



WORKSHOP REPORT

Prevention of foot and mouth disease in endemic/high risk areas

10 - 13 December 2008

Gaborone International Convention Centre, Gaborone, Botswana

Jointly organised by the SADC Foot and Mouth Disease Project and FAO-ECTAD, Gaborone

1. BACKGROUND

Livestock farming remains a cornerstone of the rural economy for most Southern African Development Community (SADC) member states. However, more than 75% of livestock production is under extensive communal management and is therefore prone to numerous challenges, including but not limited to animal diseases that hamper livestock productivity. Transboundary Animal Diseases (TADs) such as foot and mouth disease (FMD) are particularly difficult and costly to manage under extensive communal systems. For the SADC Region, the problem is compounded by the fact that the three serotypes of FMD, SAT 1, 2 & 3, are maintained within wild African buffalo (*Syncerus caffer*) populations. It is for this reason that most SADC member states are considered endemically infected, limiting prospects for international and regional trade in livestock and livestock products.

Since 2000, there has been a sustained increase in the temporal and spatial distribution of FMD outbreaks in the region. This situation prompted the request for the development of a regional strategy for the progressive control and management of FMD and a project to enhance FMD control. The request received funding under the 9th EDF, and is being implemented under the auspices of the SADC/FANR through the SADC Foot and Mouth Disease Project in collaboration with the Food and Agriculture Organisation (FAO) through a Contribution Agreement. One of the activities under this collaboration is to train animal disease managers within the region in appropriate disease management of FMD in endemic/high risk areas.

It is against this background that the SFMDP, in collaboration with the FAO-ECTAD unit in Gaborone, organised the training workshop described herein in Gaborone, Botswana from 10 - 13th December 2008.

2. PARTICIPATION

The training workshop was attended by a total of twenty (20) field-based animal disease control managers from eight SADC member states comprising: Botswana (1); Malawi (3); Mozambique (3); Namibia (3); Swaziland (3); Tanzania (1); Zambia (3) and Zimbabwe (3). Proceedings of the training were facilitated through the inputs of regional experts from Botswana Vaccine Institute (BVI) and Zimbabwe as well as members of the SFMDP and the FAO-ECTAD unit. The course program is given in Annex 1.

3. METHODOLOGY

The training was carried out over a 4 day period and comprised of lecture presentations, discussions, scenario analysis and problem solving.

Introductory comments were given by the Project Leader of the SFMDP and the ECTAD Regional Manager; the official opening was performed by the Senior Program Manager Livestock, SADC FANR.

On day 1 and 2 groups of trainees were presented with a set of guiding questions after the introductory presentations and lectures. The outputs of their group work are given in Annexes 2 and 3.

On day 3, three groups were formed and a carefully constructed scenario was given to them (Annex 4) and they were requested to develop FMD control options to address the problems presented by the scenario. Participants' proposed solutions are given in Annex 5.

The options given by the participants were evaluated and model answers given as feedback (see Annex 6).

On day 4 participants were taken for an excursion to Lobatse to view a prototype mobile crush pen that could be useful to SADC countries when addressing cattle diseases in remote areas.

4. SALIENT POINTS OF DISCUSSION DURING THE COURSE

This chapter highlights some of the main discussion points that were pointed out by resource persons as well as by participants.

Endemicity of FMD in the SADC Region

- Although in many parts of the world, e.g. in Latin America, the objective is FMD eradication, in Southern Africa this is not possible because of the presence of African buffalo that maintain SAT-types of FMD virus, hence it is important to learn to live with the disease
- The Southern African situation is particularly complex since SAT-type viruses show more genomic variation than do types within the Eurasian group (A, O & Asia 1); with SAT 2 being the most variable of the SAT viruses with 5 lineages and 15 genotypes
- Because of the establishment of large TFCAs in the SADC Region, the complexity and extent of SAT virus distribution will increase
- However, awareness to the possibility of introduction of foreign viruses needs to be borne in mind (e.g. introduction of type O into South Africa in 2000)
- The FAO strategy of introduction of an international Road Map towards progressive control and management of FMD, using a regional approach is being promoted also in Southern Africa

Key elements of the traditional management approach to FMD control in the SADC region

- The key issue is that FMD control is not possible unless a country has good Veterinary Services and supporting legislation covering all aspects necessary, e.g.
 - Movement control (management of movement of animals and animal products)
 - Disease control infrastructure e.g. crush pens and fencing

- An effective animal identification and trace-back system
- Understanding of the epidemiological situation in the agro-eco systems that occur in particular countries/regions
- The capacity to maintain effective surveillance and control programmes such as routine vaccination
- FMD control is not only the responsibility of the Veterinary Services but it requires cooperation from the society as a whole, particularly farmers, abattoirs, police etc

Issues related to FMD vaccines

Botswana Vaccine Institute (BVI) gave a presentation to clarify some FMD vaccinology issues, particularly as they relate to recent occurrences of FMD in vaccinated cattle populations in the region.

- Dendrograms of virus identification are a very useful tool to explain similarities and differences between different outbreaks
- Countries are encouraged to assist in the search for new vaccine strain candidates by providing buffalo probang samples to BVI. It is strongly recommended that samples should be taken every 2-5 years. This would allow the vaccine producer to be pro-active and to adjust the vaccine AG composition according to circulating field strains at a faster rate.
- BVI will have a new vaccine manufacturing plant as from 2010 in which they will have the facilities for store purified FMD viral antigens over liquid nitrogen (i.e. facilities for maintenance of a vaccine bank). In view of this facility the above recommendation becomes even more important.
- It recognised that vaccination is usually done as a preventive measure; however, in general FMD vaccines in the SADC Region are not applied according to manufacturers' recommendations, because the second dose of the primary vaccination (i.e. the primary immune response should be achieved by administration of two doses of vaccine approximately 4 weeks apart) is usually not given. Some countries apply two vaccinations in this way but only when vaccinating in an outbreak situation. It is recommended that as far as possible manufacturers' instructions should be observed for good results.
- It is often assumed that high vaccination coverage results in high herd immunity levels. Caution should be applied and since the *basic reproductive rate* (R_0) is not known, herd immunity should be established through *post vaccination sero-monitoring* (PVM). Countries are encouraged to make PVM an integral part of routine FMD management.
- For PVM it is essential that the antigen employed in the serological test is homologous with antigens incorporated into the vaccine.
- BVI is in the process of ensuring that homologous antigen for PVM will be continuously available.

Strategies for FMD management

- *Disease Free Zone* as a possible concept:

- The OIE only recognises freedom from FMD, BSE and CBPP - for other diseases it is a matter of self declaration.
 - Borders of zones must be clearly demarcated on the ground (requires fencing!)
 - Animal populations in and outside the zone must be effectively separated
 - Constant surveillance for the disease in question must be conducted on an on-going basis
 - If the relevant infection is detected in the zone the disease-free status will be lost for between 3 months and 2 years (means also access to export markets is lost!).
- *Fences*
 - If fences are not high enough, antelope can still play a role in the spread of the disease by jumping the fence
 - Increasingly elephant populations in the SADC Region are endangering fences and render maintenance very difficult
 - A solution is to build elephant-proof fences; however, these are very expensive and may be opposed for social reasons (people can't easily cross them)
- *Compartmentalisation as a possible concept:*
 - Definition: "elements of a production chain that do not need to be geographically linked but that need to have the same highest bio-security standards"
 - Although concept is accepted by OIE, it cannot presently be applied to FMD because of a ruling by the OIE Scientific Commission). This ruling, however, is presently being challenged, as air-borne transmission has never been described for Africa, and it is anticipated that the situation will be changed during the next OIE General Session in 2009
 - But even if accepted by OIE, the challenge is to establish integrated bio-security systems and to find interested trading partners.
- *Commodity based trade (CBT) as a possible concept:*
 - "Properly prepared deboned beef derived from healthy cattle should be exportable from zones even though they are not free from FMD".
 - It is argued that deboned beef is in itself healthy, provided it comes from healthy animals.
 - It is argued that CBT would increase volume of production and supply to markets, which in turn would encourage the private sector (producer) to make sure that their animals are healthy, which would encourage them to invest in livestock production!
 - The African Union and SADC both support development of standards to enable CBT to be accepted internationally.

Surveillance for FMD

- As with any disease, successful management of FMD also depends on an appropriate and robust system to determine the disease frequency and its geographical distribution. The system must be able to detect a change in the epidemiological status of the disease in a timely manner (early detection) so as to enable rapid response (early reaction) in order to successfully manage the disease.
- Surveillance for FMD must therefore be a well planned and managed activity. This requires establishment of appropriate disease control infrastructure (such as well resourced laboratories, well maintained fences and crushpens), well trained field personnel and use of various statistical methodologies for disease mapping and monitoring. The inputs of other stakeholders such as farmers, private vets, community animal health workers and NGO,s must be encouraged.
- A well coordinated information management system (data collection, transmission, collation, analysis and final dissemination of results) must be in place to allow for rapid feedback and decision making.
- Surveillance for FMD in the region should be targeted at addressing two important factors:
 - Detecting infection: this largely depends on a robust passive surveillance system i.e. through routine activities such as early response to farmer reports. In high risk areas, statistically determined serological surveys may be implemented.
 - Post-vaccination sero-monitoring: to determine herd immunity and monitor vaccine efficacy.
- Experience from the region has shown that where appropriate surveillance systems are in place; FMD outbreaks can be detected early and rapidly eliminated. However, where there are gaps in the surveillance system this often leads to serious problems in managing the disease.
- It would be desirable to be able to differentiate disease-induced antibodies from vaccine-induced antibodies (the so-called DIVA system), by detecting the non-structural proteins which are specific for a natural infection. However this is not yet possible for SAT viruses for 2 reasons: the commercially available NSP tests are not specifically developed for SAT viruses and the vaccine is not 100% purified, hence expresses also NSP to a certain degree.
- In inter-epidemic periods the virus circulates in buffaloes, hence surveillance needs to be done in buffalo populations .

Annex 1: Course programme

SFMDP/FAO Workshop: 10-13 December 2008 FMD prevention in endemic/high risk areas: Course programme

Session	Topic	Resource person/s	Remarks
Day 1			
8.30 - 8.45	Registration		
Session 1 8.45 - 9.30	Welcome & course objectives Opening address	SFMDP - A. Massarelli FAO - S. Munstermann SADC - Mr B. Hulman	Short address
Session 2 9.30 - 10.30	Endemic FMD in the SADC Region <ul style="list-style-type: none"> • SAT virus types & association with wildlife • Characteristics of FMD in different species • The wildlife/domestic animal interface 	G. Thomson	Power-point presentation with question & answer session
1030 - 1100	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 3 11.00 - 12.00	Management of FMD in the SADC Region <ul style="list-style-type: none"> • Key elements of the traditional approach • What constitutes high risk? 	S. Hargreaves	Power-point presentation with question & answer session
Session 4 12.00 - 12.30	FMD vaccines <ul style="list-style-type: none"> • Composition & requirements for effective administration of vaccines • Dynamics of the immune response to FMD vaccine • Genotypes & topotypes • Relationships between 'coverage', 'herd immunity' and the 'reproductive rate' 	G. Thobokwe	Power-point presentation with question & answer session
12.30 - 14.00	<i>LUNCH</i>	<i>LUNCH</i>	<i>LUNCH</i>
14.00 - 14.30	Session 4 continued...	G. Thobokwe	

14.30 - 15.00	Organisation of vaccination campaigns	K. Motshegwa	Power-point presentation with question & answer session
1500 - 1515	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 5 15.15 - 17.00	Plenary discussion: Problems commonly associated with vaccination campaigns which compromise efficacy <ul style="list-style-type: none"> • Campaign design • Logistical issues 	Facilitator: S. Munstermann Group 1: Tan; Moz; Mal; Zam (Chair: S. Hargreaves) Group 2: Nam; Bot; Swa; Zim (Chair: M. Mokopasetso)	Formation of 2 groups to identify critical success factors for generation of high levels of herd immunity through vaccination
Day 2			
Session 1 8.30 - 9.30	Report back on Session 5 of Day 1	Group representatives	20 minute presentation by each group plus discussion
Session 2 9.30 - 10.30	Key strategies for FMD management in SADC Region <ul style="list-style-type: none"> • Zonation & compartmentalization in context of FMD • Use of fencing • Commodity-based trade & FMD 	G. Thomson	Power-point presentation with question & answer session
10.30 - 11.00	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 3 11.00 - 12.30	Key elements of surveillance for FMD in SADC Region <ul style="list-style-type: none"> • Disease surveillance in livestock, Practical Sampling issues • Disease surveillance in wildlife • Sero-surveillance, including in vaccinated populations (use of NSP testing); Monitoring of vaccination; The role of laboratories 	M. Mokopasetso G. Thomson G. Thobokwe	Power-point presentation with question & answer session
12.30 - 14.00	<i>LUNCH</i>	<i>LUNCH</i>	<i>LUNCH</i>
Session 4 14.00 - 15.00	Importance of movement control & trace-back as a management tool.	S. Hargreeves	Power-point presentation with question & answer session
15.00 - 15.15	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 5 15.15 - 17.00	Plenary discussion on surveillance in vaccinated cattle populations	Facilitator: S. Munstermann	Each country to identify the strengths & weaknesses of

		Group 1: Tan; Moz; Mal; Zam (Chair: S. Hargreaves) Group 2: Nam; Bot; Swa; Zim (Chair: M. Mokopasetso)	their surveillance system & identify priorities for improvement
Day 3			
Session 1 8.30 - 9.30	Report-back on discussion from Session 5 of Day 2	Groups	
Session 2 9.30 - 10.30	Recent experiences of Botswana and Namibia in managing FMD: lessons learned	K. Motshegwa Shoopala	
10.30 - 11.00	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 2 11.00 - 11.30	Presentation of 3 FMD scenarios (i.e. endemic/high risk situations) for further group work	G. Thomson	Flip-chart illustrations
Session 3 11.30 - 13.00	Group working session	3 groups with one country representative in each group	3 groups to be formed to address each of the FMD scenarios presented
13.00 - 14.30	<i>LUNCH</i>	<i>LUNCH</i>	<i>LUNCH</i>
Session 4 14.30 - 15.00	Group report back	Groups	
15.00 - 15.15	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 5	Analysis of the approaches presented by the groups	Course leaders	
Day 4			
	Field visit to Lobatse		

Annex 2: Group work output of DAY 1

Guiding questions for Organising a vaccination campaign (critical factors for achieving high herd-level immunity)

1. How do you organise vaccination campaigns in your country? Describe step by step
2. What are the weaknesses that you have detected when organising vaccine campaigns?
3. What do you think works very well regarding vaccine campaigns in your country?

	GROUP 1	GROUP 2
	Tanzania; Mozambique; Malawi; Zambia	Botswana; Namibia; Swaziland; Zimbabwe
Pre-campaign activities	<ul style="list-style-type: none"> • Budget: proposal sent to HQ. • Resource mobilisation: Human, finances, transport, vaccines, equipment and materials. • Vaccination programme is planned and developed and disseminated • Checklist developed • Appropriate timing selected • Meetings with local community leaders to discuss vaccination campaign • Prepare crush pens/races • Awareness campaigns.. leafelets, radio, meetings • Establish cold chain • Take serum from animals to assess antibody status (Herd immunity) • Establish cattle census 	<ul style="list-style-type: none"> • <i>Budget</i>: Draft budget is submitted to HQ by district/regional head 1 year prior to campaign. • <i>Crush-pen</i> evaluation and rehabilitation • <i>Programme</i> is drawn and information disseminated to farmers • <i>Teams</i> are mobilised (including mechanics) <ul style="list-style-type: none"> ➢ District team ➢ Re-enforcement from other districts • <i>Procurement</i>: vaccines, equipment, transport; ice and cooler boxes
During Campaign	<ul style="list-style-type: none"> • Formation of teams with a team leader • Briefing of staff • Identification of vaccinated animals by paint mark • maintain appropriate cold chain 	<ul style="list-style-type: none"> • Briefing meeting: <ul style="list-style-type: none"> ➢ designation of coordinator, supervisors and team leaders ➢ SOPs • Actual vaccination - livestock identification

	<ul style="list-style-type: none"> • maintain appropriate records i.e. <ul style="list-style-type: none"> ○ numbers of cattle vaccinated ○ vaccine doses used, batch numbers of vaccine, shortages of animals ○ surveillance for presence or absence of disease 	<p>with pain or brand</p> <ul style="list-style-type: none"> • Record keeping • Supervision and monitoring
<p>Post vaccination campaign</p>	<ul style="list-style-type: none"> • Issue certificate of vaccination to cattle owners/community leader • Debrief with staff/ assess records/ write reports • Do follow up vaccinations on animals that missed main vaccination programme • Establish vaccination coverage • Carry out sero surveillance to establish herd immunity • Audit all equipment used on vaccination campaign and repair where necessary 	<ul style="list-style-type: none"> • Identification of vaccinated animals • Inaccurate census numbers (expected turn-out) • Records of vaccine batch numbers, date of manufacture and expiry • Procurement <ul style="list-style-type: none"> ➢ Bureaucratic delays ➢ Vaccine availability • Cold chain maintenance at crush level - pouch for in <ul style="list-style-type: none"> ➢ Use of vacc. pouch packed with ice for in use vaccine bottle encouraged in Zim ➢ Cold chain monitors to trek vaccine to crush (BVI to supply) • Accurate census - determination of expected numbers • Procurement - red tape delays • Vaccination timing (primary and secondary vaccination) • Record keeping - batch numbers, expiry dates • Vaccination timing (1° and 2° vaccinations) <p>Lack of post vaccination sero-surveillance to determine if sufficient herd immunity has been built and report back</p>

Weaknesses	<ul style="list-style-type: none"> • Private sector pays for vaccine (Tanzania) • Inadequate resources to procure sufficient vaccines • Private sector pays for vaccine (Tanzania) • Non compliance with manufacturers instructions for use of vaccine(Booster not given 1 month after primary vaccination) • Vaccine may not have appropriate strains to cater for outbreak • Poor cold chain • Poor communication flow. Information frequently stops at some community leaders • Reluctance of farmers to bring cattle for vaccination • Poor timing of vaccination campaign i.e during rains, during ploughing or harvest time • Ignorance of smallholder farmers • Poor extension service delivery 	<ul style="list-style-type: none"> •
Strengths	<ul style="list-style-type: none"> • Dedicated experienced staff • Centrally controlled campaign • Farmers want cattle vaccinated • Vaccination coverage determined • Herd immunity established 	<ul style="list-style-type: none"> • There is clinical (physical) surveillance • Contact with the farming community • There is good programming • Briefing and de-briefing meetings

Annex 3: Group work output of DAY 2

Guiding questions for Strengths and weaknesses of country surveillance systems and priorities for improvement

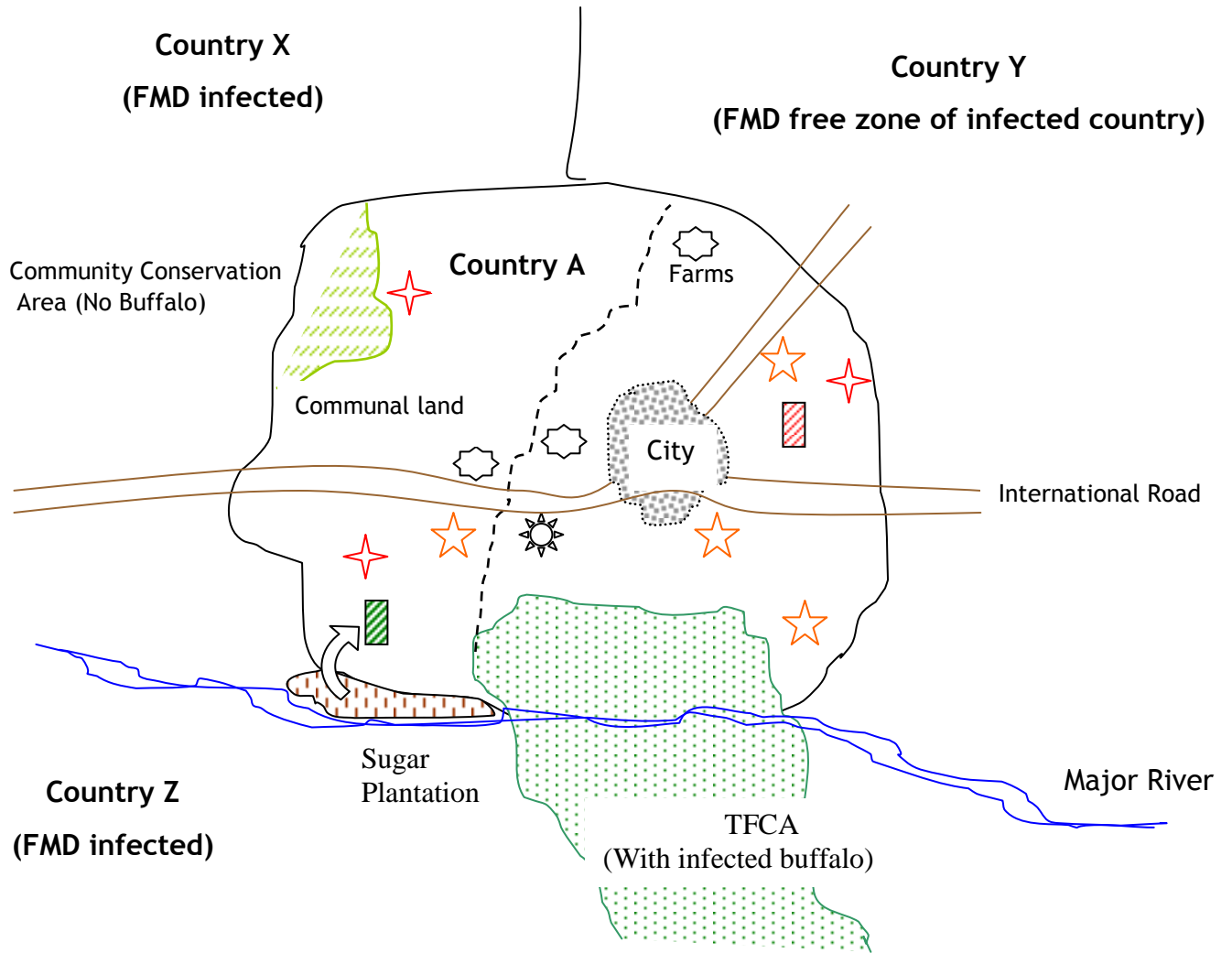
1. How does your surveillance for FMD system work? What are the elements of this system? Describe step by step
2. Is there any evaluation of your surveillance system done?
3. What is the role of your CVL in FMD surveillance?
4. What type of permit system (movements control; back-tracing) is in place and how do you reinforce it?
5. Strength and weaknesses of your surveillance system

	GROUP 1	GROUP2
	Tanzania; Mozambique; Malawi; Zambia	Botswana; Namibia; Swaziland; Zimbabwe
1.0 How does your surveillance system for FMD work? What are the elements of this system?	<ul style="list-style-type: none"> • Passive Surveillance <ul style="list-style-type: none"> ➤ Reports ➤ Farm visits ➤ Routine abattoir inspection ➤ Movement control (Trace back systems) ➤ Livestock markets monitoring (Tanz) • Active Surveillance <ul style="list-style-type: none"> ➤ Sero-surveillance (Area specific) ➤ Pre and post vaccinations sero-monitoring ➤ Clinical examinations ➤ Post mortem findings ➤ Border (control) surveillance ➤ Wild life (situation specific; Moz & Zam) 	<ul style="list-style-type: none"> ❖ Livestock inspections <ul style="list-style-type: none"> • Farms (all countries) • Dip tanks/crush pens - DIPPING sessions / vacc campaigns • <i>Weekly visual inspections in Swaziland, fortnightly inspections at dip tanks, 2x annually</i> • Quarantine stations for export abattoirs (Nam, Bots) and animals imported into vaccinated areas (BOTS) • Auctions, export abattoirs (all countries) • Pre-movement inspections ❖ Sero-surveillance <ul style="list-style-type: none"> • Vacc. monitoring in vaccinated herds (Bots) • Herd immunity (random sampling) (Bots) • infection in surveillance areas (Bots, Nam) ❖ Passive surveillance <ul style="list-style-type: none"> • Farmer reports



<p>2.0 Is there any evaluation of your surveillance system</p>	<ul style="list-style-type: none"> • All countries have an epidemiological unit that monitors and evaluates the surveillance system 	<ul style="list-style-type: none"> • Attendance of clinical cases • Only external evaluation by E.U (Nam, Bots, Swazi) • Bilateral agreement inter country evaluation (Nam/bots) • Swazi inter district audit • District vet performance appraisal
<p>3.0 What is the role of your CVL in FMD surveillance?</p>	<ul style="list-style-type: none"> • Quality control of specimen collected • Dispatch of specimen to regional labs and getting feed back • Collect Specimen from the field (at times) applicable to all the four countries • Serological analysis/diagnosis (except Mozambique and Malawi) 	<ul style="list-style-type: none"> • Serology - routine diagnostics all except Swazi
<p>4.0 What type of permit system (movement control) is in place and how do you enforce it?</p>	<ul style="list-style-type: none"> • Import permits centrally controlled • Export permits are centrally controlled in Malawi and Tanzania but decentralised in Zambia and Mozambique • Within the country permits are issued on all moving animals • At district level permits are issued by V/As • In Moz. And TZ they also issue permits for products e.g. meat movement permit. • INTER DISTRICT <ul style="list-style-type: none"> ➢ District Veterinary Officer issues permits and can delegate • Outside the region (Province, Division) <ul style="list-style-type: none"> ➢ District Veterinary officer issues permits in consultation with the province. And in Malawi the Chief Animal Health and Livestock 	<ul style="list-style-type: none"> • Inter-zonal permit (Bots)/ Red cross permit (Nam) • Movement permit (ZM) • International import/export certificates (animal)- all

	<p>Development officer (CAHLDO) issues the permit</p> <ul style="list-style-type: none"> • Trace-back system: <ul style="list-style-type: none"> ➤ This is done by Permit register books and permits ➤ All animals are covered in the permit system ➤ Most important details include: <ul style="list-style-type: none"> • Sex, brandmark, species, owner, Destination, area of origin, validity, number, date& official stamp, specific route, mode of transport, name of issuing officer and designation and signature etc. • Enforcement: <ul style="list-style-type: none"> ➤ Road Blocks ➤ Patrols ➤ Penalties ➤ Escorts (Zambia, Tanzania) ➤ Placing seals 	<ul style="list-style-type: none"> • Trace-back system <ul style="list-style-type: none"> ➤ Permit registers -all ➤ Data base (Nam, Bots) ➤ Individual animal identification (Nam, Bots) ➤ Farm/ Zone (Zim/ Swazi) ➤ Individual farmer record (herd or stock cards) ➤ Zonal branding (Bots, Nam) and Regional (Nam) ➤ Dip tank brand (Swazi) • Enforcement <ul style="list-style-type: none"> ➤ Legislation ➤ Extension (Zim) ➤ Local police/chief's permit/ dip tank committee (Swazi) ➤ Black listing of non compliant farmers (Nam)
5.0 Strengths of your system	<ul style="list-style-type: none"> • Easy traceability • Farmer compliance • Early detection of disease • Minimises livestock theft and cruelty • Administering the correct vaccination • Achieves disease control 	<ul style="list-style-type: none"> • Dedicated staff • Facilitates trade • Permit system stock theft deterrent • Facilitates detection of other disease & extension service delivery
6.0 Weaknesses of your system	<ul style="list-style-type: none"> • Inadequate staff • Inadequate laboratory capacity • Inadequate resources: Transport, equipment, reagents, finances e.t.c. • Poor identification system of animals 	<ul style="list-style-type: none"> • Missing animals • frequency of inspections • Resource intensive (vehicles, staff) • Timing of sero-surveillance vis-à-vis vaccinations/ buff. Incursions

	<ul style="list-style-type: none">• Vast operational areas for the limited staff• Inefficient communication system	<ul style="list-style-type: none">• False negatives (sensitivity of test)• Under reporting by farmers• Poor record keeping
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Key:

-  Feedlot
-  Animal Feed production facility (pigs +)
-  Export abattoir
-  Local abattoir
-  Piggery (2000 sows)
-  Dairy (500 cows)
-  Game-proof fence

Scenario Exercise - Guidelines

1. Situational considerations

- Country A's borders are not fenced but the neighbouring country to the east (country Y) has a game-proof fence (12 strands, 2.4m in height & electrified) adjacent to the TFCA, i.e. south-eastern corner of country A.
- The TFCA is not fenced.
- Cattle population is 5 million; 70% in the communal area.
- Pigs population is 0.2 million; >90% commercial.
- Sheep & goat population is 6 million; >95% in communal areas.
- Buffalo number about 5000 all in the TFCA or close to it which also has a range of antelope and carnivores. There are also 3000 elephants in the TFCA.
- Country A wishes to access international markets for a range of commodities derived from animals (and wildlife too, e.g. venison), but particularly fresh beef and processed pork products, e.g. bacon and various types of ham, all subject to cooking.
- Political imperatives make it essential that small-scale producers also share access to export markets (i.e. the benefits should not only accrue to the commercial, large-scale sector).
- The sugar estate in the neighbouring country to the south (i.e. country Z) exports molasses and bagas to the feed mill just across the border for formulation into commercial cattle feed. Other constituents of the feed are all derived from within country A.

2. What you are asked to do

- Develop the outline of a FMD management plan for country A taking all the factors depicted/mentioned in the scenario outline and the sketch map into account. This must include the following:
 - Strategy to manage FMD
 - Surveillance programme to support that strategy
 - Auditing system/programme

3. Resources to carry out the actions developed above

- Assume enough appropriate resources (people, money & machines) are available to carry out your plan
- However, use of resources should not be out of proportion to the economic benefits that could be expected of the system proposed. Furthermore, the plans offered should make the most efficient use of the resources.

Annex 6 Group work output for FMD Scenario

	GROUP 1	GROUP 2	GROUP 3
Proposed Strategy	<ul style="list-style-type: none"> • Zoning, compartmentalisation & commodity based trade <ul style="list-style-type: none"> ➤ Erect a Kruger-type fence around the TFCA ➤ Erect a Bonnox fence along the border with country X ➤ Establish a buffer zone in the communal area <ul style="list-style-type: none"> ○ Vaccinate all cattle in the buffer zone ○ Use zonal brand to identify animals ○ Movement with permit only within the buffer zone ➤ Establish surveillance zone <ul style="list-style-type: none"> ○ No animals vaccinated ○ Use zonal brand to identify animals ➤ Dairy and pig farms become bio-secure compartments 	<ul style="list-style-type: none"> • Zoning <ul style="list-style-type: none"> ➤ Establish a double cordon fence along the border with the TFCA and country X. ➤ Establish a vaccinated surveillance zone some distance from the cordon fence ➤ Commercial (Farms) remain a free area without vaccination 	<ul style="list-style-type: none"> • Fence off the TFCA (depends on support of neighbouring countries) • Establish a cordon fence along the border with country X • Implement bio-security measures on transportation of raw materials from country Y.
Surveillance System	<ul style="list-style-type: none"> • Monthly crush-pen inspections within the buffer zone & surveillance zones • Farm inspections • 30 day quarantine prior to movement to abattoir 	<ul style="list-style-type: none"> • Infected Zone (TFCA) <ul style="list-style-type: none"> ➤ Probang sampling within 2 years (assuming there are cattle in the TFCA) ➤ Sero-monitoring ➤ Research for other diseases 	

		<ul style="list-style-type: none"> • Free vaccinated zone <ul style="list-style-type: none"> ➤ Passive surveillance (Routine farm visits) ➤ Active surveillance <ul style="list-style-type: none"> ○ Livestock inspections ○ Herd immunity monitoring ○ Vaccine efficacy monitoring ○ Record keeping and animal identification • Free area without vaccination (farms) <ul style="list-style-type: none"> ➤ Quarterly farm visits ➤ Abattoir inspections ➤ Pre-movement inspections ➤ Animal identification system 	
Evaluation	<ul style="list-style-type: none"> • Inter-district audits (bi-annual) • Trading-partner inspections • OIE inspections (PVS evaluations) 	<ul style="list-style-type: none"> • Trading partner inspections • Internal auditing by supervisors • International inspections (OIE) 	

FMD TRAINING WORKSHOP: MODEL ANSWER TO STRATEGY SCENARIO

There is no 'right' or 'wrong' answer to the problem posed! However, an example of a possible strategy is the following:

1. Overall strategy for management of FMD in Country A

Basically divide the country into 3 zones:

- FMD infected zone - the TFCA
- FMD-free zone with vaccination - the communal land (CL) area (application to be made to OIE within the next 2 years)
- FMD-free zone without vaccination - commercial farming (CF) area (application to be made to OIE within the next 2 years)

2. What will physically be done to achieve establishment of these zones

- Fence off the TFCA from the rest of the country - game-proof fence joining the neighbouring country fence in the east and as far as the river in the west
- Not necessary to divide the CL & CF areas (i.e. along the dotted line) because farms in CF already fenced but the DVS will ensure maintenance of the fences especially those along the 'divide'.
- The borders of the country will not be fenced because each zone is basically compatible with areas of bordering countries. However, border control of movement of livestock & livestock products will be applied at major road entry/exits to the country. A control point will also be established at the border of the vaccination and non-vaccination zones of the country.
- Develop a cattle identification system that will be able to differentiate animals from the two FMD-free zones (with and without vaccination).

3. Management of FMD and trade access in each of the 3 zones

3.1 *FMD-free zone without vaccination - CF area*

- Entry of animals from other 2 zones into this zone will only be permitted under exceptional circumstances - details to be determined by the DVS (but will probably require quarantine).
- For export of processed pork products - no problem as long as they are sourced from export abattoir.
- For dairy products - also no problem.
- For export of beef (bone-in) from export abattoir will be encouraged as long as the supply of bagas & molasses for animal feed production in the adjacent zone is managed. Two alternatives for this are:
 - Sourcing of molasses & bagas from outside the country is discontinued
 - The feed company becomes incorporated into the bio-security management system of the feedlot (i.e. creation of a 'compartment')

In summary, exports of animal products from this zone should not be a problem. Imports of animal products from the vaccination zone would need to be carefully controlled and there would need to be controlled at the major access road crossing between the 2 zones.

FMD-free zone with vaccination - the CL area

This zone would be managed by vaccination of all cattle every 6 months and according to the vaccine manufacturer's recommendations (all young animals to receive two primary vaccinations 2-4 weeks apart. Other species will not be vaccinated.

Export of de-boned beef will be enabled by establishment of an export abattoir in this zone (an existing abattoir could be up-graded), i.e. export of de-boned beef is permitted in terms of OIE Terrestrial Animal health Code.

Export of mutton & goat meat sourced from the export abattoir could also be exported subject to bilateral agreement with suitable trading partners.

For the pork producer in this zone, export of processed products could be allowed on the basis of a commodity approach. This could be to other countries as well as to the FMD-free zone.

Fresh milk from the dairy should only be sold within the zone of production (milk can contain high concentrations of FMD virus). However, processed milk products could be considered for export depending on what the processing involves.

Export of venison from the communal conservation area should be possible based on a commodity approach (e.g. biltong - a safe product).

FMD infected zone - the TFCA

As far as possible, livestock should be kept out of the TFCA. If that cannot be done the animals will be vaccinated three times a year and only be permitted to enter other zones following strict quarantine.

Venison (and possibly beef) derived from this zone could be traded outside the zone or even exported on a commodity basis (e.g. biltong) but special provisions and arrangements would need to be made by the DVS.

Annex 8

Evaluation of FMD training course on 10 - 12 December 2008, Gaborone, Botswana

	Criterion	Score	%
1. How did you find the period of training (3 days)?	Too long		
	Just right	15	75%
	Too short	5	25%
2. Quality and clarity of presentations	Very good	15	75%
	Good	5	25%
	Not so good		
3. Select the three presentations that were of highest interest to you			
Strategies for FMD management: zonation, compartmentalisation, commodity based trade		14	70%
SAT type virus, Characteristics of FMD, wildlife/domestic interface		9	45%
Movement control, carrier cattle, permit system		8	40%
Key elements of the traditional approach		7	35%
Disease surveillance general		7	35%
Herd immunity		5	25%
FMD vaccines, genotypes and topotypes		4	20%
Recent experience in Botswana		3	15%
Organisation of vaccination campaigns in Botswana		1	5%
Sero-surveillance		1	5%
Recent experience in Namibia		1	5%
Surveillance in wildlife		0	0%
4. Proportion of lectures to group work	Just right	19	95%
	Too many presentations	1	5%
	Too much group work	0	0%
5. Does the content of this training match what you as an individual do in your position	Perfectly	17	85%
	Not quite	2	10%
	Not at all	0	0%
6. How did you find the scenario exercise	Very interesting	20	100%
	Too complicated	0	0%
	Not of interest to me	0	0%

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Training on FMD Prevention in endemic/high risk areas
Gaborone, 10 - 13 December 2008

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