

**World Organisation for Animal Health (OIE) Veterinary Education  
Establishment Twinning Project**

**Sokoine University of Agriculture, College of Veterinary & Medical Sciences  
and  
Kansas State University, College of Veterinary Medicine**

**Workshop Report,  
31 October to 11 November 2016  
Morogoro, Tanzania**



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## Executive Summary

The main objectives of the first workshop were to build consensus on priorities for the Twinning project, to further refine a 3-year work plan, carry out a needs assessment, and build trust between the partners.

Tasks specifically relating to *OIE Day 1 Competencies of graduating veterinarians* included, reviewing the available *OIE Performance of Veterinary Services (PVS)* report for Tanzania (2008) to identify education related needs required for maintaining an effective National Veterinary Services in Tanzania; conducting an assessment of material needs at Sokoine University of Agriculture (SUA) College of Veterinary and Medical Sciences (CVMS); and mapping the current SUA Bachelor of Veterinary Medicine (BVM) curriculum against the *OIE Day 1 Competencies*.

These tasks were all completed during the workshop and the outputs are summarized in the body of this report. The 2008 PVS report identified needs in several areas of undergraduate education<sup>1</sup> (Bachelor of Veterinary Medicine (BVM) degree) and Continuing Education for qualified veterinarians and veterinary paraprofessionals. To address Continuing Education, Kansas State University College of Veterinary Medicine (KSU) and SUA will work to develop and deliver several new courses and will engage other partners (including Iowa State University) in this process.

A curriculum mapping exercise identified that the BVM degree at SUA includes topics which relate to all of the *OIE Day 1 Competencies*. However, further evaluation (including a key word search) and discussion will be needed to identify specific topics and courses for strengthening. A stakeholder survey carried out by SUA will also aim to further identify local needs. KSU will map its own curriculum against the *OIE Day 1 Competencies*. SUA and KSU intend to publish a paper in a peer-reviewed journal comparing the curriculum mapping exercises at the two colleges, and also comparing the *OIE Day 1 Competencies* against the competencies prescribed by the American Veterinary Medical Association (AVMA).

The material needs assessment revealed that core infrastructure required for delivery of the BVM and paraprofessional training is in urgent need of upgrade. SUA and KSU will communicate these needs to existing donors and hope to engage other external donors in supporting upgrades at SUA. To enhance the development of a sustainable business model at SUA, a staff member at SUA has been enrolled in a Masters of Business Administration (MBA) at KSU which was due to start in January 2017.

The first workshop focused on developing mutually beneficial opportunities for networking which would enhance education both at SUA and KSU. Visiting faculty from KSU gave four guest lectures to students at SUA. Video-conferencing facilities were used to initiate and host the first clinical case discussion group between KSU and SUA. The longer term objective of this is for faculty and students from both SUA and KSU to collectively discuss, on a monthly rotational basis, clinical cases presented at each college. This will expose students at KSU and SUA to a broader and more diverse range of clinical cases, whilst developing

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<sup>1</sup> In many parts of the world (including Africa and Europe) the veterinary degree (BVM) is an undergraduate degree. In America the veterinary degree is a post-graduate degree. The BVM in Tanzania is equivalent to the American DVM.



their communication skills. It will also generate additional educational material for both KSU and SUA. A plan was also developed for connecting researchers at the two veterinary colleges in areas of mutual research interest.



**Group Photo 1 Left to right:** Joshua Fine, Erick Komba, Emmanuel Mwakijungu, Rudovick Kazwala, Athanas Ngou, Tesfaalem Sebhatu, Maulilio Kipanyula, Keith Hamilton, Amandus Muhairwa, Doreen Ndossi, Derek Mosier, Modesta Makungu



**Group Photo 2 Left to right (back):** Elliot Phiri, Athanas Ngou, Raymond Fanuel, Derek Mosier, Chacha Werema, Modesta Makungu, Marie Keith, Nora Schrag, Hezron Nonga, Keith Hamilton, Tesfaalem Sebhatu, (front) Emanuel Mwakijungu, Sharaduhuri Kimera, Erick Komba, Joshua Fine

## 1. Introduction and purpose

### World Organization for Animal Health (OIE) Veterinary Education Establishment (VEE) Twinning Project

The *OIE Veterinary Education Establishment (VEE) Twinning Programme* establishes and supports partnerships between veterinary schools with shared interests in infectious animal diseases, cattle medicine, diagnostics, research, One Health, and agricultural development. The OIE awarded a VEE Twinning project grant to KSU and SUA in early 2016 to focus on sustainable strengthening of the veterinary curriculum and educational resources at SUA. Over the course of the three-year project, objectives include integration of all elements of the *OIE Core Curriculum* into the SUA BVM degree program, delivery of educational resources needed to enable veterinary students to acquire *OIE Day 1 Competencies* needed to support National Veterinary Services. In addition, the project will aim to establish SUA as a regional Centre of Excellence for Veterinary Education, facilitating the sustainable delivery of education to veterinary students and veterinary professionals throughout southern and eastern Africa.

This report describes the first twinning workshop which was held at SUA in Morogoro, Tanzania in November 2017. As described in the twinning project work plan, the workshop included the following activities:

- Reviewing OIE PVS reports to contextualize the VEE Twinning project
- SUA CVMS presentations of outcomes from the college's 2015 curriculum review (as performed by the Veterinary Council of Tanzania [VCT])
- Conducting a needs assessment, to include (1) a review of the current curriculum and educational resources to identify and prioritize areas for the project, and (2) assess material needs at SUA CVMS
- Determine priorities of the project and the strategic plan
- Evaluate existing curricula and educational material related to *OIE Core Curriculum* and *Day 1 Competencies*
- Evaluate external resources/e-learning potential
- Develop performance parameters for measuring successful implementation of the VEE Twinning project (to include plans for metric collection on student performance both during their training and during their first five years as graduates)
- Engage in knowledge exchange involving educational and training techniques
- Assess areas for collaborative scientific research
- Identify areas for developing Continuing Education course (hosted at SUA in project year 3)
- Assess broader funding needs to complement VEE Twinning project
- KSU participants to give lectures and visit regional farming systems
- Develop a detailed work plan for the VEE Twinning project



### **Sokoine University of Agriculture (SUA) College of Veterinary and Medical Sciences (CVMS)**

SUA is located in Morogoro, Tanzania. It was established in 1984 by upgrading of the Faculty of Agriculture, Forestry and Veterinary Sciences of the University of Dar es Salaam through Act No. 6, 1984, which was repealed by the Universities Act of 2005. SUA has been operating under its own charter since 2007. SUA has grown to include a total of four Colleges, one Faculty, and one School. This includes, the Colleges of Agriculture, Social Sciences and Humanities, Veterinary and Medical Sciences (CVMS), and Forestry, Wildlife Management and Tourism, the Faculty of Science, and the School of Agricultural Economics and Business Studies. Other academic units include the Directorate of Research and Postgraduate Studies, Directorate of Undergraduate Studies, Institute of Continuing Education, Center for Information and Communication Technology, Pest Management Centre, the Sokoine National Agriculture Library.

Having recently been upgraded from Faculty status, during a restructuring, the CVMS is one of the newest campus colleges at SUA. In Tanzania, veterinary education started in 1976 when the division of Veterinary Science was established under the Faculty of Agriculture and Forest of University of Dar es Salaam. After establishment of SUA, the Division of Veterinary Science was elevated to the Faculty of Veterinary Medicine (now CVMS). Initially the Faculty offered the Bachelor of Veterinary Science (BVSc) degree. This was later changed to the Bachelor of Veterinary Medicine (BVM). SUA CVMS is the sole veterinary college in Tanzania offering two undergraduate degree programmes namely BVM and Bachelor of Science in Biotechnology and Laboratory Science BSc (BLS), 23 postgraduate degree programmes (MSc and PhD) and two none-degree programmes, namely Diploma in Animal Health (DAH) and Diploma in Laboratory Technology (DLT). The CVMS vision is to become an internationally recognized center of excellence in promoting socioeconomic development through practical skills, entrepreneurship, research and integration of basic and applied knowledge in solving societal challenges. In 2016, the CVMS has a total of 875 students of which the 349 are BVM with class sizes ranging from 65 to 75. During 2015/2016 a total of 56 students graduated and were conferred the BVM degree.

### **Kansas State University (KSU) College of Veterinary Medicine (CVM)**

Located in Manhattan, Kansas, the College of Veterinary Medicine (CVM) is part of the Kansas State University (KSU), which was founded in 1858, and became the first U.S. land-grant college five years later. Established in 1905, the CVM has produced at least 5,000 veterinary graduates. The KSU CVM is dedicated to scholarship through innovation and excellence in teaching, research, and service to promote animal and human health for the public good. It is accredited by the American Veterinary Medical Association (AVMA), and offers a graduate degree DVM course of study to approximately 100 students per year, and postgraduate learning through MSc and PhD programs. The KSU CVM has a long history of international collaboration and has a dedicated office of international programs (est. 2015), focusing on international outreach and integrating international veterinary medicine into the CVM's educational and research repertoires.



## 2. Summary of recommendations and actions from the workshop

<b>PVS Evaluation Review</b>	Connect staff from MPH programs at KSU and SUA with a view to comparing curricula, sharing educational material, and developing joint MPH projects. Seek funding (extrinsic to twinning project budget) for public health related activities.		Ellyn Mulcahy Rudovick Kazwala
	Jointly (KSU and SUA) develop appropriate Continuing Education (CE) for paraprofessionals and veterinarians <ul style="list-style-type: none"> <li>○ Develop a CE module for epidemiology (to be accredited by Veterinary Council of Tanzania (VCT)) for: <ul style="list-style-type: none"> <li>▪ field veterinarians (including risk analysis, GIS, surveillance, data management) to be delivered in year 3 of the Twinning Project</li> <li>▪ laboratory workers – linking of laboratory and field data, general data management, disease reporting obligations and importance of transparency <ul style="list-style-type: none"> <li>• Timeframe must consider approval by VCT</li> </ul> </li> </ul> </li> <li>○ Offer CE module on epidemiology online</li> </ul>		Caryl Lockhart Esron Karimuribu
	Explore the use of Moodle at KSU for sharing educational material with SUA (provide pathology teaching material)		Tesfaalem Sebhatu Derek Mosier Doreen Ndossi
	Utilize Iowa State University (ISU) online training modules for provision of CE in infectious diseases <ul style="list-style-type: none"> <li>○ Contact Jim Roth, Director, Center for Food Security and Public Health, ISU</li> <li>○ SUA to provide feedback to adapt material for applicability to East Africa setting</li> </ul>		Doreen Ndossi Chacha Werema Keith Hamilton Jim Roth
	Include information about importance of national/international disease reporting and chain of command (including supervision of paraprofessionals) in CE and core curriculum	Before June 2017	Maulilio Kipanyula Keith Hamilton
	Discuss potential for ISO accreditation of diagnostic laboratories at SUA (options for interaction between KS Diagnostic Laboratory, BRI Diagnostic research areas, ISO accreditation)	Discuss at next workshop	Christopher Kasanga Tesfaalem Sebhatu Gary Anderson
	Strengthen risk analysis, professional communication (stakeholder engagement, risk communication, etc.), infectious diseases in core BVM curriculum as separate courses	Before June 2017	Maulilio Kipanyula Caryl Lockhart

<b>Curriculum</b>	<p>Curriculum Mapping</p> <ul style="list-style-type: none"> <li>○ Define methodology for curriculum mapping at SUA and KSU</li> <li>○ SUA should engage broader group of relevant SUA faculty (5-6 experts) to review and analyze results of curriculum mapping exercise from workshop (available as if requested)</li> <li>○ Identify gaps (using the key word approach) and ways to address the gaps (e.g., including courses on risk analysis, communications, infectious diseases that had been previously identified as gaps in the 2008 PVS Evaluation)</li> <li>○ Map KSU curriculum against OIE Core Competencies and compare results with SUA curriculum map – identify opportunities for sharing education material</li> <li>○ Publish a paper in a peer-reviewed journal on SUA-KSU curriculum mapping exercise, methodology could be used for other veterinary colleges</li> </ul>	Prior to workshop 2 first half 2017	Derek Mosier Hezron Nonga
	<p>Develop SUA stakeholder survey to inform curriculum needs</p> <ul style="list-style-type: none"> <li>○ Share KSU strategic planning stakeholder survey with SUA</li> <li>○ Identify people and groups who have a stake in SUA BVM curriculum</li> <li>○ Survey SUA stakeholders on their needs in the BVM curriculum <ul style="list-style-type: none"> <li>▪ Draft budget and seek funding</li> <li>▪ Design questionnaire</li> <li>▪ Implement survey</li> </ul> </li> <li>○ Discuss curriculum challenge questions/complete template through 3-4 workshops</li> </ul>	Present results at workshop 2 March 2017	Rudovick Kazwala Tesfaalem Sebhatu Caryl Lockhart
<b>Research</b>	<ul style="list-style-type: none"> <li>○ Collect information about current and proposed research projects at SUA CVMS; this will help in identifying possible research partners at KSU CVM</li> <li>○ Match and introduce researchers, explore opportunities for collaboration, seek joint funding opportunities</li> </ul>		Tesfaalem Sebhatu Rudovick Kazwala Tuntufye
	<ul style="list-style-type: none"> <li>○ Explore opportunities for exchanges of post docs and PhDs between KSU and SUA</li> </ul>		Esron Karimuribo Tesfaalem Sebhatu
<b>Material needs assessment and external funding</b>	<ul style="list-style-type: none"> <li>○ Complete agreed-upon needs assessment focused on physical, human, financial resources needed to deliver BVM curriculum. Include costs of maintaining capacity.</li> <li>○ Provide the OIE with the needs assessment</li> </ul>		Joshua Fine Keith Hamilton Maulilio Kipanyula



	<ul style="list-style-type: none"> <li>○ Create two-pager for dissemination to potential donors (divide by categories of need, tailor to donor types)</li> <li>○ Approach existing and potential future donors with summary needs assessment – private foundations, industry, U.S. government agencies, international NGOs</li> </ul>		
<b>Student exchanges</b>	Establish a link between KSU and SUA student international clubs and encourage regular activities		Marie Keith Modesta Makungu
	Explore options for clinical training exchanges with KSU (coordinate with UC Davis), e.g. small/large animal clinician, etc.		Nora Schrag Modesta Makungu
	Explore possibilities for summer school at SUA in collaboration with KSU e.g. 'One Health Summer School'		Keith Hamilton Hezron Nonga Robinson Mdegela
	Hold regular (monthly) joint case study (clinical, pathology, imaging, etc.) sessions and journal clubs via Skype on Wednesday (7am USA, 4pm Tanzania). Test call prior to session.		Modesta Makungu Tesfaalem Sebhatu
<b>Administrative actions</b>	Finalize and sign Memorandum of Understanding between SUA CVMS and KSU CVM		Maulilio Kipanyula Tesfaalem Sebhatu
	Sign sub-recipient contract agreement		Rudovick Kazwala Tesfaalem Sebhatu
	Nominate 2 BVM students (5 <sup>th</sup> year) for student exchange program (March 2017) to KSU before end of November 2016		Modesta Makungu Tesfaalem Sebhatu
	Nominate SUA experts and identify dates for second workshop in March/April 2017 (soon owing to visa issuance)		Modesta Makungu Tesfaalem Sebhatu
	Project management: <ul style="list-style-type: none"> <li>○ Prepare deliverables from initial meeting (for OIE)</li> <li>○ Add detail to work plan</li> <li>○ Decide on reporting mechanisms for project going forward</li> <li>○ Decide on metrics needed for monitoring project execution</li> </ul>		

### 3. Workshop programme:

Date	Topics covered	Participants or Presenter
<ul style="list-style-type: none"> <li>Day 1: Oct 31</li> </ul>	<ul style="list-style-type: none"> <li>• Introductions and background to the project</li> <li>• Overview of SUA CVMS</li> <li>• Discussion about the veterinary profession in the USA and its challenges in supporting National Veterinary Services</li> </ul>	<ul style="list-style-type: none"> <li>• Maulilio Kipanyula and Rudovick Kazwala</li> <li>• Keith Hamilton</li> </ul>
	<ul style="list-style-type: none"> <li>• Discussion about the veterinary profession in Tanzania and its challenges in supporting National Veterinary Services</li> </ul>	<ul style="list-style-type: none"> <li>• Rudovick Kazwala</li> </ul>
	<ul style="list-style-type: none"> <li>• Discussion about student life at K-State and SUA</li> </ul>	<ul style="list-style-type: none"> <li>• Marie Keith</li> </ul>
	<ul style="list-style-type: none"> <li>• Discussion about the objectives of OIE Veterinary Education Establishment Twinning Programmes</li> </ul>	<ul style="list-style-type: none"> <li>• Keith Hamilton</li> </ul>
	<ul style="list-style-type: none"> <li>• Agreement on workshop agenda &amp; composition of working groups</li> </ul>	<ul style="list-style-type: none"> <li>• Tesfaalem Sebhatu</li> </ul>
	<ul style="list-style-type: none"> <li>• Review of the OIE PVS report for Tanzania (2008) to identify curriculum needs</li> </ul>	<ul style="list-style-type: none"> <li>• SUA &amp; KSU participants</li> </ul>
	<ul style="list-style-type: none"> <li>• Discussion about networking between KSU and SUA student chapters</li> <li>• Planned joint SUA-KSU student activities</li> </ul>	<ul style="list-style-type: none"> <li>• SUA &amp; KSU participants</li> </ul>
<ul style="list-style-type: none"> <li>Day 2: Nov 1</li> </ul>	<ul style="list-style-type: none"> <li>• Continued review and discussion of key findings from OIE PVS report for Tanzania (June 2008)</li> <li>• Assessment of areas for joint KSU-SUA research opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Rudovick Kazwala</li> <li>• SUA &amp; KSU participants</li> </ul>
	<ul style="list-style-type: none"> <li>• Field visit to livestock farming systems around Morogoro to assess opportunities for KSU student externships</li> </ul>	<ul style="list-style-type: none"> <li>• Nora Schrag</li> <li>• Marie Keith</li> <li>• Modesta Makungu</li> </ul>
	<ul style="list-style-type: none"> <li>• Assessment of wider funding needs to complement the VEE Twinning</li> </ul>	<ul style="list-style-type: none"> <li>• SUA &amp; KSU participants</li> </ul>
<ul style="list-style-type: none"> <li>Day 3: Nov 2</li> </ul>	<ul style="list-style-type: none"> <li>• Review results of 2014 Veterinary Council of Tanzania (VCT) third party assessment of SUA CVMS</li> </ul>	<ul style="list-style-type: none"> <li>• Maulilio Kipanyula</li> <li>• SUA &amp; KSU participants</li> </ul>
	<ul style="list-style-type: none"> <li>• Overview of Southern African Centre for Infectious Disease Surveillance (SACIDS)</li> <li>• Tour of laboratory, clinic, and hospital areas to assess educational/material needs at SUA and develop core material needs/budget estimate</li> </ul>	<ul style="list-style-type: none"> <li>• Gerald Misinzo</li> <li>• SUA &amp; KSU participants</li> </ul>

<ul style="list-style-type: none"> <li>Day 4: Nov 3</li> </ul>	<ul style="list-style-type: none"> <li>Derek Mosier arrival at SUA</li> </ul>	
	<ul style="list-style-type: none"> <li>Presentation: Outcomes of latest Curriculum Reviewed at KSU and SUA</li> </ul>	<ul style="list-style-type: none"> <li>Derek Mosier</li> <li>Hezron Nonga</li> </ul>
	<ul style="list-style-type: none"> <li>Conduct needs assessment on curriculum at SUA</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU participants</li> </ul>
	<ul style="list-style-type: none"> <li>Mapping of SUA, KSU, against OIE Core Curriculum and Day 1 Competencies</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU participants</li> </ul>
	<ul style="list-style-type: none"> <li>Conduct assessment on core educational and material needs at SUA including development of a budget estimate</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU participants</li> </ul>
	<ul style="list-style-type: none"> <li>Discussion about establishment of student network KSU and SUA IVSA Chapters</li> </ul>	<ul style="list-style-type: none"> <li>Dominica Dominican</li> <li>Raymond Fanuel</li> <li>Marie Keith</li> <li>Nora Schrag</li> </ul>
	<ul style="list-style-type: none"> <li>Presentation: to students on Pharm on the Farm Clinical Pharmacology</li> <li>Continuation of discussion about SACIDS and complementarity with twinning project</li> </ul>	<ul style="list-style-type: none"> <li>Nora Schrag</li> <li>Esron Karimuribo, Mark Rweyemamu (by phone), Paul Gwasika, Modesta Makungu, Josh Fine, Keith Hamilton, Marie Keith</li> </ul>
<ul style="list-style-type: none"> <li>Day 5: Nov. 4</li> </ul>	<ul style="list-style-type: none"> <li>Preparation of a draft mapping matrix for SUA Curriculum</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU Curriculum Group</li> </ul>
	<ul style="list-style-type: none"> <li>Assessment of wider funding needs to complement the VEE Twinning</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU participants</li> </ul>
	<ul style="list-style-type: none"> <li>Discussion about establishing a regular clinical discussion group between KSU and SUA staff/faculty</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU participants</li> </ul>
	<ul style="list-style-type: none"> <li>Knowledge exchange on educational and training techniques</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU participants</li> </ul>
	<ul style="list-style-type: none"> <li>Planning of student exchanges between SUA &amp; KSU (activities/ dates)</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU participants</li> </ul>
<ul style="list-style-type: none"> <li>Day 6: Nov 5</li> </ul>	<ul style="list-style-type: none"> <li>Field visit to Masai livestock market</li> </ul>	<ul style="list-style-type: none"> <li>Keith Hamilton, Derek Mosier, Tesfaalem Sebhatu, Maulilio Kipanyula, Modesta Makungu</li> </ul>
<ul style="list-style-type: none"> <li>Day 7: Nov 6</li> </ul>	<ul style="list-style-type: none"> <li>Field visit to Mikumi National Park to assess potential for wildlife and conservation learning experiences</li> </ul>	<ul style="list-style-type: none"> <li>Keith Hamilton, Derek Mosier, Tesfaalem Sebhatu</li> </ul>
<ul style="list-style-type: none"> <li>Day 8: Nov. 7</li> </ul>	<ul style="list-style-type: none"> <li>Discussions about the OIE Core Curricula &amp; Day 1 Competencies to identify needs for curriculum strengthening at SUA &amp; KSU</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU Curriculum Group</li> </ul>

<ul style="list-style-type: none"> <li>Day 9: Nov 8</li> </ul>	<ul style="list-style-type: none"> <li>Field visit to APOPO facility to observe demonstration of rat detection of landmines<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>Keith Hamilton, Derek Mosier, Joshua Fine, Tesfaalem Sebhatu</li> </ul>
	<ul style="list-style-type: none"> <li>Discussion about on the OIE Core Curricula &amp; Day 1 Competencies to identify needs for curriculum strengthening at SUA &amp; KSU</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU Curriculum Group</li> </ul>
	<ul style="list-style-type: none"> <li>Guest Presentation to students: Hepatic Pathology</li> </ul>	<ul style="list-style-type: none"> <li>Derek Mosier</li> </ul>
<ul style="list-style-type: none"> <li>Day 10: Nov. 9</li> </ul>	<ul style="list-style-type: none"> <li>Visited APOPO facility to observe rat detection of samples of M. tuberculosis (Human T.B.)</li> </ul>	<ul style="list-style-type: none"> <li>Keith Hamilton, Derek Mosier, Joshua Fine, Tesfaalem Sebhatu</li> </ul>
	<ul style="list-style-type: none"> <li>Guest lecture to students: Respiratory System Pathology</li> </ul>	<ul style="list-style-type: none"> <li>Derek Mosier</li> </ul>
	<ul style="list-style-type: none"> <li>-Identification of areas for developing a Continuing Education course at SUA (accounting for PVS report, profession's needs and role for paraprofessionals)</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU participants</li> </ul>
<ul style="list-style-type: none"> <li>Day 11: Nov. 10</li> </ul>	<ul style="list-style-type: none"> <li>Discussion on the summary recommendations and action</li> </ul>	<ul style="list-style-type: none"> <li>SUA &amp; KSU participants</li> </ul>
	<ul style="list-style-type: none"> <li>-Lectured to students on International Solidarity</li> </ul>	<ul style="list-style-type: none"> <li>Keith Hamilton</li> </ul>

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<sup>2</sup> APOPO is a Belgian non-profit NGO that utilizes detection rats for humanitarian purposes such as clearing landmines and detecting tuberculosis. APOPO is an acronym standing for *Anti-Persoonsmijnen Ontmijnende Product Ontwikkeling*, or Anti-Personnel Landmines Detection Product Development. (<https://www.apopo.org/en/about/our-work/faq/all>)

#### 4. OIE – PVS Evaluation report of Tanzania (2008)

Discussion about recommendations from 2008 PVS report

##### Report Review and Commentary

Discussion about the SUA perspective on the 2008 PVS report, updates on status of Veterinary Services since 2008, and recommendations on actions to address education-related PVS findings through the VEE Twinning Project.

##### General situation:

Human and animal populations in Tanzania are growing rapidly. Land use changes (urbanization) in the north of the country mean that the livestock population is moving further south. This in turn is leading to deforestation in areas into which livestock are moving. Climate change may also be impacting on farming patterns. Land use and climate change are having both positive and negative impacts on disease distribution, for example deforestation is leading to a decreased incidence of African trypanosomiasis around Morogoro.

##### Sokoine University of Agriculture (SUA):

SUA is a publicly funded university. The veterinary college at SUA has recently (July 2016) been upgraded to the status of college, and renamed as the College of Veterinary and Medical Sciences (CVMS).

SUA plans to establish a human medical college which will provide SUA with a comparable profile to other established universities in Africa (including the university in Dar es Salaam). The inclusion of a medical college at SUA will complement current veterinary public health and One health initiatives at SUA, e.g. SACIDS, which could position CVMS as a leader in One Health. In preparation for the medical college, the CVMS is adapting its curriculum with the eventual aim of offering pre-clinical courses common to both medical and veterinary degrees. The current veterinary curriculum is being updated to a transition curriculum, which will eventually evolve to offer these courses. The objective is for CVMS to serve as a nucleus for the future medical college.

There is a strong research program at SUA CVMS which focusses on One Health and high impact infectious animal diseases. Research activities and infrastructure are being grouped under the umbrella of a Science Technology and Innovations Park (Center of Excellence). Whilst research and post graduate training is relatively well supported, there is an urgent need to invest in core infrastructure needed for delivery of the BVM at SUA.

Although education is heavily supported by the government students contribute to their course fees and living expenses and borrow money through a government loan scheme. The fees and student debt burden are at a much lower level than in the USA.

##### Veterinary profession:

Currently, SUA CVMS is the only Veterinary College in Tanzania, but the University of Dar es Salaam is in the process of establishing a second veterinary school in the country. The new veterinary school is



currently being evaluated for approval by the Veterinary Council of Tanzania (VCT), which is the Veterinary Statutory Body.

In general, animal health professionals in Tanzania fit into one of three categories – State (public service) Veterinarians, Private Veterinarians, or Veterinary Paraprofessionals. Historically, almost all veterinarians worked for the government, but this is changing. In 2016 approximately 75% work for the government and 25% work in the private sector.

Veterinary paraprofessionals usually qualify with a diploma or a certificate (from SUA CVMS, a Livestock Training Institute (LTI), or from a private institution). With 700 veterinarians and 4000 paraprofessionals in the country, paraprofessionals play an important role in animal health and veterinary public health. There is a shortage of veterinarians which is particularly apparent at the field level where there is a heavy reliance on paraprofessionals. The quality of Veterinary Service delivery varies significantly between districts, and many districts urgently need more field veterinarians to support the delivery of animal health and veterinary public health.

Decentralization and weaknesses in the disease reporting chain are major challenges for the National Veterinary Services. This situation resulted from the structural adjustment policies of the 1990s. National veterinary diagnostic laboratories are overseen by an agency which reports directly to the ministerial level, bypassing the chief veterinary officer of the National Veterinary Services (OIE Delegate). Therefore in practice, the Central Veterinary Laboratory works independently of the National Veterinary Services.

In addition, decentralization of power and budget to the district level creates conflicts of interest and leads to under-reporting of animal diseases. Decentralization has also led to proliferation of poorly regulated paraprofessionals. In particular, dispensing of veterinary medical products is poorly regulated.

The number of private veterinary practices in Tanzania is increasing. Historical economic studies have shown that the purchasing power of livestock owners was increasing and this may have provided opportunities for the private veterinary sector to expand. However more recent studies are required to demonstrate this. In general terms, animal health care is in its infancy in Tanzania.

An OIE PVS evaluation had been carried out in Tanzania in 2008. Since then an OIE PVS Gap Analysis and Follow-up has been carried out. Most recently in 2016, in the framework of the Global Health Security Agenda, a Joint External Evaluation (JEE) Mission was carried out.

Only the 2008 PVS Evaluation report was available to the participants at the workshop. Core competencies and recommendations from this report which are relevant to education were reviewed and discussed.

## **Results of the OIE Performance of Veterinary Services (PVS) Evaluation Report 2008**

### **Human, physical and financial resources:**

#### *1.2.B. Competencies of veterinary paraprofessionals:*

*Quality of veterinary paraprofessionals has improved since 2008.*

A major challenge is the provision of private training of low quality by private entities including some NGOs; content of this training can conflict with training issued by the government. Some NGOs have put



the power of drug dispensing into the hands of under-qualified Community Animal Health Care Workers which has further fueled a lack of regulation in the use of veterinary medical products.

SUA trains paraprofessionals through a diploma program in Animal Health and Production.

Continuing Education (CE) is provided by SUA and government-run Livestock Training Institutes (LITs). Discussions are underway to require a Master's degree (in a relevant field) for Regional Veterinary Officers (RVOs) and District Veterinary Officers (DVOs).

### **Recommendations for the Twinning project**

- Develop a link between the MPH program at KSU and SUA, allowing staff at KSU and SUA to compare respective MPH programs and share educational material.
- Jointly (KSU and SUA) develop/deliver appropriate CE for paraprofessionals and veterinarians in Tanzania.
- Develop a mechanism for providing lower-level in service training to district level e.g. using a web based platform (SUA use Moodle).
- Explore the use of Moodle at KSU for sharing educational material with SUA.

#### *1.3.B. Continuing Education*

SUA should be the national leader in the provision of CE for veterinary services.

SUA offers CE which is designed for veterinarians, but material could also be adapted and developed for paraprofessionals. Currently, it is a legal requirement for veterinarians to participate in CE; this could also be made a requirement for paraprofessionals.

Two SUA staff will visit South Africa (Pretoria) as part of an *OIE Veterinary Statutory Body (VSB) Twinning Project*. During this visit, they will consider adapting South African CE programs to Tanzania.

The project plan for the OIE VEE Twinning includes developing, jointly with KSU, a CE module which will be implemented in year 3 of the project.

Elsewhere in the PVS report a need was identified for training in disease surveillance, risk analysis, GIS, and linking data from different sources (genetic data [SUA has genetic sequencing capacity], epidemiology, field investigation, laboratory diagnostics). This was considered an appropriate area for KSU to provide assistance.

Identified areas of priority for strengthening CE include:

- Epidemiology (surveillance, GIS, remote sensing, coordinating epidemiology and laboratory surveillance, risk assessment, linking genetic and epidemiology data)
- Animal Welfare
- AMR/ prudent use of antimicrobials/ pharmacology/ regulation of veterinary medicinal products
- Infectious disease detection, diagnosis, prevention and control
- CE modules could also be shared with the LITs for other paraprofessionals not trained by SUA



**Recommendations for the Twinning Project:**

- Develop CE module with KSU for epidemiology to be delivered in year 3
- Contact UC Davis about use of the Bioportal to link epidemiology and genetic data
- Contact Iowa State University (ISU) (Jim Roth) to request that SUA have access to the online training course in infectious diseases free of charge
- Move towards provision of online CE (Moodle is preferred platform for SUA)

*I-4 Technical independence:*

There are problems with the chain of command and decentralization of veterinary services. Laboratory surveillance results are not reported directly to the National Veterinary Services by district veterinary investigation centers (VICs) or the central Veterinary Laboratory Agency; rather they are reported to ministerial level.

**Recommendations for the Twinning Project:**

Include material on the importance of national and international disease reporting and chain of command in CE and core BVM curriculum.

***Technical authority and resources****II-2 Veterinary Laboratory***Recommendations for the Twinning Project:**

- Discuss potential for accreditation (ISO) of diagnostic laboratories at SUA
- SUA could deliver CE for Laboratory staff in Tanzania, particularly linking field surveillance to laboratory diagnosis and data management, aimed at fostering a culture of sharing.

*II-3 Risk Analysis*

Risk analysis is offered in the veterinary curriculum at SUA, but could be strengthened and delivered through a specific course.

**Recommendations for the Twinning Project:**

- Strengthen risk analysis in core BVM curriculum as a separate course
- Include risk analysis in CE epidemiology module

*II-5 A and B Surveillance*

SUA could train field staff in passive surveillance. There is a need to assess and coordinate what NGO's are planning to do in this area for training of veterinarians and paraprofessionals. Training should involve both active and passive surveillance. The sequencing capability at SUA could be used to attract new surveillance projects.





*II-6 Disease Response*

There is interest in a CE course focused on disease recognition (transboundary diseases, clinical signs, e.g. *Peste des petits ruminants* [PPR]).

*II-7 Disease, prevention, control and eradication*

CE for data assessment needed.

*II-8 Veterinary Public Health and Food Safety*

- Veterinary paraprofessionals performing meat inspection need extra training/SOP for specialized content (CE)
- Veterinary medicines and biologicals – covered in core curriculum, but gap in understanding of rationale for drug approval, who can administer (vets vs. farmers). Antimicrobial use is not well regulated and expected to become more of a problem if livestock production increases, e.g. overuse in poultry.
- Emerging Issues
- Animal welfare to be included in CE

**Interactions with stakeholders***III-3 Communications Skills*

In the BVM core curriculum, communication courses relate to training in English language skills. However there is a need to develop professional communication skills needed for engaging stakeholders, risk communication and extension activities. This should be addressed in KSU and SUA curricula.

**Recommendations for Twinning Project**

Professional communication to be strengthened and delivered as a course in core BVM curriculum focusing on stakeholder engagement, extension work, risk communication, etc.

**Access to markets***IV-4 International Certification*

This is considered important for the OIE. Assume certification is done by veterinarians and not paraprofessionals. Traceability is also being evaluated.

*IV-7 Transparency*

Core content for OIE disease notification – is part of different courses at SUA (e.g. jurisprudence). Recommend making this a required course at SUA – notifiable/transboundary diseases, reporting responsibilities.

**Recommendations for Twinning Project**

Jointly (SUA and KSU) develop an explicit course on notifiable diseases and reporting responsibilities.



## Summary of Gaps and Actions for Twinning Project Relating to PVS Evaluation

Topic Area	Action Items
MPH	<ul style="list-style-type: none"> <li>• Develop link for KSU/SUA MPH staff to share educational resources</li> </ul>
Continuing Education	<ul style="list-style-type: none"> <li>• Develop/deliver CE modules for veterinarians &amp; paraprofessionals</li> <li>• Develop module for OIE VEE Twinning Project to deliver in year 3 (Epidemiology: GIS, risk analysis, data management, surveillance)</li> <li>• Explore online mechanisms (specifically Moodle) for sharing information between SUA and KSU, SUA and local practitioners</li> <li>• Modules for laboratory staff, for SUA to use to train other laboratories in Tanzania</li> <li>• Identify KSU training material for laboratory personnel to share</li> <li>• Other specific topics: Risk Analysis, meat inspection, clinical recognition of transboundary/reportable diseases, animal welfare</li> <li>• Contact Jim Roth (Iowa State) about sharing transboundary disease training modules for CE, efforts to improve disease-specific response plans</li> <li>• Assess what other NGO's are active in areas related to Twinning Project (avoid overlap)</li> </ul>
Core Curriculum	<ul style="list-style-type: none"> <li>• communications (scientific) with stakeholders as part of KSU and SUA core content</li> <li>• risk analysis</li> <li>• explicit course on notifiable disease and reporting responsibilities</li> </ul>
Management and Policy	<ul style="list-style-type: none"> <li>• KSU to assist in developing SOP for management of veterinarians and paraprofessionals</li> <li>• Evaluate options for disease-specific response plans for Tanzania</li> </ul>
Surveillance	<ul style="list-style-type: none"> <li>• Opportunities to develop combined programs for GIS, Remote Sensing, Epidemiology, Active and Passive Surveillance</li> <li>• Involve sequencing capability</li> </ul>

Examples of potential donors or projects to engage (see needs assessment):

- iAGRI<sup>3</sup> – assess scope of USAID/Ohio State iAGRI project with SUA and potential for synergy or overlap. Phase 1 focused on crops, phase 2 may focus on livestock.
- Assess mechanisms for synergy with USAID Feed the Future projects, combining twinning project activities with KSU College of Agriculture.
- Gates Foundation – Are also involved in livestock modernization efforts in Tanzania, through ILRI

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<sup>3</sup> The Innovative Agricultural Research Initiative (iAGRI) is a Feed the Future project funded by the United States Agency for International Development (USAID). It is managed by the Office of International Programs and Agriculture at the Ohio State University (OSU), and coordinates activities with SUA. The overarching objective of the project is to “strengthen the capacity of the Sokoine University of Agriculture (SUA) and the Ministry of Agriculture, Food Security and Cooperatives (MAFC) to contribute to the development of effective solutions to address food insecurity in Tanzania.” (<http://iagri.org/about/>)

## 5. Veterinary curriculum

### a. Background:

Objectives of the VEE Twinning Project include *enhancing the veterinary curriculum at SUA to account for all elements of the OIE Guidelines on Veterinary Education Core Curriculum, and enhancing educational resources for the provision of Core (Day 1) Competencies which are required to support the National Veterinary Services (5).*

These objectives align with recommendations made in the audit report of the Veterinary Council of Tanzania (VCT) which made general recommendations to address the deficiencies in the SUA CVMS BVM training (2).

- Improve teaching spaces for lectures and laboratory spaces to accommodate up to 100 students.
- Improve practical training facilities for field and laboratory based practicals such as equipping the hospital with modern teaching and diagnostic facilities, ambulatory services, field camping equipment, and transport vehicles.
- Improve the academic and technical staff capacity
- Ensure Veterinary Graduates acquire *OIE Day 1 Competencies*

Curricular needs were first addressed by reviewing and discussing the PVS Evaluation report (2008) (see section 3 of this report), the VCT audit report, and then by conducting a curriculum mapping exercise. Future work will include further analyzing the results of the curriculum mapping exercise (key word search) and carrying out a stakeholder survey on curricular needs.

### b. Introduction and methodology for curriculum mapping of SUA curriculum against *OIE Day 1 Competencies and OIE Core Curriculum*

The main objective of the curriculum mapping exercise was to identify possible gaps and mismatch of BVM courses when compared with the *OIE Guidelines on Model Core Curriculum of the OIE Day 1 Competencies*. The exercise involved the participation of faculty and curriculum experts from SUA and was facilitated by Derek Mosier (who had recent experience of mapping the KSU curriculum against AVMA core competencies). The exercise involved going through the proposed transition SUA curriculum and listing each course against *OIE Guidelines on Model Core Curriculum* and *OIE Day 1 Competencies*. For each SUA course, the detailed description of the course content was reviewed to assess which of the *OIE Core General, Specific and Advanced Competencies* were covered.

The results of the exercise indicated that in general all components of the *OIE Model Core Curriculum of the Day 1 Competencies* were covered in the BVM curriculum (Refer to SUA Curriculum Matrix).

However, the SUA draft curriculum mapping Matrix needs to be further analyzed to identify strengths and weaknesses through a key word search. The methodology for this second phase in the exercise will be developed before the next workshop at KSU.



### c. Proposals for curriculum mapping at KSU CVM curriculum

KSU has recently mapped its curriculum against the AVMA Core Competencies for an AVMA accreditation which is due to take place in April 2017.

It was proposed that KSU should map its own CVM curriculum against the *OIE Model Core Veterinary Curriculum* and *OIE Day 1 Competencies*. The results will be compared with the results of the mapping exercise at SUA and will also be used to compare the AVMA Core Competencies against *OIE Day 1 Competencies*.

KSU and SUA hope to publish a paper in a peer reviewed journal describing the methodology and compares the results. The paper will provide a model for other Veterinary Education Establishments to use and refine.

A timeframe will be prepared for the mapping exercise.

### d. Stakeholder engagement and survey

A stakeholder engagement survey is an important tool for carrying out a strategic plan and assessing curricular needs. It would help SUA CVMS to achieve its goals of educating a competent veterinary workforce which met the needs of local stakeholder. The stakeholder engagement survey should help to prioritize strategic and operational changes. At KSU CVM a stakeholder survey was carried out using an online survey questionnaire. The KSU online stakeholder survey experience could not be directly applied to the Tanzanian situation due to lack of comprehensive access to the internet in villages and remote areas. A face to face stakeholder survey is needed for Tanzania which incurs financial budget to implement the survey. Survey questions also need to be adapted to the local and national setting in Tanzania (including local language of stakeholders).

Strategic challenge questions from the KSU stakeholder survey were shared with SUA (9).

It was agreed that SUA carry out a stakeholder survey before the next twinning workshop. This ambitious task would involve identifying the stakeholders; developing and adapting survey questions; estimating and securing a budget; conducting the survey (mainly through face to face interview), and analyzing the results.

## 6. Opportunities for research collaborations

One of the objectives of the Twinning project is to *develop opportunities for joint research between the partners, which will aim to strengthen disease detection, surveillance, reporting and control in Tanzania and the region.*

SUA CVMS has a significant research program, engaging regional partners (including SACIDS, One Health Central & Eastern Africa (OHCEA) and international partners (US Agency for International Development (USAID), US Defense Threat Reduction Agency (DTRA), SACIDS).



Facilities at SUA include several BSL 1-2 laboratories, molecular biology (including PCR and whole genome sequencing), vaccine and cell culture (Figure 1), a laboratory animal unit, and human-animal interface environments including wildlife parks, farms, markets.

Research areas of focus at SUA include infectious animal diseases and zoonoses; antimicrobial resistance; natural compounds; wildlife/ecosystems; use of biosensors.

Research interests at KSU and SUA are strongly matched.

Combined with access to collective expertise and resources at KSU and SUA, there are significant opportunities for research collaboration. Recommended thematic areas (and identified focal points at each institute) include:

- One Health and zoonotic disease (RVF, rabies, brucellosis, anthrax, tuberculosis)
- High impact animal diseases (ASF [infection/ transmission dynamics, role of wildlife], FMD, PPR)
  - RVF – SUA: Mirende Matiko, KSU: Sally Davis
  - ASF – SUA: Gerald Misinzo, KSU: Lina Mur
- Emerging diseases
- Vector borne diseases
- Natural compounds - KSU: Ronette Gehring
- AMR – SUA: Hezron Nonga
- Epidemiology – SUA: Eron Karimuribo, KSU: Caryl Lockhart
- Animal Production (fertility and nutrition)
- Vaccine development – SUA: Philemon Wambura
- Biosensors – KSU: Derek Mosier
- Diagnostic test development, in particular pen-side tests
- Socioeconomic studies

### **Recommendations for research**

- Collect information about current and proposed research projects at SUA; this will help in identifying possible research partners at KSU
- Explore opportunities for exchanges of post docs and PhDs between KSU and SUA
- SACIDS - Disease reporting and surveillance through mobile phone platforms is being developed in collaboration with the Skoll foundation. This is currently focused on syndromic surveillance with limited utility. To fully use the potential utility of mobile phone disease reporting platforms, there needs to be advancement in development of locally appropriate fit for purpose pen side tests.





**Figure 1.** KSU staff visit Rift Valley Fever Laboratory at SUA

## 7. Student exchanges, collaboration and networking

The twinning project plans to *further develop an international network of veterinary students to enable the next generation of veterinarians to have an international perspective in veterinary medicine, which is a critical capacity in addressing national and global disease threats.*

Dr. Nora Schrag (KSU faculty staff) and Marie Keith (KSU student and KSU Chapter IVSA president) met with students in the SUA IVSA chapter to discuss collaboration and networking between the two colleges, and to plan joint SUA-KSU student activities. They toured livestock farming systems around Morogoro to assess opportunities for KSU student externships and educational experiences in Morogoro.

### Clinical case sharing and joint discussion

Joint case discussions and sharing of case histories/ material will provide students and faculty with access to a broader range of clinical presentations and case material. It will strengthen problem solving skills by exposing students to different approaches for clinical work up. Students and faculty will also improve communication skills.

During the workshop this concept was piloted when a KSU faculty member in Kansas presented a case of lead poisoning in feedlot cattle in Kansas to a group of faculty and students at SUA via Skype. The exercise was a success, with significant interest from SUA students (Figure 2). The KSU professor was able to convey the information clearly and run a questions and answers session through the available teleconferencing equipment. However, the functionality could be greatly improved by 1) improving bandwidth of internet in the SUA conference room, 2) projecting sound from speakers (already installed in the room), rather than through the laptop, and 3) using an external and sensitive microphone (a spider phone?) to better pick up sound in the SUA conference room.





**Figure 2.** Online Case Presentation by videoconference from KSU to Students and Faculty Staff at SUA

### **Exchanges of students between SUA and KSU**

A further goal of the twinning project is *to establish student exchanges between KSU and SUA and to enhance the DVM/BVM educational experience by exposing students to a wider range of diverse production systems, clinical case presentations, human-animal-ecosystem interface environments, and wildlife. This will provide benefits at institutional, national and international level through enhanced perspectives in international veterinary medicine, networking, and greater sharing of information and experiences.*

### **Planned student and faculty exchanges for the twinning project**

Planned activities for the twinning project include exchanges of eight students and one faculty member over the course of the three years. This will immerse students from SUA in education and student life at KSU, and KSU students will in turn be immersed in education and student life at SUA. Students will be asked to share their experiences with their peers during the exchange and on return to their home institute. One faculty staff from SUA will visit KSU for in depth immersion in KSU educational life and to further build on activities identified in workshops 1 and 2.

During the workshop there was a discussion about logistics and timing of the student exchanges. The proposed schedule is as follows:

#### **Year 1 (2017):**

Two BVM 5<sup>th</sup> year students from SUA to visit KSU for 6 weeks to participate in student life and educational experiences (c. 11<sup>th</sup> March 2017)



**Year 2 (2018):**

Project related to research and comparative educational experience

Two 5<sup>th</sup> students from SUA to visit KSU for 8 weeks (c. 19<sup>th</sup> March 2018)

Four students 4<sup>th</sup> year from KSU to visit SUA for 4 weeks in 2018

1 Faculty member from SUA to KSU for 8 weeks in 2018

**MPH opportunities**

There is a potential interest for collaboration between the KSU and SUA MPH programmes. This may involve two-way exchanges of students and faculty/staff, MPH projects, and sharing of educational material between SUA and KSU.

**Other opportunities for collaborative student activities**

Students from IVSA chapters at SUA and KSU have also been discussing other potential opportunities for collaborative experiences. Specific opportunities for further consideration include.

**Exchanges/ externships**

a. Experience in short student externship research projects and/or field experience between 1<sup>st</sup> and 2<sup>nd</sup> years

1. Preclinical and Para-clinical students

2. Inter-year (vacation) breaks

- KSU students mid-May to mid-August
- SUA students mid-July (early Sept is when field practical ends) to mid-October

b. Clinical year students exchange

1. SUA and KSU clinical rotations are not directly comparable. However exchanges could be addressed through an “Externship” category credit for KSU students.

- For KSU students, the SUA Wildlife rotation would be a good opportunity. It is only offered during certain times of a year and involves spending three weeks in Ngorongoro and Serengeti National Parks. Ideally, this would occur near the wildlife session of 5<sup>th</sup> year SUA students (Mid-July to mid-August).
- Aquatic medicine – This capability at SUA represents an opportunity not available at KSU, so may be attractive for U.S. students.

2. SUA Clinical students interested in pursuing a modified clinical experience could be hosted at KSU in a tailored program. (This may be easier than participating in an official KSU clinical rotation).

- For example, students interested in dairy production could spend 8 weeks with KSU dairy instructors and researchers.





- The KSU 3<sup>rd</sup> year students have a surgical skills elective that runs for half a semester in the spring semester (either January-February or March-April), so this may be an option as part of an eight week exchange for a SUA clinical student who has already started surgery.
- Students who take part in a student exchange would be required to give a presentation about their experience or a particular technical topic when they visit the other school, and also when they return to their home institution.
- Efforts should be made to develop, strengthen, and maintain networks through individual and group interaction (Skype, email etc.).
- IVSA/International Programs Office can set this up for students at KSU.
- TVSA can set this up for students at SUA.

## Social Media

### c. Online Discussion Forum for knowledge exchange and topical interaction

- Platform options include Blog, Facebook, Canvas, Moodle.
- Would necessitate expert moderators (professors, clinical residents, interns) in the discussion. Ideally, one from each school per discussion topic.
- Case of the month – invited professor at each school could share a case each month on a similar topic; could upload pictures/radiographs/diagnostics/findings/etc.
- Interactive/Real Time: Students could prepare a presentation on a topic of interest and then invite a faculty member to provide input and moderate the topic. The discussion forum would be shared between the two schools using an appropriate e-learning platform. To accommodate KSU and SUA schedules and the time difference, SUA students recommend 12 pm at KSU/8 pm (9 pm during DST) at SUA, though some days, SUA students have class until 7:20 pm. KSU students have lunch break at 12:00 pm most days.

### d. WhatsApp Group, closed Facebook Group or email forum for TVSA-SAVMA.

- Alternatives: Blog, Google Drive location for files
- Due to strict photo sharing regulations, institutional administration would need to be consulted and continuously involved.
- In addition, privacy settings (password protected/ restricted access) must be considered to limit participation/access.

## Tanzania Veterinary Student Association

e. Networking between the chapters of the Tanzania Veterinary Student Association (TVSA) and Student American Veterinary Association (SAVMA) at SUA and KSU. This may be best addressed through the efforts of a small group of students at SUA and KSU. The TVSA president recommends designating a single student at each school to be the focal point for interaction, with the lead role transitioning between SUA and KSU each year.

### f. KSU's SCAVMA is planning to delegate an IVSA representative to the SCAVMA board in Spring 2017.

- A primary role of this representative could be liaison to the TVSA.
- TVSA is willing to elect a similar representative.



## Discussion about One Health Summer School

There was discussion about establishing a 2-3 week course in One Health for African veterinary students to run out of SUA in conjunction with SACIDS. The course may interest American and European MPH and DVM students as it provides educational experiences in an international environment and network opportunities for African, American, European students. A 2-3 week course may attract foreign students as more cost effective and less time demanding. It may also be an opportunity for SUA to raise revenue.

## Concept Note

The One Health Summer School would introduce students to One Health concepts and experiences in an environment rich in human-animal-ecosystems interaction (Figure 3). It would equip students with problem solving skills and basic training in laboratory diagnostics. The summer school would be implemented through SUA CVMS—a Center of Excellence in Infectious Diseases of Humans and Animals in Eastern and Southern Africa and an implementer of several One Health projects—a regional leader in One Health.

It would build on and strengthen existing initiatives including SACIDS and the OIE Veterinary Education Establishment Twinning project between KSU and SUA.

### Objectives:

- Introduction to One Health concepts
- Field experiences in an environment rich in human-animal-ecosystems interaction
- Development of skills in problem solving, surveillance, and diagnostics
- Strengthening of networks within Africa and between Africa and America

### Mechanisms for delivery:

- Pedagogic teaching – lectures, discussions
- Field visits – farms, markets, slaughter houses, wildlife parks, villages
- Laboratory training

Location: Sokoine University of Agriculture, Morogoro, Tanzania

Partners: Sokoine University of Agriculture College of Veterinary and Medical Sciences; Kansas State University, College of Veterinary Medicine; World Organisation for Animal Health (OIE); World Health Organization; Will Hueston

Open to: DVM students and practitioners from Africa, Europe and USA

Class size: 20-30

Time period: 2-3 weeks in August 2017

Fee: to cover accommodation, educational materials and lecturers





**Figure 3.** A Cow Assisted by Masai Herdsmen at Calving – opportunities for students from KSU to see different production systems

### **Field Visits: Masai livestock market and Mikumi National Park**

As part of the workshop agenda, KSU and SUA participants visited two local sites which serve as representative examples of One Health and conservation in Tanzania. Participants first visited a Masai livestock market where cattle, sheep and goat are brought for sale every Saturday (Figure 4). Animals are slaughtered, exsanguinated and skinned at the centre of the market (Figure 5). A paraprofessional trained meat inspector is assigned to inspect the meat in the open field. Barbequing is popular in the market.

The Masai are a Nilotic (indigenous to the Nile valley) ethnic group, inhabiting southern Kenya and northern Tanzania. They are among the most widely-recognized of the local populations due to their residence near the many game parks of the African Great Lakes, and their distinctive customs and dress. The Masai live in the traditional semi-nomadic lifestyle herding their livestock. Cattle are the central to the traditional Masai lifestyle. Cattle constitute the primary source of food and livelihood for the Masai, who consume their meat, milk and on occasion, their blood.

The livestock market visit confirmed the importance of One Health and disease surveillance in pastoral environments, particularly in terms of potential areas of study for KSU students and externs.

The group from KSU and SUA also visited the Mikumi National Park, a diversified wildlife resource which offers the potential for wildlife and conservation learning experiences for KSU students (Figure 6).





Figure 4. Livestock market in Morogoro, Tanzania



Figure 5. One Health Concept—The Human-Animal-Environment Interface: animals being slaughtered for consumption at a Masai market



**Figure 6.** Buffalo Herd at Watering Point in Mikumi National Park, Morogoro, Tanzania

#### **Visit to APOPO Rat Training Centre**

Twinning Project workshop participants from KSU visited the APOPO rat training centre at SUA. The APOPO rat training centre breeds and trains African Giant Pouched rats to detect landmines and human tuberculosis (TB). The fully trained APOPO rats are used for detection of the human TB, and once trained, can screen thousands of sputum samples every month. The research and development in this diagnostic approach could be used to detect other animal/human diseases as a biosensor tool. These rats have been used to enhance the livelihoods of communities by regaining their land from the threat of landmines or to as part of control programs for tuberculosis, which remains among the World's leading causes of death in developing countries.



**Figure 7.** APOPO rat sniffing out landmines

## 8. Material needs assessment

### Objective

*As part of the OIE Veterinary Education Establishment (VEE) Twinning Project, to perform an assessment to evaluate material needs at the Sokoine University of Agriculture, College of Veterinary and Medical Sciences (SUA, CVMS), located in Morogoro, Tanzania.*

Note that this subsection of the Twinning Project Workshop Report includes only a portion of the results of the Material Needs Assessment. The results are presented, with appropriate addenda, in a separate standalone document which will be disseminated to potential donors.

### Approach

A needs assessment was conducted through direct discussions between the project team members from KSU CVM and SUA faculty representatives, by conducting tours of college facilities, and performing a collaborative review of recent needs assessments carried out by third parties.

The SUA CVMS Principal, Prof. Maulilio Kipanyula, presented the results of a third party assessment, conducted by an independent consultant (German Technical Cooperation Agency [GTZ] project), on behalf of the Veterinary Council of Tanzania (VCT). As described, this review occurred in 2014 and a final report was generated in 2015. A summary of the findings was presented, along with plans by SUA to address identified deficiencies. The parties involved in the VEE Twinning Project do not intend to duplicate this recent review. Instead, those findings are presented, as appropriate, along with additional observations made by Twinning Project participants.

### Background and Introduction

In Tanzania, the health of agriculture, the environment and the public are at risk: human and animal populations are expanding rapidly. In addition, populations are on the move, resulting in land use changes, such as deforestation and urbanization. Climate change is a compounding influence on this already delicate situation.

Within this environment, the government of Tanzania recognizes the importance of livestock to the well-being of the country's population. The sector is seen as critical for "poverty alleviation, food security enhancement, employment creation and environment conservation."<sup>4</sup> Accordingly, the Tanzanian government recently established a *Livestock Modernization Initiative*, intended to "increase food and nutrition security and food safety, create employment opportunities and contribute to the national economy, social stability and sustainable environment."

Clearly, the veterinary profession is poised to play a major role in furthering the objectives of this Initiative, and more broadly, in acting to support the instantiation of a One Health approach within the Tanzanian

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<sup>4</sup> United Republic of Tanzania, Ministry of Livestock and Fisheries Development. (2015 July). Tanzania Livestock Modernization Initiative. Retrieved from [http://livestocklivelihoodsandhealth.org/wp-content/uploads/2015/07/Tanzania\\_Livestock\\_Modernization\\_Initiative\\_July\\_2015.pdf](http://livestocklivelihoodsandhealth.org/wp-content/uploads/2015/07/Tanzania_Livestock_Modernization_Initiative_July_2015.pdf)



milieu of public, animal, wildlife and environmental health. Within this context, the role of the Tanzanian veterinarian is changing. Historically, almost all veterinarians were employed by the federal government. Presently, approximately 25% work in the private sector, and the industry is also served by a growing number of veterinary paraprofessionals, who are playing an increasingly important role in animal and veterinary public health. There are challenges, however, primarily due to an overall shortage of veterinarians, and poor regulatory oversight of veterinary paraprofessionals.

Any approach towards strengthening the Tanzanian veterinary industry will require foundational improvement in educational infrastructure. The Sokoine University of Agriculture (SUA), located in Morogoro, Tanzania, was established in 1984, and its College of Veterinary and Medical Sciences (CVMS), serves as the only veterinary educational institution for the country.

The SUA CVMS vision is to become an internationally recognized center of excellence in promoting socioeconomic development through practical skills, entrepreneurship, research and integration of basic and applied knowledge in solving societal challenges.

SUA CVMS offers two undergraduate degree programs, namely the BVM and Bachelor of Science in Biotechnology and Laboratory Science BSc (BLS), 23 postgraduate degree programs (MSc and PhD) and two non-degree programs, the Diploma in Animal Health (DAH) and the Diploma in Laboratory Technology (DLT). To date, the CVMS has graduated a total of 875 students, of which the 349 are BVM, with class sizes ranging from 65 to 75. During the 2015/2016 school year, a total of 56 students graduated and were conferred the BVM degree.

The establishment of veterinary education in Tanzania was achieved through involvement of international development partners, including Denmark, UK, Germany, Ireland, and Australia. With generous assistance from the development partners and with a dedicated, formative academic staff that were largely trained at the University of Nairobi Faculty of Veterinary Medicine, Tanzanian veterinary educational capacity for training future veterinarians was brought up to international standards, and due to the high quality of the Tanzanian graduates, SUA CVMS has garnered a prestigious reputation for the caliber of its educational programmes. Unfortunately, the reputation is at increasing risk, owing to current inadequacies (in terms of quantity and quality) of the material and equipment used in offering the laboratory-based practical training of BVM students.

Though SUA CVMS is directly funded by the government of Tanzania, the institution routinely is dramatically underfunded, receiving between 4-10% of its requested annual operating budget. In addition, the central university claims an overhead of 25% from the CVMS on internally generated revenue (clinical services income), and claims 10% overhead from donor funded research and development funds. The central university administration provides basic utilities in return, including electricity and water expenses.

The CVMS also receives external, project-specific funding from several donors, including the U.S. Defense DTRA, USAID, the Norwegian Agency for Development Cooperation (NORAD), the Danish International Development Agency (DANIDA), the SACIDS, among others, for post graduate training and research projects. However, these resources do not address the basic core requirements of the CVMS for fulfilling its clinical and educational mission for undergraduate programs.



Resources are urgently needed to maintain and strengthen the core infrastructure at the SUA CVMS to support a broad One Health and sustainability mission in Tanzania, in accordance with the goals of the *Livestock Modernization Initiative*. This will allow the CVMS to play a material role in efforts at animal and zoonotic disease control, enhancing agricultural productivity, and modernizing the veterinary profession. Accordingly, resources are critically needed to ensure the viability of the veterinary educational program, and specifically to ensure delivery of the BVM and the OIE Day 1 Competencies.<sup>5</sup>

Core infrastructure at the institution is under additional pressure from a projected increase in enrollment for the BVM degree. The current facilities (laboratories and theatres), which are stretched beyond their capacity, were designed to accommodate a maximum of 35 students.

### Material Needs Assessment Results

For ease of understanding, topics addressed as part of the needs assessment are categorized into the following: Infrastructure, Education, Electronic Resources, and Human Resources. In addition, categories for cross-cutting and other topics are also included.

A summary of material needs topics, categorized for relevance in achieving objectives of the VEE Twinning Project, Delivery of *OIE Day 1 Competencies*, or general need as part of BVM curriculum/core infrastructure, is presented as a summary. Cost estimates, as associated with corrective actions for material need deficits identified, are also presented.

Material Needs Assessment Category and Findings	Necessary for VEE Twinning Project?	Necessary for Delivery of OIE Day 1 Competencies?	Necessary for BVM Curriculum/ Core Infrastructure	Associated Costs for Corrective Actions (USD)
1.0 Infrastructure				
1.1 Equipment and Office Space	✓	✓	✓	\$300,000
1.2 Veterinary Teaching Hospital/Clinic		✓	✓	\$200,000
1.3 Teaching Laboratory Facilities	✓	✓	✓	\$146,000
1.4 Lecture Theatres/Seminar Rooms	✓	✓	✓	\$500,000
1.5 Transportation Resources	✓	✓	✓	\$135,000
1.6 Laboratory Animal Facility		✓	✓	\$100,000

<sup>5</sup> World Organisation for Animal Health (OIE). Veterinary Education Core Curriculum: OIE Guidelines. September, 2013. [http://www.oie.int/Veterinary\\_Education\\_Core\\_Curriculum.pdf](http://www.oie.int/Veterinary_Education_Core_Curriculum.pdf) Accessed November 28, 2016.



Material Needs Assessment Category and Findings	Necessary for VEE Twinning Project?	Necessary for Delivery of OIE Day 1 Competencies?	Necessary for BVM Curriculum/ Core Infrastructure	Associated Costs for Corrective Actions (USD)
1.7 Facility Generator (Emergency Back-Up)		✓	✓	\$70,000
2.0 Education				
2.1 Class Size/Intake			✓	
3.0 Electronic Resources				
3.1 Website Functionality			✓	\$20,000
3.2 Status of Connectivity	✓		✓	\$30,000
4.0 Human Resources				
4.1 Staff/Student Ratio	✓	✓	✓	\$200,000
4.2 Support Staff	✓	✓	✓	\$200,000
5.0 Other Topics				
5.1 Laboratory Accreditation			✓	\$25,000
6.0 Cross Cutting				
6.1 Inadequacy of Funding	✓	✓	✓	

## Summary mission needs assessment results

### 1.0 Infrastructure

#### 1.1 VCT Audit Finding: Equipment and office Space -

- Under equipped and deteriorated Veterinary Teaching Hospital;
- Nonfunctional X-ray and gaseous inhalation anesthetic machines
- Inadequate, old, and nonfunctional Laboratory equipment (e.g. microscopes/ tissue processing machines/outdated/autoclaves)
- Deteriorated laboratories, lecture rooms.

SUA CVMS Response: Concur. It is worth noting that the BLS (Bachelor of Biotechnology and Laboratory Science) and Diploma programs have added pressure on the use of these facilities.

KSU/SUA Assessment: Deficiencies in functionality in some equipment in the hospital were observed (radiography machines, anesthesiology [gas], and laundry [for sterilization] non-functional). There is a general need for improvement of educational mission-specific, critical systems at facility.



### *1.2 VCT Audit Finding: Teaching hospital/Clinic*

- Lack of large animal wards
- Few kennels for dogs and cats
- Lack of pharmacy in the clinic
- Low number of clinical cases referred to the clinic
- Has lost the status of a Veterinary Hospital due to deterioration of infrastructure and poor equipment and drugs

SUA CVMS Response: Concur; Request of space and resources to build these facilities within the CVMS premises

KSU/SUA Assessment: concur with findings.

There is a need to enhance the hospital extension service to local animal owners and increase the number of referrals (clinical case load) to the SUA animal hospital. Holistic improvements and enhanced marketing approaches may address this. There is a need to establish a pharmacy with an electronic inventory system to monitor dispensing and use of products by local animal owners. Support is needed to encourage local animal owners to use a well-regulated dispensary at SUA, to counter the unregulated and inappropriate use of animal pharmaceutical products in the field.

In Tanzania, at present, there are problems of veterinary (particularly laboratory) service delivery and this is impacting chemotherapy and disease control, in general. There is widespread misuse of veterinary drugs due to diagnoses largely being based on clinical signs. Treatment is of the “shotgun” type, whereby one or more drugs are administered simultaneously or sequentially in the hope that one of them will cure the disease diagnosed clinically. This is costly to the farmer and moreover likely contributes to the alarming increase in pathogen development of drug resistance some of which has impact on drugs used in man. Consequently, it is of utmost importance that efforts be made to improve and increase awareness of improved laboratory-based disease diagnosis for evidence-based drug treatment and control of the diseases. Establishment of a referral diagnostic unit as part of the Veterinary Hospital will reduce the problem.

### *1.3 VCT Audit Findings: Teaching Laboratory Facilities*

Laboratories were designed for 30-35 students and are now stretched well beyond their capacity with 70-80 students. Hands-on practical work is highly compromised.

SUA CVMS Response:

- The laboratories were designed to accommodate 30-35 students. Hands-on skills such as microscopy, culture plating and serology are seriously compromised, especially considering the fact that the same laboratories have to accommodate BLS and Diploma programs.
- The laboratory equipment is old, some instruments are not working and others are obsolete. Currently the Faculty has 20 working microscopes to cater for an average of 72 BVM students plus BLS and Diploma students.
- In addition, the supply of laboratory consumables is uncertain which further compromises training.



- The standby generator is 30 years old and can no longer cope with prevailing power outages. Yet at times, the faculty lacks funds for fueling the generator to support class practicals.
- Lack of reliable power poses significant health risks as stored specimens/biological are destroyed.

SUA CVMS Response: Improve Laboratory Space – Long term (by June 2021) - Construct four new labs to accommodate around 100 students each and expand the necropsy room. The labs will be for gross anatomy, microscopy, physiology, biochemistry, pharmacology, toxicology, clinical pathology and one for bacteriology and parasitology.

KSU/SUA Assessment: concur in need for improvement in critical systems for facility operation, i.e. power, transportation, health and safety. Similarly, recommend addressing training equipment needs, (e.g. limited access to microscopes, need for additional surgical equipment).

#### *1.4 VCT Audit Findings: Lecture theatres/seminar rooms*

There is overcrowding in the lecture theatres due to the increased number of students.

SUA CVMS Actions/Plans: Improve Space for Lectures – Long Term (by June 2021) - Build and equip two new lecture theatres with a capacity for 100 students in each theatre.

KSU/SUA Assessment: Concur.

#### *1.5 VCT Audit Findings: Serious lack of reliable and adequate transport facilities*

These greatly affect students off campus work including collection of specimens from the abattoir for teaching.

SUA CVMS Response: Concur; the Faculty has had not had a new vehicle since 1994. Lack of transport also contributes to the low case load as outreach/extension activities cannot be done.

KSU/SUA Assessment: Concur with recommendation for improved transportation capabilities. This is needed for extension field activities, diagnostic sample collection, and for safely transporting students, faculty and external experts between SUA and Dar es Salaam.

#### *1.6 VCT Audit Findings: Laboratory Animal Facility*

It is old and broken down.

SUA CVMS Response: Concur: The malfunctioning air-extraction system poses a significant health risk to the attendants and to students who work in that facility during their special projects.

KSU/SUA Assessment: Concur, though not specifically evaluated apart from other facilities.

#### *1.7 New Topic: Clinical Skills Laboratory*

- SUA is interested in establishing clinical skills laboratory on campus.
- SUA has observed the clinical skills laboratory at the University of Pretoria, South Africa.
- Considered necessary to accommodate larger classes.



## 2.0 Education

### 2.1 VCT Audit Finding: Increased number of students per intake

Admission is an average of 80 students when the space was designed to accommodate 25-30 persons.

SUA CVMS Response: The consequences to the more than three-fold increase in the number of students include:

- In some occasions class rooms and laboratories are congested hence not safe in case of a need for an emergency evacuation
- Limited hands on exposure in the class practicals
- Encourages plagiarism during course assessment tests
- Compromised Laboratory safety
- Improperly executed field practicals
- Difficulty conducting practical tests

KSU/SUA Assessment: Concur. See other recommendations for space enhancements.

### 2.2 New Topic – KSU/SUA Assessment – Material support for continuing education

- Both the Veterinary Council of Tanzania and the SUA CVMS faculty recognize the need for expanded opportunities for veterinary continuing education. This is also necessary for establishing sustainable capability in the context of the OIE Performance of Veterinary Services (PVS) Pathway.
- It is expected that various material support requirements will be necessary to facilitate development of curricula, provide salaries for participating instructors, and support technological methodologies needed for dissemination of educational material, e.g. enhancement of Electronic-Resources at SUA CVMS.

## 3.0 Electronic-Resources

### 3.1 VCA Audit Finding: SUA website accessible globally

SUA CVMS Response: The website lacks important details, such as course contents, which could attract students from other parts of the world (Figure 7).

KSU/SUA Assessment: Concur. Updates to the SUA CVMS website are currently underway, however recommend exploring options for further enhancements.

### 3.2 New Topic – KSU/SUA Assessment – *Improve Connectivity and website content at CVMS Campus*

- Need for IT technical/maintenance personnel
- Need for additional personnel to maintain and update e-resources
- Need for increase bandwidth and coverage
- Need for a designated room for lecture recording (to facilitate online education)
- Need improvements to the computer laboratory for student access
- Need designated Wi-Fi (with high broadband) area for student use



- Need for improve e-journal access to scientific and clinical sources



**Figure 8.** The building in which the workshop took place. Construction was funded by the SACIDS project and contains a well-equipped molecular biology laboratory and meeting room with teleconferencing facilities. Elsewhere lecture hall and meeting room facilities are in need of upgrade.

## 4.0 Human Resources

### 4.1 VCT Audit Finding: Staff/student ratio

Staff to student ratio fluctuates from average 1:10 to 1:34 (academic) and 1:10 to 1:80 (supporting) and consequently, causes compromise in training;

SUA CVMS Response: Concur. However, it is worth noting that CVMS academic staff are also involved in the teaching of postgraduate students, BLS and Diploma students within the College. They are also involved in the teaching of other degree programs in the department of Animal Science, College of Forestry Wildlife Management and Tourism and Faculty of Science. The reported ratio is therefore much higher than the realistic one. The same applies to the technical staff ratio. The given ratios, which TCU is complaining are low, are underestimation.

Nevertheless, other academic staff members from other Faculties especially from the department of Animal Science-are also actively involved in the teaching of BVM students

KSU/SUA Assessment: Need to address through increasing capacity – spanning infrastructure (larger class and clinical space) and teaching/support personnel levels required to accommodate larger class sizes.

### 4.2 VCT Audit Finding: Supporting staff

- Stagnant recruitment of supporting staff and no replacement of retired/deceased personnel



- Heavy work load that is likely to affect quality and quantity of teaching

SUA CVMS Response: Concur. In addition, there is apparently no timely replacement of retired/deceased lab attendants and secretaries.

SUA CVMS Proposed Correction - *Improve staffing levels for both academic and technical (Staff and Technical Staff)*

- Short Term (2016/17 Financial Year)
  - Fill vacant technical positions in the departments
  - Recruit additional academic staff to match with the teaching loads
  - Recruit specialized staff in equine, porcine, avian and aquatic medicine
- Medium Term (2016/17 Financial Year)
  - In house training of technical staff
- Long Term (by June 2021)
  - Specialized training locally and abroad
  - Maintain continuous replacement of outgoing staff.

KSU/SUA Assessment: Concur. Loss of institutional knowledge associated with retiring and departing staff, coupled with no succession capabilities, poses a significant risk for operations of the institution. This is complicated given funding constraints (funding at 4-10% of what's requested). Recommend pursuing alternative mechanisms for staffing positions.

## 5.0 Other Topics

### 5.1 New Topic – KSU/SUA: Laboratory Accreditation

- SUA is interested in KSU assisting research laboratories in achieving ISO certification
- SUA diagnostic laboratory, if accredited, could eventually become a regional diagnostic resource (Tanzania, surrounding countries). Interest in establishing a diagnostic laboratory at the veterinary hospital.
- There is an interest/opportunity for KSU Biosecurity Research Institute (BRI) to provide emerging disease protocol training for laboratory personnel.

KSU/SUA Assessment: Recommend further discussions, e.g. engage Kansas State Veterinary Diagnostic Laboratory (KSVDL), located at KSU CVM.

## 6.0 Cross Cutting

### 6.1 VCT Audit Finding: Inadequate funding

The College receives 4 to 10 % of the requested budgets despite the increased number of students.

- Capital Funding
- Renovation of Facilities



SUA CVMS Response: Concur. In addition, funds are disbursed late hence compromising the conduct of practical training. Furthermore, the amount of disbursed funds very often does not reflect the students number increase, hence the demand for practical materials. Fees paid by students have however, remained the same despite the increase in the cost of materials in the market.

KSU/SUA Assessment: *Institutional Sustainability* Concur with above findings. Need for reliable funding stream is integral for continued operations. Challenge of managing non-governmental funding also present, (i.e. there are project-specific funds for designated activities), so equipment, space or personnel may be restricted in range of support. Notably, deficiencies were observed in core veterinary clinical functional areas, while various externally-supported projects onsite appear relatively well-resourced.

The involvement of multiple external partners in SUA creates a significant demand on staff time at SUA which may divert them from their core responsibilities. External donors must be sensitive to this and account for time spent managing and implementing projects.



## 9. Conclusions and next steps

The first workshop in the twinning project succeeded in introducing faculty and students from SUA and KSU to one another and building a mutual trust between the partner institutes.

Preliminary priorities for the twinning project were identified based on a prior PVS report for Tanzania, the strategic plan for SUA, and by mapping the proposed transition curriculum against the OIE Day 1 Competencies. This included broad veterinary curricular and continuing education needs as well as identifying infrastructure and material needs (through the material needs assessment).

Further opportunities for collaboration between students, faculties and researchers were explored.

Key activities that will need to take place before the next workshop (due to take place in KSU) include:

1. SUA staff to enroll on and start MBA at KSU
2. First student exchange (2 students from SUA for 6 weeks due to arrive at KSU in March 11, 2017)
3. Stakeholder survey in Tanzania (to identify curricular needs) to be completed in February 2017
4. Further mapping of SUA curriculum using key word search
5. Mapping of KSU DVM curriculum against *OIE Day 1 Competencies*

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## 11. References

1. Sokoine University of Agriculture Faculty of Veterinary Medicine Revised Curriculum for the Bachelor of Veterinary Medicine (BVM) Degree Programme, March 2015
2. Veterinary Council of Tanzania Report on the Auditing of the Veterinary School at Sokoine University of Agriculture, Morogoro, Tanzania, 17 April 2015
3. Kansas State University College of Veterinary Medicine Curriculum for the DVM Degree Programme. <http://www.vet.k-state.edu/education/dmp/graduate/curriculum/>
4. A Guide to Veterinary Education Twinning Project, OIE September 2013  
[http://www.oie.int/Veterinary\\_Education\\_Twinning\\_Guide.pdf](http://www.oie.int/Veterinary_Education_Twinning_Guide.pdf)
5. Veterinary Education Core Curriculum OIE Guidelines, OIE September 2013.  
[http://www.oie.int/Veterinary\\_Education\\_Core\\_Curriculum.pdf](http://www.oie.int/Veterinary_Education_Core_Curriculum.pdf)
6. OIE Recommendations on the Competencies graduating veterinarians ('Day 1 graduates) to assure National Veterinary Services of quality, OIE May 2012  
[http://www.oie.int/fileadmin/Home/eng/Support\\_to\\_OIE\\_Members/Vet\\_Edu\\_AHG/DAY\\_1/DAYON\\_E-B-ang-vC.pdf](http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/Vet_Edu_AHG/DAY_1/DAYON_E-B-ang-vC.pdf)
7. Sokoine University of Agriculture Faculty of Veterinary Medicine Revised Curriculum for the Bachelor of Veterinary Medicine (BVM) Degree Programme, August 2008
8. OIE PVS Evaluation Report of the Veterinary Services of Tanzania, June 2008
9. Strategic challenge questions, Kansas State University, College of Veterinary Medicine



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## Annex 1: Strategic Challenge Questions

### Sokoine University of Agriculture: College of Veterinary and Medical Sciences

#### STRATEGIC CHALLENGE QUESTIONS

#### Curriculum - Internal Questionnaire

Q1-1	Based on available data (surveys etc.), where are the strengths and weaknesses in our curriculum?	
Q1-2	What are the <u>Top-3</u> changes to the curriculum you would recommend?	
	What is your #1 change idea (from Q1-2)?	
Q2-1	Should OIE competencies be better integrated into every year of the curriculum? If so, how?	▪
Q2-2	How can there be more emphasis on OIE professional competencies without packing more courses/content into the curriculum?	▪
Q3-1	How should the whole curriculum be better integrated and connected?	▪
Q3-2	Is there a new model or concept to make the curriculum more <u>a single connected program</u> , than a collection of separate modules?	▪
Q4-1	What is the goal of a curricular review?	▪
	How should a curricular review and its implementation be managed?	▪
Q4-2	What would be an <u>innovative, new mgmt. approach that would be most effective for our curriculum?</u>	▪
Q4-3	How can other veterinary curriculum models inform us about systemic changes that should be considered for the curriculum?	▪
Collab- -oration	Should SUA collaborate with other entities (CVM's, research institutions, agricultural colleges, etc.) to create innovative course materials? If so, who are potential candidates?	▪
One Health	Should 'One Health' have more prominence and emphasis in the curriculum?	▪
National, Regional + Global	Should there be more focus on national (Tanzania) needs in the curriculum? How? Should there be more focus on regional (East Africa and SADC) needs in the curriculum? How? Should there be more focus on international animal health in the curriculum? How?	▪



Commun- -ications	How can we improve communication skills of our students beyond the existing curriculum?	▪
Staffing	Is there adequate staffing to administer the curriculum? If not, where is additional staffing needed?	▪
Facilities	Are there adequate facility resources to support the curriculum? If not, where are additional resources needed?	▪
Listen to Stake- -holders	Should external stakeholders have a say in the design of the new curriculum? If so, how?	▪
	External Stakeholders – what would be the <u>boldest, most innovative ideas</u> you could think of to engage and use the knowledge of External Stakeholder in the context of curricular changes?	▪ ▪

### Closing Questions

What additional information would be helpful in evaluating the curriculum?	▪ ▪
What are the major barriers to innovation or change?	▪
If there was additional funding available, how would you prioritize investment in the curriculum?	▪ ▪
How would the opening of another veterinary college (Dar Es Salaam) impact the SUA curriculum?	▪
What problems do you envision as part of implementing a new curriculum?	▪



## List of Acronyms

Acronyms	
<b>AMR</b>	Antimicrobial Resistance
<b>APOPO</b>	Anti-Personnel Landmines Detection Product Development
<b>AVMA</b>	American Veterinary Medical Association
<b>BRI</b>	Biosecurity Research Institute
<b>BSc (BLS)</b>	Bachelor of Science in Biotechnology and Laboratory Science
<b>BVM</b>	Bachelor of Veterinary Medicine
<b>CE</b>	Continuing Education
<b>CVM</b>	College of Veterinary Medicine
<b>CVMS</b>	College of Veterinary and Medical Sciences
<b>DAH</b>	Diploma in Animal Health
<b>DLT</b>	Diploma in Laboratory Technology
<b>DTRA</b>	Defense Threat Reduction Agency
<b>DVM</b>	Doctor of Veterinary Medicine
<b>DVO</b>	District Veterinary Officer
<b>FMD</b>	Foot and Mouth Disease
<b>FP</b>	Focal Point
<b>GIS</b>	Geographic Information System
<b>GTZ</b>	German Technical Cooperation
<b>iAGRI</b>	Innovative Agricultural Research Initiative
<b>ISO</b>	International Organization for Standardization
<b>ISU</b>	Iowa State University
<b>IVSA</b>	International Veterinary Students' Association
<b>KSU</b>	Kansas State University
<b>LITI</b>	Livestock Training Institute
<b>MBA</b>	Master of Business Administration
<b>NGO</b>	Non-Governmental Organization
<b>OHCEA</b>	One Health Central and Eastern Africa
<b>OIE</b>	World Organisation for Animal Health
<b>PPR</b>	<i>Peste des petits ruminants</i>
<b>PVS</b>	Performance of Veterinary Services
<b>RVF</b>	Rift Valley Fever
<b>RVO</b>	Regional Veterinary Officer
<b>SACIDS</b>	Southern African Centre for Infectious Disease Surveillance
<b>SAVMA</b>	Student American Veterinary Medical Association
<b>SUA</b>	Sokoine University of Agriculture
<b>TB</b>	Tuberculosis
<b>TCU</b>	Tanzanian Commission for Universities

<b>Acronyms</b>	
<b>TVSA</b>	Tanzania Veterinary Students Association
<b>USAID</b>	U.S. Agency for International Development
<b>USDA</b>	U.S. Department of Agriculture
<b>VCT</b>	Veterinary Council of Tanzania
<b>VEE</b>	Veterinary Education Establishment
<b>VIC</b>	Veterinary Investigation Center
<b>VS</b>	Veterinary Statutory Body
<b>VTH</b>	Veterinary Teaching Hospital

