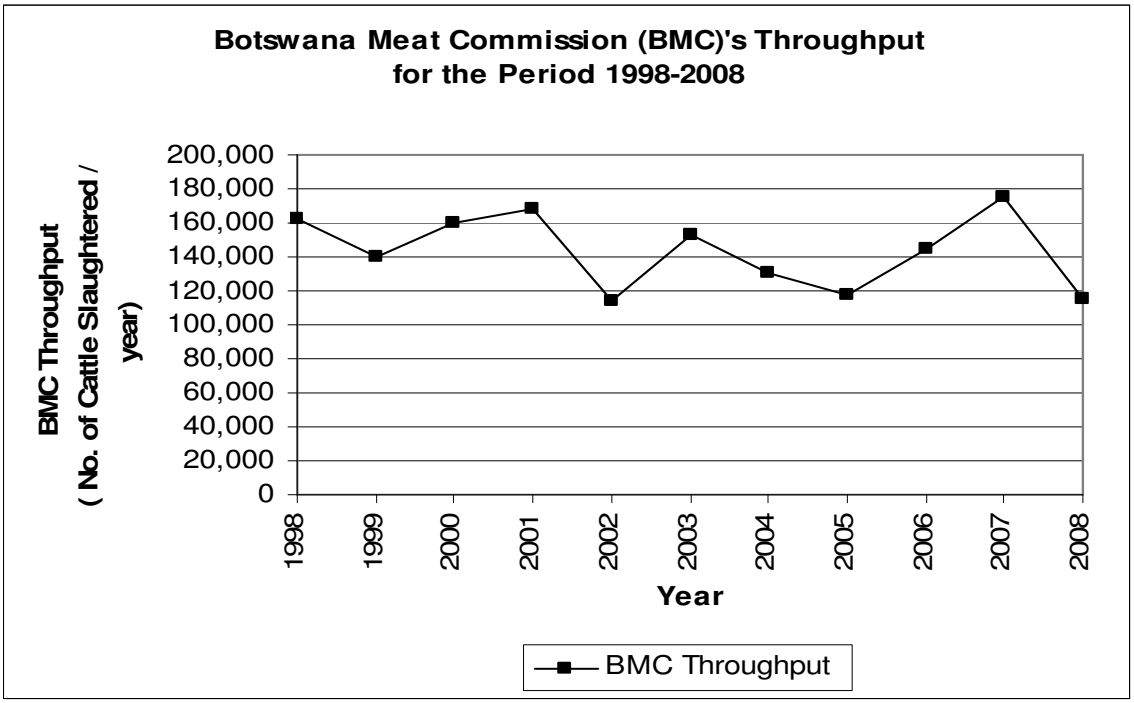

Fig. 4 Annual Cattle Throughput at the BMC's Abattoirs: 1998-2008

Source: BMC Annual Reports (Various).

Incidence of Poverty in Botswana: Who is Poor?

Before investigating the relationship between the EU-imposed LITS and poverty, we use the 2002-2003 household income and expenditure survey (HIES) data to describe the poverty situation in Botswana. Table 1 presents mean monthly poverty datum lines by geographical regions. In 2002/03, the national mean household poverty line was estimated at P571.65 per month. The average household size was 4.14 persons (CSO,2008). However, the mean household PDL for cities and towns (P556.84 per month) was lower than the national average while the PDL for urban villages

(P587.15 per month) was greater than the national average. The mean household PDL for rural and urban areas were estimated at P570.09 and P572.76 per month, respectively. The expenditure on food constituted about 63-84 percent of the total mean household PDL across the geographical regions. Rural and urban villages recorded higher proportions of food compared to cities and towns.

Table 1 Mean Poverty Datum Line (PDL) by Geographic Region (2002/03)

Geographical Category	Food (Pula / month)	Clothing	Personal Items	Household Goods	Housing	Total PDL	Proportion of Food (%)
Urban	427.25	39.75	14.30	28.00	57.57	572.76	74.59
Rural	471.08	45.23	15.38	22.10	9.59	570.09	82.63
Cities/Towns	361.92	32.72	12.40	34.74	110.27	556.84	65.00
Urban Villages	486.25	46.10	16.02	21.92	9.99	587.15	82.82
Rural Areas	471.08	45.23	15.38	22.10	9.59	570.09	82.63
Gaborone	338.89	31.22	12.08	34.78	111.12	532.22	63.68
Francistown	387.83	33.69	11.57	32.70	109.82	581.06	66.74
Other Towns	383.75	34.65	13.56	36.17	109.08	582.67	65.86
South East	464.22	42.91	15.62	21.31	9.79	560.49	82.82
North East	482.84	47.64	15.48	23.00	9.88	585.81	82.42
North West	478.05	43.13	15.31	20.91	9.14	573.09	83.42
South West	516.53	52.15	17.16	22.10	9.87	624.64	82.69
National	445.41	42.02	14.75	25.56	37.69	571.65	77.92

Table 2 Proportion of People Living Below the PDL by Geographical Region (2002/03)

	Sample Size (Households)	Total Population	Population Share (%)	Population with Consumption < PDL	Head Count Index (P_0)	Poverty Gap Index (P_1)	Poverty Severity Index (P_2)
Urban	4,589	915,065	56.0	117,659	19.4	6.5	3.0
Rural	1,464	717,857	44.0	321,808	44.8	18.4	9.8
Cities/Towns	2,826	369,812	22.6	39,113	10.6	3.3	1.6
Urban Villages	1,763	545,253	33.4	138,547	25.4	8.7	4.1
Rural Areas	1,464	717,857	44.0	321,808	44.8	18.4	9.8
Gaborone	1,418	176,216	10.8	11,520	6.5	1.9	1.0
Francistown	595	81,069	5.0	11,448	14.1	4.4	2.0
Other Towns	813	112,527	6.9	16,144	14.3	4.7	2.1
South East	1,310	494,101	30.3	152,397	30.8	11.8	6.0
North East	1,348	631,484	32.5	204,877	38.5	14.1	7.0
North West	369	136,464	8.4	57,755	42.3	18.6	10.7
South West	200	101,062	6.2	45,326	44.8	20.3	10.9
Total	6,053	1,632,922	100	499,467	30.6	11.7	6.0
Rural/Urban Ratio					2.31	2.82	3.23

Table 2 presents the proportion of people living below the poverty datum line by geographical region. Overall, approximately 31 percent of the national population was living below the poverty line in 2002/03. However, the proportion of households that were living below the poverty line in the urban areas (19.4 percent) was lower than the national average while the proportion of families that were living below the PDL in the rural areas (44.8 percent) exceeded the national poverty rate. The incidence of poverty in the rural areas is at least two-folds that in the urban areas when using the Head count and the Poverty Gap indices. However, the Poverty severity index shows that the incidence of poverty in the rural areas was at least three-fold that obtaining in urban areas.

BIDPA (2006; 2007) summarized the 2002-03 HIES sample household data and provided expansions to total households in Botswana. HIES sampled a total of 6,053 households nationwide as can be seen from Table 3 below. The sample households were classified according to whether or not they received government transfers through social safety nets (SSNs) programmes (BIDPA , 2007).

Table 3 Households Benefiting from Government Transfers Through SSNs

	Sample beneficiary households		Population households	
Benefit Status	Frequency	Percent	Frequency	Percent
Did not benefit from SSNs	4,510	74.5	267,864	68.0
Benefitted from SSNs	1,543	25.5	126,408	32.0
Total	6,053	100	394,272	100.0

Source: Adopted from BIDPA (2007).

Table 3 presents a summary of the 2002-03 HIES sample households and respective expansions to total households in the country. BIDPA (2007) investigated the effectiveness of social safety nets (SSNs) in Botswana as poverty reduction interventions. Thus, they categorized HIES sample households according to whether or not they received government transfers through SSNs. We strongly believe that SSNs are meant to alleviate poverty directly and must be pro-poor. It is on this basis that we adopt the BIDPA (2007)'s SSN-beneficiary approach to poverty and apply it in our analysis. It can be seen from Table 3 that of the 6,053 sampled households, only 1,543 (25 percent) received government transfers through SSNs while the rest did not benefit from SSN programmes. At country level, 126,408 households (32 percent) were enrolled in

government SSN programmes while 267,864 households (68 percent) did not benefit. Ideally, SSN beneficiaries must be the poor people! Is that the case in Botswana? The answer is "NO" according to findings of BIDPA (2007) as can be deduced from Table 4.

Table 4 Households Receiving Government Transfers By Expenditure Quintile

Quintile	Monthly per capita consumption expenditure	Sample Households	
		Number	Percent
Q1	Y < P465.22	509	33.0
Q2	465.22 < Y ≤ 821.73	422	27.3
Q3	821.73 < Y ≤ 1410.34	324	21.0
Q4	1410 < Y ≤ 2803.40	194	12.6
Q5	Y > 2803.40	94	6.1
	Total	1543	100.0

Source: Adopted from BIDPA (2007).

Table 4 shows SSN-beneficiary households by per capita consumption expenditure quintile using poverty datum lines (PDLs) constructed by the Central Statistics Office in the HIES database to classify households as poor and non-poor The lower quintile (Q1) represents poor households (with monthly per capita consumption expenditure of less than P465.22) while the other four quintiles (Q2, Q3, Q4 and Q5) represent non-poor households (BIDPA, 2007). Results indicate that non-poor households constitute a little over two-thirds of the beneficiaries of government transfers through SSNs. Poor households account for only a third of the SSN-beneficiaries. This result implies that SSN programmes in Botswana are not well-targeted at poor households and that significantly hindered progress towards poverty reduction in the country.

Another important dimension of poverty is the role played by gender. Table 5 shows how sample and population heads of household were distributed by gender. Results indicate that majority of the sample SSN-beneficiary households were female-headed (95 percent) while 54 and 46 percent of the population households were male-headed and female-headed, respectively.

Table 5 Distribution of Population and Sample Beneficiary Household by Gender

	Sample beneficiary households		Population households	
Gender	Frequency	Percent	Frequency	Percent
Male	82	5	211,403	53.6
Female	1,461	95	182,869	46.4
Total	1,543	100	394,272	100.0

Source: Adopted from BIDPA (2007).

Table 6 presents the distribution of poverty across life-cycle using per capita consumption expenditure quintiles. The lower quintile (Q1) represents the poor households while the other quintiles (Q2, Q3, Q4 and Q5) represent non-poor households. Results revealed that poverty is most prevalent in children and elderly in Botswana. Children aged 0-5 years scored the highest headcount poverty index (about 42 percent), followed by elderly aged 65 and above with a headcount poverty index of 37 percent. Furthermore, Table 7 presents individuals in each age group as poor and non-poor using poverty datum lines. Similar results were obtained. An examination of poverty headcount indices also revealed that poverty is highest among children aged 0-5 years (recorded a poverty headcount index of 41 percent) and elderly aged 65 and above (recorded a poverty headcount index of 37 percent). The least hit by poverty are the youth aged 21-39 years, with a poverty headcount index of 23 percent.

Table 6 Poverty By Age Group and Per Capita Expenditure Quintile

Per Capita Expenditure Quintile	Age Group						Total
	Children (0-5 yrs)	Children (6-11)	Youth (12-20)	Youth (21-39)	Elderly (40-64)	Retired Adult (65+)	
Q1	98,604	92,945	102,429	99,259	67,521	32,738	493,496
Q2	61,046	74,230	93,735	94,767	58,162	25,122	407,062
Q3	36,705	46,903	66,308	89,633	46,110	16,868	302,527
Q4	23,830	30,162	52,204	84,927	42,166	8,719	242,008
Q5	15,062	19,062	28,544	82,934	37,535	4,694	187,831
Total Population	235,247	263,302	343,220	451,520	251,494	88,141	1,632,924
Relative Poverty Head Count Index	41.92	35.30	29.84	21.98	26.85	37.14	30.22

Source: Adopted from BIDPA (2007).

Table 7 Distribution of Population and Poverty (Headcount Index) By Age Group

Age Group	Non-Poor	Poor	Total	Percent	Headcount Index
Children (0-5 years)	139,970	95,277	235,247	14.4	40.50
Children (6-11)	170,354	92,947	263,301	16.1	35.30
Youth (12-20)	238,813	104,407	343,220	21.0	30.42
Youth(21-39)	347,215	104,305	451,520	27.7	23.10
Elderly (40-64)	180,728	70,766	251,494	15.4	28.14
Retired Adult (65+)	55,710	32,432	88,142	5.4	36.80
Total Population	1,132,790	500,134	1,632,924	100.00	30.63

Source: Adopted from BIDPA (2007).

Table 8 presents mean monthly total household expenditures from all income sources and from government transfers through SSNs. On average, poor households (Q1) received monthly government transfers of P104.02 whereas non-poor households in the fifth quintile (Q5) received P196.26. The size of mean government transfers through SSNs per household does not seem to be evidently correlated with per capita household expenditure quintiles. What is obvious though is that poor households depend more on government transfers than non-poor households. Results indicated that government transfers account for about 19 percent of the consumption expenditure for poor households, compared to only 3 percent of non-poor households in the fifth quintile (Q5) (BIDPA, 2007).

Table 8 Share of Beneficiary Expenditure from Government Sources

Per Capita Expenditure Quintile	Average Monthly Total Household Consumption Expenditure		Share of Government Transfers (%)
	All Sources	Government Transfers	
Q1	613.53	104.02	18.9
Q2	1,129.90	166.88	16.4
Q3	1,758.51	146.60	10.3
Q4	3,200.22	100.14	4.7
Q5	11,197.68	196.26	2.8
	2,841.07	208.78	17.6

Source: Adopted from BIDPA (2007).

Impact of the EU-imposed LITS Requirement on Poverty in Botswana

The study investigated the impact of the EU-imported de-boned beef requirement on rural poverty in Botswana using government transfers to the poor through well-targeted SSNs programmes. Table 9 presents average annual household expenditure from government transfers through SSNs programmes by per capita consumption expenditure quintiles. It can be seen that there are 1,543 households that receive government transfers amounting to P2,504,922.48. Of the 1,543 beneficiary households, only 509 are poor households (those in the lower quintile (Q1) and are shown to be receiving only P635,354.16 per year. Non-poor households receive 75 percent of government transfers through SSNs each year. Suppose all the government transfers being received by non-poor households (those in quintiles Q2 through Q5) were to be re-directed towards poor households. The mean annual total household consumption expenditure for the poor will be increased from P635,354.16 to P2,504,922.48. This translates to a mean monthly total household consumption expenditure from government transfers through SSNs programmes of P4,921.26. Based on poverty datum lines constructed by the CSO, and the new household consumption expenditure of P4,921.26, there will be no poor household in Botswana. Initial costs of the LITS project went over US$35.0 million in order to comply with the EU beef market requirement. This project is fully funded by the Botswana government. Based on the initial costs of the project, on average, the Botswana government spends P52million annually to meet the EU imported de-boned meat requirement. These are funds being diverted from the development budget for the country.

Table 9 Annual Household Expenditure From Government Transfers through SSNs

Quintile	sample number	mean monthly total household expenditure from govt transfers	mean annual total household expenditure from govt transfers
Q1	509	104.02	635,354.16
Q2	422	166.88	845,080.32
Q3	324	146.60	569,980.80
Q4	194	100.14	233,125.92
Q5	94	196.26	221,381.28
	1,543		2,504,922.48

Source: Author calculated from BIDPA (2007).

BIDPA (2007) reported that, at the country level, 126,408 households benefited from government transfers through SSNs programmes (see Table 3). Of these SSN - beneficiary households, only 33 percent were poor households (see Table 4) according to CSO poverty datum lines. This means only 41,715 households are poor in Botswana. These are the only households that SSNs programmes should target. Given a mean monthly household expenditure of P104.02 (as shown in Table 9), total mean monthly consumption expenditure budget for the poor would amount to P4,339,194.30. This monthly figure translates, on average, to P52,070,331.60 per year. The implementation of the LITS project costs the Botswana government P52million per year on average. If this money was to be redirected to finance SSNs programmes, the mean annual household consumption expenditure from government transfers in Botswana would at least double.

Contribution of Cattle Income to Household Gross Income and Poverty Alleviation

Tables 10 and 11 as well as Figure 5 present household cattle ownership by income level based on the household income and expenditure survey for the years 2002-03. About 62 percent of the total households in Botswana did not own any cattle in 2002/03. However, in the case of those households that own cattle, results show that cattle ownership rises with income for monthly household income levels between P600 and P8,000. Interestingly, there appears to be relatively higher cattle ownership among very low income households. On the other hand, there is lower cattle ownership amongst very high income households. This suggests that cattle are an important source of income for low income households. Thus, an increase (decrease) in income from cattle is likely to have a positive (negative) impact on the incidence of poverty in the country.

Table 10 Household Cattle Ownership By Income Level (2002/03)

		Disposable Income Bracket (Pula Per Month)											
	Total	*<200*	*200-400*	*401-600*	*601-1000*	*1001-1500*	*1501-2000*	*2001-3000*	*3001-4000*	*4001-6000*	*6001-8000*	*8001-10000*	*10000+*
Households	394,272	66,772	54,934	40,526	54,494	38,111	25,658	34,083	22,019	24,416	11,734	7,606	13,920
Number of Cattle	Number of Households												
0	*246,335*	*38,398*	*35,504*	*26,719*	*37,100*	*23,566*	*16,147*	*20,898*	*13,404*	*14,253*	*6,544*	*4,694*	*9,107*
1-9	77,885	15,186	11,280	7,798	10,631	7,945	5,017	6,978	4,112	4,215	2,874	833	1,015
10-19	33,312	7,713	5,101	3,154	3,387	3,286	2,405	2,773	1,755	2,187	509	408	634
20-39	20,880	3,189	1,493	1,725	2,202	2,399	1,109	2,026	1,886	1,699	1,122	721	1,310
40-59	7,889	1,321	1,123	629	561	420	641	667	376	946	242	371	593
60-79	2,921	210	104	181	287	238	165	499	227	468	235	102	207
80-99	1,143	126	0	81	0	131	0	48	98	162	50	71	376
100-149	1,380	232	249	49	66	0	94	101	0	218	0	209	162
150-199	495	0	0	38	144	0	0	0	60	82	32	0	140
200+	2,033	398	81	152	115	126	81	93	101	187	126	198	377

Source: CSO (2008)

Table 11 Estimated Number of Cattle Ownership By Income Level (2002/03)

		Disposable Income Bracket (Pula Per Month)											
	Total	*<200*	*200-400*	*401-600*	*601-1000*	*1001-1500*	*1501-2000*	*2001-3000*	*3001-4000*	*4001-6000*	*6001-8000*	*8001-10000*	*10000+*
Households	394,272	66,772	54,934	40,526	54,494	38,111	25,658	34,083	22,019	24,416	11,734	7,606	13,920
Range	Estimated Number of Cattle												
1-9	389,425	75,930	56,400	38,990	53,155	39,725	25,085	34,890	20,560	21,075	14,370	4,165	5,075
10-19	333,120	77,130	51,010	31,540	33,870	32,860	24,050	27,730	17,550	21,870	5,090	4,080	6,340
20-39	417,600	63,780	29,860	34,500	44,040	47,980	22,180	40,520	37,720	33,980	22,440	14,420	26,200
40-59	315,560	52,840	44,920	25,160	22,440	16,800	25,640	26,680	15,040	37,840	9,680	14,840	23,720
60-79	175,260	12,600	6,240	10,860	17,220	14,280	9,900	29,940	13,620	28,080	14,100	6,120	12,420
80-99	91,440	10,080	0	6,480	0	10,480	0	3,840	7,840	12,960	4,000	5,680	30,080
100-149	138,000	23,200	24,900	4,900	6,600	0	9,400	10,100	0	21,800	0	20,900	16,200
150-199	74,250	0	0	5,700	21,600	0	0	0	9,000	12,300	4,800	0	21,000
200+	406,600	79,600	16,200	30,400	23,000	25,200	16,200	18,600	20,200	37,400	25,200	39,600	75,400

Source: CSO (2008) and own calculations

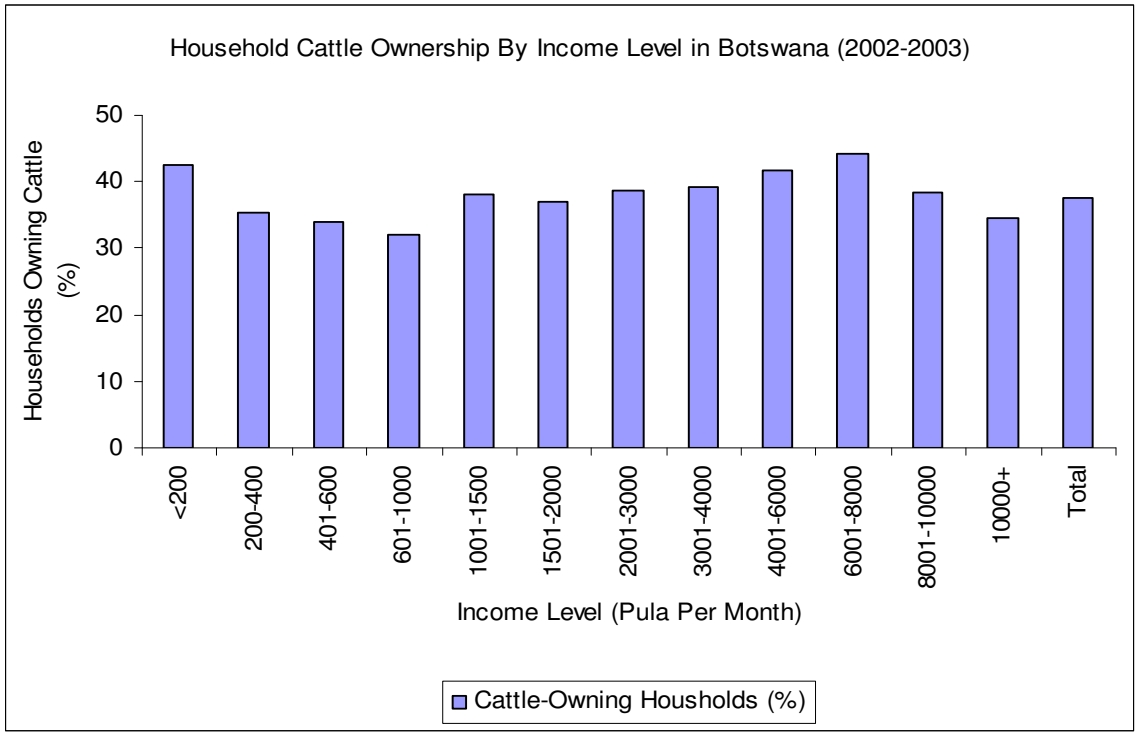

Fig. 5 Household cattle ownership by income level (2002-03)

Table 12 and Figure 6 present the proportion of income derived from cattle ownership by income level. Results show that income from cattle provides a greater proportion of total income for poorer households. For instance, cattle income contributes about 62 percent of gross income for cattle-owning households with monthly income of less than P200, 25 percent for the income bracket P401-P400, and 18 percent of household gross income for the income bracket P401-P600 per month. For higher income cattle-owning households, the contribution of cattle income to gross income was estimated at about 2 percent. This further emphasizes the importance of income from cattle to the poorer cattle-owning households in Botswana. A similar trend was observed when all households (cattle owners + non-cattle owners) were considered. Cattle income contributed about 26 percent of gross income for households with monthly income of less than P200, 9 percent for the income bracket P401-P400, and 6 percent of household gross income for the income bracket P401-P600 per month. For higher income households, the contribution of cattle income to gross income was estimated at about 1 percent (Jefferis, 2007).

Table 12 Estimated Income from Cattle Ownership By Income Level (2002/03)

	Disposable Income Bracket (Pula Per Month)												
	Total	*<200*	*200-400*	*401-600*	*601-1000*	*1001-1500*	*1501-2000*	*2001-3000*	*3001-4000*	*4001-6000*	*6001-8000*	*8001-10000*	*10000+*
Households	394,272	66,772	54,934	40,526	54,494	38,111	25,658	34,083	22,019	24,416	11,734	7,606	13,920
Range	Estimated Income from Cattle Sales (Million Pula)												
1-9	109.7	21.4	15.9	11.0	15.0	11.2	7.1	9.8	5.8	5.9	4.0	1.2	1.4
10-19	93.8	21.7	14.4	8.9	9.5	9.3	6.8	7.8	4.9	6.2	1.4	1.1	1.8
20-39	117.6	18.0	8.4	9.7	12.4	13.5	6.2	11.4	10.6	9.6	6.3	4.1	7.4
40-59	88.9	14.9	12.6	7.1	6.3	4.7	7.2	7.5	4.2	10.7	2.7	4.2	6.7
60-79	49.4	3.5	1.8	3.1	4.8	4.0	2.8	8.4	3.8	7.9	4.0	1.7	3.5
80-99	25.7	2.8	0.0	1.8	0.0	3.0	0.0	1.1	2.2	3.6	1.1	1.6	8.5
100-149	38.9	6.5	7.0	1.4	1.9	0.0	2.6	2.8	0.0	6.1	0.0	5.9	4.6
150-199	20.9	0.0	0.0	1.6	6.1	0.0	0.0	0.0	2.5	3.5	1.4	0.0	5.9
200+	114.5	22.4	4.6	8.6	6.5	7.1	4.6	5.2	5.7	10.5	7.1	11.2	21.2

Source: CSO (2008) and own calculations

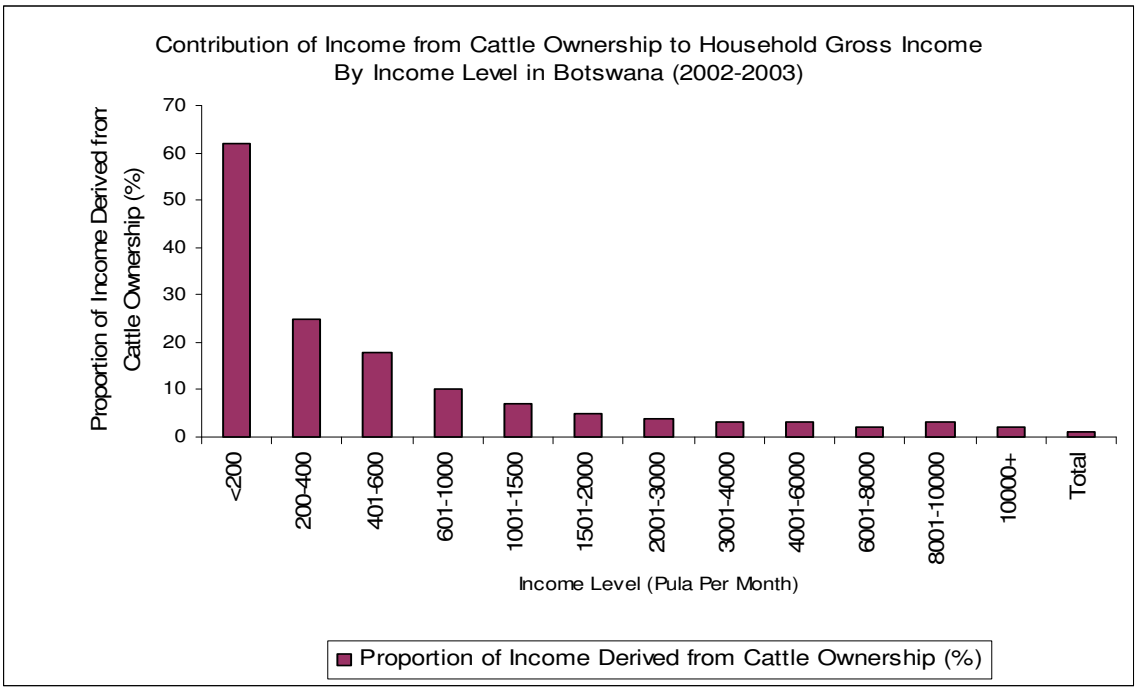

Fig. 6 Contribution of cattle income to household gross income (2002-03).

CONCLUSION REMARKS

This study examined the effects of the European Union (EU)-imposed livestock identification and traceback system (LITS) on Botswana's beef exports, revenue and rural poverty. The Botswana Meat Commission, the sole exporter of beef, is heavily reliant on the European Union beef market for "better" returns on its fresh or chilled beef as well as the frozen boneless beef. However, both fresh or chilled boneless beef and frozen beef exports to the EU have declined significantly over the study period. A similar trend was observed in the case of the real value of total boneless bovine meat exports. The decline in total beef exports to the EU can be attributed to several factors including outbreak of cattle diseases, drought as well as cattle prices. However, though not proven in this study, we believe supply of cattle to the BMC also went down because farmers whose cattle did not have reticular bolus are not allowed to sell them to the BMC. Not all cattle farmers have inserted reticular bolus into their cattle even at this point in time.

The on-going EU-imported de-boned meat requirement of individual identification of cattle and traceability of beef products has imposed an extra financial burden on Botswana government. The imposed financial burden is almost the size of the current budget for social safety net programmes in Botswana. If money spent on the LITS project were to be re-directed towards poverty alleviation programmes, the mean annual household consumption expenditure from government transfers through SSNs would at least double and reduce the incidence of poverty in the country. However, due to data limitation and time constraints, a comprehensive cost-benefit analysis was not performed to consider possible alternative markets for Botswana beef.

A high proportion of national population in Botswana lived below the poverty line, with the incidence of poverty in the rural areas almost double that experienced in the urban areas. However, the majority of cattle were owned by rural households with average monthly income not exceeding P1000 per month. Cattle income contributed a significant proportion of gross income for poorer households. Thus, an increase (decrease) in income from cattle is likely to have a positive (negative) impact on the incidence of poverty in the country. Any circumstance that negatively (positively) impacts trade in the cattle industry will have a negative (positive) impact on poverty in Botswana. Livestock development support programmes that target cattle-owning households to improve cattle off-take in the rural areas will positively and significantly contribute towards poverty reduction in the country.

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