“Analysis of institutions, policies and the cattle supply chain for small-scale farmers in Ngamiland District, Botswana”

Field Practicum Report

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Introduction

Cattle raising in Ngamiland District, Botswana plays an important role in community livelihoods, representing more than 30% of household income and, by tradition, it is also a social and cultural icon of status among the members of the community.

Among the most important challenges, there are institutional issues and foot-and-mouth disease (FMD), a highly contagious disease with control methodologies that obstruct the flow of the cattle market.

There is a lack of alignment between the relevant national institutions and the needs of the smallholders. These weak interactions and lack of coordination between the financial institutions and the national institutions responsible for issuing the FMD outbreak bulletins, accompanied by inefficient measures to provide maintenance to the veterinary fences, affect the production of small farmers in the communities. These and other situations influence cattle production in a negative way, often pushing small farmers and their households into poverty.

The present project describes and examines the supply chain of cattle and the problems present in each section of the chain. Key economic factors are evaluated toward improving the flow of the market and provide local development alternatives. A set of procedures and recommendations to improve the supply chain of cattle in Ngamiland District conclude the report.

Objectives

The objectives of this project were to:

- Provide a set of recommendations to improve the flow of the cattle market between communities and within supply chains so as to improve the income potential that comes from cattle raising in Ngamiland communities.
- Use information collected during field research on the current situation of the cattle market in Botswana to inform business strategies of small-holders seeking to improve their market positioning for these products.
- Provide a roadmap towards strategic design of cattle production in Botswana through inter-institutional coordination and improved policies related to cattle production.
Botswana is neighbored by South Africa to the east and south, Zambia to the north and Zimbabwe to the northeast. The country’s total land area is approximately 584,000 km$^2$, with a mean altitude above sea level of 1000m. It has a population of 2,031,000 and a 1.2% population growth rate (World Bank, 2011). Approximately 17% of the country is national parks, forest, game and private reserves (Burgess, 2006).

Most of the country’s soils are sandy, and are alluvial and colluvial. The western area of the country is covered by deep sands shaping the Kalahari Desert, which is two-thirds of the country’s land area. People usually get water through boreholes reaching underground aquifers at a depth of between 200m and 1000m.

Surrounding the Okavango Delta the soils are mostly silty sands with little organic content; and as the rivers flow through the delta the soils turn fine sandy on the seasonally flooded flats and silt sandy on the dry lacustrine shoreline areas (Burgess, 2006).

Botswana enjoys a wealth of natural resources, but regarding agriculture the areas used for crops vary every year since the country is prone to drought. As a result not all the areas planted can be harvested, since the crops depend on rainfall during the growing season. Around 90% of Botswana’s territory is classified as rangelands, which account for beef production (80% communal land and 20% commercial rangelands)(A.A. Aganga and S.J. Nsoso, 2009).

Cattle History in Botswana

In the pre-colonial time the areas that where outside the fields and the village were known as grazing land. Their cattle holding system was called a mafisa, which is characteristic of Tswana and Sotho societies, in which the ruling class loaned cattle to clans or families, and they became herdsmen through a type of feudal system (Parsons, 1977). Cattle in Botswana were seen as a production good used for draft, transport and calves, as a consumption good, and as a form of long-term investment and saving for future production and consumption (Hubbard, 1986)

During colonial times (1889-1966) the building of water-points increased, which opened unexploited grazing areas for perennial use. This increase in grazing land combined with increased use of veterinary medicines to control for disease led to large increases in cattle population. Part of the plan also included fencing the country into separate veterinary compartments. However, colonizers' use of agro-ecosystems was mostly
focused on increasing short-term outputs, ignoring the depletion of the resources that produced the wealth (Flora, 2001).

In the 1950s, a change in the world beef trade opened new doors to the British market, as a consequence of a beef shortfall in the US supply.

One of Britain’s post-war colonial policies was investment in production through the Colonial Development Corporation (CDC), which the British Secretary of State used to initiate, finance and operate projects related to agricultural production or other development activities in the colonial empire. This included a development and welfare grant of 400000 pounds for the Bechuanaland Protectorate (now Botswana) to drill boreholes. This contributed to a 34% increase in the cattle population between 1949 and 1959. However, the lack of water supplies limited the expansion of livestock production and reduced the carrying capacity of the range (Hubbard, 1986).

From 1966 to present times, the post-colonial era has been marked by a divergence between production goals and cattle numbers, which has led to the creation of livestock as a national policy.

Revenues from cattle during the colonial times were more than twice the government’s expenditures on the industry, but after the post-colonial era, expenditure on the industry became higher than tax revenues from the state. After the 1970s, the industry’s fiscal position shows how the industry status changed from being the leading sector in the economy and preferred choice for private local investment to being a drain on the economy. As a result the industry contributed to a reduction of public revenue while attracting an increasing amount of public expenditures on infrastructure such as fences, treks’ maintenance, breeding research, subsidies for bulls’ purchase and insemination, etc. (Hubbard, 1986).

In 1975, when the UK (European market for Botswana) joined the EEC (now known as EU), the country’s beef exports were threatened by two issues. First were the tariffs and quotas, and second was the need to meet the European quality standards, set by the EEC Veterinary Commission which took the place of UK’s Ministry of Agriculture as the licensing authority for meat imports. Still, Botswana did gain fairly good access for their beef in the EEC market, thanks to a special concession in the Lome Convention Agreement.

In general, cattle, more than other livestock animals, have always played an important role in the social and economic dynamics in Botswana society. It is also used as a means of exchange, or in case of disputes, punishments are settled with payments of cattle, and if a man wants to marry, he has to pay the bride’s dowry by delivering cattle to the woman’s family.
The Cattle Sector of Botswana’s Economy

The rangelands, also known as the “Cattle Post”, is an unfenced area which has a central watering point, and near it the owner or the herdsman builds a hut and takes care of providing water to livestock. Water is usually pumped, but in certain areas where the water table is shallow, water is obtained from hand-dug wells. The cattle post usually has a fenced kraal traditionally made of thorn tree branches and tree trunks set deep into the ground. Currently, the kraals are mostly built with poles and wire (i.e. commercial ranching). The cattle are released during the day, sometimes for several days before they return for water. During the winter and the rainy season cattle can graze far from the kraal. Non-lactating cattle stay outside the kraal sometimes, except in places where there are predators; cows with calves tend to stay closer to the kraal because they need water more often than the rest of the cattle and to protect the calves from predators (Burgess, 2006).

Land Tenure on Botswana Farms

Land tenure goes from tribal or traditional, to leasehold, to freehold. In the case of tribal and leasehold land, both of them go back to the state once the period established in the lease agreement expires. Although, tribal lands’ fields and boreholes are often passed from one generation to the next; however, if not used on a regular basis the District Land Board may withdraw the right to it. Leaseholds are maintained for 50 years and renewed if desired. On the other hand, freehold is held for life or 999 years. Freehold and leasehold land are administered by the government authorization, while tribal land is administered through the District Land Board authorization (Burgess, 2006).

Tribal Ranch and Cattle Post Sizes in Botswana

The standard size for tribal grazing lands ranches (TGLP) is 8km x 8km, though this size may be reduced to 6km x 6km where there is more water availability. Size is set through the water allocation policy of the Department of Water Affairs. On the cattle posts, the local Land Board authorizes the use of boreholes or wells and these areas are not usually fenced since it is common land.

In locations where traditional cattle owners have few animals, they form syndicates so they can own a borehole jointly.
Socio-Economic and Market Issues of Cattle in Botswana

Cattle in Botswana represent 73% of the total livestock population. This is a common trend in southern Africa since cattle is a dominant species there. Cattle raising has many functions as a source of income to the household, food, and draft power (Ababa, 2012). Due to climate and geographic conditions, a high percentage of Botswana’s rural population is dispersed and has very little potential to generate a viable income from economic activities, although 38.9% of the population lives in the rural areas (Jefferis, 2005; World Bank Report, 2012). There is very low potential for crop production and this makes cattle the more common source of income and food for most of the smallholders in the traditional farming system. Cattle also are an important asset for their multiple uses in social, economic and cultural terms. Cattle are sacrificed for cultural and spiritual ceremonies. Due to the lack of banking institutions in the far parts of the country, cattle are seen as the only investment (“bank of the hoof”) and a symbol of wealth, prestige and social security among the smallholders. The higher the number of cattle, the more prosperous and respected they become and they get a higher recognition and command in the society. Several studies show that cattle in Botswana provide 33.3% of total household income (Ababa, 2012).

At independence (1966) the population of the national cattle herd was reduced because of drought, thus one of the main objectives of the new government was to increase the population of cattle. This was done through the introduction of subsidized borehole technology. Also the government sought improvement in disease control by providing free vaccination against major diseases, which reduced cattle mortality (Malope & Batisani, 2008).

As a result of expanding the national cattle herd overstocking and range degradation appeared, thus this created over-grazing, retreat of preferred perennial grasses and encroachment of thorny shrubs, which is frequently observed in areas where people practice communally managed livestock grazing and leased ranches, particularly close to water sources (Wallgren et al., 2009).

Therefore, the government sought alternative ways to increase production while reducing range degradation; also, it became evident that only a few cattle owners could pay for borehole drilling and once they had them, they had de facto ownership of grazing in the area; this was considered a land grab (Peters, 1997). In order to reduce degradation and increase equity, mostly in communal areas, the government created two related land reforms for agriculture, the Tribal Grazing Land Policy (TGLP) in 1975 and the National Policy on Agricultural Development (NPAD) in 1991. The TGLP aimed to enhance cattle productivity and range management, to improve the living standards of rural farming communities, and to reduce the inequity between the rich and poor.
The NPAD objectives were also to enhance cattle productivity and decrease range degradation (Malope & Batisani, 2008).

**Cattle Production Systems in Botswana**

Most livestock in Botswana can be found on communal land. Here three basic production systems can be found: small-scale traditional livestock keeping, medium-scale unfenced cattle "post" livestock keeping, and medium-scale to large fenced commercial livestock ranching. The small-scale system allows open access to grazing, pushing the stocking levels to the ecological carrying capacity. On the other hand commercial ranching means exclusive access to grazing, thus restricting stocking levels to the economic carrying capacity. The cattle post system is in the middle of the two extremes.

The small-scale and low-input large-scale production activities may have beneficial effects on livelihoods, and positively contribute to national income; yet, this system could function in a better way in more densely settled areas if addressing suboptimal policies that could potentially improve the economic efficiency and contribution to the sector. Greater profits can be expected from improving herd productivity, but currently the input and transport subsidies, while increasing the smallholders’ net income, seem to reduce private incentive to participate in activities of community management that aim to enhance herd productivity. Therefore, such subsidies could have more economic efficiency if allocated to increasing these incentives, and promoting more adequate institutional development (Barnes, Cannon, & Macgregor, 2008a).

Due to transport and commercial constraints, fenced commercial production is not recommended for Botswana’s more remote communal areas; in lieu of this the expansion of the livestock industry should aim to promote low-input beef production systems, like the cattle post system.

Though fencing strengthens property rights, it also implies higher capital costs and mobility reduction of cattle and wildlife, hence strongly decreasing profits. Therefore policies that promote fencing are not economically efficient (Barnes, Cannon, & Macgregor, 2008b).

**Cattle Market in Botswana**

Traditionally the beef industry in Botswana has been important for the economy and the society, having significant contributions to GDP, exports, the employment sector
and an important role in social and cultural matters. However, there is a growing crisis in the cattle and beef sector. The Botswana Meat Commission (BMC) is reducing its throughput due to excess capacity and operational inefficiency; thus this institution is having losses and the prices set for farmers are being reduced.

The BMC was established as and remains a statutory institution and is owned and controlled by the Government. There are abattoirs Maun, Lobatse and Francistown, the latter was opened in 1990; the one in Maun, was opened between 1983 and 1996, though this was never to export to the EU because it is inside Ngamiland District, which is defined as a red zone due to endemic foot and mouth disease.

The country has a 19,000 tons quota with EU under the EU-ACP Cotonou Agreement; this enables Botswana to sell beef to EU without having to pay duties that are applied to other beef exporting countries (Overseas Development Institute, 2007). Considering that the BMC holds the beef export monopoly and since they prohibit live cattle exportation and importation, they are placed in a privileged position facing little or no competition. This monopoly situation results in the absence of normal competition forces that come out of trade, causing a reduction in the efficiency of beef production (Jeffreis, 2005).

By 2005/06 about 45% of the country’s total labor force was employed in the formal sector, around 20% in each of traditional agriculture and the informal sector; most of this group is likely to be occupied in the cattle sector (United Nations System in Botswana, 2007).

In 1996 it was determined that there were around 60,000 cattle production units, of which 99% were in the traditional grazing sector. Taking into account that in 1994 291,000 households were recorded in Botswana, this means that approximately 20% of all households were directly connected to cattle raising.

In Botswana cattle raising is focused on an oxen production system, in which the farmer rears the animal for two to three years looking forward to reaching a slaughter weight of over 400kg. A more modern system dictates a weaner production system in which the young animal is removed from the range while they are weaned at an age of seven to nine months (with a weight of 180-260kg), then fed intensively on feedlots for 100 to 110 days, and then sent to the abattoir. With the modern systems, a higher production rate is achievable and environmental impacts are reduced.

**Beef Demand in Botswana**

In Botswana, the demand for beef is based on four segments:
Botswana has a long tradition of cattle raising, thus beef has become an important part of the national diet, pushing the domestic demand from 50,000 head in 1985 to 160,000 in 2005, led by population and economic growth. The BMC sets the domestic price to protect their internal market from trade competition, which is possible because they hold a beef export monopoly, but it also reflects its own inefficiency. These prices are adopted by the local butchers who supply the product domestically. BMC also sets the sub-regional prices, making the price of beef lower than that of chicken, which increases the demand for beef but at the expense of cattle farmers. One exception was on January 2006, when there was a price increase, which reduced the demand of beef, though this was only temporary since the demand went back to its normal levels in the second quarter of the same year (D'Allonnes, 2006).

The domestic demand prefers the bone-in forequarters, same as RSA, which indicates that there is a niche for market expansion since the RSA has less strict standards than the EU.

Unfortunately, this market remains unexplored, even when the prices offered are higher than the rest of the world (except for EU). Southern Africa Customs Union has established a 40% tariff on imported beef from Botswana. Even with the tariff, RSA demand is strong, though Botswana has failed to take advantage of these lucrative market conditions. In fact, BMC has blocked other potential exporters from the RSA market by imposing the same export standards dictated by EU, even when these are not the same required by RSA and making it even worse by keeping the ban on non-BMC exports. As a result, there is a direct loss of revenue, and these barriers limit competition and impose social costs on the country (Grynberg, 2012).

The above conditions also put Botswana's cattle industry at a disadvantage. There is a constant threat from producers such as Argentina and Brazil who produce grass-fed organic cattle at low cost. They offer prime cuts that the EU's demand is expected to require in the upcoming years, and for which they are willing to pay a premium price. Yet, Botswana has not come up with a plan to fight against these competitors.

*The Cattle Supply Chain in Botswana*

Traders purchasing cattle directly from ranchers base their transaction on visual assessment of live cattle while the meat is sold by weight. The cost of transaction and risks regarding meat animals are allocated in the price margin of the live animal along
all the levels of the supply chain in order to minimize losses. These risks involve weight reduction when transporting or trekking cattle, animals may die before being slaughtered or may be condemned during veterinary inspection.

In Botswana cattle are sold through a variety of marketing outlets, including the BMC (69.7%), butcheries (8.2%), traders (7%), auction (6.7%), and other farmers (8.2%). The number of intermediaries in the supply chain is very low compared to other African countries like Ethiopia (Ababa, 2012).

The slaughter facilities include abattoirs, slaughter houses and the BMC, whose export abattoir in Lobatse has higher standards of operation and is the only one authorized by the EU to slaughter animals for exportation to EU. This abattoir has a capacity of 800 cattle per day, but is only working at 60% capacity due to competition from private slaughter houses that offer better prices to the farmers. Besides the BMC there are another 18 private facilities and 12 local authority establishments. Most of the animals these facilities slaughter come from the traditional sector, and they supply the domestic meat market.

During 2003-2008 there was a 44% and a 35.2% decrease in the amount of slaughters in the traditional and commercial sectors respectively, though the trend reversed for 2008-2009 in both sectors. This irregular trend was probably caused by FMD outbreaks (in years 2003, 2004-2006, 2007-2009), which caused the exports to EU to stop. On the other hand, there was a decade long trend of a higher amount of cattle slaughtered coming from the traditional sector. This made up 48% of all the national cattle slaughtered from 1999 to 2010.

The BMC abattoir slaughters more animals from commercial ranches and feedlots because they usually provide high quality meat compared with animals raised in the traditional sector. Most of the animals in the country are slaughtered in abattoirs and the meat is inspected and graded to ensure food safety of meat consumption and a fair price for consumers.

For many years the country has exported high-quality beef to the EU market, even in the presence of strong competitors such as Brazil, New Zealand and Argentina, which offer good services regarding beef quality and price (Ababa, 2012).

Export and Domestic Beef Markets in Botswana

Today, Botswana beef products can enter the EU market at tariff rates of 5% or less, while tariff rates on imports from other big beef producers such as Canada, Australia, Brazil and Argentina range from 50% to nearly 100%. Botswana beef products also have duty-free access to the South African market, compared to 40% for
most of the countries. Botswana exports to other Southern African Development Community (SADC) countries are subject to a preferential 15% duty instead of the normal 25%.

Botswana has three abattoirs approved by the EU and South Africa to export beef. Botswana has one of the best veterinary services in Africa, known because of its full disclosure and rapid containment of disease outbreaks. This supply chain inspires great trust in the export market, especially the EU, which is highly sensitive to health and safety concerns. Agriculture is a main source of livelihood for most of Botswana, thus its government highlights the importance of boosting agricultural yields and productivity through the National Development Plan 9 (NDP9), which targets income expansion and the creation of sustainable jobs.

In 2003/2004, agriculture contributed 2.3% of the GDP, out of which about 70 to 80% was attributable to cattle production (BEDIA, 2007); and in 2004, beef exports represented 1.7% of Botswana’s total exports (Jefferis, 2005). Cattle production is an important asset for the rural economy as a source of income, employment and investment. It also has strong linkages with the rest of the economy as a supplier of inputs for meat processing, leather and other industries.

Botswana Meat Commission (BMC) is an agency owned by the government, and it holds the monopoly over exports of beef; also it sells beef products directly to retailers in the local market. Currently it runs two abattoirs in Lobatse and Francistown, reaching a total slaughtering capacity of 300000 cattle annually. Botswana’s government is analyzing this monopoly system, to identify opportunities to free this sector.

The number of cattle supplied to BMC has been declining over the years, while there has been an increase in domestic consumption and local butcheries have experienced a growing number of cattle available for slaughter. Although, in 2006 there was a throughput increase of 16% compared to the previous year, it is thought this might be associated with an increase in the price rates set by BMC combined with good prices internationally.

**Conceptual Framework of Cattle Supply Chain of Ngamiland Communities, Botswana**

Cattle rearing in Botswana is a very important human component of social interactions between communities. Cattle are used for important events like weddings, funerals and settlement agreements. A cattle herd also determines status within a community. The more cattle a person has the more important this person’s opinion
becomes, and a large herd is highly respected among their society as a symbol of wealth and wisdom.

The overall framework (Figure 1) for the study details the relationships between on-farm assets, and the community and market contexts to evaluate the importance of cattle raising on household livelihoods.

On the left are the capital assets specified as a set of components that contribute to sustainable livelihoods. The figure represents how the interaction between stakeholders are negatively affected by challenges such as institutional failures and diseases, among others that lead the smallholders to underperformance of their livelihoods. The analysis that follows offers alternatives to improve the farmers' opportunities to maintain a sustainable production system and avoid poverty, given this conceptual framework.
Conceptual Framework of Cattle Supply Chain of Ngamiland Communities, Botswana

Figure 1 – Analysis, Policy interventions and Potential outcomes, (adapted from USAID, 2006)
Background of Cattle in Botswana

The country is divided in 15 districts (Figure 2), 9 of them are urban and the remaining 6 are rural. Most livestock is in the rural areas where they have coexisted with wildlife in neighboring areas, like it has happened in Ngamiland District for many years. However, information from the Department of Wildlife and National Parks indicates that over the past few years there has been an upsurge in cases of negative interaction between livestock and wildlife. In order to avoid this problem the Department of Animal Health and Production has tried many strategies; the main one is fencing to minimize the contact between livestock and wildlife. Though it is a good method, it does not solve the problem completely.

A second method is to set watering points for both wildlife and livestock. Since Botswana is an arid country, water is a primary limiting factor that drives ecological factors (Department of Animal Health and Production, 2007), thus water provision has a potential influence over wildlife movement. Also, the use of modern livestock husbandry techniques could play an important role in preventing interactions between wildlife and livestock.

Figure 2 – Botswana’s Districts (Ephotopix, 2012)
Figure 3 – Botswana Map (Google Maps, 2012)

- A: Sankuyo
- B: Mawana Checkpoint
- C: Shorobe
- D: Nokaneng
The three communities involved in the study (Figure 3) surround the Okavango Delta and are inside Ngamiland District, which is considered to be an animal disease “red zone” due to its tendency to experience foot and mouth disease (FMD) outbreaks.

Here the contact between cattle and water buffalos creates an endemic circle of FMD, an infectious and sometimes fatal viral disease that affects cloven-hoofed animals, including domestic and wild bovids. The disease is a severe plague for the cattle business. It is highly contagious and is easily spread by infected animals through aerosols, contact with contaminated equipment, clothing, feed, vehicles, and by domestic and wild animals (Canadian Food Inspection Agency, 2007).

The measures for containing the disease include considerable efforts in vaccination, monitoring, trade restrictions, quarantines and eventually the elimination of millions of animals. Also, the Botswana government built the Buffalo Fence, with the objective of protecting cattle from diseases. In the case of Sankuyo, which is inside fence, they have to keep their cattle on cattle posts that are in the area between Shorobe and the Mawana checkpoint (Figure 3).

Empirical Data Collected Regarding Cattle Market in Ngamiland District, Botswana

During the months of June and July of 2012, field research involved three approaches: a Supply Chain Analysis in Shorobe, Sankuyo and Nokaneng communities, making use of focus group discussions (FGD), a SWOT analysis with cattle farmers in these communities to collect necessary data, and third, key informant interviews with the main stakeholders involved in the supply chain.

Focus Group Discussions and Data for Supply Chain Analysis

The methodology used to lead the focus group discussion was based on the following set of guiding topics (United States Geological Survey, 2011):

- Input supplies: feeding supplements, vaccines, grazing areas, water sources, etc.
- Market information: prices, trends, buyers, suppliers.
- Financial services: credits, savings, and insurance.
- Transport services: provided by the country slaughter houses, buyers, local abattoirs.
- Government support for product development and diversification
The meetings started with a prayer led by one of the elders. At the beginning of the meeting all farmers were asked about particular data regarding their farms, like number of livestock units, pen dimensions, water sources, feeding, etc. Once they provided this information and as the meeting continued they became more and more confident and willing to share their experiences, and their perceptions about advantages and disadvantages of their operations and of the supply chain as a whole.

In Shorobe and Sankuyo two students from University of Botswana, Tshoganetso Masunga and Abraham Motau, led the focus group and took notes of all the information shared during the meeting (see table 1).

The first community that participated in the focus group discussion was Shorobe, where 12 farmers attended, two of whom were women; also the chief and deputy chief of the community were there.

In Sankuyo, there was an attendance of 9 farmers, four of whom were women and the activity was led the same way as in Shorobe.

The same methodology was applied in Nokaneng where six farmers attended, but here the FGD was led by two community members who were trained to direct the session; a man called Ananias Murangy led the discussion and the notes were taken by a woman called Sealebeng Tekelo.

The three FGDs lasted around two and half hours, since some participants arrived late, and after the session started, so they came up with more conversation topics. Also, the number of attendants mentioned were farmers, but there were more people than expected in the sessions, most who were not farmers. They would attend because of curiosity, or because they would see friends of theirs participating, or because of the food. This was also one of the reasons why the sessions would take longer than expected.

<table>
<thead>
<tr>
<th>Community</th>
<th>Moderators</th>
<th>Attendants</th>
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<tbody>
<tr>
<td>Shorobe</td>
<td>Tshoganetso Masunga</td>
<td>Women</td>
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<tr>
<td></td>
<td>Abraham Motau</td>
<td>2</td>
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<tr>
<td>Sankuyo</td>
<td>Tshoganetso Masunga</td>
<td>Women</td>
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<td>Abraham Motau</td>
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<tr>
<td>Nokaneng</td>
<td>Ananias Murangy</td>
<td>Women</td>
</tr>
<tr>
<td></td>
<td>Sealebeng Tekelo</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 1 – Focus Group Discussions
SWOT Analysis Described by Farmers

After the farmers were guided through the focus groups and finished the activity, they started the second part, which was the SWOT analysis.

To explain the SWOT analysis cattle farmers were told what this second activity was about by providing examples and showing them the SWOT structure. This activity lasted around an hour for each community; each one of them came up with opinions about the different strengths, weaknesses, opportunities and threats to cattle production and together reached a consensus that is shown in Figure 4.

Key Informant Interviews

Key informant interviews included personnel at the Veterinary Department, the Animal Production Department, the Livestock Advisory Centre, two supermarkets, six butcheries (three in Maun and three in Gumare), and the BMC. Altogether, they made a total of thirteen interviews, which provided information regarding the methods used to handle diseases in endemics areas, especially the ones neighboring the Buffalo Fence, services and training provided to cattle farmers and regulations of the beef market.

The interview questions for the butcheries and the supermarkets were structured in the following way (Action For Enterprise, n.d.):

- Where and how much do you pay for the meat?
- How many animals do you kill per week?
- What meat cuts do you sell the most?
- How much do you charge for the meat cuts?
- Do you kill the animals or do you use an abattoir?
- How do you transport the meat to your business?
- What are your biggest problems?
- What are the requirements you have to fulfill in order to be allowed to work?

In the case of the butcheries the interviewee was usually an employee or the owner (manager) of the business; the interviewees in the supermarkets were the general manager and the butchery manager of Choppies and Spar respectively.

The interviewees with the Veterinary Department, the Animal Production Department and the Livestock Advisory Centre were the Chief Veterinarian and his assistant, the
Feeding Manager, and the Project Manager respectively. The structure of the interview involved the following:

- What do you do as an institution?
- What do you think about the problems that the cattle farmers are facing in Ngamiland District?
- How have the institutions improved the conditions for farmers to improve their productivity?
- What do you consider are the main problems for small farmers in the district, and how has your institution decreased these problems?

Regarding the input store that we visited (Woodsmoke) we interviewed the Warehouse Manager and the owner, and we asked them the following questions:

- What type of products do you sell?
- What services do you offer?
- What are the most common products you sell?
- What are the feedings the farmers prefer the most?
- What types of problems do you have regarding the cattle market?
- What are the prices you offer to your customers?

The final and probably one of the most important interviewees was the staff at the BMC. They were given a set of questions that they later answered and sent by mail. The questions were the following:

- What are the requirements that farmers should fulfill in order to deliver their animals to BMC?
- What is the relation between BMC, farmers and the Local Abattoirs? (how do you work with them?)
- When you receive the animals, what is the procedure in terms of slaughtering?
- Is meat the only thing you process? (what about milk)
- We would like to know about your market, where do you sell the meat that you process e.g. whether to the supermarkets, butcheries, etc.
- We would like to know what prices you offer to the cattle farmer, according to the meat quality of the animals.
- Do you buy live cattle? If so, how much do you pay for every animal?
- How do you rate that animal (what price you pay for it)?

Transport

- We would like to know what transport facilities you offer to the cattle farmers?
• How much do you charge for transport, is it per head of cattle, distance, weight, etc?

Sanitation
• What health standards do you manage?
• Do you have health inspectors?
• How have foot-and-mouth disease affected your work? How are you overcoming this problem?

Economics
• How many staff do you have?
• What is the maximum capacity of cattle heads that your facilities receive per day / month / year?
• What is the difference between BMC and Maun Local Abattoir?

Supply chain structure of Cattle in Ngamiland District, Botswana

End markets of the Supply Chain

The main product buyers in terms of meat are the supermarkets and the butcheries and they buy most of their meat from the local farmers. In cases when there is a FMD outbreak they go to neighboring districts outside the red zone. This represents increased costs since they have to go further, buy from more than one farmer and sometimes it may take more than one day, which increases the cost of logistics.

This is why the supermarkets prefer to buy from Senn Foods in Francistown, which also sells meat, but they only sell the carcass and no organs. Therefore, this represents a loss of this product segment of the market for the supermarkets.

Business and enabling environment of the Supply Chain

The institution that regulates the cattle market along the chain is the Department of Animal and Health Production, which is responsible for the prevention and control of important animal diseases, development of livestock, extension services, artificial insemination, meat hygiene, etc.

At the same time this department manages two important components that provide support to farmers in the country; the Livestock Advisory Center, which serves as an
outlet of livestock inputs for the farmers and provides them with subsidized veterinary medicines and livestock feeds; and also the Department of Veterinary Services which is in charge of providing veterinary assistance and promoting sustainable livestock industry practices by preventing and controlling animals diseases.

These institutions play an important role in cattle production since they are the main support for small-holders, and also they are responsible for ensuring the sustainability of the business by providing services and inputs, and improving the cattle rearing knowledge and capabilities of cattle farmers.

Their choices affect the cattle market directly. For example, this is the case when the Department of Health and Animal Production dictates a FMD outbreak, since this stops the meat commerce of the district. On the other hand, a common comment in the focus groups was the existing opportunity to improve breeding and thus production with the use of artificial insemination applied by the Department of Veterinary Services.

**Vertical linkages of the Supply Chain**

The main actors among the stakeholders that create vertical linkages in the meat market include national institutions such as the Department of Animal Health and Production, which provides the necessary veterinary services and vaccines for free for all farmers and feeding inputs with subsidized prices. This offers a cost advantage to the small holders not only regarding cattle, but for all agricultural production in general. This type of support puts the small holders in a position where they can meet the market demand and improve their household income.

Another institution that plays an important role in the meat market is the BMC, which holds the cattle and beef export monopoly. It is the only institution authorized to export the derived products and is the one in charge of setting the meat prices offered to the cattle farmers.

The BMC’s share of total off take decreased to less than 50% from 1995 to 2003. This shows that BMC is, every day, less able to compete in the domestic cattle market. This happens because despite the fact they have access to better export prices, the prices they offer to its sellers are not enough to cover the process required to sell to BMC. This involves the risks farmers run on having their cattle condemned, detained or low graded if they do not meet BMC’s export focused standards.

These failures happen because this state-owned monopoly holds the power to set the prices. However, in 2006 BMC increased the prices paid to producers by 40%. This may
have been influenced by the Botswana Cattle Producers Association, which was created in 2005 with support of USAID in order to promote the farmers’ economic interests. Among the main recommendations provided by the association was one to increase cattle prices paid to farmers (USAID, 2006).

*Horizontal linkages of the Supply Chain*

The Botswana Cattle Producers Association is one of the main horizontal linkages, since it promotes the demands of all cattle farmers in the country and gives them a strong advocate as a stakeholder when policies are to be made.

The association was created with the help of USAID as a way to provide support to cattle farmers and as a way to apply the recommendations given by USAID in the policy briefing paper “How trade liberalization can contribute to resolving the crisis in the beef and cattle sector” issued on 2005.

*Supporting markets of the Supply Chain*

Financial institutions play an important role in the cattle market. They provide the small holders with credit that helps them improve their production techniques and increase the size of their business.

The farmers can look for private banks or the National Development Bank, in order to apply for loans. Also the government offers programs that the farmers can subscribe to and apply for micro-credits to improve livestock management and development of infrastructure.

Notwithstanding, since FMD is endemic in the area, financial institutions are less willing to provide loans. Therefore, the state offers agricultural programs in which it plays the role of guarantor for the farmer, this way, if there is a FMD outbreak and the farmers can’t pay, the state would pay
Results and Analysis

*Cattle Supply Chain for Ngamiland District, Botswana*

Figure 4 – Supply Chain Analysis (adapted from USAID, 2006)
The supply chain structure (see Figure 4) starts with the input providers, in this case the stores that sell the feed, vaccines and veterinary services. Among these, there are the Livestock Advisory Centre (Department of Animal Health and Production - Ministry of Agriculture), which provides farmers with subsidized feed, free vaccines and free veterinary services. The other two are Woodsmoke and River Valley. Both of them offer the same services mentioned before, but they are private, and not subsidized.

The input stores main market segment is not cattle anymore. The farmers are not in economic conditions to buy feed for their cattle. To alleviate this constraint, the National Development Bank has offered credits to the farmers so that they could have access to inputs for their cattle. The credit would be provided on the condition that the animal was branded and it had to be slaughtered at BMC so that the bank would know when the animal was slaughtered and recover its money. Unfortunately this did not work very well due to FMD or because the cattle would get lost in the bush and never found again.

The next link in the chain is the farmers. They used to practice an oxen production system in which they would raise and feed the animal for three years before slaughtering it, but since 2006 they have been turning into the weaner production system in which cattle are slaughtered at one year of age; this way the business is more economically viable and less environmentally damaging.

Their outputs are cattle, calves, meat and dairy products. The meat goes to supermarkets in Maun like Choppies, Spar, Shoprite and Shoppers, who buy an average of 10 animals per week; and to butcheries who buy an average of 4.6 animals per week, the Botswana Meat Commission (BMC) and the Local abattoirs (see Figure 5).
However, when there is a FMD disease outbreak Ngamiland District gets sealed and no one can buy or sell cattle, so the farmers from the communities lose by investing extra on feeding their cattle and paying the herd boy for an indefinite time until the Veterinary Services Department lifts the ban. Since FMD is endemic in the area, Ngamiland District has been declared a permanent red zone and meat can only be consumed locally. On the other hand the supermarkets and butcheries have to look for cattle outside their district, so they look for farmers in neighboring districts. Once they select the animal they will process, the animal must be slaughtered and partially processed inside the district where it was bought. The latter is supervised by the Veterinary Department, after that it is put on a truck, and the truck is sealed with a sticker of the Veterinary Department. Once the truck arrives at the store that will sell the meat, the Veterinary Department is the only one authorized to remove the sticker, and they remain until the end supervising the unloading of the meat into the store.

The big supermarkets follow the same pattern, but they buy more cattle compared to the butcheries. The problem with this commercial pattern is that, according to the butchers and supermarket managers, the farmers are not serious businesspersons. They might sell their cattle to the best offer or may say that they cannot find the animal
that they were going to sell because it got lost in the bush. What makes it worse is the lack of regulation on the prices of cattle, which is not weighed before its selling, and only priced by visual estimates of weight.

Therefore, supermarkets, looking for a more serious company, go to Francistown, in the Central District and buy meat from SENN Food, but they only sell carcasses, not organs. This not only increases the cost of meat, but also limits its variety.

**Cattle Supply Chain Dynamics**

*Upgrading the Cattle Supply Chain*

Currently small cattle farmers in Ngamilnad District are used to supply beef to the local market only, yet there are opportunities to promote upgrading in the production techniques; though they must be bolstered by the national institutions that support the farmers from the beginning to end of their production cycle. By doing so, they ensure their flow of supplies to the local market.

There is an existing need for the farmers and the buyers to be connected. The national institutions play a key role in preserving this connection, so that the buyers do not look for beef elsewhere. This connection between farmers and buyers is constrained by the constant FMD outbreaks and lack of price authorities to enforce price regulations.

The current measures applied when there is an FMD do not consider the fact that farmers cannot stop trading beef because it represents a high percentage of their income. Depriving them from selling their production is a direct threat to their livelihoods, thus there is much need for upgrading the cattle ban measures in case of FMD outbreaks.

**Supply Chain Governance of the Cattle Supply Chain**

The Ministry of Agriculture is at the top of the relevant institutions who govern the cattle supply chain. Its delegated institutions are the BMC and the Department of Animal Health and Production, which at the same time is subdivided into the Department of Veterinary Services and the Livestock Advisory Center.

Together they determine, evaluate and monitor the regulations for cattle raising and distribution. This involves vaccination and health checkups, grazing and feeding
techniques, as well as the check points set on the roads to control FMD, beef transportation, etc.

The above mentioned institutions are responsible for maintaining the safety and efficiency of the cattle market flow, between the input providers, abattoirs, butchers, supermarkets, and the final consumer.

*Inter-Firm Relationships in the Cattle Supply Chain*

In recent years, the relationship between BMC and the farmers has not been very friendly. On October 2012, the Meat Trade News Daily published an article presenting the problems that BMC was going through, pointing out that the trend of bad corporate governance characterized by corruption, mismanagement, non-accountability and unethical practices in state owned corporations is disconcerting, referring specifically to the state-owned BMC. In addition, it mentioned that the corruption comes from upper levels, referring to President Khama.

This is not the first time that these types of issues have come up. Most of the problems between BMC and cattle farmers are rooted in the constant FMD outbreaks and the lack of ability from the national institutions to maintain the flow of the beef market during the outbreak.

This situation brings economic consequences to the cattle farmers and the buyers, who have to look for meat products in neighboring districts, increasing the prices and causing a reduction in the domestic demand.

The subsidies provided by the state and the above-described situation also causes the input stores to divest from the cattle-feeding segment.

Altogether, these circumstances create a lack of trust in the national institutions along the supply chain, especially among the small cattle farmers who are the ones that lose the most during FMD outbreaks.

*Inter-Firm Cooperation and Competition in the Cattle Supply Chain*

At the level of the small farmers, competition happens with the neighboring districts and Senn Food, whenever an FMD outbreak is declared. The cattle farmers at Ngamiland District are unable to do any trade at all with their cattle, and this provides
the perfect conditions for the neighboring farmers and Senn Food to fill Ngamiland’s market with their beef.

Regarding abattoirs and slaughter houses, BMC has an advantage compared with the rest because it is the only one authorized to export beef. Although their rigorous quality standards push farmers to look for more secure buyers. In the case of Ngamiland, the cattle farmers sell their cattle to the butchers, supermarkets and between each other.

The inability to address FMD outbreaks puts the local cattle farmers in disadvantage compared to the rest of districts of the country and also foster a lack of good will to cooperate with the national institutions. In addition, it creates an environment of unfair competition among the farmers.

Transfer of Information and Learning Between Firms Involved in the Cattle Supply Chain

The Department of Animal Health and Production, through its subdivisions, provides training to the farmers and assistance on how to maintain a healthy cattle herd.

Different international organizations also provide cattle farmers with training in techniques on how to improve their production, take care of the cattle and prevent attacks from predators.

It is very important to bear in mind that since the relationship between the cattle farmers of Ngamiland District and the national institutions is not the best of all, there is no great incentive for the cattle farmers to learn from them. Thus, there is an important gap to fill in the process of delivery and absorption of new knowledge and skills.
Beef Cattle Market Map for Ngamiland District, Botswana

Figure 6 – Market Mapping, (adapted from USAID, 2006b)
The present market map (Figure 6) illustrates a trail from the final consumer to the place where the product is developed. Along the way this trail is influenced by business environments and services that are critical between a given pair of segments.

**Market chain and principal competing channels of the Cattle Supply Chain**

The beef production in Ngamiland District only satisfies the local consumption, since beef from the district is not allowed to be exported because of the frequent FMD outbreaks.

The main cattle buyer is the BMC. Once the farmer has fulfilled all the steps towards selling cattle (cross check movement animal permit, quantity, seals, off load, pen) to the BMC, the Department of Veterinary Services is notified and the farmer receives an electronic code with a quota allocation receipt and then a kill agenda is created. After that, cattle are sorted, marked and slaughtered (price list – Annex 1).

The commission deals with meat and meat related products (hides and skin, carcass meal, bone meal, etc) and they sell to butchers, individuals, Lobatse Cannery and other businesses (e.g. lodges).

The local abattoirs are privately owned and they charge a fixed P350\(^1\) fee excluding VAT per cattle head.

The butcheries and supermarkets buy directly from farmers, but the prices they offer are lower compared to the ones offered by BMC (price list - Annex 2). The difference is that BMC requires higher standards and these are not so difficult to meet when farmers sell directly to the butcheries or supermarkets. When there is a FMD outbreak the supermarkets and butcheries have to visit farmers from neighboring districts, and they offer higher prices to those farmers, and that plus logistics increases the retail price of meat locally.

Sometimes farmers from neighboring districts are not serious and do not fulfill the cattle purchase that was previously arranged. This brings more trouble to the supermarkets when they have to buy cattle, since they have to look for improvised alternatives. That is one of the main reasons why they go to Francistown and buy their meat from Senn Food.

\(^1\) Exchange rate (USD-Pula): $1 = P7.77
It is not always easy for cattle farmers to achieve the requirements set by BMC. While their cattle have access to better pastures and water sources during the rainy season, when the dry seasons come, these two resources decrease and the farmers economy does not allow them to purchase feed to supplement their cattle alimentation; even when the Livestock Advisory Center offers subsidized prices.

Business environment of the Cattle Supply Chain

Cattle production is affected by many factors. FMD is one of the main issues, in part because this fatal and endemic disease is not easy to diagnose until the symptoms are very advanced. Vaccination for this disease is provided by the Department of Veterinary Services only twice a year (while the recommended doses is three times a year), creating weaknesses in the animal health system.

In addition to FMD, wildlife represents a significant problem. Predators usually attack cattle during grazing in communal areas, plus during this time cattle can get in contact with water buffalos and get FMD, since water buffalos carry the disease but the disease does not affect them like it does with cattle. This is the main reason why butcheries and supermarkets have to look for neighboring farmers and/or Senn Food.

During the dry season cattle must walk more in order to get water. This energy waste results in loss of weight and it also exposes the animals to higher risks of predator attacks or getting lost in the bush since they get farther from the cattle post.

Business services of the Cattle Supply Chain

The supply chain is complemented by services that facilitate the flow of the product (in several stages) towards the final consumer.

Market information plays an important role among the services, since it provides actors of the supply chain, like the exporters, with the necessary regulations established by the foreign markets. In this case, it is the EU, which is the most important beef export destination for Botswana’s production. In addition, information is handled by national institutions, like the Department of Animal Health and Production, which is deals with information regarding FMD bulletins, agricultural products price lists and vaccination campaigns.

In the case of the communities inside Ngamiland District, they cannot export since they are inside the red zone; so their beef production goes to local butchers, individuals, other businesses (lodges) and the Lobatse Cannery. Nevertheless, it is important for the
small farmers to receive technical support, especially from the Department of Veterinary Services, since the main problem in the area is FMD.

In addition to this, the Livestock Advisory Center represents a key part of the production process by providing training to the small cattle farmers on how to feed and take care of their cattle to ensure high quality standards when taking their cattle to BMC. It is also important to take into account, not only how to take care of cattle, but what are the best cattle breeds for the area.

Secondary services like transport and, packaging and storage are also part of the market map. Regarding transport, the rates for these services are subject to negotiation between the farmer and the driver. The price charged usually oscillates between 200-300P per animal. The transportation costs are charged per head and it varies depending on the travelling distance. The transporters must acquire a special permit to transport cattle and this permit is issued by the Department of Veterinary Services.

BMC is the only agency that works on packaging and storing meat products. They adopt the regulations set by the EU to do so. BMC is committed to maintain the requirements of the ISO 9001:2008 standards in order to manufacture products of consistent quality, which meet statutory, regulatory and customer requirements. To ensure food safety they have implemented a Hazard Analysis Critical Control Point (HACCP) system that conforms to the requirements of South African National Standard (SANS) 10330:2006 and the British Retail Consortium (BRC) Global Standards in Foods.

In addition to this, there are inspectors from the Department of Veterinary Services who deal with cattle health issues, and a Quality and Compliance Department. Lately, technical services offered by the Livestock Advisory Centre.
SWOT Analysis Described by Cattle Farmers from the Researched Communities

Content for the SWOT analysis (Figure 4) was developed during focus groups with farmers from the three communities researched, guided by Tsoganeztsu Masunga, a graduate student at the University of Botswana.

**Figure 4 – SWOT Analysis, (Trinity Web Works, 2012)**
**Strengths**

In this case are:

- Indigenous technical knowledge, which the community farmers consider is very important, since it honors their traditions.
- Technical training, which the community receives from the Department of Animal Health and Production.
- Pens, that they know how to build and fix, and they use it to keep their cattle safe during the night.
- Boreholes, which they use to extract water for their cattle (seasonal).

**Weaknesses**

Unfortunately what they consider their weaknesses are more than their strengths, among the most important there are:

- The communal grazing lands leads predators to kill cattle, this happens because the farmers do not own grazing lands, their farms mostly include a pen, a small house they use to store tools, so they have to practice communal grazing which exposes cattle to interactions with predators.
- Lack of financial resources, farmers say that there’s been financial programs before but, since F&M disease outbreaks happen without any warning, sometimes they got the funds and invested them in their cattle, but whenever they wanted to sell the animals, they were not allowed because of the F&M disease outbreak.
- Lack of transport, BMC offers transport services, but sometimes, these communities are very far and the road is not paved so the drivers refuse to go and farmers have to spend more money trying to get a vehicle to get their cattle out to BMC or the abattoirs.
- Lack of lands to build paddocks.

**Opportunities**

- Access to local medicine, which is provided by the Veterinary Service Department.
- Subsidies received in the products they buy from the Ministry of Agriculture departments
- Employment creation, they consider that if cattle business gets bigger through increased cattle production this would create jobs for the people in the community.
• Artificial insemination, which farmers say is a great opportunity to increase production, and improve and optimize breeding.
• Loans, that they receive from financial institutions
• Free veterinary services, offered by the Veterinary Services Department

Threats

• Wildlife, since it is easy for wildlife to cross the Buffalo Fence, they also kill the cattle.
• Buffalo Fence is not well maintained, the farmers say that the fence has points in which the fence is broken or weak and animals have memorized these points and easily cross to the other side and cause trouble with livestock. The buffalo fence is a double fence made of barbed wire, but for an elephant, for example, it is very easy to cross over it, weakening the poles and opening holes. Also there are sections in which floods have weakening the structure of the fence.
• FMD disease, which not only kills their cattle, but also if the Veterinary Department notices you have an infected animal, they will kill all your cattle.
• Car accidents, because inside the cities people drive slowly, but once they get to the dirt road, which is surrounded by farms, they speed up and cause accidents, sometimes with cattle or wildlife.
• Age discrimination at time of looking for loans, farmers say that since they are old, the financial institutions do not want to give them loans, because they are afraid they will not be able to repay.
• Not favorable weather / Drought: farmers consider that whenever the dry season comes water becomes scarce and this is a key factor for cattle survival.
• Too much processes required for entering government programs, farmers think that government programs have become more and more difficult to access, because there are more processes involved in order to participate in them.
• Farmers are being advised to feed cattle with bone meal but they are making cattle sick, also foot and mouth disease virus remains latent in bones and bone marrow, so it is not recommendable to feed cattle with bone meal.
• It is dangerous to look for cattle in the bushes if you don't have a shotgun, farmers say whenever the cattle is taken to free graze, there are some occasions in which cattle gets to inside the bushes and the herd boys are afraid of going to look for it because of wildlife.
• Tse-Tse fly, causes Nagana, which is an infection that brings fever, muscular wasting, anemia and swelling of tissues, and sometimes, if not treated on time, it causes death to cattle.
• Lack of new product services, they want product services that support the enhancing of cattle production.
• No efficient veterinary services: According to them, this happens because whenever they have a health problem with cattle the Veterinary Services Department takes very long, and sometimes the animal is already dead by the time they arrive.

• There is a lack of herd boys, this may be happening because most of the young people go to work to the big cities. Also the few herd boys they can find get drunk or leave the working place earlier than normal because they are not supervised.

• Water availability depends on seasonality.

SWOT Analysis Results

Strategic plan based on SWOT Analysis Results

Matching up strengths and opportunities, it is possible to take advantage of the subsidies provided by the state on veterinary medicines and feed costs to ensure a healthy and efficient production. Yet it is important to consider that the right amount of FMD shots should be administered to cattle, and farmers must be taught about the importance of supplementary feedings.

Breeding improvements can be achieved with the use of artificial insemination, which added to veterinary services may increase the production and lead to the creation of employment for the people of the same community.

In addition, an important strength is to consider the traditions of the communities, in this case indigenous technical knowledge. It is important to study this and determine which techniques are indeed effective and include them in the technical workshops where the cattle farmers participate and notice that their traditions are being taken into account.

If the above circumstances are put in, it is very likely that the financial institutions would be willing to provide loans and funding to support production programs. Although it is important to consider that for this to happen the Department of Veterinary Services should be aligned with the financial institutions. Current experiences in which the farmer receives a loan, but then is unable to sell his cattle because the Department of Veterinary Services issued a FMD outbreak bulletin, leaving the cattle farmers unable to repay the loan, must be anticipated and strategies developed to address this recurrent issue.

Among the weaknesses pointed out by the cattle farmers, is the fact that the veterinary services are not there when they are needed, and often take too much time to get where required. In communities like the ones in Ngamiland District, because they are considered to be in the red zone, on time veterinary services should be a priority in order to reduce the possibility of FMD and other diseases from spreading out.
Another issue is the lack of herdboys, which happens mostly because the cattle farmers have small numbers of cattle and are unable to offer good wages, thus the young men go to the bigger cities to get jobs that offer better salaries. There is a need for the relevant national institutions to align their functions with the financial institutions; doing so may provide the adequate environment for cattle raising to succeed, thus creating employment opportunities.

A constant worry for the cattle farmers is the risk of interactions with wildlife; it represents a great threat, especially for farmers who practice communal grazing. The buffalo fence has several damaged points along the fence, which allows wildlife to cross and attack their cattle. On the other hand, water buffalos cross the fence and this is a major problem because they are the main carriers of FMD.

While interactions between wildlife and cattle cannot be totally stopped, the number of cases can be reduced by providing adequate maintenance and patrolling the veterinary fence, and by training the farmers on how to build more resistant pens with materials they can find in their own farms and surroundings.

On occasion, since some communities are far from the city, the lack of transport services becomes a problem for farmers, but it is possible to consider that, since the officials of the veterinary services are present during the slaughtering process, they could offer the transportation service with subsidized rates, and this way ensure the adequate transportation of beef.

Unfavorable weather is one of the main reasons why cattle die, especially during the dry season. The Livestock Advisory Center plays an important role here, by offering adequate feeding supplementation for cattle to be more resistant to the dry seasons. It is important, however, to consider that cattle farmers are being advised to feed their cattle with bone meal. It is not being considered that the virus of FMD remains latent in the bones and bone marrow, thus it is not recommendable to feed cattle with bone meal.

**Final Results**

In the three communities, the percentage of people who own cattle is higher than 30%; cattle raising not only represents a business activity, but also a form of long term investment.

The main problem for the cattle market is F&M disease, which reduces the selling rates of the cattle farmers, while increasing their feeding and labor costs. A higher percentage
of cattle farmers do not have a large number of animals. This means the few animals they own represent a high percentage of their subsistence income.

In the case of communities like Sankuyo, which is inside of the Buffalo Fence, wildlife represents 27% of the cattle losses, this and F&M disease control strategies have forced the farmers to take their cattle to places such as Shokomoka, which is outside the Buffalo Fence.

The control measures undertaken by the Veterinary and Health Departments pushes the butcheries and supermarkets to look for meat products outside the limits of Ngamiland. This represents higher logistic costs that create price increase of around 80%, this is the case of ration meat (meat with high content of fat), which is the most purchased due to its low price and medium quality, thus it is more accessible for low and middle class households.

Meat cut prices

![Meat cut prices-Choppies (Maun), Pula](image)

Figure 7 - Choppies, Botswana, 2012

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1 USD = 7.77Pula
The information in figures 7 and 8 was provided by the manager of one of the main supermarkets in Botswana called Choppies. He explained that whenever there is a FMD outbreak they have to go outside the district to buy the meat they need to sell in the supermarket, resulting in high increases in meat prices.

On the other hand, since farmers are not committed when doing business, the supermarkets prefer to buy from Senn Food, which is a company that sells meat in Francistown (Central District). They only sell carcasses, not organs, so the supermarkets are not only increasing the price of meat, but losing the organs section of the market.

**Conclusions**

- Vaccination campaigns do not provide an adequate amount of shots to prevent the disease (currently only two shots are being provided per animal, when the necessary shots are three).
- The Buffalo Fence is not being well maintained, i.e. there are damaged sections that allow wildlife and cattle to cross through the barrier.
• When FMD outbreaks happen, the Veterinary Department issues a quarantine period (time indefinitely) which keeps the cattle farmers from selling their cattle or derived products, but the authorities do not offer any compensation or alternative.

In order to address these problems it is necessary for all the relevant national departments such as the Department of Veterinary Services, the Department of Animal Health and Production and other related institutions from the Ministry of Agriculture of Botswana to work to align with the main needs of the farmers. This will involve increasing productivity and safety regarding the FMD outbreaks.

Among the most important, there is a need of financial resources, the latter have existed before. Though, the usual situation is that the farmer gets the loan and invests it in his cattle and then the Veterinary Services Department issues a bulletin of foot and mouth disease outbreak in the area, and the farmer is not able to sell his cattle, thus he cannot repay the loan. This reduces the probabilities of getting another loan in the future and condemns the farmer to lack of funding.

Based on the results of the FGDs and the Key Informant Interviews, it is important to consider that a critical point for intervention is among the business environment, where FMD is directly related to wildlife and vaccination. Thus, in times when there is an outbreak, national institutions, such as the financial institutions and the Department of Veterinary Services, play a key role, offering support to the farmers, especially smallholders, not only to overcome the halt of Ngamiland’s beef market, but also avoiding the total paralysis of Ngamiland’s market, and reducing the area ratio of the cattle ban.

**Policy Prescriptions for Botswana’s Cattle Production**

In order to come up with successful strategies regarding cattle production, policy makers should assume that cattle farming has a positive influence on long-term sustainable agriculture. Also, these strategies should consider fair economic returns to cattle farmers, sustainability of natural resources and production levels, low damaging effects on the environment, low use of external inputs, and the fulfillment of human needs for food and income along with their social needs.

Animal agriculture depends on major research outputs of technology, thus it is necessary to adapt and prompt the transfer of technologies for small-scale farmers that lack resources. This way it is possible to ensure the sustainability of animal agriculture development.
One of the biggest barriers to the adoption of innovations in the area of animal agriculture by the small cattle farmers is the communal land tenure system, which is associated with dearth of clearly defined and thus, lack of secure property rights. This situation leads to dual grazing, excessive exploitation, lack of investment, and mismanagement of resources. By guaranteeing land use and range land policies, property rights will be secure and cattle farmers would be motivated to grow fodder and have a better control of their animals’ breeding. By achieving these outcomes, it will be possible to control the spread of infectious diseases more efficiently.

**Recommendations for Improvements in Botswana’s Cattle Production**

*Farmers*

- Keep cattle, not only separated from the buffalo fence, but also at a distance from it in order to better avoid possible wildlife attacks or interaction with water buffalos.
- Adopt measures to reduce possibilities of FMD contagion, such as maintaining hygiene within the areas inside their farms.
  - This should also include disinfection of tools and training the herd boys on hygiene measures when handling the cattle.
- Ban bone meal in feed, since the FMD virus remains latent in bones and bone marrow. The BMC produces the bone meal as a byproduct; however, since one of the main sources of the virus are the bones and bone meal, it would be recommendable as a preventive measure to stop feeding it to cattle.

*Veterinary department*

- Train cattle farmers not only on animal husbandry techniques, but also on ways of creating a healthy environment for the animals to avoid the disease.
- Enforce vaccination campaigns, by providing three shots a year (as recommended to avoid FMD) instead of two (as being done in present day).
- Improve the diagnosis measures that determine if the animal carries the disease or not.
- Develop better pen structures that can be easily built by the farmers to avoid cattle to escape or wildlife to attack cattle.
Government

- Break the export monopoly system held by BMC and allow farmers to sell their cattle to other purchasing points. The beef monopoly causes trade competition to be absent, resulting in a decreased performance of the competitive industry pressures, especially in the beef production sector.
- Issue measures to regulate cattle price rates that farmers offer to buyers, because the ministry of agriculture issues a table of prices for agricultural products, but nobody regulates the prices that farmers put to their cattle when selling it to a buyer, unless the transaction happens through BMC. This regulations may be easily enforced by the Department of Veterinary Services since they are the ones present when the animal is slaughtered, by making sure the transaction is being made according to the prices set by the ministry of agriculture.
- Provide cattle farmers with incentives in order to capture their local production, thus enforcing a greater control over meat trading and FMD.
- Assess whether trade liberalization of the cattle sector is viable and can support future agricultural reforms that aim to provide the local cattle farmers with better market opportunities.

Future research

- The next steps of the research should focus on what are the traditional indigenous knowledge of the communities, and how that knowledge can be merged with modern techniques taught by the national institutions. Seeking to make a manual of cattle herding techniques that is better accepted by the small-scale farmers.
- It is necessary to perform more FGDs with more communities in Ngamiland District, and also with communities in neighboring districts, looking forward to elaborate a comparison study. This should include more key informant interviews, especially to the private and financial institutions to define their actual position. It is important to know what they are doing to overcome beef market halt when there is a FMD outbreak.
- Further research should cover the position of the final consumer in the supply chain. This is important to capture the perception of the customers and see if their loyalty to meat as a product is affected by the constant change in prices.
References


## Annex 2 – BMC Cattle Price-list

<table>
<thead>
<tr>
<th>Grade</th>
<th>Age</th>
<th>Tooth</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime</td>
<td>1-2 4month</td>
<td>0</td>
<td>17.25</td>
</tr>
<tr>
<td>Super</td>
<td>24-36 months</td>
<td>2</td>
<td>14.60</td>
</tr>
<tr>
<td>Grade 1</td>
<td>30-36 months</td>
<td>3-4</td>
<td>13.50</td>
</tr>
<tr>
<td>Grade 2</td>
<td>3-4 years</td>
<td>5-6</td>
<td>13.00</td>
</tr>
<tr>
<td>Grade 3</td>
<td>4 years</td>
<td>5-6</td>
<td>6.50</td>
</tr>
<tr>
<td>Grade 4</td>
<td>4 Years and above</td>
<td>8(Full mouth)-Toothless</td>
<td>5.25</td>
</tr>
<tr>
<td>Cannery</td>
<td>Aged</td>
<td>toothless</td>
<td>3.38</td>
</tr>
<tr>
<td>Dead on Lairages</td>
<td></td>
<td></td>
<td>Paid on average price of its mob</td>
</tr>
<tr>
<td>Dead on Arrival</td>
<td></td>
<td></td>
<td>150.00</td>
</tr>
</tbody>
</table>

## Annex 3 – Meat Cuts Price-list (Supermarkets and butcheries)

<table>
<thead>
<tr>
<th>Meat Cuts</th>
<th>Supermarkets (Maun)</th>
<th>Butcheries (Maun)</th>
<th>Butcheries (Gumare)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Choppies</td>
<td>SPAR Safari</td>
<td>Green Land Butchery</td>
</tr>
<tr>
<td>Ration meat (Kg)</td>
<td>16 28.95</td>
<td>- 30.87</td>
<td>25 26 24</td>
</tr>
<tr>
<td>Steak (Kg)</td>
<td>27.95 34.95</td>
<td>- 69.19</td>
<td>30 38.95 30</td>
</tr>
<tr>
<td>Briskit (Kg)</td>
<td>- - -</td>
<td>- 34.92</td>
<td>30 27 29</td>
</tr>
<tr>
<td>T-bone (Kg)</td>
<td>26.95 33.95</td>
<td>- 34.92</td>
<td>30 24 35</td>
</tr>
<tr>
<td>Tale</td>
<td>39.95 42.95</td>
<td>- -</td>
<td>30 24 26</td>
</tr>
<tr>
<td>Minced meat (Kg)</td>
<td>- - 38</td>
<td>28 26 26</td>
<td>24 24 26</td>
</tr>
<tr>
<td>Burwoers (Kg)</td>
<td>- - 33.92</td>
<td>30 24.95 29</td>
<td>24 24.95 30</td>
</tr>
<tr>
<td>Heart (Kg)</td>
<td>34.95 -</td>
<td>- - 15</td>
<td>30 22 28</td>
</tr>
<tr>
<td>Intestines (Kg)</td>
<td>- - -</td>
<td>- - 11</td>
<td>30 22 28</td>
</tr>
<tr>
<td>Tongue (Kg)</td>
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<td>- - 25</td>
<td>25 20 20</td>
</tr>
<tr>
<td>Liver (Kg)</td>
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<td>- - 32.93</td>
<td>28 22 28</td>
</tr>
<tr>
<td>Kidney (Kg)</td>
<td>34.95 -</td>
<td>- - 23.96</td>
<td>30 8 11</td>
</tr>
<tr>
<td>Head</td>
<td>- - -</td>
<td>- - 25</td>
<td>- - -</td>
</tr>
<tr>
<td>Leg</td>
<td>- - -</td>
<td>- 8</td>
<td>- - -</td>
</tr>
<tr>
<td>Blade (Kg)</td>
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<td>- -</td>
<td>- - -</td>
</tr>
<tr>
<td>Rump (Kg)</td>
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<td>68.96</td>
<td>- - -</td>
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