Implementation of non-geographic approaches to beef trade in the SADC region

By

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DEDICATION

To my wife, Naledi Beauty Palime and daughter, Ayandah Thotloetso Palime for their valuable time used for this MSc dissertation. Time lost is never found!

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Declaration

I, Mosiuoa Zachariah Palime, hereby declare that the work on which this dissertation is based is original and that neither the whole work nor part of it , is being, shall be submitted for another degree at this or any other university, institution for tertiary or professional examining body.

Signed _____ Date February 15, 2016

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Abstract

Access to international and regional markets for beef has been an on-going problem for southern African countries for many decades because the South African Territories (SAT) serotypes of foot and mouth disease (FMD) viruses are endemic to wildlife populations in the southern African region. This makes establishment of FMD-free zones, essential for accessing high-value beef markets difficult, expensive and impractical for many locations in southern Africa. For that reason commercialization of livestock production in the region has been inhibited.

The creation of FMD-free zones which requires use of artificial or natural boundaries and in southern Africa it has been the construction of veterinary cordon fences (VCFs) to separate animal populations of different FMD status which has proven successful in some countries (such as Botswana, Namibia & South Africa) but not in others for a variety of reasons, i.e. the current 'model' has only been possible for a small proportion of cattle producers in southern Africa. This means that apart from the damaging effects that some VCFs have had or have on the environment generally and wildlife conservation in particular, only roughly 15% of the cattle population in the mainland countries of the Southern African Development Community (SADC) are raised in FMD-free zones. For balanced rural development of the SADC Region, where cattle are culturally and economically vital to the indigenous inhabitants and wildlife conservation and associated economic activities are important contributors to regional gross domestic product, it is essential to improve access to regional and international markets for beef and other animal products produced in locations outside FMD-free zones.

The World Organisation for Animal Health (OIE) has introduced a partially non-geographic FMD standard for trade in deboned beef (viz. Terrestrial Animal Health Code Article 8.8.22) that potentially overcomes this problem; however, Article 8.8.22 contains at least one 'killer' requirement that makes its implementation impossible. The issues associated with this problem have been identified in this study and possible solutions proposed.

An attempt was made to gauge acceptance by SADC Member States but the responses to the questionnaire used were inadequate to reach a reliable conclusion in this respect. It was concluded that taking technical, logistical and financial constraints into account, non-geographic approaches represent the best opportunity that SADC countries have of expanding access to regional and international markets. Moreover, it is suggested that non-geographic approaches could be integrated into the Standard Methods and Procedures in Animal Health (SMP-AH) Programme once adopted by SADC, thereby strengthening the capacity of the Region's competent authorities. SMP-AH Programme is at a proposal stage and has not been officially launched in SADC. The SMP–AH Programme proposes to harmonize activities of animal health authorities of SADC Member States in respect of selected diseases that impact trade and/or human health.

List of Acronyms

ADB	African Development Bank
ALOP	Appropriate level of protection
ASF	African swine fever
AU-IBAR	African Union - Inter-African Bureau for Animal Resources
CAADP	Comprehensive African Agriculture Development Programme
CBT	Commodity-based-trade
CAC	Codex Alimentarius Commission
COMESA	Common Market for Eastern and Southern Africa
CSF	Classical swine fever
DFZ	Disease-Free Zone
DRC	Democratic Republic of Congo
DVS	Directorate of Veterinary Services
EAC	East African Community
EIS	Epidemiology and Informatics Sub-committee [LTC]
EU	European Union
EU-FMD	European Commission for the Control of Foot-and-Mouth Disease [FAO]
FANR	Food, Agriculture and Natural Resources (directorate) [SADC]
FAO	Food and Agriculture Organisation of the United Nations
FMD	Foot-and-mouth disease
FMDV	Foot-and-mouth disease virus
GDP	Gross Domestic Product
GF-TADs	Global Framework for the progressive control of Trans-boundary Animal Diseases
HACCP	Hazard analysis and critical control points

KAZA-TFCA	Kavango-Zambezi Transfrontier Conservation Area
LTC	Livestock Technical Committee [FANR]
OIE	World Organisation for Animal Health
PCP-FMD	Progressive Control Pathway for FMD
PVM	Post-vaccination (sero) Monitoring
PVS	Performance of Veterinary Services (OIE initiative)
RCA	Revealed Comparative Advantage
SACU	Southern Africa Customs Union
SADC	Southern African Development Community
SADC-LTC	Southern African Development Community – Livestock Technical Committee
SADRN	Southern African Development Research Network
SAT	Southern African Territory [FMD]
SC	Sub-Committee [SADC]
SFMDP	SADC Foot and Mouth disease Programme
SPS	Sanitary and phytosanitary
TAD	Trans-boundary Animal Disease(s)
TAHC	Terrestrial Animal Health Code
TFCA	Trans-frontier Conservation Area(s)
US$	United States Dollar
VCF	Veterinary Cordon Fence
WCS	Wildlife Conservation Society
WTO	World Trade Organization

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1. Introduction

Access to international and regional markets for commodities and products derived from animals has been an on-going problem for southern African countries for many decades. This results from the South African Territories (SAT) serotypes of foot and mouth disease (FMD) viruses being endemic to the region and resulting international trade restriction (Scoones et al., 2010). In southern Africa wildlife, African buffalo in particular, are maintenance hosts for the SAT serotypes of FMD viruses (FMDV – Thomson, Vosloo, & Bastos, 2003). This makes eradication of FMD from the region currently impossible.

Trade standards for commodities and products derived from animals are currently based mostly on the geographic occurrence of transboundary animal diseases (TADs), FMD in particular. This usually implies that the country or zone of origin is free from FMD in order for commodities and products derived from animals to be exported. Therefore, exporters of livestock and livestock products are required to prove that FMD does not occur in the locality of production as outlined in Article 8.8.22 of 2015 (World Organisation for Animal Health [OIE], 2015). Some southern African countries have managed to do that through the creation of FMD-free zones (e.g. Botswana, Namibia & South Africa).

However, establishment and maintenance of FMD-free zones, essential for accessing high value markets for livestock commodities, has proven difficult and expensive for southern African countries. Indirect socio-economic and environmental costs of FMD-free zones are also high (Thomson et al., 2013a). For these reasons, only a minority of southern Africa's livestock producers live in FMD free countries or zones (Thomson et al., 2013b).

On the other hand, FMD risks associated with trade in beef can be managed in ways that do not require that the country or zone of production is recognized as free from FMD, i.e. through the application of non-geographic risk management processes (Paton, Sinclair, & Rodrı´guez, 2010;

Thomson et al., 2013b). In essence these authors have built on the original observations of Henderson & Brooksby (1948) that deboned beef from which the visible lymph nodes have been removed is a safe product (safe beef) in terms of FMD risk. Nevertheless, the FMD risk of such beef, while 'very low', is probably not negligible. For that reason, additional measures, either up- or down-stream of the abattoir, are likely to be necessary (Paton et al., 2010). It has been shown that this is possible using a value chain approach which has the advantage of enabling integration of the management of animal disease and food safety risks (Thomson et al., 2013b).

Non-geographic approaches to management of FMD-associated trade risk could benefit many thousands of small scale cattle producers in non-FMD-free areas of southern Africa because it would obviate the requirement for expanding and/or creating additional FMD-free zones in the region. The latter has (1) proven increasingly difficult to achieve in recent years and (2) FMD-free zones with their associated fencing systems have been shown, at least in some cases, to be environmentally and socio-economically disastrous (Barnes, 2013; Ferguson & Hanks, 2010).

It is vital for future healthy rural development in southern Africa that both commercialization of livestock production and bio-diversity, including wildlife, conservation be accommodated in policy development and land-use planning. This dual approach could significantly contribute to bio-diversity conservation and mitigate rural poverty in SADC by promoting the export of beef from deep rural areas that currently have limited access to both regional and international markets.

The standard-setting body for trade in animal commodities dealing with animal health issues– OIE, in 2011 introduced a partially non-geographic trade standard in the Terrestrial Animal Health Code (TAHC), i.e. Article 8.7.25 (Table 1) which was revised and adopted as Article 8.8.22 during the 83rd General Session of World Assembly of OIE Delegates, May 2015. This standard caters for trade in deboned and matured beef from which the visible lymph nodes have also been removed (sometimes referred to as 'deglanding') derived from FMD-infected countries or zones (OIE, 2014a). The standard does not require that the area of production is located in a FMD-free zone.

Table 1 – TAHC Article 8.7.25 of 2014

Recommendations for importation from FMD infected countries or zones, where an official control programme for FMD, involving compulsory systematic vaccination of cattle, exists:
For fresh meat of cattle and buffaloes (*Bubalusbubalis*) (excluding feet, head and viscera). *Veterinary Authorities* should require the presentation of an *international veterinary certificate* attesting that the entire consignment of *meat*:

- comes from *animals* which:
  - have remained in the *exporting country* for at least three months prior to *slaughter*;
  - have remained, during this period, in a part of the country where cattle are regularly vaccinated against FMD and where official controls are in operation;
  - have been vaccinated at least twice with the last *vaccination* not more than 12 months and not less than one month prior to *slaughter*;
  - were kept for the past 30 days in an *establishment*, and that FMD has not occurred within a ten-kilometre radius of the *establishment* during that period;
  - have been transported, in a *vehicle* which was cleansed and disinfected before the cattle were loaded, directly from the *establishment* of origin to the approved *abattoir* without coming into contact with other *animals* which do not fulfil the required conditions for export;
  - have been slaughtered in an approved *abattoir*:
    i. which is officially designated for export;
    ii. in which no FMD has been detected during the period between the last *disinfection* carried out before *slaughter* and the shipment for export has been dispatched;
  - have been subjected to ante- and post-mortem inspections for FMD with favourable results within 24 hours before and after *slaughter*;
- comes from deboned carcasses:
  - from which the major lymphatic nodes have been removed;
  - Which, prior to deboning, have been submitted to maturation at a temperature above + 2°C for a minimum period of 24 hours following slaughter and in which the pH value was below 6.0 when tested in the middle of both the longissimus dorsi.

The SADC Livestock Technical Committee (LTC) adopted Article 8.7.25 (Phakalane Declaration; SADC-LTC, 2012) as a basis for developing a non-geographic regional standard for beef trade. Furthermore, the Common Market for Eastern and Southern Africa (COMESA) formally adopted a commodity based trade (CBT) approach in 2008 as a means of increasing opportunities for trade in livestock products (COMESA FAMIS, 2012). The difficulty was that Article 8.7.25 contained a killer provision in the form of clause *1d* which required certification that FMD have not occurred in any susceptible species within a 10 km radius of where cattle were kept in the last 30 days before being slaughtered. FMD is defined in chapter 8.8 of the TAHC as clinical or sub-clinical infection of any susceptible species (OIE, 2015). Clause *1d* (clause *1c* of Article 8.8.22) was and it is still inappropriate in locations where free-living wildlife occurs, the reason being that where free-moving wildlife are present in the locality no-one can reliably certify that infected wildlife have not come within 10 km of the establishment where the cattle concerned were kept in the previous 30 days. Therefore, while Article 8.7.25 (from now onwards Article 8.7.25 would be referred to as Article 8.8.22) could potentially be

beneficial to thousands of cattle producers in southern Africa it requires modification to render it practical in local circumstance.

In an attempt to measure the feasibility of implementing non-geographic approaches to beef trade in the SADC region, a questionnaire was sent to SADC Chief Veterinary Officers (CVOs) to obtain their opinion. It was intended that based on the opinions obtained in this way. Technical experts in SADC and at OIE were also consulted in order to ascertain their opinion. In this way it was hoped that the strengths and weaknesses of Article 8.8.22 could be accurately ascertained. Detailed policy recommendations were developed whereby practical non-geographic approaches for beef trade in SADC could be established for the benefit of livestock producers located at the livestock and wildlife interface. The resulting recommendations will hopefully benefit broader regional development initiatives. Results of this research may also provide information to OIE and Regional Economic Communities (SADC and COMESA) so that appropriate policies for commercialization of livestock production in the region are developed.

a. Analysis of the concepts (geographic vs non-geographic approaches)

TAHC predominantly adopts a geographic approach which applies to an animal subpopulation defined primarily on a geographical basis using natural, artificial or legal boundaries (OIE, 2014f). Geographic approach refers to creation of disease-free countries or zones. This definition is based on the point that international trade in live animals and commodities is mostly concentrated on ensuring that they are sourced from areas free from trade-influencing TADs unless the exporting country is able to create geographic zones that can be certified free of the disease. This approach is difficult to implement in areas with large numbers of free-living cloven-hoofed wildlife which are dispersed over vast geographic areas. As a result, VCFs have been erected to differentiate animal populations with differing disease status with specific reference to FMD. However, the results have been devastating on wildlife and rural communities around such areas as it will be discussed at a later stage. Moreover, emphasis on zoning makes countries not to explore more holistic approaches to disease management which could outweigh geographic approach.

Biological risks associated with international trade in livestock commodities need to be managed across the value chain under non-geographic approach. Non-geographic approach refers to trade facilitating options for countries not being able to establish and maintain country or zonal freedom from disease. The options could either be CBT or compartmentalization. The *Phakalane Declaration* describes CBT as an array of alternatives that can be used to ensure the production and processing of a particular commodity or product are managed so that identified food safety and animal health hazards are reduced to appropriate risk levels (SADC-LTC, 2012). OIE (2014f) describes compartmentalization as a procedure that may be implemented by a country to define and manage animal subpopulations of distinct health status within its territory, in accordance with the recommendations in TAHC for the purpose of disease control and/or international trade. TAHC recommendations on compartmentalization cannot be applied in all situations because effective implementation depends inter alia on the epidemiology of the disease, country factors, environmental factors, the biosecurity measures which may be applicable, and the health status of animals in adjacent areas, surveillance and the public/private sector relationship. Compartmentalization may be particularly applicable in intensive industries where production systems are vertically integrated not in extensive settings for livestock production.

b. Beef production and trade flows in the SADC Region

In essence there were more than 1.4 billion cattle in the world in 2013 of which 68.1 million (4.6%) were in southern Africa (Table 2) while Africa as a whole had 17.9% of the total (FAOSTAT, 2014). In southern Africa about 75% cattle population is managed under small-scale traditional farming systems (SADC, 2012a). About 0.4% of international trade in beef involves southern Africa as reported by FAOSTAT and the quality of the beef produced is not in demand in many parts of the world. Quality is a vital issue when it comes to marketing any product including beef. It is also so that different markets require quality in different respects, e.g. some markets, but not all, require marbled beef which SADC countries cannot generally supply. Furthermore, countries of the region like Botswana and Namibia are only price competitive as a result of tariff protection (Kandenge, 2012; Thomson, 2013a). This is due to

lack of investment in cattle production as well as shortage of trade incentives as SADC indicated. Investment in beef production, like in any other industry, is contingent on profitable market access, i.e. access to potentially profitable markets is a precondition for private sector investment. As things stand, prevailing geographic approaches are deterrents for potential SADC beef production investment. So should SADC be trying to export beef to international markets in the first place? The simple answer is no. However, in many parts of rural southern Africa cattle are economically and socially important and also important to local economies.

Table 2 SADC Member States Cattle Population in 2014

Member State	Cattle Population
Angola	4,687,475
Botswana	2, 500,000
DRC	745,000
Lesotho	650,000
Madagascar	10, 100,000
Malawi	1,150,000
Mauritius	7,302
Mozambique	1,689,097
Namibia	2, 800,000
Seychelles	200
South Africa	13,887,898
Swaziland	630,000
United Republic of Tanzania	21,125,252
Zambia	3,050,000
Zimbabwe	5,080,000
Total	**68, 102,224**

Source FAOSTAT, 2014

Cattle farming play a vital role in agricultural issues and subsidize the livelihoods of most rural communities in SADC (Thomson et al., 2013a; Zhou, Minde, & Mtigwe, 2013). In SADC, cattle farming is categorized as subsistence/ traditional farming (cattle kept for nutritional needs, wealth, security and social and cultural functions); small-scale commercial farming (cattle kept for income and nutrition); and large-scale commercial farming (cattle kept only for income) as iterated by Zhou et al. (2013) and Msangi (2014). Most cattle are in traditional farming and are of indigenous types. There are some non-indigenous and hybrid cattle, and most of these are located in large-scale commercial and small-scale farming systems (Rewe, Herold, Kahi, & Zárate, 2009). There are also a significant number of pure bred cattle in South Africa (Scholtz, Bester, Mamabolo, & Ramsay, 2008) and a few in other SADC countries too (McIntyre, Herren, Wakhungu, & Watson, 2009). Southern Africa has five agro-ecological zones: arid, semi-arid,

sub-humid, humid and highland (Seo, 2014). Cattle are present in all these zones although few are present in arid locations.

Cattle production systems in SADC involve a mixture of extensive and intensive systems. For instance, in South Africa about 70% of slaughtered cattle are fed for 90-110 days in feedlots; most of these cattle being derived from extensive production systems, including those in neighboring countries (Frylinck, Strydom, Webb, & Du Toit, 2013). However, in most other SADC countries feedlots are uncommon although there is a move in this direction in Botswana. In the dry western half of southern Africa particularly feedlots face the difficulty that suitable fodder is either unavailable or expensive. For that reason grass-fed beef is the norm but production is limited by arid or semi-arid conditions resulting in low carrying capacity. In many if not most southern African countries the carrying capacity of the veld is low and that is a primary reason why grass-fed beef production in the SADC Region is relatively inefficient.

Exotic breeds are potentially more productive in terms of beef production but require an environment that suits them, particularly appropriate feeding. In environments that are unsuitable for them, exotic breeds are poor producers. This means that indigenous breeds should be improved under national breeding policy to achieve good performance as they are acclimatized to prevailing climatic conditions in contrast to commercial production and research policy that favour exotic breeds. However, improvement of genetic potential requires better management to sustain such cross-breeds, feeding in particular. That is often not forthcoming so such initiatives often fail.

Within the SADC Region Botswana and Namibia are the main beef exporters. Other SADC Member States are net beef importers due to their low levels of production (FAOSTAT, 2014; Rakotoarisoa, Iafrate, & Paschali, 2011). South Africa is included in the list of net beef importers even though it predominantly produces high-value grain-fed beef (DAFF, 2013). South Africa produces much more beef than either Namibia or Botswana but it is nearly all consumed locally.

FAOSTAT reported that in 2011, beef produced per country was as follows; South Africa 789, 032 MT, Namibia 52,590 MT and Botswana 58,045 MT. Moreover, FAOSTAT highlighted that among top 20 commodities exported per country; boneless beef is number three (ranked by value) for both Botswana and Namibia while bone-in beef is number 9 and 12 respectively for Namibia and Botswana. This situation demonstrates a clear dichotomy between beef production and trade.

c. Need for correction of current beef production and trade trends

In most southern Africa countries colonial policies empowered large-scale commercial farmers by provision of exotic dairy and beef cattle breeds to provide beef and milk products to Europeans dwelling in urban centres and to satisfy a diversity of markets (Assan, 2013; De Schutter, 2011; Step Center, 2008). Moreover, disease control strategies and market infrastructure were in place. Subsistence farmers did not benefit from the colonial era. However, both large scale and small scale farmers are increasingly faced with the sanitary challenges of exporting beef to lucrative markets. SADC imported about 143,881 tonnes of beef (11,990/year) between 2000 and 2011 and exported 383,567 tonnes in the same period (FAOSTAT, 2014).

Proportional to the number of cattle in the SADC region, beef production is below the international norm. For instance SADC with more than 68 million cattle in 2012, about 3,5 million heads of cattle were slaughtered, carcass weight was 2,710 Hg/An (hectogram per animal) and 927,705 tonnes were produced as reported by FAOSTAT (2014). However, FAOSTAT found that South America with more than 354 million cattle had 66,387,061 heads of cattle slaughtered; 2,249 Hg/An carcass weight; and 14,931,911 tonnes produced in 2013. Moreover, FAOSTAT reported that Australia with more than 29 million cattle had 8,538,435 heads of cattle slaughtered; 2,686 Hg/An carcass weight; and 2,293,424 tonnes produced in 2012. These figures prove that other parts of the world have more cattle and produce more beef. SADC countries with around 4.6% of the world's cattle only provide 0.4% of beef traded internationally. This demonstrates inefficiency.

When assessing the top 20 produced agricultural commodities in Australia, SADC and South America beef is highly ranked as figures 1, 2 and 3 below indicate. For instance in both SADC (Fig. 2) and South America (Fig. 3) beef stands at number one and number two in Australia (Fig. 1) when ranked by value (FAOSTAT, 2014). This is very crucial because SADC is protected by Economic Partnership Agreements (EPAs) to export beef to EU lucrative markets which once replaced will expose SADC to competition from South America and Australia (Agritrade, 2012; Chiwandamira, 2006). It should be noted that not all countries in SADC have functional EPAs. EPAs provide quota and tariff-free export opportunities for beef export (European Commission, 2014). There is a lot of uncertainty about the renewal of EPAs before the end of 2014 and if not renewed, these beef exporters will be charged for the most favoured nations (MFN) tariff; this is about 80% of income from EU exports. Moreover, Southern African Custom Union (SACU) imposes 40% tariff on beef imports into countries that make up the customs union, namely Botswana, Lesotho, Namibia, South Africa and Swaziland (Organisation for Economic Co-operation and Development [OECD], 2006).

Botswana and Namibia benefit from a two-way tariff advantage in respect of beef trade (Thomson et al., 2013b). Southern Africa is not competitive at international beef markets without EPAs. What needs to be done is; to improve investment for competitiveness; adoption of modern farming methods; and implementation of non-geographic animal health standards in order to have an exportable surplus to consumption and the ability to supply international markets with the quality of product demanded and at a price that can sustain production.

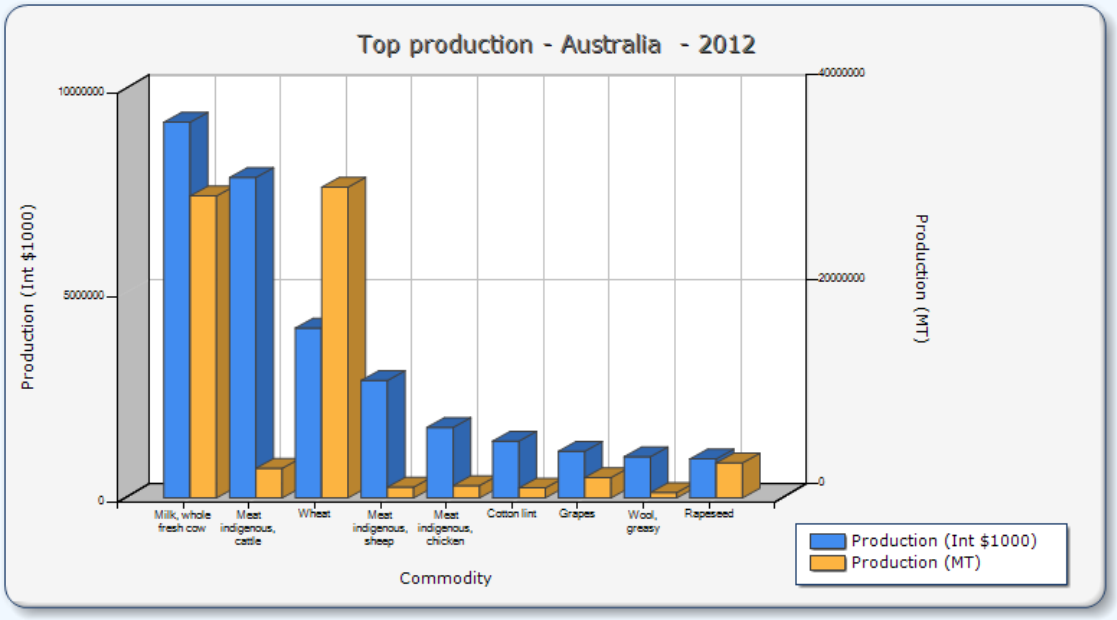

Figure 1 Australia top produced agricultural commodities (source FAOSTAT, 2014)

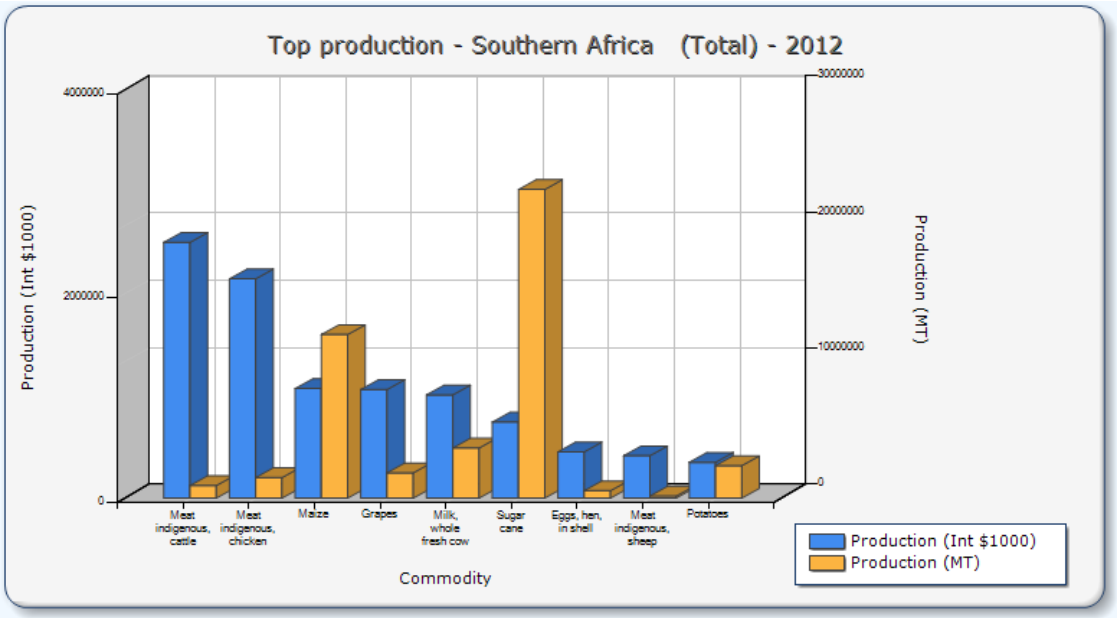

Figure 2 SADC top produced agricultural commodities (source FAOSTAT, 2014)

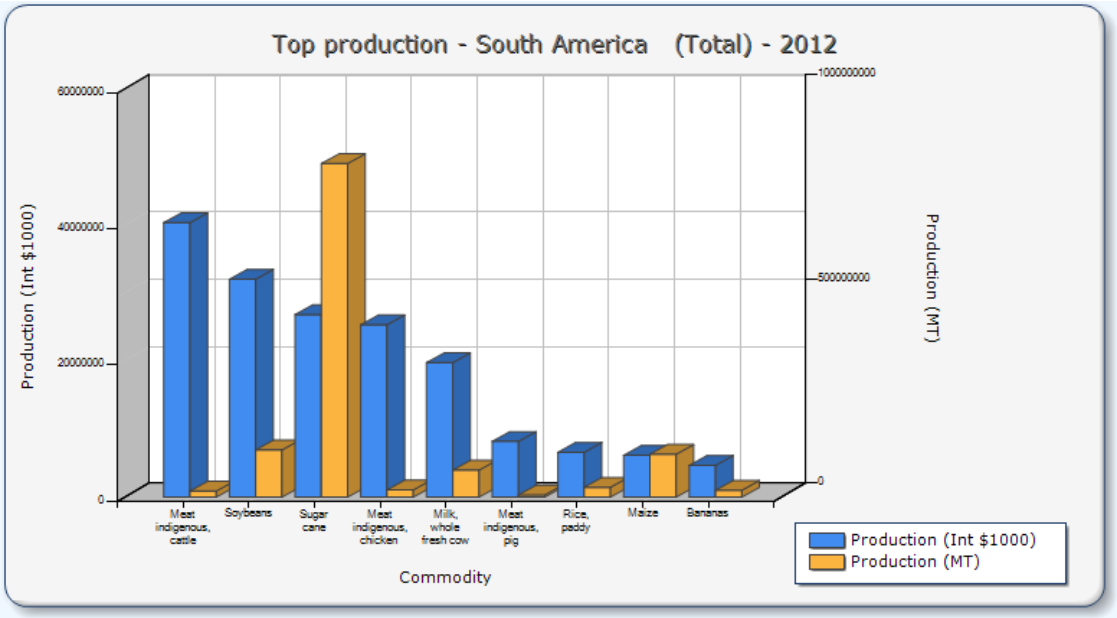

Figure 3 South America top produced agricultural commodities (source FAOSTAT, 2014)

Around the world in 2011 beef exports were valued around US$ 143 billion because of high demands in countries like US, Japan, Russia Federation and Germany (FAOSTAT, 2014). FAOSTAT further indicated that none of the African countries appeared in the top 20 beef exporting countries. However, SADC supplied 0.5% of total global beef exports in 2011, which is less by 57% when compared to 2010 statistics according to FAOSTAT. Nevertheless, SADC represents Africa on global beef exports because it supplied more than 90% to African exports. According to SADC (2011), there are four SADC Member States (Botswana, Namibia, South Africa and Swaziland) that export beef to international markets but only Botswana and Namibia are major beef exporters. Since 2010, both Botswana and Namibia had a decreasing supply of beef to the EU markets. For instance in 2011, beef exports declined by 91.6% and 35.8% for Botswana and Namibia respectively (Agritrade, 2012). The decline in beef exports had been linked to TADs outbreaks, stringent sanitary requirements in the EU and escalating beef prices globally (Agritrade, 2012; Rich, 2009 and Thomson et al., 2013b) and poor marketing of livestock in domestic markets. Bonsal (2014) reported that in the past decade African meat imports increased by 300% (1.8 million tonnes). SADC beef exporters should explore intra/inter – regional trade as requirements are not as stringent as in lucrative beef markets.

Namibia has managed to maintain regular beef exports to EU markets (Agritrade, 2012) and this might be because Namibia has never encountered FMD outbreaks in the FMD-free zone since 1962 (OIE, 2014a). As noted by Rich and Perry (2011) and Thomson et al. (2013b) Namibia is a more efficient beef exporter than Botswana. However, it should be borne in mind that beef production is declining and this condition will continue to be so in Namibia as highlighted by Chiriboga,Kilmer, Fan, and Gwande (2008), Lindsay et al. (2013) and Potgieter (2012). For instance, beef production has dropped from 83,138 MT in 2005 to 52,590 MT in 2014. Beef production trend has been as follows: 2012 = 52,590 MT, 2011 = 51,088 MT, 2010 = 54,279 MT, 2009 = 60,315 MT, 2008 = 59,442 MT, 2007 = 75,133 MT, 2006 = 73,839 MT, and 2005 = 83,138. Namibian beef production is declining due to (1) lack of marketing strategy for beef from the northern part of the country; and (2) shortage of livestock production and processing facilities (TradeMark Southern Africa, 2011).Thomson et al. noted that even though Namibian deboned beef had a revealed comparative advantage (RCA >1) for 6 years from 2005 to 2011, that advantage has been gradually declining and, at the current rate, will fall to between one and zero before the end of this decade. This means that once RCA is less than unity, Namibia will have a comparative disadvantage in beef industry.

1.4 Regional initiatives on beef trade in SADC

Under the Comprehensive African Agriculture Development Programme (CAADP) framework, southern Africa is increasing its focus on the agriculture sector. In 2012, the SADC Livestock Technical Committee (LTC) adopted Article 8.8.22 of the TAHC (Phakalane Declaration) as the basis of a policy for developing non-geographic approaches for regional beef trade (SADC-LTC, 2012). The Common Market for Eastern and Southern Africa (COMESA) formally adopted CBT approach in 2008 as a means of increasing opportunities for trade in livestock products (COMESA FAMIS, 2012). However, implementation of the policy has remained limited due mainly to lack of implementation guidelines. CBT needs a regional strategy and supporting policy along supply chain for effective risk mitigation measures and greater market access. However, countries like Botswana, Namibia and South Africa which do export are not supportive of this policy generally because it could compromise their export status.

To further investigate this approach an internationally funded project was recently conducted in the Zambezi Region (ZR) of Namibia as discussed in the following paragraph. The ZR is an integral part of Kavango - Zambezi Transfrontier Conservation Area (KAZA TFCA), which covers an area about the size of France. It is inhabited by a wide variety of wildlife species including more than 250, 000 elephants and about 150, 000 cattle (Barnes, 2013). Because the ZR is inhabited by large herds of African buffalo it is not free from FMD, i.e. considered by the Directorate of Veterinary Services of Namibia as an FMD-infected zone (OIE, 2015).

Studies by Barnes (2013) and Cassidy, Thomson, and Barnes (2013) investigated the economic consequences and benefits of various land use options for the ZR and concluded that establishment of the ZR as a FMD-free zone would be unachievable for logistical and financial reasons, i.e. the costs, including environmental costs would outweigh any economic gains in abattoir viability and / or livestock farming incomes. In order to help rural community members in this region benefit from all land uses, the United States (US) Millennium Challenge Account (MCA) funded the Namibian Meat Board Project looking at resolving technical issues related to exploring options for exporting deboned, deglanded and matured beef from KAZA-TFCA despite FMD being endemic to the ZR (SADC-LTC, 2014a). The MCA-funded pilot project employed integrated value chain hazard management system that employed CBT and HACCP approaches – which are similar in principle – to achieve ALOP for food safety and animal disease control (Thomson et al., 2013b). The following nine prerequisites and critical control points (CCP) were incorporated into the value chain management system:

i. Motorized transportation of cattle to quarantine stations and abattoir.
ii. Disinfection of motorized transport between batches of cattle.
iii. Revaccination of cattle against FMD on entry to the quarantine station.
iv. Veterinary inspection of all animals on entry to and exit from the quarantine facility as well as weekly inspection during quarantine.
v. Ante- and post -mortem health inspection at the abattoir.
vi. Temperature control of carcasses and harvested cuts of beef.
vii. Prescribed carcass maturation of beef including pH determination.
viii. Thorough deboning and deglanding.

ix. Microbiological monitoring.

The pilot project was able to demonstrate that the approach is implementable and that 'equivalence' was achieved with Article 8.8.22 and therefore should be acceptable to trading partners. As TAHC Article 8.8.22 cannot be fully implemented in ZR due to clause *1d* (because wildlife movement cannot be managed or tracked). The Project therefore provided a technically sound alternative for marketing deboned beef that fulfils international requirements (Thomson et al., 2013b). Moreover, the project developed a frame-work for the accommodation of livestock production and wildlife conservation in the ZR. Both livestock and wildlife sectors are vitally important for communal farmers who rely on income from tourism and cattle farming.

2. Hypothesis

Although Article 8.8.22 provides a potential solution to the inability of many cattle producers in southern Africa to access high value beef markets, the Article can be modified to render it practical and thereby contribute to improving regional trade in beef.

3. Objectives

The study sought to analyze the feasibility of implementing non-geographic approaches to deboned, deglanded and matured beef trade in SADC region.
This involved:

- Assessing the strengths and weaknesses of TAHC Article 8.8.22 from a technical perspective using available scientific literature;
- Identifying the technical, logistical and financial constraints to implementation of TAHC Article 8.8.22 as a trade enhancing mechanism in the following two situations:

- for trade in deboned, deglanded and matured beef within the SADC region

- for export of deboned, deglanded and matured beef from parts of SADC countries that are not recognized as free from FMD to intercontinental markets;
- Provision of technical explanations as to why and how the technical solutions developed can overcome the inherent deficiencies of Article 8.8.22.

4. Methodology

a. Study Area

SADC is composed of the following countries: Angola, Botswana, Democratic Republic of Congo (DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe (SADC, 2014). According to OIE (2014a), FMD has been reported in all Member States (Fig.4) with the exception of Lesotho, Madagascar, Mauritius and Seychelles.

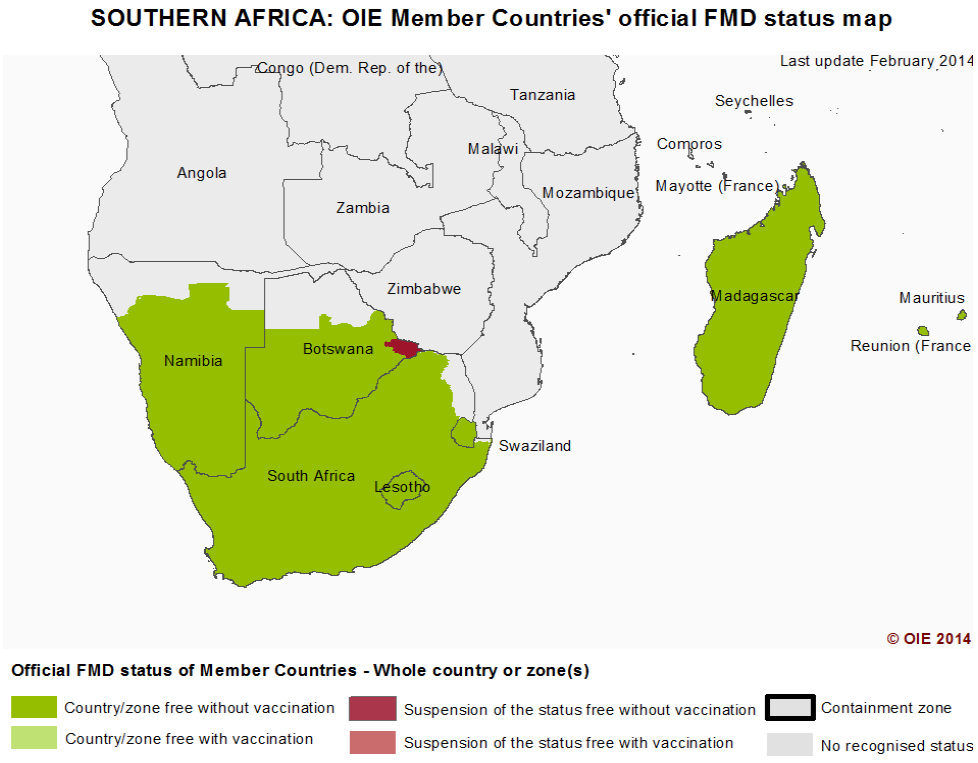

Figure 4 FMD status of SADC Member States according to the OIE on 14 February 2014 (OIE, 2014e)

b. Data collection

In this study both primary and secondary data were collected; primary data in the form of answers to a questionnaire completed by CVOs and semi-structured interviews with technical experts, while secondary data were obtained from available scientific/technical literature. The questionnaire was used to gather relevant information on: export of safe commodities from FMD infected areas, risk mitigation measures applied before export, import of safe commodities from infected areas and issues inhibiting the export of animals and animal products.

The methodology used data obtained from questionnaires completed by five Member States after sending questionnaire to all 15 SADC Member States and an intensive study of available literature on the subject. Moreover, site visits were made to five selected SADC Member States (Botswana, Mozambique, Swaziland, Tanzania and Zambia) representative of countries with different FMD status within southern Africa. Semi-structured interviews were held with:

a. Unit head of the Food, Agriculture and Natural Resources (FANR) Directorate, SADC Secretariat - Livestock Unit;
b. Representative of the Wildlife Conservation Society - Animal & Human Health for the Environment and Development (WCS-AHEAD) Programme
c. OIE officials.

This mix of experts (Table 3) was selected as they deal with animal health issues at either SADC level or OIE level. The interviews were conducted from February 2012 to December 2013. The occasions and environment varied for interviews; it was either during SADC LTC and Subcommittee (SC) meetings (May/November 2012 and April 2013), regional animal health conferences, phone calls or email enquiries.

Table 3: Officials involved in semi-structured interviews

Name	Position & Organization
Mr. Beedeeanan Hulman	Senior Livestock Programme Officer – SADC FANR Directorate
Dr. Steve Osofsky	Executive Director – WCS Wildlife Health & Health Policy Programme
Dr. Neo Mapitse	Deputy Head - OIE Animal Health Information Department
Dr.Alejandro Thiermann	President – OIE Terrestrial Animal Health Standards Commission
Dr. Kobedi Segale	Deputy Director of Veterinary Services – Ministry of Agriculture, Botswana
Dr. Zacharias Massicame	Head of Veterinary Epidemiology - Ministry of Agriculture, Mozambique
Dr. Roland Dlamini	Director of Veterinary and Livestock Service, Swaziland
Dr. Fredrick Kivaria	National Epidemiologist, Ministry of Livestock Development and Fisheries, Tanzania
Dr. Joseph Mubanga	Director of Veterinary and Livestock Development, Zambia

The questionnaire (Annex A-A) was designed to gauge acceptance or preference of importing deboned, deglanded and matured beef from FMD endemic areas into FMD free zones / countries based on non-geographic approaches. Data collected from CVOs were transferred to Microsoft Excel for cleaning and analysis (Microsoft Corporation, 2014). Analysis was done using a mixture of descriptive statistics, graphs and nonparametric inferential statistics on the data from questionnaires and semi-structured interview. Answers to the questionnaires (Annex A-B) were assessed, summarized and reported in this dissertation.

c. Questionnaire design and distribution

The questionnaire used was adapted from the *Part A: Sanitary and international standards considerations* study conducted by Brückner (2013) entitled, "Assessing opportunities for African countries to strengthen trade in animal products in compliance with international standards through commodity based trade, zoning, improved traceability and certification." The questionnaire was customized to cater for the SADC beef trade needs and challenges and assessed on March 2013 in the field with the help of two experts:(1) Dr. Mo Salman, Professor of Veterinary Epidemiology, Animal Population Health Institute , College of Veterinary Medicine and Biomedical Sciences, Colorado State University, USA whose work includes helping nations identify and combat infectious animals diseases that have an impact on trade and food security such as FMD; and (2) Dr. Tembo Mumba, State Veterinarian at the Department of

Rural Development and Agrarian Reform, Eastern Cape Province, South Africa (former Director of Veterinary Epidemiology at the Department of Livestock Services, Lesotho).

The questionnaire was sent to SADC CVOs on June 1, 2013. Each CVO was requested to complete the questionnaire by September 30, 2013.

d. Data Analysis

The responses to closed-ended questions from questionnaires were coded and stored in Microsoft excel. Dillman (2011) described a closed-end question as one that restricts respondents to a choice of answers, i.e. a multiple choice system. Descriptive statistical methods of excel, such as frequency tables (Microsoft Corporation, 2014) were used in data analysis of open-ended questions which were collated, tallied and proportions calculated. An open-ended question is designed to encourage a full, meaningful answer using the respondent's own knowledge and also tend to be more objective and less leading than closed-ended questions (Bogdan, 1984; Rea & Parker, 2012; Rossi, Wright & Anderson, 2013; Taylor & Zaller & Feldman, 1992). Additionally, responses from the semi-structured interviews were captured and reported.

5. Results

a. Socio-economic and environmental disparities generated by international trade standards that impact on beef trade

DFZs which are currently implemented under geographic approaches by trading partners as outlined in OIE TAHC Chapter 4.3 were developed as a trade facilitation measure many years ago (OIE, 2014f). Beef can be exported from DFZs if importing country's sanitary requirements are met. In SADC countries where wildlife and cattle live together in the same biosphere; both wildlife and beef industries have experienced a negative result. The conflict between wildlife conservation and commercialization of beef production in SADC is due to the fact that wildlife

especially African Buffalo acts as reservoir of FMDV and international animal health standards indirectly prohibit this mingling (Article 8.8.11 and Article 8.8.22). This has resulted in indirect social, environmental and financial repercussions on both wildlife and beef sectors; continuing reduction of wildlife species due to lethal effects of veterinary cordon fences (Cumming, Osofsky, Atkinson, & Atkinson, 2015; Gadd, 2012; Sinkala et al., 2014; Thomson et al., 2013a).

VCFs are neither described nor are prerequisites in TAHC but are accepted by trading partners as effective methods for establishment of DFZ in beef exporting countries and are erected to separate wildlife from domestic animals to curb transmission of FMD virus. OIE has clear standards for attainment of country or zonal FMD freedom with or without vaccination (OIE, 2015). Countries like Lesotho and Swaziland have country freedom from FMD without vaccination. Buffaloes do play a role in Swaziland but have attained country freedom from FMD. Establishing and maintain FMD country freedom needs stringent separation of FMD-free animals from potentially infected animals (OIE, 2015), basically achieved through VCFs. Even though TAHC does not prescribe or define VCFs but do recommend the establishment of protection zones which need not be fences but could be geographical entities.

Cattle farmers in FMD-infected and protection zones have not been empowered due to lack of market access and economic value of their cattle (Thomson et al., 2004). Southern African national governments with FMD-endemic statuses subsidize maintenance of FMD-free zones but this investment does not yield positive results lately because FMD-free zones are proving increasingly difficult to maintain (Scoones et al., 2010). Letshwenyo (2012) highlighted that establishment of TFCAs in most SADC Member States has already yielded or going to pose logistical and technical challenges on FMD control as TFCAs would facilitate free movement and distribution of FMD positive buffalo herds. The lethal effects of VCFs on wildlife and underdeveloped beef industry in SADC FMD-endemic areas with large cattle populations call for the implementation of non-geographic animal health trade standards that are both livestock and wildlife commercially friendly and globally accepted regardless of the fear of FMDV reintroduction by lucrative markets.

b. The current regional FMD situation and consequences

FMD is a contagious viral disease of domestic and wild cloven-hooved animals (OIE, 2015). The virus that causes FMD is the prototype member of the Aphthovirus genus of the family *Picornaviridae* (Carrillo, 2012; Knowles, 2013; Knowles & Samuel, 2003; Nsamba et al., 2015). *Picornaviridae* are non-enveloped viruses with single-stranded ribonucleic acid (RNA) genome of positive polarity (Ahlquist, 2006; Mumford, 2007). There are seven immunologically distinct FMD virus serotypes: O (named after place of origin: *Oise* – town in northern France, reported in 1922); A (named after place of origin: *Allemagne* –German, reported in 1922); C (named after the discoverer: *Waldmann* – reported in 1926); SAT 1, 2 & 3 reported in 1958; and Asia1 reported in 1957 (Pirbright Institute, 2014). Among the FMDV serotypes, there is no cross protection; immunity to one FMD virus serotype does not protect an animal from other serotypes (Jamal & Belsham, 2013; Rodriguez & Gay, 2011). The most important fact is that O, A, C & Asia1 serotypes and SAT serotypes have different evolutionary lineages (Jamal & Belsham, 2013; Kasanga et al., 2014; Maree et al., 2014).

Serotype O is distributed in most regions of the world where FMD is endemic (Pirbright Institute, 2010a; Samuel & Knowles, 2001). The last case of FMD virus serotype C was reported in 2004 in Kenya and has possibly disappeared spontaneously (OIE, 2014b; Pirbright Institute, 2010b). African countries have not reported FMDV serotype Asia1 (OIE, 2014b; Pirbright Institute, 2010c). Among the six FMDV serotypes reported in Africa, the three SAT serotypes are essentially restricted to sub-Saharan Africa (Alexandersen & Mowat, 2005; Bronsvoort et al., 2008; Hall, Knowles, Wadsworth, Rambaut, & Woolhouse, 2013; Sahle, Dwarka, Venter, & Vosloo, 2007; Vosloo, Bastos, Sangare, Hargreaves, & Thomson , 2002). SAT serotypes probably evolved in association with African buffalo (*Syncerus caffer*) (Knowles, 2013; OIE, 2014a). In spite of the fact that, healthy African buffalo are maintenance hosts for SAT serotypes, they have not shown any evidence that to be maintenance hosts for Eurasia serotypes (Anderson, Doughty, Anderson, & Paling, 1979; Ayebazibwe et al., 2010; Thomson et al., 2003).

FMD outbreaks are increasing in the SADC region (OIE, 2014e), although this may be due to improved reporting to OIE. However, the increase has also been attributed at least in part to loss

of effectiveness of vaccine and vaccination (Mulumba, 2012; SADC-LTC, 2012). Botswana, Namibia and South Africa have reported 54, 95 and 98 FMD outbreaks respectively between 2005 and 2014 (OIE, 2014b). In 2011 South Africa had the FMD-free zone status being suspended due to detection of FMD virus in the FMD free zone where vaccination is not practiced (OIE, 2014d) and that outbreak resulted in international trade restrictions on livestock commodities being imposed. As a result South Africa lost an estimated $348 million on beef and game meat exports to lucrative markets (Department of Agriculture, Fisheries and Forestry [DAFF], 2015). Some countries in SADC that have an abundance of wildlife and the potential for commercial cattle farming have limited access to international markets for livestock and wildlife derived products due to the prevalence of FMDV.

c. The current international trading system

i. International sanitary standards and bodies that set trade standards

International sanitary and Technical Barriers to Trade (TBT) standards are aimed at preventing unjustified non-tariff barriers to trade. That is why the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) was formulated. The SPS Agreement encourages MS of the World Trade Organization (WTO) to base their import requirements on international standards where they exist (WTO, 2014). Due to the influence of all issues that are able to affect the health of consumers, the WTO mandated two international organizations to provide the standards for the SPS Agreement in respect of food safety and trade in animal commodities and products:

- OIE was established in 1924 following the pandemic spread of rinderpest from India to Europe and consequent devastating losses to cattle farmers (OIE, 2014c). OIE currently has 184 Member States. OIE is mandated by the WTO to provide standards for animal disease issues that influence trade in commodities derived from animals. These standards are contained in the Codes (TAHC and Aquatic Animal Health Codes) and Manuals (Terrestrial and Aquatic) which contain diagnostic and vaccine standards (OIE, 2014b).

The Codes and Manuals provide standards which can be used to achieve assurance in respect of animal pathogens.

- The Codex Alimentarius Commission (CAC): Two institutions of the United Nations, *viz* Food and Agriculture Organisation (FAO) and World Health Organisation (WHO) in 1963 formed the CAC in order to provide international food safety standards (CAC, 2014). CAC produces standards that are published in the Codex Alimentarius. The Codex Alimentarius is a collection of internationally acknowledged standards, codes of practice, guidelines and other recommendations relating to foods, food production and food safety.

Food safety (i.e. Codex) standards are non-geographic in nature but OIE standards are predominantly focused on the geographic distribution of infectious agents pathogenic to animals. OIE standards have two main limitations; (i) detrimental effects on ecosystem health and rural development consequent upon the use of game-proof fences to establish zones free from TADs – FMD in particular. Some of these fences have had profound effects on wildlife populations (Ferguson & Hanks, 2012) and (ii) lack of methodological coherence with food safety standards. The underlying factor is that food safety and OIE standards are based on different approaches that complicate trade in livestock commodities and products. This complex situation, i.e. the incompatibility between CAC and OIE standards has been reconciled by mutual agreement between the two to accept and harmonise standards in several horizontal chapters of the TAHC (CAC, 2012).

ii. Equivalence and its possible application in the SADC Region to facilitate improved market access for beef

OIE (2014b) describes equivalence as "the state wherein the sanitary measure(s) proposed by the exporting country as an alternative to those of the importing country, achieve(s) the same level of protection." Chapter 5.3 of TAHC has provisions that complement Article 4 of the SPS Agreement on determining equivalence of sanitary requirements as reported by OIE and WTO

(2014). Provisions on determining equivalence require the evaluation of the official veterinary service of the exporting country and determination of how equivalence can be achieved. Potential possible application of equivalence in the SADC region could facilitate improved market access for beef. For instance, country A (exporter) does not need to replicate country B's (importer) disease control strategies. In simple terms; demonstration of equivalence could provide a mechanism for market access for southern African countries. Typically, recognition of equivalence is achieved through bilateral consultations and the sharing of technical information as indicated by the WTO. More specifically it generally also requires a risk assessment to demonstrate equivalence.

d. New opportunities based on equivalence

The future for SADC beef exports to lucrative markets based on the creation of FMD-free zones is faced with essentially intractable problems explained in the Introduction to this dissertation. Therefore alternative approaches such as compartmentalization and value chain systems such as Article 8.8.22 need to be considered. Moreover, Standard Methods and Procedures in Animal Health Programme (SMP-AH) which is designed to strengthen southern Africa's capacity to compete in high value markets and promote intra/inter-regional trade could assist in the implementation of new approaches.

i. Articles 8.8.22 – advantages and disadvantages

Article 8.8.22 provides a process whereby beef can be exported as a safe commodity from FMD-infected countries or zones provided that a number of risk mitigation measures are applied that collectively reduce the risk of FMDV spread to acceptable levels. As outlined in Table 4, clauses *1a* to *1e* of Article 8.8.22 require a series of risk mitigation measures to be applied in the field or at the abattoir to reduce the risk of FMDV presence or transmission. Clauses *1f* to *2b* prescribe measures to reduce the risk of FMDV survival in beef.

Table 4 – OIE TAHC Article 8.8.22

Recommendations for importation from FMD infected countries or zones where an official control programme exists

For fresh meat of cattle and water buffaloes *(Bubalus bubalis)* (excluding feet, head and viscera) *Veterinary Authorities* should require the presentation of an *international veterinary certificate* attesting that the entire
consignment of *meat*:

1. comes from animals which:
   - i. have remained, for at least three months prior to *slaughter*, in a *zone* of the *exporting country* where cattle and water buffaloes are regularly vaccinated against FMD and where an *official control programme* is in operation;
   - ii. have been vaccinated at least twice with the last *vaccination* not more than six months, unless protective immunity has been demonstrated for more than six months, and not less than one month prior to *slaughter*;
   - iii. were kept for the past 30 days in an *establishment*, and that FMD has not occurred within a 10 kilometre radius of the *establishment* during that period, or the *establishment* is a *quarantine station*;have been transported, in a *vehicle* which was cleansed and disinfected before the cattle and water buffaloes were loaded, directly from the *establishment* of origin or *quarantine station* to the approved *slaughterhouse/abattoir* without coming into contact with other animals which do not fulfil the required conditions for export;
   - iv. have been slaughtered in an approved *slaughterhouse/abattoir*:
     - a) which is officially designated for export;
     - b) in which no FMD has been detected during the period between the last *disinfection* carried out before *slaughter* and the shipment for export has been dispatched;
   - v. have been subjected to ante- and post-mortem inspections within 24 hours before and after *slaughter* with no evidence of FMD;
2. comes from deboned carcasses:
   - from which the major lymphatic nodes have been removed;
   - which, prior to deboning, have been submitted to maturation at a temperature greater than + 2°C for a minimum period of 24 hours following *slaughter* and in which the pH value was less than 6.0 when tested in the middle of both the longissimus dorsi muscle.

Source OIE (2015) as at February 7, 2016

However, Article 8.8.22 has several weaknesses and among them is a potentially killer factor (Clause *1c*) which cannot be fully implemented in FMD endemic areas where wildlife movement cannot be managed or tracked (e.g. the ZR of Namibia). Clause *1c* is therefore technically, logistically and financially challenging to apply in some parts of the SADC region. Even though Article 8.8.22 is an international standard the question arises as to whether it could be made more applicable to the situation in many parts of southern Africa? Table 5 below provides more detail into the strengths and weaknesses of the different clauses of Article 8.8.22 from a southern African perspective.

Table 5: Analysis of the Strengths and Weaknesses of OIE TAHC Article 8.8.22

Article 8.8.22 Recommendations	Strength	Weakness	Conclusion
1. a) *'Comes from animals which: have remained, for at least three months prior to slaughter, in a zone of the exporting country where cattle and water buffaloes are regularly vaccinated against FMD and where an official control programme is in operation;*	The scientific basis for the adoption of a specific 3-month period is ambiguous, but is no doubt intended to prevent cross-border rustling.	• Both sides of the border could have the same FMD status and therefore it would not make much difference if the animals did originate from the other side of the border. • Three-month residence requirement will be difficult to verify in some locations. • Porous borders may result in a free-flow of infected cattle as animals do not respect borders. • In many cases border lines only exist in books and no clear demarcation of borders exits. It is surveillance intensity rather than time that establishes the risk of the presence of FMD virus. • 'Official control is in operation' is a vague statement and suffers from the disadvantage of being open to different interpretations as to what is necessary and this may act as a major impediment to trade for SADC	The provisions of this clause would be impossible to certify reliably unless there is a reliable animal identification and movement recording system. Therefore, the preamble to the clause should also require an adequate animal traceability system.
b. 'Comes from animals which: have been vaccinated at least twice with the last vaccination not more than six months, unless protective immunity has been demonstrated for more than six months, and not less than one month prior to slaughter	i. Effective vaccination significantly reduces the risk that immunized animals or their products could be infected by FMD virus. . This ensures that animals have been vaccinated according to an acceptable routine programme.	• Vaccination may fail to control the disease due to: defective or time-expired vaccine, incorrect vaccine storage and application, poor vaccination coverage, immunological unresponsiveness in malnourished animals, viruses in field not matched to the vaccine strains, and exposure to infection before the development of an adequate level of vaccinal immunity.	The article addresses the level of herd immunity that needs to be induced by routine vaccination. Specific and prescriptive criteria should be developed for the FMD official control programme. This is a scientifically sound requirement.
c. *Comes from animals which: were kept for the past 30 days in an establishment, and that FMD has not occurred within a 10 kilometre radius of the establishment during that period, or the establishment is a quarantine station;*	• This measure, if it can be applied, would minimize the probability of slaughter cattle coming into contact with infected livestock or wildlife	• "FMD not occurred within 10km": Under extensive production systems, communal areas and movement controls of southern Africa, especially where wildlife occurs, this clause is not implementable. • It is unclear whether the TAHC definition of establishment is adequate to cover production practices in extensive rangeland systems. • Surveillance needed to certify this requirement is	If infection is subclinical it does not matter how much time elapses; there will be no clinical disease. Moreover, this requirement cannot be satisfied in extensive systems where infected wildlife may be present. For these reasons this is an impractical requirement in the context of southern Africa.

		impossible both financially and logistically in locations with abundant wildlife populations.	
d. "*have been transported, in a vehicle which was cleansed and disinfected before the cattle were loaded, directly from the establishment of origin or quarantine station to the approved abattoir without coming into contact with other animals which do not fulfill the required conditions for export"*	1. Indirect FMD transmission may occur when objects or materials contaminated with FMD virus are present. Vehicles may serve as mechanical transmitters of the infection. Therefore this requirement is logical.		The clause addresses the fact that FMDV can be spread by vehicles. The positive idea here is that animals would not be moved on foot through an infected area. So this point seems valid. The standard makes clear the vehicle must be disinfected.
e. *i) "have been slaughtered in an approved abattoir: which is officially designated for export"*	2. Approved abattoir ensures that good hygiene procedures are followed & that pre- & post-slaughter inspection for FMD is conducted. The FMDV transmission risk is thereby reduced.		This is a scientifically sound requirement.
f. ii) *"have been slaughtered in an approved abattoir: in which no FMD has been detected during the period between the last disinfection carried out before slaughter and the shipment for export has been dispatched"*	3. This clause ensures proper disinfection of the abattoir in the event that FMD infected animals are slaughtered.		This clause makes sense as it would be dangerous to abandon the principle of high and uniform hygiene standards in approved abattoirs.
f. "have been subjected to ante- and post-mortem inspections for FMD with favourable results within 24 hours before and after slaughter"	4. This requirement ensures that carcasses of clinically infected cattle are not exported	In cattle that have partial natural or vaccinal immunity, clinical signs may be undetectable or may be missed. Infected animals in the incubation period present a high risk for FMDV contamination of the abattoir	This clause makes sense.
2. *Comes from deboned carcasses:* *a. "from which the major lymphatic nodes have been removed"*	5. The pH in lymph nodes & bone marrow does not usually reach the required value to inactivate virus and their removal reduces the risk of residual FMDV survival in boneless beef (Paton et al., 2010).	Lymph nodes and bone marrow might not be completely removed and it would be possible for FMDV to survive in such tissue remnants.	Deboned and deglanded beef presents a very low risk on containing FMDV; however it cannot be concluded that the risk is negligible without additional risk mitigation measures (Paton et al., 2010).
b. *"which, prior to deboning, have been submitted to maturation at a temperature above + 2°C for a minimum period of 24 hours following slaughter and in which the pH value was below 6.0 when tested in the middle of both the longissimus dorsi".*	• FMD viral levels are low in skeletal muscle and further inactivation occurs when the virus is exposed to pH of <6.0. • Testing pH value in the middle of both the longissimus dorsi ensures that the muscle pH has declined adequately to inactivate FMDV.		This clause makes sense because maturation followed by removal of potentially infected tissues and organs will mitigate the risk.

ii. Compartmentalization – advantages and disadvantages

A compartment, by definition provided by the OIE, is "an animal subpopulation contained in one or more establishments under a common biosecurity management system with a distinct health status with respect to a specific disease or *specific diseases* for which required surveillance, control and biosecurity measures have been applied for the purpose of international trade" (OIE, 2014b). The compartment could be one or more feedlots or dairies managed under a common biosecurity system but also include the conduits between them.

Successful implementation of compartmentalization would require high private investment with DVS oversight and bilateral negotiations between the exporter and importer as this has been the case in the pig and poultry industries (Scoones et al., 2010; Thomson & Penrith, 2015). The question that remains is whether compartmentalization would be practical in the SADC beef industry under current FMD-endemic situation? Compartmentalization is not applicable in extensive livestock production systems because production systems are not vertically integrated and it is difficult to institute common biosecurity systems in communal farming areas where the cattle have many owners (Thomson & Penrith, 2015; Thomson et al., 2013a). Moreover, clauses 2c and 2d of TAHC Article 8.8.4 prohibit vaccination against FMD and introduction of animal vaccinated against FMD within the past 12 months in compartments (OIE, 2015). Under current SADC FMD virus situation and presence of African buffalo, compartmentalization could not be successful.

Compartmentalization could be complemented by non-geographic animal health trade standards to enable FMD-endemic areas have more access to beef markets. Compartmentalization is a partially geographic approach and like Article 8.8.22 is difficult to apply in extensive production systems, especially where wildlife is present. In order to implement compartmentalization, FMD-endemic SADC Member States should have an official control programme and a surveillance system for FMD that allows an accurate knowledge of the distribution and prevalence of FMD in the country (OIE, 2014b). As things stand in SADC (Annex A-D), compartmentalization is not feasible for beef industry due to lack of capacity at country level.

iii. Value chain systems – advantages and disadvantages

FAO (2011) described value chain as the people and organizations responsible for processing raw material into a ready-for-sale product from farm to fork; each step along the chain contributes value to the product. Thomson et al. (2013b) found that a number of scientifically tested strategies could be incorporated in the management of risk along the value chains to ensure sanitary safety, including their use in combination. Thomson et al. contented that Food safety, FMD and other TADs risk can be managed along value chains due to the fact that HACCP and CBT principles are similar and can readily be applied in parallel along a beef value chain (Fig. 5). Article 8.8.22 is in reality a value chain standard – it just has a clause which makes it impractical.

The Namibian project on the development of export opportunities for beef from FMD-endemic areas yielded a blueprint for a value chain system that generates internationally acceptable risk mitigation through application of the principle of equivalence (Fosgate, Thomson, Penrith, & Thalwitzer, 2014). Considering that the value chain approach defined by Fosgate et al. (2014) was proven by an independent quantitative risk assessment to fulfil international requirements for demonstration of equivalence with Article 8.8.22, FMD-endemic countries should consider its implementation.

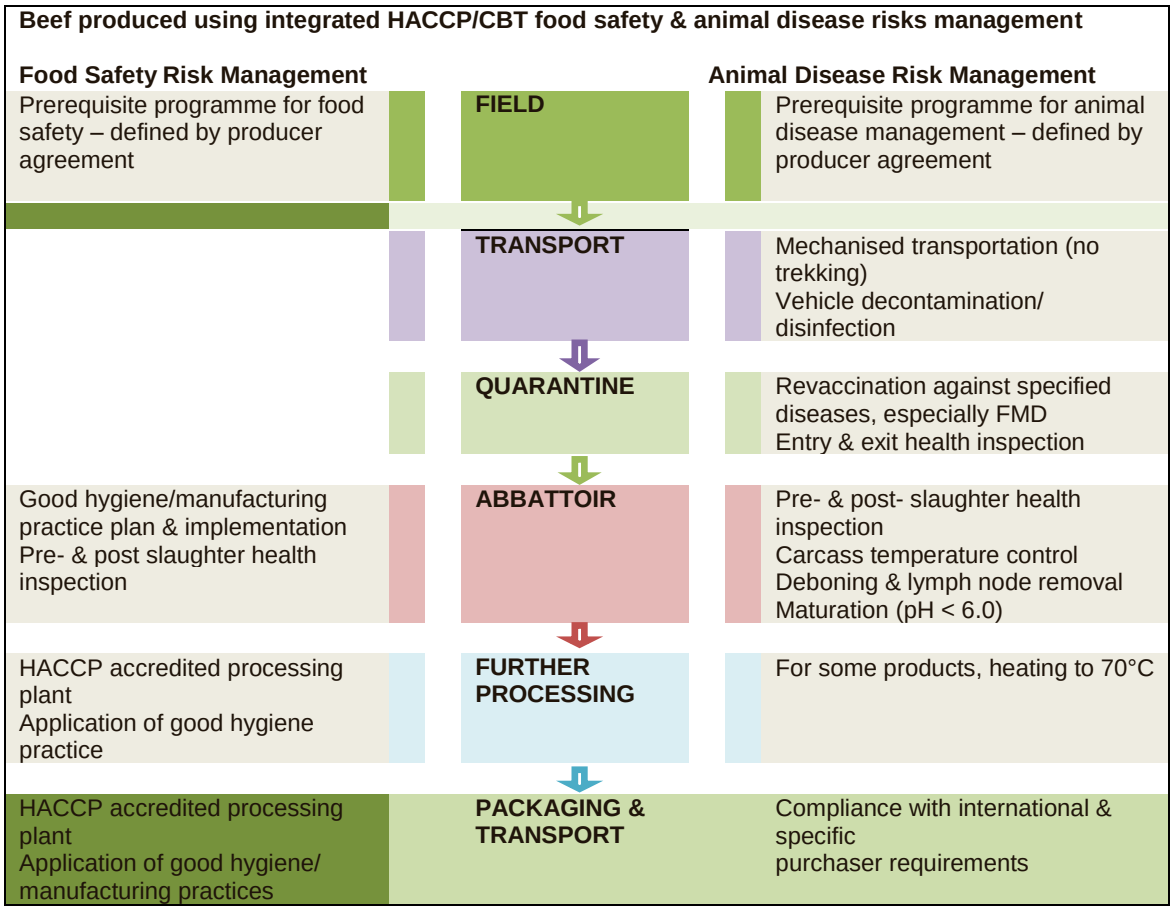

Figure 5 Parallel application of food safety and animal disease risk management measures along a value chain for beef production in an FMD-endemic area (Adapted from Thomson & Penrith, 2015).

iv. Standard Methods and Procedures in Animal Health Programme

The SADC Secretariat initiated the creation of a free trade area in 2008 to enhance intra-regional trade (SADC, 2012b). The intended benefits however, have not been realized in the livestock sector due to fear of introduction of animal diseases among Member States. SADC-LTC further indicated that key challenges include weak capacity of Member States to meet existing sanitary standards, weak disease control systems, lack of an effective regional framework to harmonize the management of animal diseases, inadequate information sharing at all levels on policies, strategies, disease outbreak information, lack of a coordinated regional initiative to facilitate intra-regional livestock trade and isolated, capital intensive disease control measures with frequent breakdowns.

Due to the many obstacles to formal intra-regional livestock trade, prolific informal trade channels have developed with weak monitoring activity at borders creating ripe environments for this trade to flourish. This is causing unpredictability and high costs as well as dangers of disease transmission across borders. Borders lack the physical infrastructure to adequately address these risks and inspectors do not have the necessary skills to identify risks (AU-Commission, 2013). In addition, there are often inadequate, nonexistent, overbearing, or unenforced policies in place to regulate the movement of livestock and livestock products across borders. Finally, policies and protocols vary widely between Member States resulting in unnecessary complexity and confusion, which hamper trade and provide further motivation for bypassing the legal frameworks that do exist. To meet this regional demand and to promote livestock and livestock products trade with other regions and internationally there is need for harmonisation of animal health regulatory requirements in the SADC region. This is because formal movement of livestock across international boundaries for trade is dependent on the acceptance of the sanitary guarantees of the exporting country and how closely it satisfies the health requirements of the importing country.

A SADC programme for the development of Standard Methods and Procedures in Animal Health (SMP-AH) was launched on September 9-11, 2014 in South Africa (AU-IBAR, 2014). During the launch of SMP-AH programme, 10 SADC Member States (Angola, Botswana, DRC, Madagascar, Malawi, Mozambique, Namibia, Seychelles, South Africa and Zimbabwe) made presentations and highlighted their strengths, weaknesses, capacity gaps and needs for the DVS. CVOs and technical partners developed an SMP-AH Concept Paper (Annex A-D) and have submitted SMP-AH Programme project proposal (Annex A-E) for funding.

The establishment of a regional SMP-AH in the SADC will provide a reliable cooperative approach to the control of TADs and zoonoses in the region and facilitate intra-regional trade in livestock and livestock products (Annex A-C). Through the SMP-AH programme the animal health regulatory requirements in the region will be harmonized through the creation and

adoption of standard methods and procedures for managing TADs in the region based on existing international standards. These methods and procedures will deal specifically with how countries undertake functions such as surveillance, management of disease outbreaks, laboratory confirmatory tests, management of vaccination campaigns and operation of border control points. Additionally, capacity building is an important component of the program to ensure that SADC Member States improve their technical capabilities as well in order to ensure quality implementation of the SMPs. The SMP-AH programme will adopt non-geographic approaches for regional trade.

e. Profile of respondents and questionnaire results and analysis

Only 33% (n=5) of the SADC MS participated in the survey namely; DRC, Lesotho, Madagascar, Swaziland and Zimbabwe. Lesotho and Madagascar are historically FMD-free, Swaziland last reported FMD in February 2001 (OIE, 2014b) and it is now considered FMD-free, Zimbabwe last had FMD-free zones in 2001 and the whole country is considered FMD-endemic and lastly, DRC never had any FMD-free status. FMD status is granted on application by the country concerned to the OIE. From that the FMD status map follows (OIE, 2014e). It should be noted that the questionnaire survey did not elicit sufficient data to enable a meaningful statistical evaluation. This was a high non-return rate which could introduce substantial bias in the estimates calculated from the returns. The reasons for the poor return rate are unknown.

6. Discussion

a. Feasibility of implementing non-geographic approaches

The preamble to Article 8.8.22 which contains a reference ‘Official control programme’ does not imply that the control programme has been endorsed by the OIE; rather the control program needs to be official in the country concerned. The Progressive Control Pathway for FMD (PCP-FMD) has a provision for official endorsement of the control programme but that implies the country has to have reached stage 3 of the PCP-FMD (Domenech, 2011). Article 8.8.22 clauses

do not distinguish, for trade purposes, between countries that adopt an official control programme and those that do not.

Application of additional pre and post abattoir risk mitigation procedures like pH control, deboning and maturation as outlined in Article 8.8.22 collectively reduce the risk of FMDV spread to acceptable levels (Henderson & Brooksby, 1948; Mutowembwa,Thomson, & Thalwitzer, 2014; Paton et al., 2010; Thomson, Leyland, & Donaldson, 2009). In addition to maintaining FMD-free zones, countries like Botswana, Namibia, Swaziland and South Africa apply pre and post abattoir risk mitigation procedures. In both Botswana and Namibia more than half the countries cattle do not qualify for international trade because they are located outside the FMD-free zones. These beef exporting countries do not allow imports from FMD-endemic areas due to the fear of endangering their FMD-free statuses. Therefore, regional trade in beef is greatly limited. National animal health policies in SADC Member States are currently based on geographic approaches.

In areas where the movement of wildlife and/or livestock cannot be controlled effectively, it would not be possible to certify that an infected animal has not come within 10 km of the establishments that provided the beef in question.

Even though OIE TAHC Article 8.8.22 is not entirely non-geographic, it creates new opportunity for allowing international trade in safe beef from FMD-endemic areas (within and close to TFCAs) and could overcome the negative effects of purely geographic approaches for beef trade. Non-geographic approaches like value chain approach would require involvement of private stakeholders at the early stages and balancing of national responsibilities at the DVS. Risk management of animal disease transmission along value chains has the potential to render the occurrence of infections that are difficult to detect by visual inspection much more effective.

This study sought to analyze the feasibility of implementing non-geographic approaches to deboned, deglanded and matured beef trade in SADC region and it found that implementation of non-geographic approaches is feasible.

Most DVS have difficulties to implement a certification process covering all the territory and all domains of activities because of lack of veterinarians in the field. The certification process is not regularly audited, although importers' evaluations could be considered as external audit of the certification process for beef exports. These constraints call for developing an external audit system of certification and a field network of government and private veterinarians to pave the way for additional future certifications (Brückner, 2013; Fermet-Quinet, Punderson, & Balcet, 2013; Thiermann & Hutter, 2013; Yehia & Mackenzie, 2013).

7. Conclusion

Implementation of non-geographic approaches offers a more viable alternative as compared to the current geographic approaches. The results showed that export of beef from SADC FMD-endemic areas is feasible particularly for intra-continental trade. This could result in solving the conflict between beef production and wildlife conservation. This means that non-geographic approaches to beef trade in the SADC region make sense because most of the livestock owners who collectively own more than 68 million cattle in the SADC Region do not benefit from farming beef. As non-geographic approaches are an issue in SADC FMD situation (wildlife/livestock interface), this study analyzed the feasibility, advantages and disadvantages, and requirements of Article 8.8.22. Management of food safety and animal disease risks along value chains offers a viable option that is currently not recognized. However, implementation of value chain systems needs a lot of factors into consideration, which were discussed in this dissertation.

It is concluded that SADC beef exporting countries should focus on regional and inter-regional markets as developed countries keep applying more stringent measures for beef from FMD-

endemic countries. Even though, Botswana and Namibia are unlikely to change their focus, in currently non-exporting countries the situation is different.

8. Recommendations to SADC Secretariat and OIE

a. Adoption of SMP-AH Programme as a SADC regional strategy

As already discussed and with further guidance from annexes A-C; A-D; and A-E attached, SMP-AH programme official adoption and implementation is recommended in SADC. There is guidance on CVOs should improve regional coordination and harmonization of livestock diseases prevention and control for increased production, competitiveness and market access for livestock and livestock products. The SMP-AH lays the framework for uniform surveillance, epidemiology, disease prevention and control, laboratory procedures and test interpretation, and quarantine procedures. Moreover, SMP-AH will enhance negotiation between trading partners using OIE recommendations as basis for discussion, for example the OIE TAHC and judgment of equivalence. SMP-AH programme once adopted as a regional strategy link with international standard setting of OIE and CAC because it would be implemented according to the recommendations provided by these two institutions. Integration of non-geographic approaches into the SMP-AH Programme could create an enabling environment for national and intra/inter-regional livestock trade.

b. Recommended changes to Article 8.8.22

Article 8.8.22 represents a value chain approach but should incorporate a greater degree of flexibility as outlined by the FAO (2011) and Thomson and Penrith (2015) on this subject. This would not only provide necessary flexibility but would also make certification based on CCPs more robust than is currently the case using only geographically based approaches. Table 6 below outlines the model on how to manage the sanitary risk measures necessary to enable reliable certification of the safety of beef from FMD-endemic area. The model is dependent on

the value chain system deemed fit by the respective DVS of the Member State exporting beef. Thomson and Penrith (2015) reported that in a number of SADC Member States there is a cattle quarantine (isolated and regularly inspected for signs of FMD) requirement of 21 days under the supervision of the state veterinary service before slaughter. It should be noted that this requirement does appear in the current Article 8.8.22. Management of sanitary risks along food value chains is dependent upon the creation of multiple barriers that provide sequential obstacles to the risk being transmitted along the value chain thus rendering risk management more reliable because it is not reliant on a single barrier. Risks of many kinds can be effectively managed and monitored along value chains at CCPs. The application of CCPs is of considerable benefit for auditing and certification. Proposed Article 8.8.22 providing a guide on VCM and certification of FMD hazards is therefore provided below:

Proposed Article 8.8.22

Recommendations for importation from FMD infected countries or zones, where an official control programme for FMD, involving compulsory systematic vaccination, exists

For fresh meat of cattle and Asian water buffaloes (*Bubalus bubalis*) (excluding feet, head and viscera)

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the entire consignment of *meat:*

1. Is derived from a defined value chain where risk factors for occurrence of FMD have been effectively identified and mitigated at CCPs that include:

a) . Safeguarding the animals were slaughtered in an officially recognised export *abattoir* that:

- Does not keep live animals for more than 24 hours before slaughter;
- Is thoroughly cleaned and disinfected before close of business each day.
- Undergoes regular auditing of the critical control points to ensure that the CCP limits are observed.

7 The animals were subjected to ante- and post-mortem inspections for FMD with favourable results within 24 hours before and after *slaughter*;

8 The meat comes from deboned carcasses:

- from which the major lymphatic nodes have been removed; which, prior to deboning, have been submitted to maturation at a temperature above + 2°C for a minimum period of 24 hours following *slaughter* and in which the pH value was below 6.0 when tested in the middle of both the *M. longissimus dorsi*.

In addition to the recommendations above, it should be borne in mind that a risk assessment needs to be conducted by an independent and competent person/body to show that the beef produced by the value chain in question achieves ALOP. This implies that if the measures detailed would not achieve ALOP then additional measures would need to be applied to bring the level of protection to that level – and proven to be effective by the risk assessment.

Table 6 Management of sanitary risk measures to enable reliable certification of the safety of beef from an FMD-endemic area (adapted from Thomson and Penrith, 2015). CCPs are indicated by boldface type and the remaining points are part of the prerequisite programme.

Location	Actions aimed at:		
	Improvement of product quality & quantity	**Achievement of appropriate level of protection for food safety**	**Achievement of appropriate level of protection for animal disease control**
Field	**5** Animal identification and record keeping **6** Compliance with producer protocol adapted to area (grazing strategy, supplementary feeding practices, herd management/ breeding practices and general health management) **7** Provision of essential infrastructure such as loading ramps for cattle	• Animal identification, record keeping and effective traceability system • Avoidance of undesirable feeding practices (e.g. use of meat/bone meal), observance of treatment recommendations for control of parasites and infectious diseases (including withdrawal periods for drugs used for treatment)	• Animal identification, record keeping and movement records/control • Grazing and kraaling strategies that avoid contact with buffalo as far as possible • Compliance with vaccinations programmes aimed at control of specified diseases including FMD • Monitoring of compliance at farm level (animal health/extension services)
Transportation	• Observance of protocol requirements aimed at avoidance of cruelty and achievement of good quality product • Provision of feed and water before/after transportation	• Observance of good practice guidelines for animal transport (avoidance of overcrowding, poorly designed vehicles, etc)	• **Motorized transportation to abattoir (i.e. avoidance of trekking)** • **Decontamination of transport vehicles between batches**
Quarantine	• Sustainable management of grazing resources • Provision of adequate water • Supplementary feeding if necessary	• Avoidance of any prohibited substances • Adherence to withdrawal periods for drugs used for treatment • Official residue monitoring programme.	• 21 day isolation of cattle • Revaccination against specified diseases, especially FMD • Compliance with FMD and biosecurity management plan • Entry & exit health inspection

Abattoir	• Provision of adequate feed and water before slaughter • Improvement of animal management practices in the holding area • Proper maturation of carcasses	• Documented traceability system • Washing down of animals on arrival at abattoir • Cleanliness of the holding areas • **Ante-mortem health inspection** • **Carcass/meat inspection** • HACCP & GHP implementation supported by independent certification • **Temperature control, including refrigeration** • **Microbiological monitoring** • Monitoring of residues	• **Documented traceability system** • **Ante- & post-mortem health inspection** • **Prescribed maturation of carcasses over a 24h period, including pH determination** • **Thorough deboning and removal of lymph nodes** • **21 day 'quarantine of meat' (post-slaughter)**

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Annexes

Annex A-A: Questionnaire used in the study

UNIVERSITY OF PRETORIA

FACULTY OF VETERINARY SCIENCE

Implementation of non-geographic approaches to beef trade in the SADC Region

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MSc (Animal/Human/Ecosystem Health)

COUNTRY: [ ]

Note:

1. Please complete the questionnaire by providing concise answers in the empty boxes provided. Use mouse or tab key to access boxes.
2. After completing this document, please email it to palimemz@gmail.com and mosiuoa@palime.co.za before 30 September 2013.
3. Please note that the data from this questionnaire will be used to gain a general insight into possible problems – the report will acknowledge those countries that have completed the

questionnaire but will not refer to individual specific countries; the summary statistics and analysis of the data.

Most countries in Southern African Developing Community (SADC) where trade-sensitive animal diseases are endemic do not have the ability, infrastructure and political support to establish and maintain disease free zones. There are also other constraints unique to SADC such as the wildlife-livestock interface, the permanent presence of the foot and mouth disease (FMD) virus in the African buffalo cultural entities and transhumance that further place constraints on these countries to comply with international standards for market access.

Countries in SADC that do not yet have the advantage of World Organisation for Animal Health (OIE) recognized free zones or status for animal diseases are currently experiencing a comparative disadvantage for entering international trade in animals and animal products. A vast potential market is in the waiting for countries in SADC to contribute to the worldwide demand that should and must be exploited. Without being able to comply with the strict sanitary guarantees required by trade partners especially in the developed world, these potential markets remain closed for the majority of SADC countries.

3. General information: Export of live animals and products

Please provide figures of national exports for the period January to December 2012

Animal specie	**Commodity**	**List the top 3 countries exported to**	**Number/quantity exported (thousands/metric tons)**
Bovine	Live animals		
	Meat		
	Skins		

4. Risk mitigation measures prior to export:

a) Are exports only allowed from disease free zones?

Yes:	No:	Do not know:

Comments:

b) Are animals quarantined prior to export?

Yes:	No:	Do not know:

Comments:

c) Do some or any animals originate from disease free compartments prior to export?

Yes:	No:	Do not know:

Comments:

d) Do you export safe commodities from FMD infected areas (e.g. meat that has been rendered safe from FMD through maturing, deboning, etc?)

Yes:	No:	Do not know:

Comments:

e) If you do not export safe commodities from infected areas, do you think this possibility can be exploited/ used in your country in the future? If the response to question 1.a is yes, please ignore this question.

Yes:	No:	Do not know:

Comments:

f) What risk mitigation measures do you apply prior to export (Please answer all relevant to your export items)?

Commodity	Risk mitigation measure	Yes	No
Live animals	***Vaccination:***		
	FMD		
	CBPP		
	RVF		
	Dipping		
	Quarantine		
	Compulsory animal identification		
Meat	Maturation		
	Deboning		
	Decrease in pH		
	De-glanding		

g) Who conducts certification for export?

Official veterinarians:	Private veterinarians:	Not Applicable:

a) General information: <u>Import</u> of live animals and products

- <u>Please provide figures of imports for the period January to December 2012</u>

Animal specie	Commodity	List the 3 most important countries imported from	Number/quantity imported (thousands/metric tons)
Bovine	Live animals		
	Meat		
	Skins/ hides		

Risk mitigation measures required prior to import:

- Are imports only allowed from disease free zones?

Yes:	No:	Do not know:

<u>Comments:</u>

- Must animals be quarantined prior to import?

Yes:	No:	Do not know:

Comments:

- Would you require animals originating from disease free compartments prior to import?

Yes:	No:	Do not know:

Comments:

- Would you require safe commodities from FMD infected areas (e.g. meat that has been rendered safe from FMD through maturing, deboning, etc?)

Yes:	No:	Do not know:

Comments:

- If you currently do not require imports of safe commodities from infected areas, do you think this possibility can be exploited/ allowed in your country?

Yes:	No:	Do not know:

Comments:

- What risk mitigation measures do you expect/require from a country prior to export to your country?

Commodity	**Risk mitigation measure**	**Yes**	**No**	**Not applicable**
Live animals	***Vaccination:***			
	FMD			
	CBPP			
	RVF			
	Dipping			
	Quarantine			
	Compulsory animal identification			
Meat	Maturation			
	Deboning			
	Decrease in pH			
	De-glanding			

b) Export zones

Do you have dedicated export zones in your country? Yes No

If not, do you consider the establishment of dedicated export zones in the future? Yes No

Should you have export zones or intend establishing such zones, will it be donor funded or funded by Government? Yes No

c) Issues inhibiting/preventing the export of animals and animal products

Please consider which (if any) of the issues below have/might have an effect for your country for not being able to enter the export market for animals and animal products or issues that make it difficult to enter the export market. If a *"yes"* or *"sometimes"* is indicated, also rate the importance of the factor on a scale of 1 to 3. (1 = important; 2=sometimes important; 3=not important):

Factor possibly affecting trade	**Yes do have an effect**	**Sometimes applicable**	**No**	**1**	**2**	**3**
Do not have official free zones						
Cannot meet sanitary requirements of Importing country						
Importing country requirements are too strict						
Do not have the capacity/infrastructure to establish official free zones						
Do not have the capacity to/infrastructure to establish disease-free compartments						
Do not have the infrastructure/capacity to produce disease-free commodities (meat)						
OIE standards are too strict to allow trade						
No incentive to enter export market						
Livestock owners are not interested to export						
Livestock production not sufficient to allow export						
Priority is to meet national demands for food supply before exporting						
Access to export markets are too costly						
Competition from surrounding countries						
Compulsory individual animal identification						

End of questionnaire

Annex A-B: Consolidated answers to the questionnaires

- Do you export safe commodities from FMD infected areas (e.g. meat that has been rendered safe from FMD through maturing, deboning, etc)?

Yes: 20%	No: 80%*	Do not know:

* This refers to FMD-free countries but export safe beef.

- If you do not export safe commodities from infected areas, do you think this possibility can be exploited/ used in your country in the future? If the response to question 1.a is yes, please ignore this question.

Yes:	No: 100%	Do not know:

* Will not be exploited due to strict veterinary export requirements

- Do you export safe commodities to other markets?

Yes: 10%	No: 90%	Do not know:

- What risk mitigation measures do you apply prior to export (Please answer all relevant to your export items)?

Commodity	**Risk mitigation measure**	**Yes**	**No**
Live animals	***Vaccination:***		
	FMD	I (20%) *In control areas to accepting countries.	II (40%)
	CBPP		III (60%)
	RVF		III (60%)
	Dipping	IIIII (100%)	
	Quarantine	IIII (80%)	
	Compulsory animal identification	IIII (80%)	
Meat	Maturation	IIII (80%)	
	Deboning	II (20%) *Market dependent	
	Decrease in pH	II (20%)	
	De-glanding	II (20%) *Market dependent	

- Would you require safe commodities from FMD infected areas (e.g. meat that has been rendered safe from FMD through maturing, deboning, etc?)

Yes: 60%	No: 40 %	Do not know:

- If you currently do not require imports of safe commodities from infected areas, do you think this possibility can be exploited/ allowed in your country?

Yes: 60%	No: 40%	Do not know:

- What risk mitigation measures do you expect/require from a country prior to export to your country?

Commodity	**Risk mitigation measure**	**Yes**	**No**	**Not applicable**
Live animals	***Vaccination:***			
	FMD	II (40%)	I (20%)	I (20%)
	CBPP	II (40%)	I (20%)	I (20%)
	RVF	III (60%)	II (40%)	
	Dipping	III (60%)	I (20%)	
	Quarantine	IIII (80%)	I (20%)	
	Compulsory animal identification	III (60%)	I (20%)	I (20%)
Meat	Maturation	IIII (80%)		
	Deboning	II (40%)	I (20%)	I (20%)
	Decrease in pH	III (60%)		I (20%)
	De-glanding	II (40%)	I (20%)	I (20%)

- Export zones

Do you have dedicated export zones in your country? Yes 0% | No 100%

If not, do you consider the establishment of dedicated export zones in the future? Yes 75% | No 25%

Should you have export zones or intend establishing such zones, will it be donor funded or funded by Government? Yes 67% | No 33%

- Issues inhibiting/preventing the export of animals and animal products

Factor possibly affecting trade	**Yes do have an effect**	**Sometimes applicable**	**No**	**1**	**2**	**3**
Do not have official free zones	I		I	I	I	I
Cannot meet sanitary requirements of Importing country	II			II	II	
Importing country requirements are too strict	II			III	I	
Do not have the capacity/infrastructure to establish official free zones		II		I	I	I
Do not have the capacity to/infrastructure to establish disease-free compartments		III		II		
Do not have the infrastructure/capacity to produce disease-free commodities (meat)	I	III		II	I	
OIE standards are too strict to allow trade		III		I	II	I
No incentive to enter export market		I		II		
Livestock owners are not interested to export	I	II			I	I
Livestock production not sufficient to allow export	II		I	I	I	I
Priority is to meet national demands for food supply before exporting	III			III		
Access to export markets are too costly	II			II	I	I
Competition from surrounding countries		II			I	III
Compulsory individual animal identification		II		I	II	I

Most important factors that hinder export of beef as rated by Member States:

- Do not have official free zones (33%)
- Cannot meet sanitary requirements of importing country (67%)

- Importing country requirements are too strict (100%)
- Do not have the capacity/infrastructure to establish official free zones (33%)
- Do not have the capacity to/infrastructure to establish disease-free compartments (67%)
- Do not have the infrastructure/capacity to produce disease-free commodities (meat) {67%}
- OIE standards are too strict to allow trade (33%)
- No incentive to enter export market (67%)
- Livestock production not sufficient to allow export (33%)
- Priority is to meet national demands for food supply before exporting (100%)
- Access to export markets is too costly (67%)
- Compulsory individual animal identification (33%)

Annex A-C: Standards Methods and Procedures Animal Health Programme

Policy Plan Priority Areas Impacted:

- Institutional Architecture for Improved Policy Formation - Build national policies, based in science, supporting regionally agreed upon policy priorities and laboratory infrastructure for risk management. Enable policy makers to build national policies, based in science, and supporting regionally agreed upon policy priorities. Build national policies supporting risk management and disease monitoring, surveillance, and control.

- Agricultural Trade Policy - Build national policies that support mutual recognition and ensure a laboratory network is able to validate quality and standards of exported and imported agricultural goods. Build national policies to ensure TADs are accounted for through regional identification, monitoring, surveillance, and control programs.

Policy Development Strategy Objectives

- **SPS Enabling Environment 1.1**: Assist countries to build transparent, participatory systems that will serve to increase the trust between countries, create an environment whereby all stakeholders have a voice in the SPS decision-making processes, and will improve the overall safety of food and feed production in the region.

- **SPS Enabling Environment 1.2:** Assist SADC and national governments to establish technical frameworks that can be utilized in domesticating any number of regionally agreed upon actions, including defining common terms that all countries utilize. Support the sharing of experiences and expertise in order to have rapid access to information.

- **SPS Enabling Environment 1.3:** Help build an understanding of SPS regulatory systems within national governments that acknowledges support for all aspects of national food control systems, including laboratory systems, surveillance, compliance and enforcement.

- **SPS Risk Management Program 2.1:** Improve the effectiveness of each country's risk management processes as a means to achieve greater safety in

domestic and regionally traded food/feed.

- **Animal Health Program 3.1:** Improve cross-border movement of products through the creation of greater efficiencies in disease diagnosis, control, and surveillance and the regional alignment of national approaches to pest and disease identification and control. This will also encourage regional integration of quarantine policies, such as through Chief Veterinary Offices, which will increase dialogue on movements of commodities and cooperation to address mutual problems.

- **Animal Health Program 3.2:** Build the capacity of Chief Veterinary Offices to accurately characterize risk and perform the information gathering, evaluation, and recording necessary to develop recommendations for a position or action in response to a specific pest/disease risk. This will:
- Provide policy makers with the necessary information to allocate resources in the event of invasion, incursion or infestation.
- Meet international obligations of transparent, science-based analysis (e.g. International Standards for Phytosanitary Measures (ISPM) No. 2.)

- **Animal Health Program 3.3:** Build capacity to improve the handling and efficacy of agricultural inputs. This includes both internal handling of products (such as veterinary medications) in terms of validating authenticity and efficacy as well as cross-border movement of products.

- **SPS Laboratory Program 5.3:** Build capacity to improve the handling of agricultural inputs and identification of counterfeit products.

- **SPS Laboratory Program 5.4:** Increase animal disease diagnostic capabilities.

Goals: The thrust of the SMP program is, at foundational level, to stabilize livelihoods of

pastoralists and other livestock owners and producers so that their future is more secure and their lives can be foreseen and planned. The avenue for so doing it through support of animal health and subsequent stabilization of livestock trade, which supports not only families involved with livestock production but national economies as well. Healthy animals provide a safe and nutritious food supply component, and additionally, jobs and livelihoods all along the value chain from initial owner to final consumer including producers, marketers, transporters, feeders, butchers, meat processors, exporters, the leather industry, secondary products of all types, and more. Livestock industries are huge contributors to national economies in the nations of Southern Africa.

Background: In collaboration with the AU-IBAR, the SMP-AH will support an approach to regionalized animal health programming for trade-related TADs that (AU-IBAR, 2014):

- Provides a framework for surveillance, epidemiology, prevention, and control of the regional priority TADs that are important to trade and exportation from and within the nations of Southern Africa.
- Aims to standardize policies and procedures for detection of and response to specified trade-significant TADs so that the disease status of the importing nations is protected.
- Tailors the program where each disease has a separate program-a Standard, Methods and Procedures specifically for that particular disease-with elements specific to its etiology and dynamics.
- Accepts already existing disease surveillance, prevention, control, and laboratory testing programs, as well as protocols being used national Departments of Veterinary Service's programs with the goal of coordinating these into a regionally coherent system.
- Designs itself to accept growth and revision as new technologies and/or improved disease control strategies become available.
- Facilitates animal health certification programs by providing a foundation of disease control against which to certify.
- Acknowledges that the exporting nations of Southern Africa may have individual differences in their structures, but that compliance with the SMP-AH program will uniformly create the condition necessary for Safe Trade with An Appropriate Level of Protection (STALOP).

• Enhances negotiation between the exporters and importers. • Addresses animal health as related to both live animal trade and trade in animal products and commodities by providing healthy animals to CBT. • Coordinates region-wide animal health prevention and disease control activities.
A regional SMP framework provides a stable foundation for both live animal trade and livestock commodity based product trade within the SADC region. The SMP program facilitates animal health certification programs by providing a foundation of disease control against which to certify. This approach acknowledges that the exporting nations of SADC may have individual differences in their structures, but that compliance with the SMP-Animal Health program will uniformly create the conditions necessary for Safe Trade with an Appropriate Level of Protection by creating harmonized animal health regulatory systems amongst the countries in the region. This approach will significantly increase overall knowledge of the disease situation in the field and greatly assist with developing policies for surveillance and response mechanisms. Surveillance and response capabilities will be expanded for the nations and the region, creating greater strength and stability of animal health systems – which in turn support food security, marketability of livestock, and economic health for both families and nations. SADC member states include Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe.

Annex A-D: SMP – AH Concept Paper

Formulated by SADC CVOs and technical partners during the launch of SMP-AH Programme on September 9-11, 2014

Introduction

SMP – AH is an approach that harmonises activities of Department of Veterinary Services of Member States to selected diseases that impact trade and/or human health.

Overall Goal

To enhance the contribution of the livestock sector in the SADC region to improved livelihoods, food and nutrition security, regional integration and economic growth.

Specific objective

Improve regional coordination and harmonization of livestock diseases prevention and control for increased production, competitiveness and market access for livestock and livestock products through the formulation and adoption of SMP-AH approach by SADC.

Result Area 1: Regional coordination and collaboration enhanced

Activity: Strengthen animal diseases prevention and control policies and programmes

Sub activities

- Support and strengthen LTC, sub committees and working groups.
- Promote the development and adoption of the SMP-AH concept.
- Foster linkages with Reference laboratories.
- Support capacity building for One Health activities in SADC Secretariat and Member States.
- Promote inter regional collaboration in animal disease prevention and control

Result Area 2: Veterinary laboratory capabilities/capacity for harmonised diagnostic procedures improved

Activity: Strengthen laboratory capabilities/capacity for harmonized diagnostic procedures

Sub - activities

- Develop and harmonize Standard Operating Procedures.
- Develop and implement training programmes for laboratory staff.
- Support quality assurance programmes (Post Vaccination sero-monitoring, proficiency testing, twinning programmes etc).
- Support establishment/strengthening of laboratory information management systems.

- Support accreditation for veterinary laboratories.
- Support capabilities in residue testing in MS.

Result Area 3: Surveillance, epidemiology, disease control and food safety frame work harmonised

Activity1: strengthen capabilities/capacities for disease surveillance and epidemiology

Sub activities:

- Develop and implement training programmes for veterinary staff.
- Develop and implement SMP for the regional priority diseases.
- Develop and implement surveillance plans.
- Build capacity for evaluation of surveillance systems.

Activity 2: Strengthen disease prevention and control

Sub-activities

- Create a database of veterinary resources and expertise.
- Develop standard operating procedures for disease prevention and control.
- Develop regional and national strategies for the prevention and control priority diseases.
- Develop and implement contingency plans for emergency response.
- Build capacity to implement regional and national strategies and contingency plans for priority diseases (eg simulation exercises).
- Customise the OIE code for the region.
- Engage stakeholders in disease prevention and control (eg biosecurity measures)

Activity 3: Strengthen food safety control systems

Sub - activities

- Assess VPH and food safety capacities in the region.
- Develop and implement appropriate training programmes on VPH and food safety including HACCP concepts.
- Strengthen the VPH and food safety capabilities (including CPDs).
- Strengthen collaboration among agencies involved in food safety.

- Promote One Health approach in food safety.
- Inventory and assess facilities for processing of foods of animal origin for capacity building purposes.
- Promote stakeholders awareness and participation in food safety.
- Enhance monitoring of use of veterinary drugs, residues and antimicrobial resistance.

Result Area 4: Inter and -intra regional livestock trade enhanced

Activity: Promote inter and intra - regional trade of livestock and livestock products

Sub - activities

- Strengthen application of value chain and risk analysis approaches (including capacity building).
- Support generation and dissemination of market information on livestock and livestock products trade.
- Promote implementation of CBT and HACCP approaches where applicable.
- Promote regional standard certification in conformity with OIE guidelines.
- Promote cost benefit studies on marketing and mitigation of risks.
- Support PPP in matters related to trade and diseases control (including stakeholders' organization).
- Support capacity building in compliance and notification.

Result Area 5: Information, communication and knowledge management enhanced

Activity: Strengthen the use of information and knowledge management systems in livestock

Sub –activities

- Strengthen LIMS and SILAB and support inter-operability with other systems (National systems, ARIS-2 and WAHIS).
- Establish and support information sharing and e-discussion groups.
- Support creation of regional virtual library.
- Enhance communication among Member States.
- Support capacity building to manage information systems.

Result Area 6: Research (technical, marketing etc.)

Activity: promote applied and need based research

Sub-activities

1. Identify knowledge gaps and target research towards answering these gaps.
2. Promote applied research on diseases control.
3. Mobilize resources for research programmes.
4. Conduct marketing intelligence search.
5. Promote and support contract research.
6. Promote sharing of research findings (support publications of research results).
7. Promote and support cross border research.

Implementation Arrangements

The program will be implemented through collaborative arrangements bringing together SADC Member States and global and regional institutions in mutually beneficial partnerships built around their mandates and comparative advantages. The key organizations earmarked for collaboration in the implementation of this program include SADC secretariat and MS, AU-IBAR and other relevant AUC technical offices, FAO, OIE, WHO, farmer organizations and other civil society organizations in the region. Their roles, responsibilities and working modalities among other procedures will be developed and agreed at the start of the program.

AU-IBAR will have the central leadership and technical support role to the implementation processes. The SADC Secretariat will play the leading role in facilitating regional level coordination and harmonization of disease control frameworks. It will also be responsible for the mobilization of regional stakeholders' participation and sustainability of the initiatives. The SADC Livestock Technical Committee (LTC) and its sub-committees, established to enhance sectoral coordination in the region will play the leading role in articulating issues and driving processes at the regional level. Other institutions, as determined by the key partners (AU-IBAR, USAID/USDA and SADC) may be eligible for sub grants as needed.

A Results-based Monitoring and Evaluation (RBM&E) system will be established to evaluate the performance of the project to ensure that targets and milestones are achieved, provide evaluation feedback to improve performance, identify and help mitigate risks and answer critical issues that may be embedded in the program. The M&E system will be operationalized through a Performance Management Plan, with indicators specific to achieving activity output and outcome results for the entire project cycle. This plan will specify the data to be collected, frequency of collection, involvement of stakeholders and the analysis to be conducted etc. A project log frame (to be presented later) will provide the basis for M&E. The M&E system will go beyond monitoring progress on the policy harmonization processes and also monitor progress on implementation within individual SADC MS. The results of M&E will provide important feedback about progress towards achievement of the milestone and encourage participating countries to implement corrective measures. Project performance will be assessed independently at mid-term and closure.

All findings and information collected during program implementation will be analyzed and compiled into reports for the donor and other stakeholders.

Indicative Budget (in USD)

The following budget table lays out indicative budget levels for the various components of the activity.

Key Intervention/Results Areas	**Year 1**	**Year 1 to 4)**
Result 1: Regional coordination and collaboration enhanced	100,000	400,000
Result 2: Veterinary laboratory capabilities/capacity for	500,000	1,500,000.00

harmonised diagnostic procedures improved		
Result 3: Surveillance, epidemiology, disease control and food safety frame works harmonised	650,000.00	2,600,000.00
Result 4: Inter and -intra regional livestock trade enhanced	100,000.00	400,000.00
Result 5: Information, communication and knowledge management enhanced	100,000	400,000
Result 6: Research (technical, marketing etc.) Strengthened	200,000	1,000,000
Program support costs	250,000	1,000,000
Total Cost	**1,900,000.00**	**7,300,000.00**

Annex A-E: SMP-AH Project Proposal

ESTABLISHMENT OF STANDARD METHODS AND PROCEDURES FOR ANIMAL HEALTH FOR THE SOUTHERN AFRICA DEVELOPMENT COMMUNITY (SADC) REGION

Developed in Collaboration between AU-IBAR and SADC

January 2015

a) The livestock sub-subsector in Africa and the need for intervention

Livestock contributes significantly to Africa's economic growth, nutrition, food security and human well-being. They are the main livelihood asset and occupation of the poor farmers and smallholders and contribute an average of up to 30% of the agricultural GDP. Africa's livestock sector is estimated to grow at between 2-2.5% against high and rising demand for animal protein, also projected to increase 500-800% by 2050. As a consequence, there is increasing recognition by policy makers of the need to enhance livestock production in the continent in order to meet food security, livelihoods, employment and other developmental needs of the majority of the rural poor. The African Union leadership, in recognition of the potential of Agriculture to transform the lives of the population, earmarked 2014 as the year of Agriculture and launched a series of policy initiatives to promote greater investment in and transformation of the sector. This culminated in the adoption of the Malabo Declaration by AU Member States' Heads of State and Governments (HOSG) in Malabo, Equatorial Guinea. In their declaration, the HOSG recommitted to *inter-alia*, (i) the principles and values of the CAADP process, (ii) enhancing investment finance in Agriculture, (iii) ending hunger in Africa by 2025, (iv) halving poverty by 2025 through inclusive agricultural growth and transformation, (v) boosting intra-Africa trade in agricultural commodities and services, and (vi) enhancing resilience of livelihoods and production systems. Specific milestones in the declaration include:

a. the pursuit of agriculture-led growth as a core strategy to achieve food and nutritional security, and prosperity,
b. allocation of at least 10% of public expenditure to agriculture,
c. creation of jobs for at least 30% of the youth in agricultural value chains,
d. tripling intra-Africa trade by 2015, and
e. ensuring that at least 30% of farm/pastoral households are resilient to shocks.

Due to various constraints, intra-Africa trade in agricultural commodities, especially livestock and livestock products, is too low compared to current and projected demand and trade flows. Food security for many rural poor and all urban dwellers significantly depends on the distributive ability of local, regional and cross-border trade networks. Intra-Africa trade in livestock and livestock products is underdeveloped largely due to insufficient capabilities for compliance with sanitary standards, transport connectivity, under-development of livestock value chains, and

inadequate diagnostic, epidemiology, laboratory and disease control capacities in Departments of Veterinary Services, Livestock diseases including those transmissible to humans are prevalent in Africa and significantly constrain trade and the free movement of livestock and livestock products nationally, regionally and internationally. Outbreaks of transboundary animal diseases e.g. Rift Valley Fever (RVF), Foot and Mouth Disease (FMD), Peste des Petits Ruminants (PPR) have resulted in livestock trade bans causing huge economic "shocks" to the livestock industries, especially among pastoralists whose entire livelihoods depend on livestock. These shocks impact personal livelihoods as well as regional and national economies, with far reaching implications on human wellbeing. More effective prevention and control of these diseases will enhance economic resilience and prevent shocks arising from market bans as well as other losses associated with them.

Intra-Africa trade in livestock and livestock products, and the resilience of livestock dependent communities can be greatly enhanced by having uniform sanitary procedures applied across nations within a region. Stabilization of trade in the livestock value chain has the effect of securing livelihoods all along the value chain. Unfortunately, African countries have differing and sometimes conflicting animal health regulations, and use different sanitary procedures making regional and international trade difficult. This is not only due to lack of trust in the sanitary measures applied, but also due to lack of comparability of procedures for effective trade facilitation.

To address this challenge the African Union InterAfrican Bureau for Animal Resources (AU-IBAR) through funding from USAID is supporting countries in the Greater Horn of Africa (GHoA) to enhance their capacity for regionally harmonised and coordinated diseases prevention and control through the Standard Methods and Procedures in Animal Health project (SMP-AH). Following very early promising results from this programme in the GHoA, the Southern African Developing Community (SADC) has identified, as a key priority, the development and implementation of the SMP approach in the region for the improved management of transboundary animal diseases to enhance intra-regional and international livestock trade.

b) The livestock sub-subsector in the Southern Africa Development Community (SADC)

The SADC is a regional economic community comprising 15 countries (Angola, Botswana, Democratic Republic of Congo (DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe). The region has a rich diversity of both livestock and domestic animal resources and animal farming systems. The SADC is also Africa's leader in the development of eco-tourism because of its pristine environment where the "Big Five" wildlife species freely roam their natural habitats, and also in innovative approaches in the management of wildlife. One such innovation is the promotion of cross-border biodiversity conservation through the creation of Trans-Frontier Conservation Areas (TFCAs) transcending national borders. Similarly, the SADC region is Africa's leading producer and marketer of ranched livestock and game products. Maintaining this critically important and delicate balance between conservation and livestock farming has, however, brought with it other challenges, particularly management of Transboundary Animal Diseases (TADs), zoonotic diseases, and other emerging and re-emerging infectious diseases. This has serious implications for animal health, public health, and intra and extra-regional trade in animal products.

Agriculture and livestock production are major social and economic sectors employing about 70% of the population in the SADC region. With over 60% of the region's total land area suitable for livestock farming, the region boasts a very diverse farm animal resource base, comprising but not limited to cattle, chickens, ducks, goats, sheep, pigs, equines (horses and donkeys), turkeys and ostriches. The region has a significant population of livestock estimated at 68 million heads of cattle, 39 million sheep, 38 million goats, 7 million pigs and 380 million poultry, capable of supporting livelihoods and supplying the region's needs for animal source feeds. Further, there is marked variation in livestock populations in Member States (MS), creating an opportunity for intra-regional trade. However, because of the widespread occurrence of TADs and limited sanitary and phyto-sanitary (SPS) capabilities, animals and animal products cannot be freely traded among MS.

The livestock sub-sector contributes between 20-40% of the region's Agricultural GDP. However this contribution is considered very low, with the potential for significant improvement. This has been attributed to the limited access to high value regional and international livestock and livestock products markets by the majority of producers due to high prevalence of animal diseases, difficulties with SPS measures, and under-developed marketing infrastructure.

Various SADC reports underscore that out of the fifteen (15) most important and feared animal diseases in the world, twelve (12) occur in the SADC region. The SADC Animal Health Year Book for 2011 reported eleven (11) TADs and a total of 8,110 disease outbreaks in the region. The most prevalent TADs in the region are African Horse Sickness, African swine fever, Bluetongue, Contagious Bovine Pleuro-pneumonia, Foot and Mouth Disease, Lumpy Skin Disease, Newcastle, Pest des Petits Ruminant and Rift Valley Fever.

Besides trade, animal diseases have major multi-sector impacts including animal deaths, public health hazards, food safety concerns, food security, incomes and livelihoods of people and reduce economic growth. Between 2007 and 2011 a total of 39,393 disease outbreaks that resulted in the fatalities of 1,195,481 animals (different species), destruction of 120,473 and slaughter of 1,402,737 for disease control purposes were reported (SADC Animal Health Yearbook for 2011). The report further shows that cattle, the most valuable livestock species were the most affected by disease outbreaks (63%) while chickens the most valuable source of animal protein for the rural poor households died the most. Other negative impacts of diseases include the destruction of over 350,000 cattle in one of the remotest districts in Botswana (1995) in an effort to eradicate an outbreak of contagious bovine pleuro-pneumonia (CBPP). More recently (2012) an outbreak of FMD in Botswana resulted in the culling of 40,000 cattle in 2011 and 30,000 goats and sheep. Besides culling and destruction of infected animals, control of animal movements and suspension of slaughter for export markets due to animal diseases has greatly impacted income generation, wealth creation, employment and the livelihoods of livestock dependent households in different MSs in the SADC region.

The SADC MS have made substantial investments in the control of TADs in an effort to secure access to international markets for their livestock. Additionally, some regional initiatives to roll-back TADs and zoonoses have also been undertaken in recent times.

However, the approaches so far utilized for controlling TADs within individual countries and the region have not produced concrete cost effective and sustainable gains. Resurgence of infections from areas or countries with inadequate disease prevention and control measures and from wildlife has to a great extent frustrated such efforts. It is therefore clear that a more robust approach in which regional countries cooperate and coordinate in tackling common problems, using verifiable and replicable methods and procedures, is required. While such an approach does not guarantee elimination of diseases, by creation of significantly improved control within a framework of regional cooperation via regionally coordinated and implemented programmes, it provides a shared structure that builds confidence among neighbours and can, thereby facilitate trade and free movement of animals and animal products.

c) Problem Description

The SADC created a free trade area in 2008 to enhance intra-regional trade. The intended benefits however, have not been realized in the livestock sector due to fear of introduction of animal diseases among MS. Key challenges include weak capacity of MS to meet existing SPS standards, weak disease control systems, lack of an effective regional framework to harmonize the management of animal diseases, inadequate information sharing at all levels on policies, strategies, disease outbreak information, lack of a coordinated regional initiative to facilitate intra-regional livestock trade and isolated, capital intensive disease control measures with frequent breakdowns.

The region's disease and livestock trade challenges are further compounded by the creation of mega trans-frontier wildlife conservation areas (TFCA) that are likely to increase wildlife-livestock-human interaction, and with this the risk of disease emergence and spread. Up to 20 TFCAs cutting across major biomes and eco-systems across SADC countries link large pieces of wildlife and cattle areas, including those traditionally separated by disease control cordon fences.

Due to the many obstacles to formal intra-regional livestock trade, prolific informal trade channels have developed with weak monitoring activity at borders creating ripe environments for

this trade to flourish. This is causing unpredictability and high costs as well as dangers of pest and disease transmission across borders. Borders lack the physical infrastructure to adequately address these risks and inspectors do not have the necessary skills to identify risks. In addition, there are often inadequate, nonexistent, overbearing, or unenforced policies in place to regulate the movement of livestock and livestock products across borders. Finally, policies and protocols vary widely between countries resulting in unnecessary complexity and confusion, which hamper trade and provide further motivation for bypassing the legal frameworks that do exist

Furthermore, even countries that have access to lucrative livestock markets are increasingly finding it difficult to access the markets due to sanitary concerns and there are concerns that without preferential treatment for accessing the markets the cost of sanitary measures in place in the countries may not justify the returns from trade. This has supported the view on the need to promote intra-regional trade of livestock and livestock products given the huge demand in the region.

To meet this huge regional demand and to promote livestock and livestock products trade with other regions and internationally there is need for harmonisation of animal health regulatory requirements in the SADC region. This is because formal movement of livestock across international boundaries for trade is dependent on the acceptance of the sanitary guarantees of the exporting country and how closely it satisfies the health requirements of the importing country.

The establishment of clear, standardized procedures for coordinated disease control among member states would remove trade barriers and obstacles, stabilize and facilitate intra-regional trade by reducing the probability of adverse decision making and building confidence between exporters and importers. Standardization and harmonization of procedures governing disease surveillance and epidemiology, laboratory diagnostics, disease control actions, and improved information sharing about SPS issues across the region would go a long way toward the necessary strengthening of Departments of Veterinary Services and promotion of intra-regional trade and livestock productivity through creation of uniform regulatory conditions that are necessary for improvement in the ability of animals to move across national and international boundaries in trade. SMP-AH Programme description and SMP-AH Concept Paper were thoroughly discussed at Annex A-C and Annex A-D on how to the way forward.

AEC Certificate

UNIVERSITEIT VAN PRETORIA
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YUNIBESITHI YA PRETORIA

Animal Ethics Committee

PROJECT TITLE	**Implementation of non-geographic approaches to beef trade in the SADC region**
PROJECT NUMBER	**V027-13**
RESEARCHER/PRINCIPAL INVESTIGATOR	**Mr. MZ Palime**

STUDENT NUMBER (where applicable)	**123 617 48**
DISSERTATION/THESIS SUBMITTED FOR	**MSc**

ANIMAL SPECIES	**Questionnaire only**	
NUMBER OF ANIMALS		
Approval period to use animals for research/testing purposes		**February 2012-December 2013**
SUPERVISOR	**Prof. G Thomson**	

KINDLY NOTE:

Should there be a change in the species or number of animal/s required, or the experimental procedure/s - please submit an amendment form to the UP Animal Ethics Committee for approval before commencing with the experiment

APPROVED	Date **29 July 2013**
CHAIRMAN: UP Animal Ethics Committee	Signature