



**Documentation of the Process of Selection of the Second
Service Laboratory for the Diagnosis of HPAI and other TADs
in the SADC Region**

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SUMMARY

The SADC region has remained free from Highly Pathogenic Avian influenza since the disease emerged in Africa in early 2006. Countries have successfully developed Preparedness plans, instigated vigilance in regards to awareness creation and early detection and have included poultry surveillance into their disease control plans.

Surveillance, however, needs good laboratory services with established diagnostic capacity and competent personnel. FAO has assisted many countries in the SADC region to achieve this goal by upgrading their services at national level. At regional level, the region is privileged to have the ARC-Onderstepoort Veterinary Institute (ARC-OVI), a regional Reference/Service laboratory which has offered diagnostic services on poultry samples for HPAI/LPAI since 2006 to other SADC Member States that have not yet developed national capacity. However, it was noted that during the years 2006 and 2007, ARC-OVI could not cope with samples from the region to confirm suspected cases of AI due to high national samples throughput.

During a meeting of the SADC Laboratory Sub Committee (LDSC) of the Livestock Technical Committee (LTC) in November 2007, the need for the identification of a second Service Laboratory to ease the pressure on ARC-OVI for the diagnosis of HPAI and other TADs was expressed.

In a broad consultative process with SADC bodies, including the LDSC, the SADC AI Working Group (AIWG) and the LTC, but also through a SADC wide laboratory capacity assessment by Regional and International Consultants, a second laboratory was selected in March 2009. The result was communicated to SADC Secretariat, which in turn presented it to the Meeting of Ministers of Agriculture, which approved the decision in May 2009.

The entire selection process including the commissioning of the consultancies was technically and financially supported by FAO.

LIST OF ACRONYMS

AGID	Agar gel immuno diffusion
AHS	African horse sickness
AI	Avian influenza
AIWG	SADC HPAI working group
ARC-OVI	Onderstepoort Veterinary Institute
ARIM	Agricultural Research Institute of Mozambique
ASFV	African swine fever virus
BNVL	Botswana National Veterinary Laboratory
BSL	Biosafety level
CBPP	Contagious bovine pleuropneumonia
CFT	Complement fixation test
CVO	Chief Veterinary Officer
CVRI	Central Veterinary Research Institute
DRC	Democratic Republic of Congo
ECTAD	Emergency centre for the control of transboundary animal diseases
ELISA	Enzyme-linked immunosorbent assay
EU	European Union
FAO	Food and Agriculture Organization
FMDV	Foot and mouth disease virus
HI	Haemagglutination inhibition
HPAI	Highly pathogenic avian influenza
LDSC	Laboratory Diagnostic Sub-committee
LIMS	Laboratory Information Management System
LPAI	Low pathogenic avian influenza
LTC	Livestock Technical Committee
MS	Member states
NCVL	Namibia Central Veterinary Laboratory
ND	Newcastle disease
NDV	Newcastle disease virus
NVL	National veterinary laboratory
OIE	Office International des Epizooties
PCR	Polymerase chain reaction
RC	Regional Consultant
SADC	Southern African development community
SOP	Standard operating procedure
TAD	Transboundary animal diseases
TOR	Terms of reference
ZCVL	Zimbabwe central veterinary laboratory

1. INTRODUCTION

Highly pathogenic avian influenza (HPAI) is caused by the influenza viruses of the family Orthomyxoviridae. These viruses can cause a scourge known as fowl plague. When spread over a large geographic area, they result in economically devastating epidemics. An outbreak of HPAI is usually regarded as catastrophic. The zoonotic potentials of HPAI have been well documented. As of August 2009, at least 440 confirmed human cases of avian flu were reported and 262 people died of the disease. Despite international efforts to control the disease, avian influenza has continued to spread throughout the world. Today, African countries have been infected by the HPAI H5N1 virus one after another.

The SADC region has remained free from HPAI since its emergence in Africa in 2006. However, an epizootic of influenza among farmed ostriches was reported in South Africa and caused both direct and indirect losses estimated at several ten of millions of euros in 2004. The SADC region had since stayed alert and never ruled out the possibility nor undermined the threat of introduction of HPAI. Countries have successfully developed preparedness plans, instigated vigilance in regards to awareness creation and early detection and have included poultry surveillance into their disease control plans. However, key to discharging a successful surveillance program is good laboratory service with established diagnostic capacity and trained personnel. At present most National Veterinary Laboratories (NVL) in the SADC region are facing a number of challenges with regard to diagnostic capacity and are obviously at different levels of preparedness. To that effect FAO has intervened in assisting many countries in the region to upgrade their laboratory capacity at national level.

At regional level, the SADC region is privileged to have a regional Reference/Service laboratory in South Africa, the ARC-OVI in South Africa, which has offered laboratory testing services on poultry samples for HPAI/LPAI since 2006 to other SADC countries that have not yet developed national capacity. However, the capacity of ARC-OVI has been, at times, stretched to the limits and almost overwhelmed due to a high national samples throughput. This triggered a need to identify another service laboratory, beside ARC-OVI, for the diagnosis of HPAI and other TADs in the region.

The initiative to identify a second service laboratory was discussed at various forums and was welcomed by all stakeholders. The criteria for the selection of the second service laboratory were developed by the SADC HPAI working group (AIWG) and consultancies were commissioned by FAO to carry out capacity assessments in all SADC NVLs.

2. METHODOLOGY AND CHRONOLOGY OF EVENTS

2(a) The need for a second service laboratory in the region

The presence of ARC-OVI in South Africa has always been viewed as a big privilege to the SADC region. This regional Reference/Service laboratory has offered laboratory testing services on poultry samples for HPAI/LPAI since 2006 to many countries in the region. It has been pointed out, however, that in the event of an outbreak somewhere in the SADC region, including in South Africa, the amount of samples submitted may exceed the processing capacity of a single laboratory and therefore the need for a second service laboratory was identified. Consequently, the Livestock Technical Committee (LTC) requested Member States (MS) to identify another service laboratory in the region for the diagnosis of HPAI.

2(b) Discussion of the need at various forums

During a meeting of the SADC Laboratory Diagnostic Sub Committee (LDSC) of the LTC in November 2007, the need was expressed and discussed. In March 2008, the issue was further discussed at the SADC AIWG, composed of members of the SADC LDSC and members of the Epidemiology and Informatics Sub Committee. The AIWG group developed criteria for the selection of the second service laboratory, which were circulated to all national laboratories and three provincial laboratories in South Africa. The proposal was presented again in April 2008 to the LDSC meeting in Lesotho for approval. Thereafter the Chairperson of the LDSC tabled the issue at the LTC meeting in April 2008 in Gaborone, for endorsement.

2(c) Initial assessment of NVLs' capacity by questionnaire

A questionnaire, previously tested in laboratories in West Africa, was modified to suit Southern Africa and was then adopted by the SADC LDSC in 2008. Under the coordination of FAO/ECTAD Southern Africa the questionnaire was sent to all SADC NVLs and responses were collated and analysed. The objective was to get insight into the capacity of the SADC NVLs as summarised in Table 1 below:

Table 1: Questions and objective/information collected by the questionnaire

Question in subsequent order	Objective/information to be collected
1. Presentation of the laboratory	To determine the level of operation (e.g. national), affiliation (e.g. public) and research capabilities of the NVL
2. Laboratory staff complement and training	To determine the overall human resources capacity of the NVL. The level and type of training received and professional categorization of the whole staff with special reference to diagnostic virology and HPAI
3. Building facilities and utility services	To determine the suitability of the NVL housing (building) (e.g. free-standing), the biosafety level of the NVL and the availability of essential utility services
4. Laboratory equipment	To determine the type and number of critical equipment items available in the Virology laboratory
5. Reagents	To determine the source of reagents for AI and other TADs (e.g. development partners) and the sources of funding used to procure reagents and materials (e.g. state allocation)
6. Reagents for viral isolation and performance of serological assays	To determine the source of consumables and standards/controls used in virus isolation (e.g. eggs) and serology units (e.g. antigens and sera), and the species and health status of birds used as blood and eggs donors
7. Sample collection, labelling and handling	To gather information on sample collectors, the utilities (e.g. vehicle) and tools (e.g. shipping boxes) used for sampling and the types and amounts of samples collected and tested for AI and ND over the past years, as well as the information about the samples collected: clinical data/history, handling, logging, quality checks, storage, retention, disposal, identification system and traceability
8. Samples received for AI testing from 2005 to 2008	To determine the amounts of samples received and tested by either own laboratory or a subcontractor (e.g. OIE/FAO Reference laboratory for AI)
9. Serological diagnostic procedures	The established serological diagnostic capacity of the NVL and the number of samples tested using this capacity
10. Virological diagnostic	The established virological diagnostic capacity of the NVL and the

procedures	number of samples tested using this capacity.
11. Molecular diagnostic procedures	The established molecular diagnostic capacity of the NVL and the number of samples tested using this capacity
12. Other diseases diagnostic procedures used in the laboratory	The established diagnostic capacity and procedures of the NVL for the diagnosis of diseases other than AI and ND
13. Reporting procedures	To assess the overall system and line of reporting and keeping of technical records by the NVL
14. Quality assurance	To establish the extent of quality management/assurance system implementation and maintenance of good laboratory practices to assure the validity and reliability of test results and services generated by the NVL
15. Safety	To determine the level of safety awareness and the extent of safety requirements implementation (including waste management) and the guarantees for the maintenance of a safe environment that poses no health threat/hazard to personnel while protecting the integrity of samples and preventing cross-contaminations
16. Needs of the NVL	Need requirements for each NVL with emphasis on training, equipment, reagents and consumable for HPAI Laboratory diagnosis

Selected information gathered during the questionnaire assessment of NVLs is summarised in Table 3 and Table 4.

2(d)(i) On-site assessment of the short-listed NVLs by the Regional Consultant

Countries' responses to the questions listed in Table 1 were analysed by the Regional Consultant (RC) and taking into consideration other geo-politic aspects four countries were short-listed for on-site visit and capacity assessment: **Botswana, Mozambique, Namibia and Zambia.**

The assessment criteria and TORs of the RC (Annexure 2) were developed by the SADC LDSC and were designed to reveal strengths, weaknesses, opportunities and threats of the assessed NVL. With this approach it was possible to come up with an objective estimation of the gaps to be filled for the upgrade. The implementation of the quality management system was also assessed to establish the status of quality assurance and the perception of staff on the concept. Interviews with management, professional and technical staff and in some instances government personnel were also conducted. Since the assessment was conducted on site, witnessing of some procedures and validation of some of the responses provided in the questionnaire were conducted.

A scoring system of "0 (not implemented) to 5 (fully implemented) was used by the RC to qualify the assessed items.

Summarised information of the outcome of the on-site assessment by the RC is presented in Table 5.

2(d)(ii) On-site assessment of the short-listed NVLs by International Consultants

The European laboratory experts of the EU project FLUTRAIN also visited the four short-listed laboratories during December 2008 and conducted another capacity assessment. All assessments were guided by the criteria defined in their TORs as developed by the SADC LDSC (Annexure 3). Similar to above, the FLUTRAIN experts identified strengths,

weaknesses, opportunities and threats of the assessed NVL to allow an objective estimation of the gaps and the selection of candidates for further training.

THE ASSESSMENT CRITERIA WERE AS FOLLOW:

Criteria 1: Sustainability

The challenges facing the majority of SADC NVL are well known. Although a ready to use NVL was not the expected outcome of the selection process, the assessed NVLs had to offer some guarantees that they would be able to cover the maintenance and operational costs of the laboratory once the funds donated by FAO for the upgrade and the running of the laboratory for the first three years had come to an end.

Criteria 2: Accessibility

The selected laboratory would serve no purpose if it was not easily accessible by other SADC countries. The efficiency of existing means of communication, including air and road transport, fix and mobile phones and internet connections, ability to organize scientific visits and training were appraised.

Criteria 3: Experience with handling samples from other countries

Similar to above the past and current experience of the NVL to handle samples obtained from outside the country was evaluated to determine its ability to handle high sample throughput for instance in case of outbreaks.

Criteria 4: Human resources

The need for a competent human work force in a diagnostic laboratory cannot be overemphasized. The number and qualification of laboratory personnel involved in diagnostic virology for HPAI and other TADs were evaluated.

Criteria 5: Staff turnover

The pattern of staff turnover, particularly the professional and technical category was considered to be critical. At the time of assessment the pattern of staff turnover and the retention policy of the department were evaluated.

Criteria 6: Experience with ND virus isolation

Experience with ND virus isolation was viewed as a strategic driver for promoting and maintaining HPAI expertise in the laboratory, and was therefore evaluated.

Criteria 7: Biosecurity

The availability and suitability of a BSL 2 that is upgradable to BSL 3 was evaluated.

Criteria 8: Space to be dedicated to diagnostic PCR

PCR is the ideal diagnostic confirmatory tool and it is fast and reliable but it comes with certain requirements as far as space availability and suitability is concerned. The number and suitability of rooms dedicated or to be dedicated to diagnostic PCR was therefore evaluated.

Criteria 9: Accreditation status

The objective was to determine the level of implementation of and compliance to quality assurance system and good laboratory practices, and to have a sense of how the concept was perceived and driven by the laboratory staff.

Criteria 10: Willingness to provide AI confirmation services to other countries

Irrespective of the available capacity no laboratory would be selected if they were not at ease with the idea of providing AI confirmation services to other countries. It was

therefore imperative to ascertain that the selected NVL would be prepared to play the role of complementing the service of the ARC-OVI.

KEY FINDINGS / OBSERVATIONS AT THE TIME OF ASSESSMENTS

(1) BOTSWANA NATIONAL VETERINARY LABORATORY (BNVL)

Procurement and funding

The procurement system of BNVL was found to have some challenges mainly when procurement has not been planned in time or when service providers failed to honour the orders until the last minute resulting in budget cut by Treasury. Financial delegations were in place and the laboratory could spend up to P20000 (USD 3030) without inviting tenders. Evidence of good housekeeping and availability of reagents and materials required for routine testing was observed (Annexure 1).

Development plan and sustainability

The BNVL management showed evidence of good leadership and strong motivation. However, no research program was conducted in the field of avian viruses. Except for the export of ostrich meat, there was no surveillance plan for avian diseases (neither in domestic nor in wild birds) in place. The plans for upgrading the laboratory were there but the overall development plan was not clearly established yet.

Accessibility

There is an easy accessibility for SADC countries due to close proximity and good accessibility of the national airport. The laboratory has a well established communication system by telephone, fax and internet and also makes use of couriers (e.g. DHL), which makes the sending of samples easy to organize. The scientific visits and training could also be organized efficiently because BNVL has good facilities and enough rooms.

Human resources and capacity

The leadership of the laboratory was found excellent but the team spirit and the rotation of scientists and technicians ("Disease Alert Team") had yet to manifest. Two veterinarians were involved in the virology section. The laboratory also had a good number of technical staff involved in the virology section with experience ranging from less than 2 to 20 years. Staff turnover at the laboratory was stabilised with the introduction of the scarce skills allowance to certain professional categories. The laboratory had experience with AI and ND virus isolation in embryonated eggs obtained from own chickens.

The diagnostic PCR was set up for infectious diseases and identification testing but was still very much under-utilised. There was no fulltime staff members assigned to the PCR section. Real Time PCR for the diagnosis of AI was under consideration but no plans were finalised. Important issues like handling of large quantities of samples (high throughput), implementation of controls (extraction or inhibition reaction controls) and risks of contamination were being addressed within the frame of the twinning with VLA, Weybridge but were not implemented yet.

Biosecurity

The Biosecurity was mainly based on containment measures and unidirectional flow of activities.

Collaborations

Although the lab was not receiving samples from other countries for testing purposes, it had good collaborations with other laboratories including VLA, UK and ARC-OVI, NCVL and ZCVL.

Accreditation status

Some laboratory sections of the BNVL including Bacterial serology Food hygiene and Biochemistry were already SANAS-accredited. A Laboratory Information Management System (LIMS), in connection with the website, was foreseen for a near future, when funds become available.

Overall, notwithstanding the challenges of the BNVL, it was found that the laboratory had good infrastructure, good competencies, capacity in AI and ND, strong motivation of the leaders and well established international collaboration. The laboratory showed good potential to be considered as a candidate for selection as a second service laboratory for HPAI in the SADC region.

(2) NAMIBIA CENTRAL VETERINARY LABORATORY (NCVL)

Procurement and funding

Procurement was difficult but possible if funds were asked sufficiently in advance. Evidence of good housekeeping and availability of reagents and materials required for routine testing was observed (Annexure 1).

Development plan and sustainability

It was found that the NCVL enjoyed a very strong support from top management. There were good plans and commitment for upgrading the laboratory but the overall development plan was not clearly established yet.

Accessibility

There is an easy accessibility for SADC countries due to good accessibility of the national airport. The laboratory has a well established communication system by telephone, fax and internet and also makes use of carriers (e.g. DHL). This makes the sending of samples easy to organize. The scientific visits and training could also be organized efficiently because NCVL has good facilities.

Human resources and capacity

The NCVL had qualified human resources with competence in diagnostic virology. However, the number of Vets was low and there have been recent outward movements of staff. A position for a Vet heading diagnosis was foreseen for 2009. The laboratory leadership was still acting in their positions and was not laboratory but more "field-oriented". The plans to fix these management issues were not clearly defined yet.

There was no experience with AI and ND virus isolation. However, diagnostic PCR was already set up for infectious diseases. Important issues like handling of large quantities of samples, implementation of controls (extraction or inhibition reaction controls) and risks of contamination were not addressed yet.

Biosecurity

The NCVL had a BSL 2 upgradable to BSL 3. There was an overall ministerial plan and budget to build a new wing and improve standards for the export of meat to the USA. This expansion should allow reorganizing the rest of the building with a real BSL3 section.

Collaborations

With the exception of proficiency testing the NCVL did not receive samples from other countries for testing purposes. However, good collaborations existed with other laboratories including ARC-OVI, ZCVL and particularly with the laboratory of Terumo in Italy with which it had a twinning program for CBPP.

Accreditation status

The NCVL was not accredited yet but the implementation of the quality management and assurance system had started and was perceived very positively by the whole staff. A quality manager had been appointed and management had started sensitising the whole staff on the need for accreditation. The drafting of the policy manual and standard operating procedures (SOPs) for most assays was underway. A LIMS, in connection with the website, was foreseen for a near future.

Overall, notwithstanding the challenges that the NCVL was facing, it had a number of commendable strengths including good infrastructure, good competencies, excellent discipline, motivation and excellent team spirit and an already good rotation of technicians ("Disease Alert Team") with sufficient qualification. On the basis of these potentials the laboratory was considered as a good candidate for selection as a second service laboratory for the diagnosis of HPAI in the SADC region.

(3) AGRICULTURAL RESEARCH INSTITUTE OF MOZAMBIQUE (ARIM)

Preamble

The USAID funding that was committed for Mozambique to set up a dedicated compartmentalized BSL 3 laboratory for AI, with PCR diagnostic tools, made the ARIM technically well-positioned for an on-site assessment to determine the possibility of maximising this great opportunity for the diagnosis of AI in the region.

Procurement and Funding

Procurement was one of the serious challenges that the laboratory was facing. The process was reported to be very slow and required that every purchase (reagents and materials) goes through the tender process. Up to six months could elapse before acquisition of goods. The budget was also very limited.

Development plan and sustainability

Staff members appeared demotivated due to low sample throughput. The USAID supported installation of the compartmentalised BSL 3 AI diagnostic laboratory was facing major problems and delays. There was little AI or ND expertise and no research program was conducted in the field of avian viruses.

Certain parts of the building like the pathology section (inclusive of the post mortem hall) were in poor state of maintenance and required immediate renovation work. The plans for the renovation of the pathology section were developed some years back but were not implemented as yet due to budget constraints. The maintenance and calibration work for some equipment items (e.g. ELISA plate reader, plate washer, etc.) were long overdue.

Accessibility

The ARIM is located near the international airport. The laboratory has a good communication system by telephone, fax and internet and also makes use of couriers. This makes the sending of samples easy to organize. The scientific visits and training could also be organized efficiently because of its close proximity to the veterinary faculty (good facilities).

Human resources and capacity

The veterinarian in charge of the AI section was young and not yet fully conversant with some laboratory techniques. Plenty of room for improvement was identified in the testing habits of the older technical staff currently involved in the tests for the diagnosis of AI. There was no experience with AI virus isolation but ND virus isolation was done in embryonated eggs. No molecular diagnostic tools were available and there were no plans to acquire them any time soon.

Biosecurity

A new BSL 2 was available but not commissioned since its donation.

Collaborations

International collaborations were limited to sending samples to ARC-OVI. However, it was reported that some visitors from Angola and Zimbabwe had visited the Institute in the past for technological exchange. There was no experience in handling samples originating from other countries.

Accreditation status

The ARIM was not accredited yet and the whole concept of quality management and assurance system was not clearly understood by the staff. There was no quality or policy manual and most SOPs were not developed yet.

Overall, it was observed that the ARIM had numerous challenges. A significant financial investment would be required to fill the gaps and more training would be needed before reaching an acceptable level of competence for classical and molecular diagnostic services. Therefore, the laboratory could not be considered for selection as a second service laboratory for the diagnosis of HPAI in the SADC region.

(4) ZAMBIA CENTRAL VETERINARY RESEARCH INSTITUTE (CVRI)

Preamble

Considering the strong and strategic collaboration between CVRI and the Veterinary Faculty of UNZA, and after noting the existence of a BSL 3 which was also available for work on AI at UNZA, it was resolved that there were sufficient grounds to consider the CVRI for an on-site assessment aimed at exploring the possibility of maximizing this great potential for the diagnosis of AI in the region.

Procurement and Funding

The institute was experiencing a major constraint on the purchase of some essential services including reagents and calibration of equipment. Any purchase above the amount of \$1,500 USD had to go through the tender process involving a long bureaucratic process.

Development plan and sustainability

A significantly low sample throughput was observed. There was little AI or ND expertise and no research program was conducted in the field of avian viruses. Most parts of the building required immediate renovation work and the equipment was obsolete. At the time of assessment there was no budget to cover the maintenance costs.

Accessibility

The CVRI is located in Balmoral, an isolated area, approximately 25 kilometres from the capital Lusaka. Access to CVRI is via a dirt road. There is a shuttle service between the CVL and Lusaka. Air transport could link up Zambia to other SADC

countries. Other means of communication including telephone, fax, and internet and courier service were available.

Human resources and capacity

The laboratory had a good number of qualified and well trained staff members in both classical and molecular diagnostic techniques for AI. However, only diagnostic serology using ELISA commercial kits could be performed.

The HI, AGID, virus isolation and molecular techniques were not performed. Despite the availability of reference sera and antigens (H5, H7 and H9 for HI and AGID) donated by IZSVE, the lack of own chicken flock for regular supply of eggs and red blood cells and a suitable gel punch made it impossible to perform virus isolation, HI and AGID.

Biosecurity

The BSL 2 was not working at the time of assessment.

Collaborations

The CVRI has strong and strategically important collaboration with the Veterinary Faculty of UNZA. The University has a BSL 3 facility which is also available for work on AI and is maintained and funded by the University of Hokaido, Japan.

Accreditation status

The CVRI was not accredited yet. The implementation of the quality management and assurance system had started and was perceived positively by the staff but it was facing major challenges due to financial constraints. A quality manager had been appointed and a quality working group has been formed. Management had started sensitising staff members on the need for accreditation. There was a policy manual and SOPs for most assays.

Overall, the CVRI could not be considered as a second service laboratory for the diagnosis of HPAI and other TADs in the SADC region. A significant financial investment would be required to correct the gaps in the routine classical serological technique and to introduce and maintain the molecular diagnostic capacity at an acceptable standard. Return on such an investment could not be foreseeable before 18 to 24 months. Although UNZA appeared willing to assist and collaborate with CVRI it was unclear how this collaboration could develop in a HPAI outbreak situation without the approval of the Japanese collaborating partners.

2(e) Meeting at FAO headquarter in Rome

The reports of the RC and the FLUTRAIN experts were submitted during December 2008 to FAO/ECTAD Southern Africa. Subsequently, a meeting, chaired by FAO, was held on 19 January 2009 at FAO headquarter in Rome to share the results of the assessments and to make a final selection. Present at the meeting were FAO CVO and his team, the SADC Secretariat representative, the Chairperson of the SADC LDSC and the Consultants.

2(f) Invitation for submission of a Business plan

The findings and recommendations of all the reports were thoroughly analysed at the meeting in Rome. Two of the four short-listed and assessed laboratories were retained as possible candidates because of the potentials they presented. After careful analysis of all the facts presented, the meeting decided not to make any final decision but rather to

invite both candidate laboratories to present a business proposal detailing their strategies and plans to guarantee a sustainable AI diagnostic service delivery in the SADC region and ability to address other TADS as drivers or complementary services. The business plans were received during March 2009 and analysed by the entire team that met in Rome and the FAO/ECTAD.

Table 2 summarises the aspects and expected information that were addressed in the business plans.

Table 2: Aspects covered in the Business plan

Aspects	Expected information
1. Diagnostic procedures <ul style="list-style-type: none"> - PCR for Avian influenza (other TADS) - Influenza virus isolation - Accreditation status 	<p>Already established: yes/no. If no, by when could it be established? At what cost?</p> <p>Already established: yes/no. Experience with ND virus isolation; if no, by when could it be established? At what cost?</p> <p>Accredited or in the process of accreditation?</p>
2. Facilities <ul style="list-style-type: none"> - BLS2 - Compartmentalized BSL3 	<p>yes/no; if no, by when could it be established? At what cost for establishment/maintenance?</p>
3. Personnel <ul style="list-style-type: none"> - Minimum 2 trained staff available 	<p>Yes/no; if no, by when could they be employed? At what cost? Training needs to reach the criteria (full capacities in AI testing)</p>
4. Workplan should consider the following aspects on a time line of 3 years	<p>Plans/needs for purchase of equipment and reagents; Employment of additional staff if needed; Advertising the role of the laboratory in the region; Establishing a training programme for labs from the region; Carry out proficiency test on diagnostic tests for the region; Establish strategic stocks of reagents for testing of samples from the region; Establish costing system or cost recovery system for testing of regional samples; For which other TADS could you envisage to offer regional services? What diagnostic tests would you offer? Do you have all equipments, facilities and personnel? If no, what would be required? At what cost?</p>
5. Other TADS (could be an added argument) OPTIONAL	<p>For which other TADS could you envisage to offer regional services? What diagnostic tests would you offer? Do you have all equipments, facilities and personnel? If no, what would be required? At what cost?</p>
6. Sustainability (needs to cover at least...)	<p>Staff retention National commitment - National financial contribution to the costs Leadership commitment</p>
7. Budget	<p>All aspects under 1 to 4</p>

KEY FINDINGS IN THE BUSINESS PLANS

Both countries submitted well prepared business plans addressing all points requested. However, it was clearly observed that the BNVL had more international exposure and collaborations than the NCVL. Some evidences included the current OIE twinning project to become a regional OIE reference laboratory for CBPP diagnosis in the SADC region, the twinning project with VLA on AI diagnosis and the State-funded consultancy that was carried out by Pirbright laboratory, UK to establish capacity for FMD (liquid phase blocking ELISA). The laboratory also included in its business plan its capability to provide FMD post vaccination monitoring. The successful implementation of the quality management system at the BNVL, as evidenced by the accreditation (ISO 17025) of some laboratory tests including CFT test for CBPP, was an important aspect noted in the business plan.

2(g) Teleconference

A Teleconference was organised and chaired by FAO headquarter on 10 March 2009. The same team referred to above was invited to participate in the teleconference. Each team member expressed views and observations on the business plans of the two candidate laboratories and a unanimously decision on the final selection was reached by the team.

2(h) Decision

After this marathon consultative process, the BNVL was unanimously selected as the second service laboratory for the diagnosis of HPAI and other TADs in the SADC region.

2(i) Communication to SADC Secretariat

The result of the selection process was officially communicated by the FAO CVO to SADC Secretariat in March 2009 after the teleconference was concluded. The SADC Secretariat was satisfied with the entire process and its outcome.

2(j) Communication to SADC Ministers of Agriculture

The SADC Secretariat had, in turn, presented the result of the selection process to the meeting of SADC Ministers of Agriculture on 21 May 2009 in Johannesburg. The Ministers were also satisfied with the whole process of selection and approved the decision.

2(k) Delegation of SADC Secretariat

The Minister of Agriculture council meeting delegated SADC Secretariat to implement the decision during May 2009.

2(l) Communication of the decision to the selected laboratory

On 25 August 2009 SADC Secretariat officially informed the Minister of Agriculture of Botswana about the decision of the Ministers of Agriculture that the Botswana NVL was selected as the the second service laboratory for the diagnosis of HAPI and other TADs in the SADC region.

3. OUTLOOK AND WORKPLAN FOR BNVL

Following the selection of the BNVL as second service laboratory for the diagnosis of HPAI in the region, a meeting was organised at VLA Weybridge, UK in early May where the business plan was revised into a three year work plan and streamlined with AI twinning project on HPAI between BNVL and VLA.

FAO made \$150 000 USD available as the initial financial contribution on the workplan and is in the process of assisting to source additional funds.

At the time of writing this report the BNVL was already in the process of procuring equipment to be able to offer the AI diagnosis service to the region.

4. CONCLUSION

Every effort was made to make the selection process of the second service laboratory as transparent and consultative as possible. Stakeholders across the board, including the SADC LDSC and LTC, SADC Secretariat, FAO/ECTAD for Southern Africa, SADC MS (NVLs) and SADC Ministers of Agriculture were involved in the process at some stage.

Consultancies were commissioned and carried out by regional and international experts and a neutral ground was used to hold the meeting for the analysis of the findings and recommendations of the consultants.

SADC Secretariat had played a role in assuring the political buy in by MS and the whole SADC administrative process was followed.

The process was long and labour intensive, and was technically and financially driven supported by FAO/ECTAD. All stakeholders were satisfied with the selection process and welcomed the appointment of BNVL as the second service laboratory. It is hoped that the Botswana government will sustain the laboratory to reach its full potential. The laboratory on the other hand is expected to take full advantage of this opportunity to advertise the services to the rest of the region and pursue its quest for full implementation of the quality system. The ultimate success of this facility will also depend on the support of all SADC MS by sending samples to the BNVL.

The completion of the process of selection of the BNVL as a second service laboratory in the region has been a very significant milestone. However, a lot of work still lies ahead and commitment and political will from SADC member countries will be imperative to make the second service laboratory fully operational and sustainable.

Table 3: selected information on training, building, equipment, reagents and samples

Country	Level of virology training	International training	Building: Biosafety Level	Laboratory equipment	Reagents for AI	Samples collection
Botswana	Diploma	Yes (5 staff members)	BSL 2	Most equipment items available Exception: gel electrophoresis tank, gel apparatus, gel documentation, sequencer, liquid nitrogen , EM	Commercial supplier: 98%, Development partners: 2%. Funding source: 100% state allocation. Reagents for viral isolation and serology: eggs, RBC, Antigen and sera available	1 Lab sampling team available. Number of samples: 3680 from 2005 to 2007.
Democratic Republic of Congo	-	Yes (number unknown)	BSL 2	Most equipment for serology and molecular techniques available. Exception: sequencer, EM, Elisa washer	Commercial supplier: 10%, Gift: 5%, In-house: 5%, Development partners: 80% Funding source: State allocation: 4%	12 Lab teams composed of 4 members each; 1 Epidemiology team composed of 3 members. Samples collected from 2005 to 2007: 4200
Lesotho	-	Yes (number unknown)	BSL 2	Poorly equipped	Development partners: 100%	-
Madagascar	Diploma and degree	Yes (4 staff members)	BSL 1	-	Commercial suppliers: 100%	-
Mauritius				-		-
Mozambique	Diploma and degree	Yes (number unknown)	BSL 2	-	Development partners: 100%	-
Namibia	In-lab training	Yes (3 staff members)	BSL 2	-	-	-
Seychelles	-	-	-	-	-	-
Swaziland	-	-	-	-	-	-
Tanzania	In-lab training, diploma and degree including PHD	Yes (number unknown)	BSL 2		Commercial suppliers: 40%, Gift: 5%, In-house: 10%, Dev partners: 45%	4 Lab teams with 4 members each. Field teams available but number unknown. Samples collected from 2005 to 2007: 25289 by the Lab
Zambia	In-house and diploma	Yes (number unknown)	BSL 1 (BSL 2 is not working)	Great challenges with equipment	Commercial suppliers: 70%, Gift: 5%, In-house: unknown	2 Lab team with 4 members each, Epidemiology team available but number unknown. Samples collected from 2005 to 2007: 1070
Zimbabwe	In-lab training, diploma and degree	Yes (number unknown)	BSL 2 (work on BSL 3 progressing well)		Commercial suppliers: 95%, Development partners: 3%, Gift and In-house: 2%	No information provided.

Table 4: Summary of human resources at the time questionnaire assessment

Country	Total whole Lab	Veterinary/Scientist Supervisors		Technical Supervisors		Technical performing tests		Assistants Not performing tests	
		Virology	HPAI	Virology	HPAI	Virology	HPAI	Virology	HPAI
Botswana	64	3	3	2	2	2	2	0	0
DRC	72	10	10	6	6	0	0	3	3
Lesotho	6	1	0	0	0	1	0	0	0
Madagascar	11	2	0	0	0	0	0	3	0
Mauritius	9	1	1	?	?	?	?	2	2
Mozambique	39	2	1	2	1	6	3	2	2
Namibia	30	2	2	0	3	0	4	0	2
Seychelles	14	?	?	?	?	?	?	?	?
Swaziland	6	1	1		0	1	1	2	2
Tanzania	88	5	5	1	1	3	3	2	2
Zambia	58	3	5	1	2	2	5	1	1
Zimbabwe	?	?	1	?	1	?	4	?	5

Table 5: summary of the outcome of the on-site assessment by the Regional Consultant

Criteria	NAM	MZ	ZAM	BOT
1. The upgrade has to fit into the overall development plan of a given laboratory to guarantee sustainability and being able to cover maintenance costs	3	1	1	4
2. Easy accessibility for SADC countries (sending of samples, communication, scientific visits, training)	4	3	2	4
3. Experience with handling samples from other countries	2	1	0	2
4. Qualified human resources with competence in diagnostic virology (minimum 2 people, at least one with BSc Vet Med, experience min 2 years diagnostic virology laboratory)	3	3	5	4
5. Pattern of staff turnover with this qualification	4	4	4	4
6. Experience with ND virus isolation	0	3	0	3
7. BSL 2 upgradable to BSL 3	4	4	1	1
8. Sufficient space in the building (number of laboratory rooms) which can be dedicated to diagnostic PCR	4	2	1	3
9. Accreditation status: accredited OR in the process of accreditation	2	0	2	4
10. Willingness to provide AI confirmation services to other countries	4	2	3	3
11. PCR (Scope of activities, Personnel, Equipment and reagents, Test methods and methods validation, Prevention of cross-contamination, Filter tips, Pipettes, Primers, Assuring quality of test results, Accommodation and environmental conditions)	4	0	0	3
12. HA/HI Eggs inoculation and allantoic fluid collected, Equipment, PBS (pH 7.4), Alsever's solution, CRBC, Antigens, Positive and negative sera	3	2	0	4
13. ELISA Reagents kit including Positive and Negative controls, reader and washer	2	1	1	0
14. AGID Reagents kit including Positive and Negative controls	0	3	1	2

ANNEXURE 1: List of reagents and materials found at NVLs at the time of on-site assessment

ASSAY	BOTSWANA	MOZAMBIQUE	NAMIBIA	ZAMBIA
HA-HI	<p>Multichannel pipettes 12: - 5-50 µl (1) - Single pipettes: - 10-1000 µl (1) - 5-200 µl (1) - Egg incubator - Incubator 37°C (1) - Water bath: 37°C (1) and 56-60°C (1) - Fridges: 2x ½ (i.e. top fridge, bottom freezer) - Freezers -20°C: 2 x ½ (i.e. top fridge, bottom freezer) - Biosafety II: not working - Bench centrifuge - Centrifuge tubes - Pipettes tips - Microtitre plates: - V-bottomed plates - Reagent trough/basin - Biosafety II which is not functioning - PBS (pH 7.4) - Alsever's solution - CRBC - Antigens for NDV and AI (H5 and H7) - Positive and negative sera</p>	<p>- 50-250 µl 8 channel - 50-250 µl 12 channel - P2 single - P10 single - P200 (x2) single - 5-50 µl single - 0.5-10 µl single - 200-1000 µl single - 40-200 µl single - Egg incubator (2) - Incubator 37°C (1) - Water bath - Fridges - Freezers -20°C - Freezers -70°C (not commissioned yet) - Biosafety cabinet (class II still in box and not commissioned yet) - Bench centrifuge - Centrifuge tubes - Pipette tips (the lab makes use of disposable tips. The following tips were available in the lab: Yellow, Blue, White) - Precision balance - Microtitre plates: V-bottomed plates were donated and are still in the store room. Routinely the U-bottomed plates are used - Reagent trough/basin: Available and sterilised in-house</p> <p>N.B. No calibration or maintenance work is conducted on equipment and most equipment is very old</p>	<p>- 5-50 µl 12 channel - 30-300 µl 12 channel - 20-30 µl single channel - 20-200 µl single channel</p> <p>N.B. Calibration of the pipettes is still a problem</p> <p>- 1 freezer -20 °C - ½ freezer -20 °C (top = freezer; bottom = fridge) - ½ fridge (i.e. top = freezer and bottom = fridge) - 1 walk-in freezer -20 °C - 2 walk-in fridge 4 °C - 1 freezer -70 °C - Bench centrifuge - Centrifuge tubes - Pipettes tips (the lab makes use of disposable tips. The following tips were available in the lab: Blue tips are used for bigger volume, White and yellow tips are used for other purposes) - Precision balance - Microtitre plates: The lab makes use of V-bottomed plates - Reagent trough/basin: Available and sterilised in-house</p> <p>N.B. The lab is still experiencing some difficulties with the calibration and maintenance of equipment</p> <p>- PBS: The laboratory makes its own PBS (pH 7.4) in the media kitchen. (Need a pH meter). All required chemicals to make PBS were available. Also, the buffers to calibrate the pH were available. - Alsever's solution: made in-house. All chemicals are available and SOP for making of the solution was also available - CRBC: - Blood collected from own farmed chickens. The information of the health status of chickens was not available - Antigens: For AI, the lab makes use of H5 and H7 subtypes obtained from OIE reference laboratory. - Positive and Negative sera Obtained from OIE reference laboratory</p>	

ASSAY	BOTSWANA	MOZAMBIQUE	NAMIBIA	ZAMBIA
AGID	N/A The lab has just started to set up AGID for IBD (not for AI purpose).	The lab is capacitated to do AGID for AI. The required materials were available including: - NaCl - Agarose - PBS - Erlenmeyer - Water bath - Glass dishes - Punchers	N/A The lab does not do AGID for AI.	The lab has done in the past some AGID tests.
PCR	<p><u>Clean room:</u></p> <ul style="list-style-type: none"> - Hot air oven - PCR workstation fitted with UV light - Bench-top centrifuge (uses eppendorf tubes) - Extraction fume (handling of sulphuric acid) - Heating block - Vortex mixer - 2 scales - Pipettes: 0.5-10 µl, 10-100 µl, 100-1000 µl - Hot plate - Fridge for reagents - pH meter (out of order) + calibration buffers (4.0, 7.0 and 10) - Filter tips <p><u>Amplification room:</u></p> <ul style="list-style-type: none"> - 2 thermal cyclers (Gen Amp PCR system 9700 and AmpliTron II) - 1 freezer - 1 fridge - 1 microplate reader (not for PCR use) - 1 heating block - 3 power supplier for electrophoresis - 1 microwave (for the preparation of agarose) - 1 centrifuge - Pipettes: 0.5-10 µl, 2 x 10-100 µl <p><u>Sample preparation room:</u></p> <ul style="list-style-type: none"> - Extraction fume - Freezers (2½) (to keep amplified samples) - 2 centrifuges - 2 heating blocks - 2 vortex mixers - Pipettes: 2 x 0.5-10 µl, 10-100 µl, 100-1000 µl. 	N/A	<ul style="list-style-type: none"> - Laminar flow - Vortex - Microcentrifuge - Racks for 1.5 ml tubes - Pipettes (1 and 10 ml) - Sterile filter tips - Falcon tubes (10 ml) - Eppendorf tubes (1.5 ml) - PCR tubes (200 µl) - Disposable gloves - Personnel protective equipment - Scalpel blades - Forceps - Thermocycler - Isopropanol - Chloroform - Trizol reagent - Distilled water - Bleach 5% or DNA away - PBS (pH 7.4) - Access RT-PCR system kit (Promega) - PCR Positive control 	<p>BALMORAL does not have molecular diagnostic capacity. These following belong to UNZA:</p> <p>RNA isolation kit:</p> <ul style="list-style-type: none"> - RNeasy mini spin columns - Collection tubes (1.5ml and 2 ml) - Lysis buffer (RLT) - Wash buffers (RW1, RPE) - RNase-free water - Beta mercaptoethanol - 70% ethanol - Sterile microcentrifuge tubes (0.5 ml, 1.5 ml) - Pipettes (adjustable): 10 µl, 20 µl and 100 µl - Pipette tips - Microcentrifuge - Vortex - Freezer -20°C - Water bath - Thermocycler - Ultra-pure water - Primers - AMV Reverse Transcriptase - Reverse Transcriptase buffer - RNase inhibitor - Ice and ice making

				<p>machine</p> <ul style="list-style-type: none"> - Negative control - PCR master mix (PCR buffer, H₂O, dNTP mix, MgCl₂, Taq DNA polymerase, forward primer, reverse primer, mineral oil) - Materials for Agarose Gel electrophoresis (agarose casting tray, electrophoresis chamber, power supply and electrode leads, UV light, camera and film) - Pipettes and tips - Agarose gel and TBE buffer - Ethidium bromide - Gel loading buffer - Molecular weigh marker - Microtubes
ELISA	N/A The lab does not do Elisa tests for AI.	The lab does not do ELISA tests for AI. ELISA is done for ND. ELISA reader and washer very old and never been calibrated in more than 20 years A washer in poor maintenance condition is also available at the lab Reagents kit including Positive and Negative controls N/A	The lab does not do Elisa tests for AI. However, the capacity is available - Reader: Multiskan EX (supplied by ThermoLab System) - Washer: PW40 N.B. Not used for AI at the moment	A reader and washer in a of poor maintenance state exist at the lab.

ANNEXURE 2: Terms of Reference - Regional Consultant: Consultancy to identify a second SADC regional service laboratory

Within the framework of the FAO Emergency Centre for Transboundary Animal Diseases (ECTAD), under the overall guidance of the FAO Chief Veterinary Officer, the technical supervision of the Animal Health Service, AGAH, the operational supervision of the Chief, Emergency Operations Service, TCEO and the direct supervision of the ECTAD Regional Manager for Southern Africa, in close cooperation with the Operations officer, the Regional Consultant shall work closely with the regional laboratories and the international consultant and will assist in achieving the following activities:

- The Consultant shall familiarize him/herself with the questionnaire based laboratory assessment and the reports from direct visits to francophone countries and shall validate unclear information contained herein by phone, fax, email.
- He/she shall establish minimum equipment and reagent requirement check lists for the OIE recommended serology tests, AG detection, virus isolation and virus identification. These check lists should include availability of trained personnel to carry out the test
- He/she shall fill in the check lists for each laboratory from the information provided in the questionnaire. Where the information provided is doubtful, he/she shall clarify it by phone, fax, and email.
- He/she shall categorize all labs into low, medium and high capacity, based on the level of completeness of the checklists.
- He/she may visit up to 3 laboratories to verify the categorization in any of the categories.
- Thereafter he/she shall finalize the short-list of laboratories.
- He/she shall have telephone interviews with the Directors of the labs in category "high capacity" to find out their willingness to become a "SADC service laboratory".

Time frame: 3 weeks plus one week together with the international consultant; RSA based with one visit to Gaborone and up to 3 visits to Countries

Reporting: Draft assessment report latest 2 weeks after the end of the consultancy

Qualification:

The consultant should have a degree in Veterinary Science, Microbiology, Virology or related qualification with not less than 5 years experience in laboratory diagnosis in either microbiology, virology. Preferably experience in Quality Assurance management and general laboratory management. Accreditation as ISO 17025 auditor would be an added advantage.

The candidate should be based in South Africa, since this country is no candidate for this evaluation

ANNEXURE 3: Terms of Reference - International Consultant: Consultancy to identify a second SADC regional service laboratory

- The consultant shall study all information available on the laboratory assessments that have already been carried out by the SADC laboratory network by questionnaire
- The consultant shall critically review the report of the regional consultant who carried out a “pre-screening” and established a short-list of laboratories to be visited
- He/she shall consult with the Chairpersons of the SADC Laboratory Diagnosis Sub Committee and the SADC HPAI Working Group as well as the Senior Program Manager SADC/FANR
- He/she should visit OVI to appreciate the delivery of services offered to the region at present
- He/she should visit short-listed laboratories and shall, in close consideration of the selection criteria, developed by the Working Group, make a thorough assessment of the suitability of the laboratories visited
- He/she should develop a plan of action for activities to be taken on board in order to fulfill the role of a “regional service laboratory” and discuss these activities thoroughly with the laboratories ranking on place 1 and 2 of the established final ranking list.
- The consultant shall formulate recommendations regarding ranking of the laboratories

Time frame: 1 month of which the first week shall be spent together with the Regional Consultant; up to 3 country visits plus visit to OVI and some days in Gaborone

Reporting: The consultant shall produce an inception report indicating also the intended methodology of assessment after 10 days of the consultancy. The final report to be produced not later than 2 weeks after the consultancy.

Qualification: The consultant should have a degree in Veterinary Science, Microbiology, Virology or related qualification with not less than 10 years experience in laboratory diagnosis in either microbiology, virology. Previous experience in laboratory assessments in the international context preferred.

ANNEXURE 4: Terms of Reference - Consultancy to document the process of the selection of a second service laboratory for the diagnosis of HPAI in the SADC region

Under the overall guidance and programme responsibility of the FAO Chief Veterinary Officer (CVO) and Head of Emergency Centre for Transboundary Animal Disease (ECTAD), the operational guidance of the ECTAD Head of Operations, the technical guidance of the ECTAD Regional Manager for Southern Africa in Gaborone, the incumbent shall carry out the following tasks :

- Review the key findings of the SADC wide laboratory diagnostic capacity assessment in view of the short-listing of the candidate laboratories for the selection process
- Review all available documentation, notes and records on the selection process for the second SADC regional Service Laboratory for HPAI and other TADs since March 2008
- Describe in detail the process of the selection for the second service laboratory, making use of the existing documentation, but streamlining it into a clear, precise, objective record
- Clean up existing documentation to clear, precise, objective records, to be used as annexes (where applicable) to the main document
- Produce a publishable record of this process

ANNEXURE 5: List of people met by the Regional and/or International Consultants

BOTSWANA

- Dr. P. Bastiaensen, OIE Sub-regional Representation SADC
- Dr. G. Brückner, Deputy Director General, OIE
- Dr. E.K. Baipoledi, Head of BNVL
- Dr. K.T. Moagabo, Head of Department of Serology, BNVL
- Dr. J. Hyera, Head of Department of Virology
- Heads of Departments for Food Hygiene, Pathology, Bacteriology, Parasitology
- Mr. M. Palai, scientist/technician, Serology
- Mr. K. Monyame, scientist/technician, Virology
- Ms. L. Nwako, Technician, Virology

NAMIBIA

- Ms Anna N. Shiweda, Permanent Deputy Secretary
- Dr Frans Joubert, Acting Chief Veterinary Officer (joubertf@mawf.gov.na)
- Dr Anna Marais, Acting Head of CVL
- Ms Julia Shimwino, Head of Department of Toxicology & Residue Analysis (j.shimwino@cvl.com.na)
- Ms RP. Shilangale, Head of Department for Food Hygiene
- Dr G. Eberle, Head of Department of Clinical Microbiology
- Ms Rosa Stella Mbulu, Head of Department for Biotechnology (rsmbulu@cvl.com.na, rsmbulu@yahoo.com)

- Dr Anne-Laure Hager, Head of Department of Pathology, Parasitology & Virology diagnostics
- (andreal@iway.na, pathologist@cvl.com.na)
- Ms G. Tjipura-Zaire, Head of Department of Serology (absent during the visit)
- Mr Roderick Haraseb, Quality Control Manager (rharaseb@cvl.com.na)
- Mr Alec Bishi, Veterinary Epidemiologist (alecbishi@hotmail.com, bischia@mawf.gov.na)
- Ms Esther Mukete Veterinary diagnostician : toxicology & Residue analysis (esther_mukete@hotmail.com)
- Mr G. Aikukutu, Chief Technician, Department for Biotechnology
- Mr Augustinus Mbang, Technician, Virology
- Ms I. Muinjangu, Technician, Serology
- Mr F. Ndiipanda, Technical Assistant, Serology
- Dr. Massmo Scacchia, Head Research and Diagnostics

MOZAMBIQUE

- Dr. Rosa Costa, DVM (Director of Animal Sciences) - rosa.costa@gmail.com
- Dr. Sara Acha DVM. Acting Head of Central Vet Laboratory – sjacha@hotmail.com
- Dr. Lourenco Mapaco, DVM – Head of AI diagnostics - lpmapaco@gmail.com
- Dr. Paula Travassos Dias – Quality Manager – paulatdia@yahoo.co.uk
- Dr. Magalo, Veterinarian – Head of Pathology
- Dr. Florencia, Director of Veterinary Services

ZAMBIA

- Dr. Swithine Kabilika, DVM (Head of Institute)
- Dr. Gregory Bwalya, DVM (Head of Virology) – gregbwalya@yahoo.co.uk
- Dr. Mweene Cheelo, DVM – mcheelo@yahoo.com
- Dr. C. Nyeleti, PhD (Principal Veterinary Research Officer)

- Dr. P.G. Sinyangwe, PhD (Director Department of Veterinary and Livestock Development)
- Dr. B.M. Hang'ombe, PhD (Head of Paraclinical Studies Department, University of Zambia)
- Dr. Aaron S. Mweene, PhD (Dean of the School of Veterinary Medicine, University of Zambia)
- Dr. Nouredin Mona, PhD (FAO Representative in Zambia)

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