



Training workshop REPORT

Management of FMD outbreaks

25 - 27 August 2009

Fairgrounds Mall, Gaborone, Botswana

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

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1. BACKGROUND

The Food Agriculture and Natural Resources (FANR) directorate of the Southern African Development Community (SADC), through its Foot and Mouth Disease Project (SFMDP) and in collaboration with the FAO-ECTAD unit for southern African, organised a training workshop on 'Management of FMD outbreaks' from 25th - 27th August 2009 in Gaborone, Botswana. This 3-day training workshop was the second in a series of three project activities foreseen under the SADC FMD project and its FAO Contribution Agreement, entitled 'Regional strategy for the progressive control and effective prevention of FMD in the SADC Region'. The first workshop focused on management of FMD in endemic/high risk areas (10th - 13th December 2008) and the last will deal with issues of achieving freedom from FMD in vaccinated areas and requirements for proving to the OIE that freedom has been achieved (scheduled for 21st - 23rd October 2009).

2. PARTICIPATION

To ensure continuity of the training, the same twenty (20) field-based animal disease control managers who had been invited to the first training were re-invited. Eight SADC member states comprising: Botswana (1); Malawi (3); Mozambique (3); Namibia (1); Swaziland (3); Tanzania (3); Zambia (3) and Zimbabwe (3) participated in the training. Eight (8) experts comprising: SFMDP (2), FAO-ECTAD (2); Regional consultant (1); Botswana Vaccine Institute (2) and Botswana DVS(1) assisted with facilitating proceedings of the workshop.

3. METHODOLOGY

The training was carried out over a 3 day period and comprised of lecture presentations, discussions, scenario analysis and problem solving.

As with the first workshop, the training comprised of interactive lecture presentations followed by discussions. Each day's lectures and presentations were followed by break-out sessions where the groups discussed, in more detail, topical issues arising from the presentations. Each group gave feedback the next morning followed by discussions. On the last day, the groups were given specific scenarios to work with followed by plenary and discussions.

4. SALIENT POINTS OF DISCUSSIONS DURING THE COURSE

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

4.1 The traditional approach in FMD management

- The meeting noted that effective management of FMD outbreaks hinges on whether a country is involved in exports of livestock and livestock products or not. For all SADC member states however, FMD control is seen as a public good.

The control of FMD is therefore a mandate of the Department of Veterinary Services. However, veterinary departments need to continue to build strong cases as to why it is necessary to manage FMD outbreaks in order to convince policy/decision makers that the resources required are justified.

- Due to the presence of the reservoir host (African buffalo) in the SADC region, eradication of FMD SAT type viruses is unlikely. In that regard, for member countries to continue to access international markets for the export of various livestock commodities, it is necessary that experts within the region make effort to educate the rest of the world about SAT type viruses and their unique differences to other FMD viruses.
- In view of the above, member countries need to take opportunity of the frequent outbreaks to undertake applied research on various factors associated with these outbreaks. This will create a wealth of information that could enable development of better strategies in the management of future outbreaks.
- The meeting noted that most SADC member states have generic Contingency Plans for management of FMD outbreaks. However, it was emphasised that it is essential that these are continuously reviewed and updated in order to ensure that use is made of new tools and ideas in FMD outbreak management.

4.2 Alternative strategies in the management of FMD outbreaks

- Noting that different countries adopt slightly different approaches in managing FMD outbreaks, it was agreed that strategies to manage FMD outbreaks must be scientifically sound and in compliance with the OIE terrestrial animal health code.
- Due to limited resources in most member states and the impact of control measures on different stakeholders, selected strategies need to be effective (optimal use of available resources) and practical to keep all stakeholders satisfied.
- Three epidemiological FMD categories are recognized under OIE;
 - Country or zone free from FMD where vaccination is not practiced
 - Country or zone free from FMD with vaccination
 - Countries or zones infected with FMD (i.e. not free)

It was noted that out of the 15 SADC member states, very few have been able to obtain official OIE recognition to qualify for the first two categories. Unless a country has applied and submitted documentation to the OIE its OIE status will not be classified. How countries can achieve official OIE status with regards to FMD will be the subject of the next training course in October 2009.

- FMD outbreaks result in immediate loss of zone category classification; but this can be recovered through application and fulfilment of conditions matching the requirement for the needed zone category.

- The case definition of FMD outbreak and recognition of freedom from FMD (zone or country) need to be reviewed to recognise the realities of the Southern African situation where carrier animals (African Buffalo) exist side by side with cattle.

4.3 Lessons learnt from management of FMD outbreaks in vaccinated cattle populations

- The lessons learnt from the 2007 Habu outbreak in the Ngamiland district of Botswana clearly indicate that in a communal grazing land tenure system, it is very difficult to control animal movement during an outbreak situation and often this may protract the course of an outbreak and make its ultimate control elusive. While disease control fences are instrumental and effective in managing animal movements, it must be acknowledged that they are very expensive infrastructure to erect and maintain. Furthermore, there are often conflicting land-use interests (such as with environmental and wildlife conservation issues) and therefore extensive consultations with various stakeholders need to be undertaken.
- Further lessons learnt from the Habu outbreak are that vaccine efficacy and vaccination program effectiveness are key factors to the success in the management of FMD outbreaks in a vaccinated population. There is therefore a need for close collaboration between vaccine manufacturers and veterinary departments in order to improve efficiency and effectiveness of vaccination programmes, particularly in the face of outbreaks.

4.4 Data Collection, Management and Reporting in the face of an outbreak

- The meeting agreed that speed is the key to the success of containing an FMD outbreak. In view of this fact, it is crucial that efficient information flow must be established between key stakeholders engaged in the management of an outbreak. Furthermore, the quality and comprehensiveness of the data obtained during an outbreak is vital in guiding appropriate strategies to be adopted in managing current and future outbreaks.
- Since laboratory support is important in confirming the disease for initial international and regional reporting, it is essential that laboratory personnel be engaged right at the start of an outbreak to ensure good quality specimen and critical information is obtained for prompt diagnosis. The Botswana Vaccine Institute indicated their willingness to technically assist with collection of specimen in the field during an outbreak and subsequent testing if they are requested to do so by member states.

4.5 Issues specific to the use of vaccines against SAT serotypes in the SADC region

- It was noted that most SADC member states rely on vaccination to manage FMD outbreaks. However, it was cautioned that vaccination is only one of the measures used in the management of FMD outbreaks. It must therefore always be strongly supported by other measures such as effective movement control of

animals, animal products and people. The participants re-emphasised the difficulty that field personnel face when it comes to livestock movement control during an outbreak under the communal grazing system. Strong farmer cooperation was viewed as critical in ensuring movement control of animals during an outbreak is possible.

- The presence of FMD SAT-type viruses in the buffalo host, presents challenges not only to the field control programmes, but also to vaccine manufacturers due to the high variability within FMD SAT-type virus isolates. This high variability requires that the strains in the vaccine must be regularly monitored to ensure that they are always protective for circulating outbreak strains. The problem is compounded by the fact that very few outbreak strains are suitable candidates for vaccine production. It was further noted that in the past, correlation coefficients such as the r-value tended to differ significantly between laboratories. This leads to problems, particularly when vaccination in the face of an outbreak appears not to yield desirable results.
- Noting that there is a lot of effort put into ensuring that a good quality vaccine is produced at laboratory level (Good Manufacturing Practices), it was emphasised that the same standard of quality control (cold chain) must be implemented at field level, in the management of vaccines, to ensure the success of vaccination programmes.
- The difficulty experienced by most member states to obtain high vaccination rates routinely, particularly when it comes to naive calves, was noted. However, as much as possible vaccines must always be applied according to the manufacturer's guidelines. In this regard, it was emphasised that calves must receive the primary inoculation at four (4) months of age and a booster two (2) weeks later. The annual boosters are recommended at six (6) month intervals.
- Noting that adopting and sticking to the manufacturers guidelines with regards to vaccination intervals may be expensive and difficult for most member states, particularly where vaccination is conducted in large communal extensive farming systems, it was advised that countries should conduct strategic vaccination programmes. This will mean that the level of FMD risk in an area must be considered in determining vaccination intervals for a specific population and area. An example of high risk areas was given of the Caprivi region in Namibia and Chobe in Botswana where cattle are vaccinated three (3) times a year due to the proximity of livestock populations to buffalo herds.
- It was indicated that developments in production of good quality vaccines are underway, but these must be supported by member countries through submission of outbreak samples to ensure vaccine strains are updated. (BVI available to support countries in the collection of samples as well as in conducting Post Vaccination Monitoring).

4.6 Monitoring, evaluation and reporting

- Most member countries agreed that during the course of an outbreak, activities are implemented in a haphazard manner without clear indications of whether progress is being made in achieving the set objectives. It was indicated that Monitoring Evaluation & Reporting or Audits are the key to advocacy and communication, particularly when dealing with policy makers to request for necessary resources in the management of an outbreak. It was therefore advised that ME&R must become an integral part of an FMD outbreak control programme to ensure efficiency and effectiveness.
- Noting that diseases often influence animal productivity and determine the extent to which a country engages in international trade in livestock and livestock products, it is essential that disease control managers develop clear indicators to monitor the animal health situation. It is only when established indicators are monitored that changes in the animal health status of a population can be picked up early enough and appropriate interventions instituted.
- Availability and quality of data are critical in the usefulness of the indicators presented. Member countries were thus advised to ensure meaningful data is obtained during an outbreak.

4.7 Mitigating impact of FMD outbreaks

- While it is the desire for most countries to halt the spread of an outbreak as promptly as possible, it was agreed that the strategy(s) adopted to manage an FMD outbreak must always take into consideration the impact on affected communities. E.g. where stamping out is adopted, a compensation strategy must be in place. As soon as practically possible restrictions on trade in livestock and livestock products must be revoked or relaxed to restore the way of life of affected communities. Examples were given of situations where movement restrictions were never revoked for years despite the fact that an outbreak had long ended.
- The welfare, general health and safety of outbreak control teams must always be addressed as these can be critical in the effectiveness of managing an outbreak.
- Strong partnerships with affected communities and other stakeholders are essential to ensure full support in management of outbreaks.

4.8 Evaluation of costs in outbreak control

- Cost Benefit Analysis and Cost Effectiveness Analysis are essential tools in management of FMD outbreaks as policy makers depend on gathered evidence to decide whether a chosen strategy to control the disease is worth the value. It was sadly noted that capacity to conduct cost benefit analysis within

veterinary departments was very limited and therefore needed to be developed.

5. **OUTPUTS** FROM GROUP DELIBERATIONS

Based on the presentations given during the each day, three groups were formed and asked to deliberate on best practices and challenges encountered by veterinary departments in relation to specific issues in management of an FMD outbreak. The following chapter summarises key elements highlighted by group discussions.

5.1 Communication and Farmer mobilisation

Communication and farmer mobilisation in the face of an outbreak

In general terms, the flow of information from the field to the central authority was similar. Upon receipt of a farmer report, the extension agent/ veterinary assistant /field officer verifies the suspicion through a clinical examination. Through the quickest means possible, the next officer up the technical hierarchy is informed until the information reaches the Director of veterinary services. Most countries indicated that the intention is to have the directorate informed within a 24 hour period. Once the directorate has been informed, farmers and the general public are informed of the outbreak suspicion either through public gatherings, print or electronic media.

International and regional reporting

International and regional organizations such as the OIE, AU -IBAR and SADC are notified of the outbreak only upon laboratory confirmation of the disease. The reporting is done by the delegated candidate (Director of Veterinary Services or his/her delegate) using specific formats provided by the respective organizations

Ongoing communication during an outbreak

All the groups highlighted the need for continuous communication to update the public and other stakeholders on progression of the disease. This is often done through press releases and briefings.

5.2 Movement control

Biosecurity and movement control

Upon confirmation of an outbreak, the area is delineated into infected, surveillance and free areas. Teams are positioned in strategic areas such that there is minimal criss-crossing of the different teams. The teams are briefed and provided with SOPs on biosecurity procedures.

Movement of teams involved in the outbreak

All the groups agreed that the movement of teams involved in the outbreak should be from the outside towards the epicentre of infection. All teams must carry disinfectant between different areas of operation. In some countries registers that monitor movement of teams and/or visitors are kept. Sanitary points are established at strategic areas around the outbreak to ensure that teams and the general public are disinfected as they leave the infected areas. Teams that are released from the infected areas are quarantined for approximately 7 - 14 days.

Movement of farmers and the general public

It was agreed that there was a need to conduct public awareness campaigns on the importance of movement in the spread of the disease. Sanitary disinfection points are necessary as they serve to sensitise the public on the importance of the disease.

Movement of animals and animal products

Subsequent to confirmation of an outbreak most countries issue a press release that bans movement of animals and animal products into and out of the infected areas. A temporary ban on slaughter of cloven hoofed animals is imposed. It was agreed that the movement bans must be lifted as soon as possible to allow trade in livestock and livestock products to resume. Lack of political support, poor compliance by farmers and limited resources were cited as challenges in managing movement during an outbreak.

APPENDIX 1

Scenario Exercise

Situation

1. A FMD outbreak has just been diagnosed on a 350-cow farm as shown in the map - the virus concerned has been typed as SAT2 but no further characterisation results are available.
2. The map shows the basic lay-out of the area which is a small part of a large southern African country which lies mostly to the east of this area. The country is dependent on exports of minerals (copper, gold & titanium), sugar, citrus fruit & juice, beef and processed pork products. Therefore, spread and persistence of the outbreak will damage the country's economy
3. The land use of the area around the outbreak is shown together with the major roads and rivers. There are many minor roads and tracks in the area but these are not shown on the map.
4. The major river shown on the map flows from the west to the east but in winter is crossable by cattle & people at a number of points
5. You have been appointed by the DVS to take charge of the situation with the following instructions:
 - Further spread of the infection must be prevented & steps must be instituted to ensure that does not happen
 - However, the country is facing recess and therefore costs must be minimized
 - Furthermore, the Government is facing an election in 9 months time and is very reliant on the rural vote. You are therefore to disrupt rural activities as little as possible so as not to antagonize rural voters
 - This outbreak must be eliminated and exports re-established as soon as possible and you are required to:
 - Institute emergency actions to prevent spread immediately
 - Present a plan of future action within 5 days with projected time lines

Outputs required

1. Identify the major risk factors for spread of the infection in this situation and prioritise them
2. Outline emergency actions necessary to counter the major risks of spread of the infection
3. Develop a plan of action which will ensure the return to normality within the shortest time-period.

Your recommendations should be consistent with the OIE's Terrestrial Animal Health Code

Groups

Group 1:

Assume the area where the outbreak has occurred is part of a zone recognized by the OIE as free from FMD where vaccination is not practiced.

Group 2:

Assume the area concerned is part of a zone recognized by the OIE as free from FMD with vaccination (however, in this zone, only cattle are vaccinated against FMD)

Group 3:

Assume that the area concerned is not recognised by the OIE as free from FMD and the livestock products are exported to poorly regulated markets in the Middle East and East Asia

Points to note

For determining output 1, consider the ways in which FMD virus could potentially be spread and the role that different animal species may play in that process. The emergency measures should therefore address high-risk factors identified

There are no 'correct or incorrect' answers - the important point is that the plan must be based on technical considerations and that you be able to explain the reason behind each part of the plan

Annex 2: Day 3 Group Work: Scenario Analysis

	Group 1	Group 2	Group 3
	FMD in an area recognized by OIE as free from FMD without vaccination	FMD free zone with vaccination	Area not recognised by the OIE as free from FMD
Identify major risks of spread of infection in this situation and prioritize	<ol style="list-style-type: none"> 1. Dairy farm - source of infection 2. Transit of milk from infected farm to processing plant and milk tanker moving from farm to farm 3. Adjacent piggery owned by same dairy farmer plus multiple piggeries through out the outbreak area - pigs are efficient multipliers of virus 4. Feedlots on either sides of the infected dairy farm 5. Neighboring communal area 6. Adjacent cattle ranch 7. Private game farm with susceptible game (antelope) 8. Citrus farm with sheep, irrigated sugar estate, 9. Road network 10. Fun farm 	<p>Contact:</p> <ul style="list-style-type: none"> • Between Animals • Between animals and humans <p>RIVER:</p> <ul style="list-style-type: none"> • Animals crossing the river • Infected farm wastage draining into the river (River contamination) <p>RAW MILK:</p> <ul style="list-style-type: none"> • this is the milk from the infected farm <p>ROADS:</p> <ul style="list-style-type: none"> • Especially those around the infected farms 	<ul style="list-style-type: none"> • Cattle in communal area, ranch and feedlot coming into contact with dairy cattle. • Pigs in piggery owned by the dairy farmer • Indirect transmission by the farm owner and farm workers
Outline emergency actions necessary to counter the major risks	<ol style="list-style-type: none"> 1. Notification to OIE, Trade partners and neighbours 2. Institute Movement Standstill 3. Close milk processing plant and slaughter houses, and ban all form cattle sales 4. Publicity - esp. communal area, neighbouring farms, politicians, local authorities 5. Demarcate containment zone as the infected farm, adjacent piggery farm, adjacent cattle ranch, cattle feedlot, fun farm and communal area 6. Surveillance to determine extent spread of disease 	<p>MITIGATING CONTACT:</p> <ul style="list-style-type: none"> • Quarantine the infected farm and surrounding farms • Sensitising neighbouring farms • Workers observing sanitary rules (disinfection) • Minimise unnecessary visits <p>RIVER RISK</p> <ul style="list-style-type: none"> • Incineration of waste from the infect farm • Stop draining infected farm's wastage into the river. <p>RAW MILK:</p> <ul style="list-style-type: none"> • Ban the marketing of raw milk from infected farm. • Ban transportation of milk and animal 	<ul style="list-style-type: none"> • Quarantine dairy farm • Set up disinfection points for farm workers and the farm owner • Separate workers for piggery unit from the dairy unit. • Put strict biosecurity measures for the piggery and dairy farm

	<p>7. Trace back / Trace forward especially cull cows, bullocks from dairy farm to feedlots and replacement heifers to other dairy farm</p> <p>8. Put up disinfection and check points on all major roads</p> <p>9. Persuade communal farmers to water their stock at alternative sites away from the river opposite the affected dairy</p> <p>10. Stamping out policy in the containment zone - dairy and piggery but spare communal area (votes!)</p> <p>11. Identify by brand mark all the remaining animals in the containment zone</p> <p>12. Regular sero-surveillance in the remaining susceptible animals (including game) in the containment zone to look for exposure to infection</p>	<p>products from infected farm</p> <ul style="list-style-type: none"> • Compensate the farm for revenue loss <p>ROADS</p> <ul style="list-style-type: none"> • Mount road-blocks to control movement and confiscate animals and animal products. 	<ul style="list-style-type: none"> • Have public awareness campaigns to minimise movement of people into the dairy farm esp from the communal area • Put security guards around farm to minimise smuggling of milk out of farm
<p>Develop plan of action to ensure return to normality within the quickest possible time</p>	<ul style="list-style-type: none"> • Epidemiological investigation to establish source of infection and precipitating factors of the outbreak and put measures to prevent recurrence • Establish sero-monitoring programme for all susceptible animals to demonstrate absence of circulating virus • Relax movement controls and allow restocking • Reopen slaughter houses, dairy processing plant and livestock markets <p>ply to OIE and trade partners for reinstatement of disease freedom status</p>	<p>Conduct cattle vaccination after laboratory confirmation</p> <ul style="list-style-type: none"> • Vaccinate cattle from the infected farm and all surrounding farms • Vaccinate all cattle along the river (downstream) • Vaccinate cattle in the communal area <p>Ref. AH Code 2008 page 6, No 2.</p> <p>Conduct Effective surveillance Ref. Article 8.5.44 page 21 of 24.</p> <p>Institute Sanitary measures on the infected farm:</p> <ul style="list-style-type: none"> • Incineration of wastage • Routine disinfection <p>Communication:</p> <ul style="list-style-type: none"> • Inform Country B (Free from FMD) about the outbreak and actions taken 	<p>The aim is to contain disease within the farm</p> <ul style="list-style-type: none"> • Vaccination around farm-10 km radius • Piggery intensify biosecurity measures • Vaccinate cattle in infected farm starting with unaffected paddocks

Annex 3: Course programme

Training workshop: Management of FMD outbreaks SFMDP/FAO Workshop: 25 - 27 August 2009

Venue: Fairgrounds Mall, Gaborone.

Session	Topic	Resource person/s	Remarks
Day 1			
0830 - 0845	Registration		
Session 1 0845 - 0930	Welcome & course objectives Opening address	SFMDP - A. Masarelli FAO - S. Munstermann	Short address
Session 2 0930 - 1030	The traditional approach to management of FMD outbreaks in southern Africa - the Botswana case	Dr M. Letshwenyo	Power-point presentation with question & answer session
1030 - 1100	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 3 1100 - 1200	Key elements of an FMD response plan <ul style="list-style-type: none"> ✓ Activation of the Emergency Response Team (Chain of command) ✓ Implementation of emergency preparedness plan ✓ Resource mobilisation (funds, vehicles, human resources and other logistics) ✓ Public relations (particularly media, politicians & international & regional obligations) 	Dr M. Letshwenyo	Power-point presentation with question & answer session
Session 4 1200 - 1230	Alternative management strategies for an FMD outbreak under various scenarios <ul style="list-style-type: none"> ✓ Important concepts (outbreak, containment zone, stamping out, movement control & vaccination) ✓ Species specific requirements (e.g. goats, pigs and other wild & domestic cloven- hoofed species) ✓ Effects of outbreak management strategies on trade & other knock-on effects 	Dr G. Thomson	Power-point presentation with question & answer session

Session	Topic	Resource person/s	Remarks
1230 - 1400	<i>LUNCH</i>	<i>LUNCH</i>	<i>LUNCH</i>
1400 - 1430	Management of an FMD outbreak in a vaccinated cattle population - Ngamiland case	Dr K. Motshegwa	Power-point presentation with questions and answers
1430 - 1500	Data collection, management and reporting in the face of an outbreak (tools and resources required) <ul style="list-style-type: none"> ✓ Surveillance requirements during an outbreak ✓ Initial laboratory support requirements & interpretation of results ✓ On-going laboratory support during the progress of an outbreak 	Dr G. Thobokwe	Power-point presentation with question & answer session
1500 - 1515	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 5 1515 - 1700	Plenary discussion: Communication and farmer mobilisation in the face of an outbreak <ul style="list-style-type: none"> ✓ International & regional reporting: what is required & what not ✓ On-going communication during an outbreak 	Groups	
Day 2			
Session 1 0830 - 0930	Report back on Session 5 of Day 1	Group representatives	10 minute presentation by each group using flip charts
Session 2 0930 - 1030	Issues specific to the use of vaccines against SAT serotypes in the SADC Region	Dr G. Thobokwe	Power-point presentation with question & answer session
1030 - 1100	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 3 1100 - 1230	Monitoring , Evaluation and Reporting of the control measures adopted (Auditing)	Dr Kereng Masupu	Power-point presentation with question & answer session
1230 - 1400	<i>LUNCH</i>	<i>LUNCH</i>	<i>LUNCH</i>
Session 4 1400 - 1500	Activities to mitigate Impact of the control strategy (post outbreak control activities) <ul style="list-style-type: none"> ✓ High level Advocacy for leadership ✓ Staff Welfare during implementation ✓ Restocking ✓ Compensation 	Dr Kereng Masupu	Power-point presentation with question & answer session

Session	Topic	Resource person/s	Remarks
	<ul style="list-style-type: none"> ✓ Relaxation of movement restrictions ✓ Surveillance 		
1500 - 1515	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 5 1515 - 1700	Plenary discussion: Biosecurity and movement control <ul style="list-style-type: none"> ✓ movement of teams involved in the outbreak <ul style="list-style-type: none"> ○ (Staff quarantine and release) ✓ Movement of farmers and the general public ✓ Movement of animals & animal products 	Groups	Power-point presentation with question & answer session
Day 3			
Session 1 0830 - 0930	Report-back on discussion from Session 5 of Day 2	Groups	
Session 2 0930 - 1030	Evaluation of costs of managing an FMD outbreak	Dr Kereng Masupu	Power-point presentation with question & answer
1030 - 1100	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 3 1100 - 1130	Presentation of an FMD outbreak scenario	Dr G. Thomson	Flip-chart illustrations
Session 4 1130 - 1300	Group working session		3 groups to be formed to address the FMD scenario presented
1300 - 1430	<i>LUNCH</i>	<i>LUNCH</i>	<i>LUNCH</i>
Session 5 1430 - 1500	Group report back	Groups	
1500 - 1515	<i>TEA</i>	<i>TEA</i>	<i>TEA</i>
Session 6	Analysis of the approaches presented by the groups	Course leaders	
Session 7 1515 - 1600	Conclusions and recommendations	Dr M. Mokopasetso	Summary workshop proceedings with recommendations
Session 8 1600 - 1610	Closing remarks	Dr S. Munstermann	

Annex 4: List of Participants

LIST OF PARTICIPANTS			
PARTICIPANT	DESIGNATION	DEPARTMENT / MINISTRY	CONTACT INFORMATION
BOTSWANA			
Dr. Moetapele Letshwenyo	Deputy Permanent Secretary	Ministry of Agriculture Private Bag 003 Gaborone	Tel: +267 368 9024 Fax: +267 Cell: +267 71 60 64 31 Email: mletshwenyo@gov.bw
Dr Kefentse Motshegwa	Chief Veterinary officer	Department of Veterinary Services PO Box 14 Maun	Fax: +267 686 0315 Cell: +267 72 344 939 Email: kmotshegwa@googlemail.com
MALAWI			
Dr Gilson Robin Njunga	Principal Animal Health Officer	Central Veterinary Laboratory P.O. Box 527 Lilongwe	Tel: +265 1 756 351 Fax: +265 1 751 349 Cell: +265 888 868 354 Email: gilsonnjunga@yahoo.co.uk
Mr Ghiven Alfred Manjawila	Ag. Chief Animal Health & Livestock Development Officer	Department of Animal Health Private Bag 1 Salima	Tel: +265 1 263 203 Fax: +265 1 Cell: +265 999 256 402 Email: gmanjawila@yahoo.com
Mrs Patricia Mayuni	Chief Animal Health & Livestock Development Officer	Blantyre Agricultural Development Division Private Bag 379 Chichiri, Blantyre 3	Tel: +265 1 919 728 Fax: +265 1 825 116 Cell: +265 999 232 608 Email: mamamayuni@yahoo.co.uk
MOZAMBIQUE			
Dr Simoes Paulo Ussene	Chief Animal Health Officer	Department of Animal Health DPA - Maputo	Tel: +258 21 782 2570/1 Fax: +258 21 782 2570/1 Cell: +258 82 49 30 990 Email: simonussene@yahoo.com.br
Dr Felix Paulo	Provincial Veterinary Officer	Bairro No 3 Rua Digivite	Tel: +258 251 23297 Fax: +258 251 23297

		PO Box 42 Chimoio	Cell: +258 82 5093 750 Email: felix.paulo1@gmail.com
Dr Paulo Josefe Veloso	Veterinarian	DPA - Gaza	Tel: +258 28 222 184 Fax: +258 28 222 184 Cell: +258 82 700 0505/828530165 Email: paulojosefeveloso@yahoo.com.br Email: mulambe85@yahoo.com.br
NAMIBIA			
Dr Johannes Shoopala	State Veterinarian	Ministry of Agriculture, Water & Forestry Private Bag 12022 130 Robert Mugabe Avenue Windhoek	Tel: +264 61 275 680 Fax: +264 61 275 682 Cell: +264 811 246 275 Email: Shoopala@yahoo.com
SWAZILAND			
Dr Nhlanhla Johane Shongwe	Senior Veterinary Officer	Ministry of Agriculture P.O. Box 162 Mbabane	Tel: +268 343 4272/68; Fax: +268 343 4665 Cell: +268 606 8702 Email: shongwenhlanhla@yahoo.co.uk
Dr Cecilia Zandile Mlangeni	Veterinary Officer	Ministry of Agriculture P.O. Box 4192 Manzini	Tel: +268 505 2113; Fax: +268 505 6443 Cell: +268 608 6819 Email: mlangeniz@yahoo.co.uk
Mr Samson Mhlengani Manana	Senior Animal Health Inspector	P.O. Box 4192 Manzini	Tel: +268 505 6443 Fax: +268 505 6443 Cell: +268 608 1971 Email:
Tanzania			
Dr. Elibariki Luiseny Olomi	Regional Veterinary Officer	P.O. Box 310 Babati	Tel: +255 27 530 317 Fax: +255 27 530 294 Cell: +255 755 461 013 Email: mchangu@yahoo.com
Dr. Michael J. Madege	Veterinarian	P.O. Box 129 Mwanza	Tel: +255 28 250 0675 Fax: +255 28 250 0675 Cell: +255 784 762 310 Email: madege64@yahoo.com

			or querauk@yahoo.com
Dr Fortunata Victory Silayo	Regional Veterinary Doctor	P.O. Box 650 Morogoro	Tel: +255 23 260 0288 Fax: +255 23 260 0288 Cell: +255 754 747 608 Email: fmsilayo@yahoo.com
Zambia			
Dr. Mweene Cheelo	Research Scientist Central Veterinary Research Institute	PO Box 33980 Lusaka	Tel: +260 211 213 444 Fax: +260 211 229 470 Cell: +260 977 743 232 Email: mcheelo@yahoo.com
Dr. Nawa Mabuku	District Veterinary Officer	PO Box 670175 Mazabuka	Tel: +260 3 230 831 Fax: +260 3 230 352 Cell: +260 977 743 745 Email: nawamabuku@yahoo.com
Dr. Charles C. Maseka	Provincial Veterinary Officer	PO Box 630065 Choma	Tel: +260 3 220 094 Fax: +260 3 220 094 Cell: +260 979 415 424 Email: masekacharles@yahoo.com
Zimbabwe			
Dr. Wilmot Chikurunhe	Provincial Veterinary Officer Mashonaland Central Province	305 Hillview Road Bindura	Tel: +263 271 7213 Cell: +263 271 7213 Cell: +263 91 252 1332 Email: wchikuru@yahoo.com
Dr. Cyprian Zishiri	District Veterinary Officer	22 Government Hill Hwange	Tel: +263 812 2252/+263 81 24387 Fax: +263 812 2252 Cell: +263 912 852 471 Email: zieesh@comone.co.zw
Dr. Kudakwashe Makwangudze	District Veterinary Officer Department of Veterinary Services	P.O. Box 191 Chiredzi	Tel: +263 31417 Fax: +263 14171 Cell: +263 912 269 638 Email: kjmakwangudze@yahoo.co.uk
COOPERATING PARTNERS			
Dr. Susanne Munstermann	FAO ECTAD Regional Manager	P O Box 80598 Gaborone	Tel: +267 395 3100 Cell: +267 7211 0509 Fax: +267 395 3104

			Email: Susanne.munstermann@fao.org
Dr. Mokganedi Mokopasetso	National Project Officer FAO - ECTAD	Private Bag 80598 Gaborone	Tel: +267 395 3100 Fax: +267 395 3104 Cell: +267 72 79 91 90 Email: mokganedi.mokopasetso@fao.org
Dr. Kereng Masupu	Independent FAO Consultant	PO Box 605 Mochudi	Tel: +267 572 8030 Fax: +267 572 8287 Cell: +267 72 73 20 98 Email: diamondale@botsnet.bw
Andrea Massarelli	Team Leader SADC Foot and Mouth Disease Project SADC Secretariat	Private Bag 0095 Gaborone	Tel: +267 395 1863/391 3357 Fax: +267 397 2848/318 1070 Mobile: +267 72 56 54 20 Email: amassarelli@sadc.int
Gavin Thomson	Team Specialist SADC Foot and Mouth Disease Project SADC Secretariat	Private Bag 0095 Gaborone	Tel: +267 395 1863/391 3357 Fax: +267 397 2848/318 1070 Mobile: +267 74 20 12 31 Email: gthomsom@sadc.int