



Status of postgraduate training in the livestock sector in East and Central Africa and priorities for ILRI's support

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Status of postgraduate training  
in the livestock sector in East and Central Africa  
and priorities for ILRI's support

International Livestock Research Institute  
Capacity Strengthening Unit (CaSt)

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## Acronyms and abbreviations

AET	Agricultural Education and Technology portal
ANAFE	African Network for Agriculture, Agroforestry and National Resources Education
ASALs	Arid and Semi arid areas
ASARECA	Association for Agricultural Research in East and Central Africa
BASIC	Building Africa's Scientific and Institutional capacity for Agriculture and natural Resources
CAADP	Comprehensive Agriculture Development Programme
CAVs	University of Nairobi College of Agriculture and Veterinary Science (CAVs)
CGIAR	Consultative group for international agricultural research
CORAF/WECARD	Conseil ouest et centre africain pour la Recherche et le développement Agricole/ West and central African Council for Agricultural Research and Development
DRC	Democratic Republic of Congo
FAO	Food and Agriculture Organization of the United Nations
FARA	Forum for Agricultural Research in Africa
FSR	Farming systems research
GDP	Gross Domestic Product
HIV/AIDS	Human Immunodeficiency Virus/Acquired immunodeficiency syndrome
IAC	Inter Academy Council
IFPRI	International Food Policy Research institute
ILRI	International Livestock Research Institute
MDG	Millennium Development Goals
MUST	Mbarara University of Science and Technology
NEPAD	New Partnership for Africa's Development
NGO	Non-governmental organization
NUR	National University of Rwanda
ODL	Open and Distance learning
SADC	Southern Africa Development Coordination
SLA	Sustainable livelihood approach

SSA	Sub-Saharan Africa
SUA	Sokoine University of Agriculture
TNA	Training needs assessment
UNAZA	Université Nationale du Zaïré
UNDP	United Nations Development Programme
USAID	United States Agency for International Development

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Lusato R Kurwijila

# Preface

Research-based capacity strengthening is one of the priority activities of the International Livestock Research Institute (ILRI). The mission of ILRI's Capacity Strengthening Unit (CaSt) is to strengthen the capacity of the livestock research and development community to contribute to the overall mandate of ILRI in achieving livestock-mediated poverty alleviation. The purpose of CaSt is to strengthen the capacity of ILRI's partners to apply their skills and resources to accomplish their goals, satisfy stakeholders' needs and improve performance and impact.

One of the five objectives of ILRI's Capacity Strengthening Strategy is to facilitate building sustainable capacity of institutes to build capacity. This could only be achieved through building the capacity of the agricultural higher learning institutes and by facilitating the effective integration of research-based learning outputs (tools, methods and approaches) into the curricula of the learning institutes.

ILRI is primarily a research institute and not a university. Thus, in terms of building the capacity of the educational institutes, ILRI would like to complement the ongoing national and regional initiatives using the principle of subsidiarity. ILRI would like to add value to the efforts of the higher learning institutes in sub-Saharan Africa and South Asia based on ILRI's comparative and competitive advantage in research and capacity strengthening. Given the limited resources, to be effective and efficient, ILRI should identify its niche and priorities to generate the maximum benefit. It is also important to seek regional consensus on the priority areas for collaboration.

In order to establish the priorities for collaborative capacity strengthening activities of the learning institutes in the areas of animal production and veterinary services, ILRI commissioned five studies covering the following subregions: Eastern and Central Africa (ASARECA region); Southern Africa (SADC region), West Africa (CORAF region); South Asia; and Southeast Asia. This report summarizes the findings of the gap analysis study for the Eastern and Central Africa (ASARECA) region. ILRI will make every effort to share and validate these findings and use this information in designing and implementing capacity strengthening activities in this region.

This task would not have been completed without the support and dedicated commitment of a number of individuals. We would like to appreciate and acknowledge the contribution made by Lusato R Kurwijila in conducting this study and preparing this report. A number of individuals provided inputs and responded to the survey questionnaires. The staff of the Knowledge Management and Information Services (KMIS) unit of ILRI assisted in editing, layout and cover design of the report. The contribution of these individuals and the support of the Senior Management of ILRI and the staff of CaSt in completing this study is gratefully acknowledged and appreciated.

The overall purpose of this study was to identify areas for collaborative action to build the capacity of learning institutes in the region. Given the different stages of development of the various universities, it may also be necessary to initiate some carefully selected national level activities to complement the regional undertakings. ILRI will make every effort to facilitate and support the national and regional initiatives in strengthening the capacities of the universities especially the postgraduate research and training in the region.

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## Executive summary

The livestock sector has a crucial role to play in reducing by half the proportion of people in extreme poverty and suffering from hunger by 2015 and MDG 7 of achieving environmental stability. To be able to do this, output from agriculture in general and livestock sector in particular has to grow at a rate of at least 4.2% per annum, i.e. greater than the human population growth rate 2.7% per annum. Agricultural education, research and development are key to achieving these objectives.

The International Livestock Research Institute (ILRI) is one of 15 future harvest centres that conducts food and environmental research to help alleviate poverty and increase food security while protecting the natural resource base. ILRI works at the crossroads of livestock and poverty by bringing high-quality science and capacity building to bear on poverty reduction and sustainable development. Capacity, i.e. the process by which individuals, groups, organizations and societies increase their ability to perform core functions, solve problems, define and achieve objectives, and understand and deal with their development in a sustainable manner, is an area of endeavour where ILRI believes it can make effective contribution directly at individual and organizational levels and indirectly at community level. The Capacity Strengthening unit (CaSt) is designed to build and strengthen the scientific knowledge and capabilities of ILRI's partners in developing countries.

ILRI recognizes that the long-term solution to address the continuous and dynamic nature of capacity strengthening needs is to develop sustainable capacity within the relevant organizations which are mandated to build capacity of the various stakeholder groups engaged in the livestock innovation system. To this effect, ILRI has undertaken a number of initiatives including training needs assessment in the ASARECA region during 2007.

The current study seeks to assess the status of postgraduate training in the ASARECA region with the overall objective of strengthening the postgraduate training and research capacity of the tertiary educational institutes in the livestock sector within SSA. The specific objective is to identify the gaps in the postgraduate training in animal production and veterinary sciences and to identify the roles and priorities of ILRI in bridging this gap.

Two approaches were used to collect information from agricultural universities in the 10 ASARECA countries: (1) use of secondary sources and (2) survey of key informants from universities using a questionnaire designed by ILRI.

The findings of the study reveal the following:

- Livestock sector is important in the economy and livelihood of considerable number of pastoralists, agropastoralists and mixed crop–livestock farmers in East and Central Africa.
- Universities in the ASARECA region are rich in highly trained agriculture and veterinary experts who play an important role not only as trainers but also in researchers and technology transfer agents in the national agricultural research systems.
- Lack of funding for AR4D is a major constraint limiting the extent of collaborative research between universities and NARS. Collaborative research between CGIAR centres such as ILRI and regional research organizations such as ASARECA is viewed as important in fostering networking and collaborative research within the region. Universities in East and Central Africa have capacity to offer postgraduate training in animal production and veterinary medicine and related disciplines.
- However, the number of candidates undertaking postgraduate training in agriculture in general and livestock and veterinary science in particular is declining or has remained stagnant in the recent past. The main reasons are lack of scholarships and funding required to maintain laboratory facilities. This is happening at a time when a new crop of scientists is required to replace the first generation of agricultural scientists who were trained in the 1960s–1980s when scholarships were freely available for studies abroad or in regional programs. ILRI could help bridge this gap by accommodating more postgraduate candidates studying at universities with SSA.

- With regard to postgraduate training or even for people with MSc and PhDs, further specialized short-term training is required in specific areas considered extremely important by respondent universities. They are those that address emerging issues such as leadership and decision making, intellectual property right policy, climate change, implications and adaptation strategies and disease surveillance and preparedness. Others, considered moderately important include innovation systems perspective and implication to R&D; design, implementation and assessment of networks and partnerships; negotiation and conflict resolution skills; *ex situ* conservation of animal genetic resources; bioinformatics; management of gene bank and gender analysis.
- There is therefore a convergence of priorities of universities in the ASARECA region and those adopted by CaSt–ILRI as potential candidates for flagship short courses in the next three to five years.

The findings and conclusions from the study lead to the following recommendations:

- a. ILRI and universities in SSA take deliberate steps to enhance their collaborative activities in research and training through :
  - Postgraduate student attachment and joint supervision
  - Joint research projects
- b. CaSt–ILRI develops modules in the areas identified in this study and in the CaSt strategy for offering to groups of interested scientist from NARS and universities in the ASARECA region and SSA in general.
- c. Governments within the ASARECA region take deliberate steps to support regional postgraduate training programs in agricultural universities with a solid backing for scholarships and research/ laboratory facilities necessary to generate the next crop of highly trained manpower required to fuel the application of science and technology in the ASARECA region in the coming decades and beyond.

# 1 Introduction

Agriculture is the most important economic sector in SSA. It contributes 70% of total employment, 40% of export earnings and about 34% of GDP (Mati 2007) compared to 60, 20 and 17%, respectively, for Africa as a whole (NEPAD–CAADP 2003). Over the last 30 years, food production has lagged behind population growth resulting in decline in per capita food production. Consequently about a quarter of the world's 800 million food insecure people live in SSA (Mati 2007). Between 1975 to 1995, the gap between supply and demand has been filled with imports of cereals, which increased from 2.6 to 8.9 million tonnes and worth about USD 2.3 billion. The livestock subsector is also important, contributing about 35% of the agricultural GDP of SSA. Yet, SSA has moved from a moderate net exporter of meat in 1975 to a net importer by 1985. Projections show that demand for meat and milk will increase from 5.5 and 16.6 million tonnes in 2007 to 11.3 and 35.4 million tonnes, respectively.

Agriculture and livestock research and development is essential for achieving MDG 11 of halving the proportion of people in extreme poverty and suffering from hunger by 2015 and MDG 7 of ensuring environmental stability. To be able to attain this, output from agriculture in general and livestock sector in particular has to grow at a rate of at least 4.2% per annum, i.e. greater than the human population growth rate 2.7% per annum (CAADP2–NEPAD 2006). Agriculture does also contribute to MDG 2, 4, 6, and 8 indirectly by providing incomes with which to pay for school fees and medical treatment and provide for adequate and balanced nutrition security for those afflicted by HIV/AIDS, malaria, tuberculosis and other diseases. Livestock products are particularly important in this regard. Livestock products (meat, milk and eggs) provide highly digestible animal protein rich in essential amino acids, easily absorbable minerals such as iron, zinc, calcium, phosphorous, vitamin B1, B2, B12, retinol and many other essential nutrients. In the year 2000, livestock production provided direct livelihoods to 200 million people, of which 97 million were people living below the poverty line (Mati 2007). Yet productivity of livestock in SSA which concentrated in the arid and semi-arid lands (ASALs) of SSA remains the lowest of any region in the world. It has rightly or wrongly been blamed for causing land degradation in 6 million km<sup>2</sup> of rangelands they occupy (23% of total area of SSA) and therefore impacting negatively on MDG7.

According to the World Bank, a 10% increase in crop yield leads to 9% decrease in the percentage of people living on less than USD 1 per day (cited by IFPRI 2007). Hence, enhancing the knowledge base through agricultural education and training, appropriate research and dissemination of technologies has potential for having significant impacts on agricultural productivity, poverty reduction and rural livelihoods of the people in SSA, the majority of whom depend on agriculture and livestock husbandry for sustaining their socioeconomic well being.

## 1.1 Background and rationale

The International Livestock Research Institute (ILRI) is one of 15 future harvest centres that conducts food and environmental research to help alleviate poverty and increase food security while protecting the natural resource base. Building on three decades of experience, ILRI works at the crossroads of livestock and poverty by bringing high-quality science and capacity building to bear on poverty reduction and

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1. Millennium Development Goals, between 1990 and 2015: MDG 1: Halve the proportion of people living in extreme poverty and hunger ; MDG 2: Achieve universal primary education.; MDG 3: Eliminate gender disparity in education ; MDG 4: Reduce by two thirds, under-five child mortality rate; MDG 5: Reduce maternal mortality ratio by three quarters; MDG 6: Halt and begin to reverse the spread of HIV/AIDS and incidences of Malaria and other major diseases; MDG 7: Ensure environmental stability and MDG 8: Develop global partnership for development.

2. CAADP's core Principles and targets include: agriculture led growth as main strategy for poverty reduction and for achieving MDG 1; attaining 6% average growth in agricultural output; and allocating 10% of national budgets to agriculture and exploiting regional opportunities and partnerships to address the identified four pillars (Land and water management; rural infrastructure, trade and market access; increasing food supply and reducing hunger; agricultural research technology dissemination and adoption; training, knowledge system. Governance, institutional strengthening for sustainable growth.

sustainable development. Capacity is the engine for enhancing the output and performance of individuals and organizations. As part of its research-based outreach and capacity strengthening, ILRI assists its partners by offering opportunities for long- and short-term training for researchers and development practitioners. The Capacity Strengthening unit (CaSt) is designed to build and strengthen the scientific knowledge and capabilities of ILRI's partners in developing countries.

The overall mission of the CaSt unit is to strengthen the capacity of the livestock research and development (R&D) community to contribute to the mission of ILRI to achieve livestock-mediated poverty alleviation. The purpose is to strengthen the capacity of ILRI's partners to apply their skills and resources to accomplish their goals, satisfy stakeholders' needs and improve performance and impact.

Within the broader framework of ILRI's strategy to 2010 and proposed Medium Term Plan (MTP), the five strategic objectives being pursued by the CaSt unit are:

- Effective integration of capacity strengthening activities into project planning, implementation and evaluation.
- Building sustainable capacity of institutes to build capacity (major shift in focus).
- Testing and implementing innovative and cost-effective training approaches and delivery mechanisms and develop and disseminate research-based training materials.
- Building skills of individuals and groups.
- Developing a functional need-based monitoring and evaluation system to communicate with partners and to assess the performance and impact of CaSt.

ILRI recognizes that the long-term solution to address the continuous and dynamic nature of capacity strengthening needs is to develop sustainable capacity within the relevant organizations which are mandated to build capacity of the various stakeholder groups engaged in the livestock innovation system. This could only be achieved through building the capacity of the universities and by facilitating the effective integration of research-based learning outputs (tools, methods, approaches and results) into the curricula of learning institutes. ILRI strongly believes that universities must play a pivotal role in providing the human resources for the agricultural led broad-based economic growth needed to achieve the Millennium Development Goals in SSA.

However, in terms of building capacity of the educational institutes, ILRI would like to complement the ongoing regional and national initiatives by using the principle of subsidiarity. ILRI would like to add value to the efforts of the higher learning institutions in SSA based on ILRI's comparative and competitive advantage. Therefore, it is important to clearly identify the niche in which ILRI could effectively contribute to the efforts of the tertiary educational institutes especially in postgraduate training.

## 1.2 Objective/terms of reference

The overall purpose of this study is to strengthen the postgraduate training and research capacity of the tertiary educational institutes in the livestock sector within SSA. The specific objective is to identify the gaps in the postgraduate training in animal production and veterinary sciences and to identify the roles and priorities of ILRI in bridging this gap.

In order to achieve this objective, a study was conducted in the ASARECA region while others that form part of this initiative were conducted in the SADC and CORAF geopolitical groupings of SSA.

1. The broader terms of reference for the consultancy study were to:
2. Review and document the role of livestock in the regional economy and the emerging challenges confronting the livestock sector
3. Review and document the current status of postgraduate training in the livestock sector in the region (including an inventory of institutes).
4. Discuss the collaboration and linkage between tertiary educational institutes and research and extension systems and their strengths and weaknesses

5. Identify the critical constraints and challenges facing the agriculture higher learning institutions in the region
6. Identify the missing elements and capacity gaps in the existing curricula (especially at the postgraduate level) to address the emerging needs and challenges of the livestock sector
7. Identify the role and priorities of ILRI in bridging the capacity gaps identified and
8. To make recommendations/suggestions on the way to move forward.

### 1.3 Approach and methodology

This study on status of postgraduate training in animal production and veterinary sciences targeted universities in the ten countries of the ASARECA region that offer training in agriculture and allied sciences. Two approaches were used:

Secondary sources of data and information were used to collect and assemble information on country and individual university profiles. This included published literature both in electronic (web based) and printed media. The portal for agricultural education and training in Africa ([www.aet-africa.org](http://www.aet-africa.org)) and websites of individual universities provided very useful information relevant to the study.

A survey of individual universities was carried out using a questionnaire developed by CaSt-ILRI. The questionnaire was submitted to at least one agricultural university contact point in all the ten ASARECA countries. Responses were received from six universities in Ethiopia, Kenya, Uganda, Rwanda and Tanzania. No responses were received from questionnaires sent to contacts in universities in the Democratic Republic of Congo (DRC), Eritrea, Madagascar and the Sudan.

### 1.4 Outline of the report

The report is made up of three chapters. Chapter 1 gives background information and context, objectives and terms of reference for the study. Chapter 2 deals with findings and analysis. These include role of livestock in the regional economy and emerging challenges facing the livestock sector, country profiles of higher agricultural education and training in general and postgraduate training in particular; critical constraints and challenges facing the agriculture higher education institutions in the ASARECA region as well as missing links and capacity gaps in existing postgraduate curricula and the role that ILRI could play in bridging the identified gaps. Chapter 3 presents key conclusions and recommendations. Appendices give further details relevant to the objectives of the study.

## 2 Current profile of livestock training in the region

### 2.1 Importance of the livestock sector in the region

Agriculture plays a significant role in the economy of sub-Saharan African countries. It contributes about 32% of the GDP. Livestock contribute about 25% of the agriculture GDP (Winrock International 1992). The concentration, performance and role of livestock in the economy and livelihoods of people of sub-Saharan Africa vary according to a number of technical, policy, institutional and agro-ecological zone related constraints that exist in different countries. The ASARECA region comprises of the Great Lakes countries of Burundi, Congo (DR), Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Sudan, Tanzania and Uganda. The ASARECA region has probably the highest concentration of livestock per km<sup>2</sup> and per capita in SSA. There are about 121 million cattle and over 160 million sheep and goats, 4.4 million camels, 3.7 million pigs and about 228 million chicken in an area covering nearly 8,710,000 km<sup>2</sup> (Table 2) which had in 2002, a population of 224 million people (FAO 2005). Livestock production is therefore important in the livelihoods of people in the ASARECA Region (Ndikumana and Kamidi 2005).

**Table 1.** Livestock population in the ASARECA region (FAO 2002)

Country	Cattle	Goats	Sheep	Camel	Pigs	Chicken
Burundi	325,000	750,000	230,000		70,000	4,300,000
Congo DR	761,000	4,004,000	897,000		953,000	19,600,000
Eritrea	1,927,000	1,700,000	2,100,000	75,000		1,370,000
Ethiopia	35,500,000	9,623,000	11,450,000	326,500	26,000	39,000,000
Kenya	11,500,000	11,000,000	7,700,000	830,000	332,000	28,000,000
Rwanda	815,000	760,000	260,000		180,000	1,200,000
The Sudan	38,325,000	40,000,000	47,000,000	3,200,000		38,500,000
Tanzania	17,704,000	12,556,000	3,521,000		455,000	30,000,000
Uganda	6,100,000	6,852,000	1,150,000		1,710,000	33,000,000
Madagascar	7,877,000	1,875,000	–	–	1,600,000	32,800,000
Total	120,834,000	89,120,000	74,308,000	4,431,500	3,656,000	227,770,000

Source: FAO (2005).

**Table 2.** Total land area ('000 km<sup>2</sup>) under different livestock production systems in ASARECA countries

Country	LGA	LGH	LGT	MIA	MIH	MIT	MRA	MRH	MRT	Other	Total
Burundi			0.2					4.4	17.2	5.6	27.4
Congo DR	6.5	347.1	12.7				17.5	299.3	58.8	1,595.20	2337.1
Eritrea	40.5	0	0.2				31.4		1.6	45.8	119.5
Ethiopia	435.1	68.2	59.4	0.1	0.8	5.3	97.7	67	262.8	140.2	1136.6
Kenya	300	14.9	11.2			90.2	28.1	62.7	75.6	582.7	1165.4
Rwanda		0.9	0.4					5.1	13.6	5.7	25.7
The Sudan	702.7	404	1.5	66			222.2	43.6	0.3	1,058.10	2498.4
Tanzania	62.6	62.6	9.6				226.6	212	45.5	320.3	939.2
Uganda	0.2	39.5	1.1			0.1	135.4	15.6	52.3	244.3	488.5
Madagascar	–	–	–	–	–	–	–	–	–	–	0
Total	1547.6	937.2	96.1	66.1	0.8	95.6	758.9	705.3	510.5	3992.3	8710.4
%	17.8	10.8	1.1	0.8	0.0	1.1	8.7	8.1	5.9	45.8	100.0

1. Production systems: LGA—Livestock only, rangeland-based arid/semi-arid; LGH—Livestock only, rangeland based, humid/sub-humid; LGT—Livestock only, rangeland based; temperate/tropical highland; MIA—Mixed irrigated arid/semi-arid; MIH—mixed irrigated humid/subhumid; MIT—Mixed irrigated temperate/tropical highland; MRA—Mixed rainfed arid/semi-arid; MRH—Mixed rainfed; humid/subhumid; and MRT—Mixed rainfed temperate/tropical highland. Source: Thornton et al. (2002).

Apart from contributing to the national economy, livestock contribute to the national food supply directly in the form of meat, milk and eggs and indirectly through providing incomes with which cereals, legumes, roots and tubers can be purchased, particularly in pastoral societies and during crop failures in one or other part of a particular country of region.

**Table 3.** Socioeconomic indicators and the contribution of livestock to the economy of ASARECA countries (Adapted from FAO 2005)

Socioeconomic indicator	Burundi	Congo DR	Eritrea	Ethiopia	Kenya	Rwanda	The Sudan	Tanzania	Uganda	Madagascar	Total (ASARECA)
Human population (million)	7	4		62.9	30.7	8	32.9	36.3	25	16.9	223.7
GDP <sup>1</sup>				7450	9876		10,809	7287	8833	3529	47,784
GDP annual growth Rate (1990–2000)				3.8%	1.8%		5.30%	4%	7%	1.5%	–
GDP per capita/year (USD)				116	328		330	207	359	215	–
GDP per capita annual growth rate (1990–2000)				1.6%	–0.7%		2.9%	1.3%	4.1%	–1.5%	–
Agricultural GDP (million USD)				3152	2533		n.a	2965	3428	892	12,970
As proportion of total GDP				52.3%	25.6%		n.a	40.7%	38.80%	25.30%	27.1
Livestock GDP (million USD)				1404	1366		n.a	876	493	306	4,445
As proportion of agricultural GDP				18.80%	13.8%		55%	29.50%	14.4%	34.3%	34.3
Human development rank <sup>2</sup>				n.a	n.a		139	162	146	150	–
Human development index				n.a	n.a		0.505	0.407	49.3%	46.9%	–
Poverty incidence <sup>3</sup>											
Total				n.a	42%		n.a	35.7%	44%	71	–
Urban				67.2%	29.3%		n.a	n.a.	n.a.	52.1%	–
Rural				70.9%	46.4%		n.a	38.70%	n.a.	76.7%	–
Nutrition security status (Kcal/capita)	1610	1670	1910	2040	2000	2290	1970	2370			
Child malnutrition <sup>4</sup>											
Stunting	0.57	0.38	0.52	0.35	0.41	–	0.44	0.39			
Underweight	0.45	0.44	0.47	0.21	0.27	0.17	0.29	0.23			–

1. Constant 1995 USD; 2. The HDI rank is determined using HDI values to the 5th decimal point from 177 countries as compiled by the UNDP; 3. National poverty line; n.a. Not available; 4. NEPAD 2004.

Source: World Bank (2002); UNDP (2004); FAO (2005).

## 2.2 Emerging challenges of livestock production in the ASARECA region

The ASARECA strategic plan has identified four major challenges for the agriculture sector in the region which apply equally to the livestock production subsector.

**Challenge 1:** Developing and adapting technologies (breeding, feeding, disease control) that can increase overall livestock farming and productivity of major livestock producers including pastoralist, agro-pastoralists, mixed crop–livestock smallholder production systems, extensive ranching as well as intensive commercial scale poultry, piggery, beef and dairy production systems.

**Challenge 2:** Developing technology transfer systems and uptake pathways, partnerships that will lead to bridging the gap between research, technology transfer, innovation and application at the farm level to achieve expected outcomes and impact on people’s livelihoods and socioeconomic wellbeing.

**Challenge 3:** Reducing postharvest losses and enhance food preservation, storage, value addition, transportation and marketing systems that ensure the supply of sufficient quantity and quality and safe food to consumers.

**Challenge 4:** Ensuring environmental sustainability by minimizing soil erosion, adopting sound soil fertility management systems, water supply for both people and livestock, conserving genetic diversity and coping with challenges of climate change and use of alternative forms of energy.

These challenges will require solutions of technical, institutional and policy nature driven by knowledge and innovation systems management that are inclusive and built around stakeholder partnerships and focused on mobilization and efficient use of resources. Human resource development including technical and tertiary education in agriculture will be part and parcel of the knowledge and innovation systems required to transform research and development through **upscaling** of technologies into actions and agricultural practices by farmers that deliver the desired outcomes and socioeconomic impacts at the national and regional level.

Following independence of most SSA countries, most countries on the African continent including the ASARECA region invested heavily in human resource development including espousing universal primary education, free secondary sectors on. The main challenge is to provide adequate and quality school education as well as tertiary education and training. However, the decline of African economies in the mid 1980 prompted highly trained manpower to emigrate from the African continent in big numbers. The program for building Africa’s scientific and institutional capacity for agriculture and natural resources estimated that about 23,000 qualified academic professionals emigrate from Africa in search of greener pastures outside the continent, mostly to Europe and America (FARA/ANAFE 2004.) This, combined with the devastating effects of HIV/AIDS, has decimated the human resource capacity in agriculture and other sectors of the economy. How to reinvigorate agricultural growth and productivity which requires highly trained manpower to work in research and development, training and extension remains a major challenge. Various institutions,<sup>3,4</sup> initiatives,<sup>5</sup> and studies<sup>6</sup> have addressed this issue in recent times. The combined effects of emigration, human resource erosion through HIV/AIDs and wars and conflicts reduced donor support for postgraduate training in Africa<sup>7</sup> worsened the human resource capacity of many African academic and agricultural research institutions. Hence, more action is needed to train and retain high level agricultural experts in most sub-Saharan African countries.

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3. World Bank, 1995. Retaining teaching capacity in African universities: Problems and prospects: Findings; Africa Region No. 39. IBRD, Washington DC, USA.

4. FARA/ANAFE. BASIC. Building Africa’s scientific and institutional capacity for agriculture and natural resources (BASIC). Publ. Forum for Agricultural Research in Africa and African Network for Agriculture, Agroforestry & Natural Resources Education.

5. Tony Blair’s Commission for Africa.

6. Johanson and Saint (2007). Cultivating knowledge and skills to grow African Agriculture (World Bank Report).

7. IAC 2004. Realising the promise of African agriculture: Science and technology strategies for improving agricultural productivity and food security in Africa. Inter Academy Council, Amsterdam, The Netherlands.

## 2.3 Different categories of livestock training institutes

Agricultural education and training in the regions starts at various levels. There have been attempts to introduce agricultural subjects in primary school curricular but with little success. In Tanzania, there have also been attempts to introduce agricultural training in secondary schools but these have not been very popular, and agriculture remains just one of the subjects taught at best.

In Ethiopia, Kenya, Tanzania, Uganda and most of the other ASARECA countries, several agricultural training institutes have been established to offer training to post-secondary school leavers at certificate and diploma levels. Most of these are those who fail to get absorbed in advanced secondary schools (A-levels) or fail to gain admission to universities and other high learning institutions. Agriculture is not the most popular vocation that many school leavers would like to engage in. It is often chosen as choice of last resort. (Johanson and Saint 2007). The cadre of technical experts are needed to serve in the extension services in the rural areas where graduates are often reluctant to work because of unfavourable working conditions and the low pay. In Tanzania, after years of neglect, and realising a large shortfall in personnel needed to work as extension agents in remote rural areas, the Government has resumed sponsoring of certificate and diploma level candidates pursuing studies in livestock training institutes and agricultural training institutes. The combined out of less than 1000 per year falls far short of meeting the 13,000 extension officers required for placements at village level in the next five years of the Agriculture Sector Development Program (ASDP). Diploma holders from these institutes form the second tier of university entrants under the mature age scheme or equivalent qualifications of most agricultural universities in the region. They tend to be more practical oriented even after they have obtained their degree qualifications compared to direct entrants.

## 2.4 Current status of postgraduate training in livestock sector in the region

There are over 80 universities in the ASARECA region out of which about 15 have faculties of agriculture and natural resources management. Ethiopia and Kenya account for at least seven faculties offering animal production and health sciences (Table 4). As a brief country review below shows, each country in the ASARECA region has at least one university with either a faculty of agriculture and/or veterinary medicine that offer both undergraduate and postgraduate degree programs in animal science and veterinary medicine. During the 1960s and 1970s, many African agricultural scientists were trained in Europe and America with scholarships from USAID, British Council, Rockefeller Foundation and others and returned home to form the first generation of post-independence university lecturers and later professors. This paved the way for launching of MSc and PhD programs in African universities first as sandwich programs in co-operation with mainly European universities. Then came the economic hardships of the mid 1980s, decline in donor funding for scholarships, falling remunerations and subsequent emigration of academicians to the better conditions of the developed countries, NGOs, the private sector and politics or the failure to return to Africa after obtaining MSc and PhDs in Europe and America (IAC 2004). During the 1990s and early 2000s, African universities were forced to adopt reforms that would help them reduce dependency on direct government and donor funding. The reforms have included admission of private fee paying students, retention by staff of income earned from consultancies and extra duty teaching and were most evident at Makerere University and University of Nairobi in Uganda and Kenya, respectively.

A renewed interest in tertiary education has led to expansion of undergraduate admissions in most universities in Ethiopia, Kenya, Tanzania and Uganda. In Tanzania, for example, enrolments have jumped from less than 9,646 in 1995/96 to 41,419 in 2006/2007 and reached over 50,000 in 2008/2009. In Ethiopia at Mekelle University, student numbers increased from 42 in 1993 to more than 20,000 in 2008. However, the number of students joining agriculture science and technology is either stagnant or declining. At Sokoine University of Agriculture, student numbers have increased from less than 500 in

1984 to only 2,260 by 2005/06 falling short of a target to enrol 5000 by 2005. At Mekelle University in Ethiopia, in the Faculty of Dryland Agriculture and Natural Resources, student numbers increased from 42 to just 700 in 2007 compared to the overall figure of 20,000 (see [www.mu.edu.et](http://www.mu.edu.et)). More top flight students are joining arts and humanities than science in general and agriculture in particular. The interest in agriculture is waning (Johanson and Saint 2007). In Kenya, only 20 candidates applied for agriculture as a first choice in 2005 compared with a combined capacity to accept 120 BSc students in two public universities (Ministry of Education, Kenya cited by Johanson and Saint 2007).

At a time when undergraduate enrolment is expanding at phenomenal rate, graduate programs at African universities have been neglected and scholarships for African to study agriculture overseas have declined sharply in recent years (IAC 2004). For example, USAID scholarships for developing country students to study agriculture in the USA fell from 310 in 1990 to only 82 in 2000 (BIFAD 2003). At the Sokoine University of Agriculture, less than 30% of more than 250 postgraduate applicants admitted in various degree programs are enrolled for lack of scholarships. This is happening at a time when a new generation of agricultural professionals is needed to replenish the dwindling pool of human resources and to exploit the opportunities inherent in new types of agricultural knowledge such as biotechnology and genetic engineering, globalization and trade, conservation agriculture and climate change. These challenges have serious implications for sustainability of agricultural science's human resource base required to train the second generation of African agricultural scientists through high quality mentoring of graduate students.

A recent study by ILRI-ASARECA-AAARNET (2007) has shown that the highest need for trained livestock research staff is in post-conflict countries such as Rwanda and Burundi.<sup>8</sup> Strategies such as Open and Distance Learning (ODL) through a CGIAR operated Global Open Food and Agriculture University have been suggested as a way of bridging the gap between current and new Master of Science postgraduates urgently required to fill high level manpower needs of least developed countries (Akundabweni et al. 2004). In view of the importance of livestock in the livelihoods and economies of most African countries, training in veterinary science and animal production has been part and parcel of higher education and training in agriculture and allied sciences in most countries of SSA and the ASARECA region in particular (AAARNET 2007). A brief country by country profile of agricultural education and training in the ASARECA member countries is given below.

## **Burundi**

The Republic of Burundi has two universities. The University of Burundi, established in 1960 and University of Ngozi, established 1999. The Faculty of Agricultural Sciences at the University of Burundi was established 1976 through Belgian Government co-operation program. The University of Ngozi offers programs in agriculture and focuses on technology transfer and research focusing on small farmers through participatory extension methods including farmer field schools. There is no training in veterinary science or animal science at postgraduate level.

## **Congo DRC**

The Democratic Republic of Congo has over 20 universities. The Universities of Hovanum (est. 1954), the Protestant Autonomous University of Congo and the University of Congo at Lumbumbashi (est. 1956) were merged in 1971 to form the National University of Zaire (Universite Nationale du Zaire UNAZA). By 1991, they had again been separated into three universities: University of Kinshasa, Kisangani University and University of Lumbumbashi (AET Africa 2008). Only four (Catholic University of Graben, University of Goma, University of Kinshasa, and University of Lumbumbashi) have faculties of agriculture while veterinary medicine is offered at the University of Lumbumbashi only (AET 2009). The University of Kisangani offers undergraduate and postgraduate studies in forestry).

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8. ILRI/ASARECA-AAARNET. 2007 Livestock training needs assessment report for East and Central Africa.

## **Eritrea**

The University of Asmara ([www.uoa.ed.er](http://www.uoa.ed.er)) opened its first graduate program in September 2004. The University of Asmara offers undergraduate degree programs in nine colleges and faculties that are comprised of 40 departments and units. The College of Agriculture has six departments, namely: Agricultural economics, agricultural and ext. (Unit), Agricultural engineering, animal science and Plant science. The University of Asmara offers training in animal science at the undergraduate and MSc level. It does not offer training in veterinary medicine. To impart competencies in prevention and control of animal diseases to its animal science graduates, courses on animal health are covered in the animal science curricular.

## **Ethiopia**

Ethiopia has more than 20 universities and about half a dozen technical and vocational education training colleges (TVETs) offering certificate and diploma courses in agriculture and animal production. There are several universities in Ethiopia offering postgraduate training in animal science and veterinary science. These include Alemaya University, Addis Ababa University (formerly Haile Selassie I University) established 1950, as University College of Addis Ababa.

Addis Ababa University launched its first MSc program in 1979 and its first PhD program in 1987 (AET, Africa 2008). It has faculties of veterinary medicine and faculty of science.

Haramaya University started as a University College of Agriculture in 1954. Haramaya University established a faculty of veterinary medicine in 2004. The College of Agriculture has 14 MSc and five PhD courses.

Hawasa University offers animal and range science courses.

Jimma University (JU) was established in December 1999 by the amalgamation of Jimma College of Agriculture (founded in 1952) and Jimma Institute of Health Sciences (established in 1983). This amalgamation resulted in the present Jimma University College of Agriculture and Veterinary Medicine (JUCAVM) being upgraded from a technical college to a college within a new university, JU.

Jimma University College of Agriculture and Veterinary Medicine has faculties of agriculture and veterinary medicine. The school of agriculture comprises of six academic departments with five regular and two summer (in-service) training programs. The MSc training programs currently being run are horticulture, animal science, and plant pathology.

The School of Veterinary Medicine launched the DVM program in the year 2002 by sharing resources with the Jimma University College of Agriculture, and then the School of Veterinary Medicine was reorganized as school in 2005, resulting in the renaming of the college as Jimma University College of Agriculture and Veterinary Medicine. The School of Veterinary Medicine comprises four departments:

- Department of Biomedical Sciences
- Department of Clinical Studies
- Department of Microbiology and Veterinary Public Health
- Department of Pathology and Parasitology

Mekelle University specializes in Dryland Agriculture and Natural Resources Management and Science and Technology. It was established in 1993 as the Arid Zone Agricultural College with 42 students enrolled in three degree programs in Animal and Range Science (ARS), Dryland Crop Science (DCS) and Soil and Water Conservation. To date, it has grown into seven faculties/colleges including business economics, dryland agriculture and natural resources management, faculty of science and technology, law, education, veterinary sciences, languages, journalism and art, and a college of health sciences. The faculty of dryland agriculture and natural Resources (FDANR) established four postgraduate programs in

animal and pastoral development, MSc in tropical resource management, dryland agronomy MSc in co-operative management and MSc in rural development. The MSc programs have an average of 20 students each per annum. The faculty of veterinary medicine is still in formative stages and is relatively young and has yet to register postgraduate students.

From the foregoing account of agriculture education and training in Ethiopia, it is apparent that the country has by far the largest number of faculties of agriculture and veterinary medicine in the ASARECA region. This is commensurate with its vast livestock resource which makes it the number one in Africa and 10<sup>th</sup> in the World.

## **Uganda**

Uganda has at least 14 universities (see Appendix 1). Makerere University, which was established in 1921 as the University College of East Africa became a full fledged university in 1970. It is by far the largest university in the country, accounting for over 90% of the total student population in Uganda's universities.

The Faculty of Agriculture at Makerere University offers ten MSc degree programs including MSc in animal science. The faculty of veterinary medicine offers eight MSc degree programs including MSc in livestock development planning and management (started in 1984); MSc degree in preventive veterinary medicine, MSc in food, animal health and production (started in 2001); MSc in aquaculture, MSc in molecular biology and biotechnology; MSc in laboratory science and management.

Mbarara University of Science and Technology (MUST) was founded in 1989. It does not offer program in animal or veterinary sciences.

## **Kenya**

Kenya has at least 13 universities of which the main ones are the University of Nairobi, established in 1956, as the Royal Technical College of East Africa (Appendix 1). By 1991, there were 4,392 teaching staff and 35,421 students in universities and colleges in Kenya. By 1998 student enrolment in Kenya's universities had reached more than 55,200 (Sifuna 1998). With the additional students in the parallel degree programs, the numbers are now much higher (Nyaigoti-Chacha 2004). Enrolment in agriculture and veterinary science programs has, however, not been as phenomenal as in arts and humanities

The University of Nairobi's College of Agriculture and Veterinary Science (CAVs), located at upper Kabere 14 km northwest of Nairobi, is the largest and oldest animal production and veterinary sciences in Kenya. The faculty of veterinary medicine was established in 1940 and agriculture in 1970. In a show of maturity, the postgraduate program has expanded greatly in recent years including MSc in animal genetics and breeding; MSc in livestock production systems; MSc in range ecology; MSc in range management in faculty of agriculture and MSc in veterinary anatomy; MSc in comparative mammalian physiology; MSc in reproductive biology, MSc in biochemistry and MSc in veterinary pathology, microbiology and parasitology (Kiama 2008).

Egerton University at Njoro was founded in 1939, and Kenyatta University in 1972. Moi University was established in 1984 at Eldoret. Jomo Kenyatta University of Agriculture and Technology was established in 1981 at Juja, 36 km northeast of Nairobi, along Nairobi-Thika Highway as a constituent college of Kenya University. It became a full-fledged university in 1994. It does not offer courses in either animal science or veterinary science. Other universities and colleges are shown in Appendix 1.

## **Rwanda**

The Republic of Rwanda has three Universities: The Kigali Institute of Science and Technology (KIST), The National University of Rwanda (NUR) and University d'Agriculture d'technologie et d'Education (UATE). NUR has a Faculty of Agriculture while UATE is a specialized university of agriculture, technology and education. KIST has no fully fledged faculty of agriculture but offers undergraduate degree program in food science and technology.

## **Sudan**

Sudan has at least 40 universities (AET 2009). The University of Khartoum (UoK) ([www.uofk.edu](http://www.uofk.edu)) was established in 1956 and is the oldest and one of the biggest universities in the Sudan. The Natural Resources Sciences Campus at Shambat—a suburb of Khartoum—situated on the east bank of the River Nile four has faculties of agriculture; animal production, forestry and faculty of veterinary medicine among more than twenty faculties in science and engineering, humanities and social sciences, medical and health sciences; and educational sciences. The faculty of veterinary sciences offers both postgraduate and under-graduate studies. The faculty of animal production offers BSc in animal science. The University of Khartoum offers Bachelor of veterinary science.

The Sudan University of Science and Technology [www.sustech.edu](http://www.sustech.edu) has a college of agricultural studies with 10 departments including animal production department which offers BSc in animal science. Other faculties of veterinary medicine are found at Upper Nile University (Malakal) and University of Bahr el Ghazal.

University of Juba is one of the new Universities established in Southern Sudan It has a college of natural and environmental studies which embraces a department of Animal Production among its eight departments which include agricultural science, departments of forestry as well as that of wildlife.

The Sudan University of Science and Technology established since 1950 as Khartoum Technical Institute (KTI), became a full-fledged university in 1990. It has a college of veterinary medicine and animal production as well as College of Agricultural studies. SUST is the largest technological university in Sudan, and is a major education and research university, home to about 65,000 students in more than 200 academic programs at both undergraduate and postgraduate levels, 1000 faculty and 1500 supporting staff (see [www.sustech.edu](http://www.sustech.edu)).

The brief above shows that Sudan has one of the largest network of university level education in animal and veterinary sciences in the ASARECA region which is commensurate with its status as a country with the largest livestock population on the African continent.

## **Tanzania**

By December 2006, Tanzania had 11 public universities with several affiliated university colleges. In addition, an additional 19 private universities are offering various degree programs. Total student enrolment was over 50,000 in 2006 (Msolla 2007). Sokoine University of Agriculture ([www.suanet.ac.tz](http://www.suanet.ac.tz)) is the only agricultural university in Tanzania. It was established in 1965 first as an agricultural college offering diplomas in agriculture. It became a faculty of agriculture under the University of Dar es Salaam in 1969/1970. In 1984 it became a full fledged university. To date it has four faculties: Agriculture, forestry and nature conservation, veterinary medicine and science. SUA has 21 undergraduate programs and offers MSc degree programs in at least 12 specializations including MSc in tropical animal production under the faculty of agriculture and Master of veterinary medicine and Preventive Veterinary Medicine in the faculty of veterinary medicine. PhD Degree programs are offered in at least eight departments and disciplines including Animal Production and Veterinary Medicine either singularly or in collaboration with other universities within the region and overseas.

## Madagascar

Madagascar has one polytechnique and five universities offering both undergraduate and postgraduate degree programs. The University of Madagascar was established in 1955 in the capital Antananarivo as an institute for advanced studies. It became University of Madagascar in 1961. In 1988, its five branches in Antsiranana Antsiranana, Fianarantsoa, Toamasina, Toliara, and Mahajanga later on became full fledged universities of same names, i.e. University of Antsiranana, University of Fianarantsoa, University of Toamasina, University of Toliara, and University of Mahajanga. The main branch retained its original name, the University of Antananarivo.

Veterinary medicine is taught at Antananarivo University but there is little information about training in animal and veterinary medicine even on websites such as the AET Africa agricultural education and training portal ([www.aet-africa.org](http://www.aet-africa.org)).

## 2.5 Collaboration and linkages between tertiary education institutes and research and extension systems

### 2.5.1 Intra-university collaboration

Table 4 gives a summary of universities in East and Central Africa which offer undergraduate degree programs in animal production and veterinary medicine. Table 4 shows postgraduate degree programs offered by Faculties of Agriculture and Faculties of Veterinary Medicine in universities of for ASARECA member countries. In terms of diversification, the Faculties of Veterinary Medicine at Makerere University stands out as being the most innovative in venturing into new areas. On the other hand Addis Ababa University and University of Nairobi's Faculty of Veterinary medicine have moved into narrow specialisations of the various veterinary disciplines at the MSc level (Table 5). In the case of Makerere, the offering of such diverse programs is made possible by extensive collaboration with other faculties and department at Makerere University. New areas that are being addressed today by the faculty of veterinary medicine that were not being addressed five years ago include:

- Policy analysis
- Livestock planning and management
- Gender analysis and livestock marketing.

### 2.5.2 Collaboration with national research system

The mission of universities is to offer tertiary education, research, advisory services of high quality. Hence universities worldwide possess the bulk of highly trained manpower in their field of specialization. The SSA and ASARECA region in particular is no exception to this global trend. Mrema (1997), for example, reported that in 1995 there were 550 African agriculture scientists with PhDs employed by universities in the ASARECA region compared to 360 in the rest of the national agricultural research systems (NARS). To date, the numbers may have increased but the ratio of university researchers to those in the NARS remains problematic all the same. This pool of agricultural experts in universities has the duty to contribute directly to national agricultural research and extension systems. However, it has been reported (IAC 2004) that university-based scientists in Africa conduct less than 10% of public agricultural research and development and a majority spend less than 20% of their time on research (Beintema et al. 1998). This has partly been due to governments in the region not investing enough in research and development in general and agricultural research for development (R4D) in particular.

**Table 4.** Universities with faculties of agriculture and veterinary medicine in the ASARECA region offering postgraduate courses

Country	University	Year university established	Faculty		Postgraduate degree program		
			Agriculture	Vet-erinary Medicine	MSc	PhD	
					Animal Science	Veterinary Medicine	
Burundi	University of Burundi	1960	√	–			
	University of Ngozi	1999	√	–			
Congo DR	University of Kinshasa	1954	√	–		–	
	University of Lumbumbashi	1956	√	√		√	
	Catholic University of Graben, University of Goma, ,		√	–	?	–	?
Eritrea	University of Asmara		√	–	√		–
Ethiopia	Addis Ababa University	1950	–	√		√	√
	Haramaya University	1955	√	√	√	√	√
	Hawassa University	1997	√	–	√	–	√
	Jimma University College Agriculture and Veterinary	1952	√	√	√	√	√
	Mekelle University	1993	√	√	√	√	–
Kenya	Egerton University	1987	√	–	√	–	√
	Jomo Kenyatta University of Agriculture and Technology	1994	√	–	–	–	–
	Moi University	1997	√	–	–	–	–
	University Nairobi	1970	√	√	√	√	√
Rwanda	National University of Rwanda	1963	√	√	–	–	–
The Sudan	University of Khartoum	1956	√	√	√	√	?
	Sudan University of Science and Technology	1950	√	√	√	√	
	Upper Nile University (Malakal) an	–	√	√	√	√	?
	University of Bahr el Ghazal						
	University of Juba		√	–	√		
	Sudan University of Science and technology	1950	√	√	√	√	√
Tanzania	Sokoine University Agriculture	1984	√	√	√	√	√
Madagascar	University d'Antananarivo	1966	–	√	–	√	–
	University de Fianarantsoa	1977	–	–	–	–	–
	University of Mhajanga	1977	–	–	–	–	–
	University of Toliara	–	–	–	–	–	–
Uganda	Makerere University	1949	√	√	√	√	√

Note: √; Available.

– Not available or information not obtained.

Within ASARECA, a competitive grant research grant system was recently introduced to bolster the availability of research funding which at the same time requires institutional collaboration between at least five institutions including universities spread across at least three countries within the region. The CGS program, although temporarily been put on hold pending institution of better administrative arrangements, has potential to enhance collaboration between NARS and universities in the region.

**Table 5.** Undergraduate and MSc degree programs in animal production and veterinary sciences offered in respondent universities in East and Central Africa

S/ No.	MSc degree program	University					
		Addis Ababa University (ET)	Egerton University (KE)	University of Nairobi (KE)	Makerere University (UG)	Sokoine University of Agriculture (TZ)	National University of Rwanda (RW)
	Faculty of agriculture						
1	Animal production	√√	√√	√√	√√	√√	√√
2	Aquaculture	–	–	–	–	*	–
3	Range science/management	–	–	–	–	*	–
	Faculty of veterinary medicine						
4	Veterinary medicine	√√	–	√√	√√	√√	–
5	Livestock development planning and management	–	–	–	√	–	–
6	Preventive veterinary medicine	–	–	–	√	√	–
7	Animal health and production	–	–	–	√	–	–
8	Aquaculture	–	–	–	√	–	–
9	Molecular biology and biotechnology	–	–	–	√	–	–
10	Laboratory Science and Management	–	–	–	√	–	–
11	Animal physiology	√√	–	–	–	–	–
12	Tropical animal health and production	√√	–	–	–	–	–
13	Tropical veterinary epidemiology	√√	–	–	–	–	–
14	Tropical veterinary parasitology	√√	–	–	–	–	–
15	Tropical veterinary pathology	√√	–	–	–	–	–
16	Tropical veterinary public health	√√	–	–	–	–	–
17	Veterinary obstetrics and Gynaecology	√√	–	–	–	–	–
18	Animal genetics and breeding;	–	–	√√	–	–	–
19	Livestock production systems	–	–	√√	–	–	–
20	Range ecology	–	–	√√	–	–	–
21	Range management	–	–	√√	–	–	–
22	Veterinary anatomy	–	–	√√	–	–	–
24	Comparative mammalian physiology	–	–	√√	–	–	–
25	Reproductive biology,	–	–	√√	–	–	–
26	Biochemistry	–	–	√√	–	–	–
27	Veterinary pathology	–	–	√√	–	–	–
28	Microbiology and parasitology	–	–	√√	–	–	–

Note: √√ = Offered at BSc and MSc level.

√ = Postgraduate program only.

\* = Undergraduate program only.

The six universities from 5 out of 10 ASARECA countries (Ethiopia, Kenya, Tanzania, Rwanda and Uganda) that responded to the questionnaire indicated that they all had collaboration with the national research system and rated this collaboration as being good. For example, the faculty of veterinary medicine at Addis Ababa University collaborates with Institute of Development Research in offering a joint program in food safety. Other universities required collaboration with basic science faculties

for courses in statistics, biochemistry as well as courses on cross cutting issues such as environmental auditing, production economics and livestock policy analysis. Areas that still required improvement include:

- Development of joint research projects
- Assignment of students on specific projects
- Creating forums to disseminate research outputs to final end users
- Joint planning and programming (e.g. problem diagnosis,
- Joint priority setting and joint program review meetings,
- Participation in in-service training programs,
- Formal collaboration in conducting trials,
- Community needs assessment surveys and
- Joint responsibility for the release of recommendations to farmers.
- Resource allocation (e.g. rotation of staff to pool experience or expertise and implement collaborative activities, sabbatical leave, or other exchanges of staff between different organizations
- Communication between organizations (e.g. radio and video programs, two way interactive communication such as telephone, electronic mail services and various print media, joint publications, web pages etc.)

### 2.5.3 Collaboration with national extension system

On the agricultural extension front, the direct involvement of agricultural universities has been minimal. Unlike in the USA Land Grant Universities system where universities have direct links with the extension system through operation of agricultural experimental stations, most universities in Africa have no direct links with the national extension system. Moreover, university research in Africa during the 1970s and 1980s was largely laboratory based or on-station applied research with little or weak links to the extension system. A paradigm shift in the mid 1980s driven mainly by donors forced universities to abandon the linear-on-station research–extension model to participatory, on-farm, farming systems (FSR) of the mid 1980s and early 1990s (Byabachwezi et al. 2003). Farming systems research which became very popular in the 1980s and early 1990s required involvement of farmers and extension workers to participate in the identification, implementation and evolution of research (Byabachwezi 2003). FSR has evolved overtime to new approaches such as the sustainable livelihood approach (SLA) which aims at elimination of extreme poverty and food insecurity. SLA requires researchers to first identify the poorest of the poor and develop strategies and interventions that address major constraints and challenges for improved productivity and sustainable livelihoods. All the respondent universities indicated that they collaborate with national extension system and rated the collaboration as good to very good. Areas of collaboration include:

- Providing training to field professionals
- Organizing workshops to disseminate research outputs.

However, the collaboration could be improved through establishing formal agreements that would promote more regular dialogues to identify possibilities for collaborative works.

### 2.5.4 Collaboration with farmer training institutes

Farmer training institutes are often part of the national extension system. They are known as agricultural extension centres or farmer extension centres. They are also used as farmer field schools and for setting up demonstration units for agricultural technologies and innovations. In Tanzania the Buhuri Livestock Training Institute (LITI-Buhuri) near Tanga was set up as a farmer's training institute, but due to budgetary constraints, the number of farmers being trained there has been declining over time. It is now training more of extension certificate candidates than farmers. Most of the livestock training institutes including agricultural universities have units with mandates to train farmers. Sponsorship is mainly by development NGOs and local government authorities. Most of the responded universities indicated that farmer training is done mainly through exhibitions, holding of field days and through farmers field schools established through on-farm action research.

Most of the respondent universities indicated to have strength in traditional disciplines such as animal nutrition, animal breeding, in the faculties of agriculture and veterinary obstetrics and gynaecology, animal production, veterinary epidemiology, veterinary public health, veterinary parasitology and veterinary microbiology in faculties of veterinary medicine.

Two universities (Addis Ababa University and University of Nairobi) faculties of veterinary medicine indicated weaknesses in few preclinical disciplines such as animal physiology, biochemistry, veterinary pathology and clinical disciplines such as public health, pharmacology, pathology and clinics. Other areas in which weaknesses were indicated included some cross-cutting issues such as climate change and policy analysis not being included in existing curricular.

### 2.5.5 Collaboration with other institutes

In the Sudan, the Sudan Academy of Sciences (SAS) represents a federal union of different research institutes and centres. Through these institutions, human and material resources are pooled to provide opportunities for advanced human resource capacity building in research and development of advanced and indigenous technologies. Thus, partnership and cooperation are encouraged with other related institutions inside or outside the country ([www.sas-sd .net](http://www.sas-sd.net)).

The Faculty of Veterinary Medicine of the University of Addis Ababa, Ethiopia, collaborates with Ethiopian Institute of Agricultural Research, regional agricultural research institutes and the Ethiopian Health and Nutrition Institute in student thesis co-supervision and thesis research fund allocations. All the respondent universities rated their collaboration as good to very good

All the respondent universities were aware of the International Livestock Research Institute and rates the collaboration with it as being good to very good. The Faculty of Veterinary Medicine of the University of Nairobi had strong ties with ILRI and the Kenya agricultural research institutes.

Main mode of collaboration was through joint research, joint supervision of postgraduate students and short courses and joint publications.

### 2.5.6 Effectiveness of the current collaboration

From collaboration with the national research system, extension system and other national and international research institutions, the rating of the collaboration was good to very good. But various bottlenecks were cited as hampering the effectiveness of the collaboration. These included lack of adequate funding, equipment at home laboratories, lack of scholarships for postgraduate students and lack of reading materials and competency in specific emerging disciplines such as intellectual property rights, climate change, bioinformatics, and policy analysis.

## 3 Strengths, weaknesses and gaps

### 3.1 Critical constraints

In this study, six universities which responded to the questionnaires (University of Addis Ababa, Makerere University, University of Nairobi, Egerton University, National University of Rwanda and Sokoine University of Agriculture) indicated that critical challenges that universities face include: students securing scholarships/funding (44% of respondent universities), lack of equipment and facilities (22%), lack of reading materials in new disciplines (11%) such as policy analysis, livestock planning and management, gender analysis and livestock marketing, intellectual property rights, climate change, genetic engineering and bioinformatics and others which are currently not being offered. Other challenges include inadequate internet facilities (11%) and inadequate accommodation for postgraduate students (11%).

### 3.2 Capacity gaps in postgraduate curricula, emerging needs and challenges

Results obtained from the six agricultural universities indicated that leadership and decision making, intellectual property right policy, facilitation skills, climate change, implications and adaptation strategies, gender analysis, management of gene bank, bioinformatics, disease surveillance and preparedness, *ex situ* conservation of animal genetic resources were being offered by only 20% of the universities while none of the respondent universities offered courses in negotiation and conflict resolution skills, design, implementation and assessment of networks and partnerships and innovation systems perspective and implication to research and development (Table 6).

Out of the least taught areas, leadership and decision-making, intellectual property right policy, climate change, implications and adaptation strategies and disease surveillance and preparedness were considered extremely important (average score = 2.5–3.0 on a scale of 3) while innovation systems perspective and implication to R&D, design, implementation and assessment of networks and partnerships, negotiation and conflict resolution skills, *ex situ* conservation of animal genetic resources, bioinformatics, management of gene bank and gender analysis were considered moderately important (average score of 2.0–2.5 on a scale of 3). Therefore these subject areas may be considered as important knowledge gaps for the ASARECA region. As expected, subject areas already being addressed by more than two thirds of the respondent institutions were not considered important for inclusion in new curricula (average score 1.5).

**Table 6.** Course topics offered/not offered by six agricultural universities in East and Central Africa in their postgraduate training programs

S/ No.	Subject areas of postgraduate training	% of respondent university offering	Rating of importance for inclusion in new curricula if not currently offered
1	Participatory methods	66.7	1.0
2	Biosafety	66.7	1.7
3	Interaction of crop–livestock–water	66.7	1.7
4	Scientific writing	66.7	1.7
5	Sustainable use of animal genetic resources	66.7	1.7
6	Convincing proposal writing	50.0	1.0
7	Effective communication	50.0	2.0
8	Monitoring, evaluation and impact assessment	50.0	2.0
9	Planning and priority setting	50.0	2.0
10	Poverty vulnerability and risk analysis	50.0	2.7
11	<i>Ex situ</i> conservation of animal genetic resources	33.3	1.7
12	Strategic planning	33.3	1.7
13	Disease surveillance and preparedness	33.3	2.0
14	Value chain analysis, market orientations and R&D	33.3	3.0
15	Facilitation skills	16.7	1.7
16	Gender analysis	16.7	2.3
17	Management of gene bank	16.7	2.3
18	Bioinformatics	16.7	2.7
19	Intellectual property right policy	16.7	2.7
20	Leadership and decision making	16.7	2.7
21	Climate change, implications and adaptation strategies	16.7	3.0
22	Negotiation and conflict resolution skills	0.0	2.3
23	Design, implementation and assessment of networks and partnerships	0.0	2.7
24	Innovation systems perspective and implication to R&D	0.0	2.7

Note: 2.5 —3.0 = Extremely important (Average score on a scale of 3).

1.5—2.5= Moderately important (average score on a scale of 3).

<1.5 = Not important (Average score on a scale of 3).

3.3 Review of importance of training offered and not offered

## 4 Needs and recommendations

### 4.1 Specific areas needing strengthening

Most of the respondents were of the view that a number of areas need strengthening. These include:

- Dairy and poultry products processing and hygiene
- Farming systems approaches to research
- Sanitary and Phytosanitary standards
- OIE regulations, and
- Conservation of livestock genetic resources.

Others include policy analysis, livestock planning and management, gender analysis and livestock marketing.

This list shows the concerns surrounding international trade in livestock and livestock products. These have to be addressed in this era of globalization and the breaking down of trade barriers under WTO rules which are increasingly impacting negatively on developing countries due to the low capacity to adapt to these changes in the global arena.

### 4.2 Role and priorities of ILRI in bridging the identified capacity gaps

The six respondent universities indicated that the role of ILRI in bridging the gap is accommodating postgraduate students to do all or part of their postgraduate research through joint research. Another area is for ILRI to offer short-term training to areas which are not currently being offered in the regional universities but which are considered extremely important or critical as outlined under section 2.5. Generally, the areas considered by respondent universities in the ASARECA region as extremely important, i.e. leadership and decision making. Intellectual property right policy, climate change, implications and adaptation strategies and disease surveillance and preparedness are part of what CaSt ILRI (ILRI 2007) identified through a needs assessment study (Ibrahim 2007) as potential candidates for flagship short courses in the next two to three years.<sup>9</sup> This close agreement of the two independent studies indicates the level of priority accorded to these topics in a changing global environment and emerging knowledge gaps and challenges. They are therefore rightful candidates for short term professional development courses for scientist in the ASARECA region.

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9. CaSt strategic plan 2007 recommended climate change; implication and adaptation strategies for the livestock sector; participatory veterinary public health approaches for disease surveillance and control; crop-livestock-water interactions; livestock policy analysis and management of networks and partnerships for R&D within the livestock innovation system as potential candidates for flagship short courses that could be run by CaSt ILRI in the next 2–3 years.

## 5 Conclusion, recommendations and limitations

### 5.1 Conclusion

Livestock sector is important in the economy and livelihood of considerable number of pastoralists, agropastoralists and mixed crop–livestock farmers in East and Central Africa. Universities in the ASARECA region are rich in highly trained agriculture and veterinary experts who play an important role not only as trainers but also as researchers and technology transfer agents in the national agricultural research systems. Lack of funding for AR4D is a major constraint limiting the extent of collaborative research between universities and NARS. Collaborative research between CGIAR centres such as ILRI and regional research organizations such as ASARECA is viewed as important in fostering networking and collaborative research within the region. Universities in East and Central Africa have the capacity to offer postgraduate training in Animal production and veterinary medicine and related disciplines. However, the number of candidates undertaking postgraduate training in agriculture in general and livestock and veterinary science in particular is declining or has remained stagnant in the recent past. The main reasons are lack of scholarships and funding required to maintain laboratory facilities. This is happening at a time when a new crop of scientists is required to replace the first generation of agricultural scientists who were trained in the 1960s to 1980s when scholarships were available for studies abroad or in regional programs. ILRI could help bridge this gap by accommodating more postgraduate candidates studying at universities with SSA.

With regard to postgraduate training or even for people with MSc and PhDs, further specialized short-term training is required in specific areas considered extremely important by respondent universities. They are those that address emerging issues such as leadership and decision making, intellectual property right policy, climate change, implications and adaptation strategies and disease surveillance and preparedness. Others considered moderately important include innovation systems perspective and implication to R&D; design, implementation and assessment of networks and partnerships; negotiation and conflict resolution skills; *ex situ* conservation of animal genetic resources bioinformatics; management of gene bank and gender analysis. There is therefore a convergence of priorities of universities in the ASARECA region and those adopted by CaSt–ILRI as potential candidates for flagship short courses in the next two to three years.

### 5.2 Recommendations

In view of the findings and conclusions, it is recommended that:

- a. ILRI and universities in SSA take deliberate steps to enhance their collaborative activities in research and training through :
  - Postgraduate student attachment and joint supervision.
  - Joint research projects
- b. CaSt–ILRI develops modules in the areas identified in this study and in the CaSt strategy for offering to groups of interested scientist from NARS and universities in the ASARECA region and SSA in general.
- c. Governments within the ASARECA region take deliberate steps to support regional postgraduate training programs in agricultural universities with a solid backing for scholarships and research/ laboratory facilities necessary to generate the next crop of highly trained manpower required to fuel the application of science and technology in the ASARECA region in the coming decades and beyond.

### 5.3 Limitations

While responses were received from only six universities in five countries and none from universities in Eritrea, DRC Congo, Madagascar, Sudan and Burundi, the results obtained reveal similar trends, strengths, weaknesses and challenges being faced by tertiary institutions in the region. Dwindling enrolment due to lack of scholarships and inadequate facilities are major challenges to be overcome.

Budgetary cuts at both national and global level institutions including the CGIAR centres have serious implications for the future of postgraduate training and research in animal science and veterinary schools in the region. African governments to commit at least 10% of their budgetary resources if released will go a long way towards meeting some of the challenges raised in the report.

## References

- Akundabweni LS, Muluvi GM and Ndege S. 2004. Diagnosis of postgraduate training needs in agriculture and food via open and distance learning (PG–ODL) in Eastern and Southern Africa. Report submitted to IFPRI (International Food Policy Research Institute), Washington, DC, USA.
- Beintema N and Gert Jan Stads. Investing in sub-Saharan African agricultural research: Recent trends: 2020 Africa conference Brief No. 8. IFPRI (International Food Policy Research Institute), Washington, DC, USA.
- Beintema N, Pardeyand PG and Rosenboom J. 1998. Educating agricultural researchers: A review of the role of African universities. EPTD Discussion paper no. 36. IFPRI, Washington, DC, USA.
- Byabachwezi MSR, Mansoor G, Kapange BW and Schrader T. 2003. Researchers and clients. Getting to know each other (better). In: Managing research for agricultural development. Proceedings of the national workshop on client oriented research held 27–28 May 2003 in Moshi, Tanzania.
- Commission for Africa. 2005. Our common interest. Report of the Commission for Africa. DFID, London, UK.
- FARA/ANAFE. 2004. BASIC (Building Africa’s Scientific and Institutional Capacity) for agriculture and natural resources (BASIC). Pub Forum for Agricultural Research in Africa and African Network for Agriculture, Agroforestry and Natural Resources Education.
- IAC (Inter Academy Council). 2004. Realising the promise of African agriculture: Science and technology strategies for improving agricultural productivity and food security in Africa. IAC, Amsterdam, the Netherlands.
- ILRI–ASARECA–AAARNET. 2007. Livestock training needs assessment report for East and Central Africa. Report submitted to ILRI (International Livestock Research Institute), Nairobi, Kenya.
- Johanson R and Saint W. 2007. Cultivating knowledge and skills to grow African agriculture. Draft World Bank paper, Washington, DC, USA.
- Kiama SG. 2008. Highlights on the College of Agriculture and Veterinary Sciences, University of Nairobi, Kenya. (see [www.oired.vt.edu/sanremcrsp/Meetings/SudanPPTs/Kiama.pdf](http://www.oired.vt.edu/sanremcrsp/Meetings/SudanPPTs/Kiama.pdf)).
- Mati BM. 2007. Sub-Saharan Africa cannot afford to miss the livestock revolution as well. Africa water and sanitation (May–June 2007). pp. 23–25.
- Msolla P. 2007. Issues of higher education in Tanzania. Ministry of Higher Education, Science and Technology, Dar es Salaam, Tanzania. (unpublished).
- Ndikumana J and Kamidi R. 2005. Challenges and opportunities for the livestock industry in East and Central Africa: Strategic priorities for research. Key note paper presented at the livestock–water productivity workshop, 4<sup>th</sup>–11<sup>th</sup> September 2005, Uganda.
- NEPAD. 2003. Comprehensive Africa Agriculture Development programme.
- NEPAD. 2006. Comprehensive Africa Agriculture Development programme. Integrating livestock, forestry and fisheries subsectors into CAADP.
- Nyaigotti-Chacha C. 2004. Reforming higher education in Kenya. Challenges, lessons and opportunities. Paper presented at University of New York workshop with parliamentary committee on education science and technology, August 2004, Naivasha, Kenya.
- Sifuna DN. 1998. The governance of Kenyan public universities. In: *Research in post-secondary education*. Vol. 3, No. 2.
- World Bank. 1995. Retaining teaching capacity in African universities: Problems and prospects: Findings; Africa Region No. 39. IBRD, Washington, DC, USA.

## Appendix 1 Terms of reference

### Consultancy study

#### *Current status of postgraduate training in livestock sector in SSA and priorities for ILRI's support*

#### *Background to the study*

The International Livestock Research Institute (ILRI) is one of 15 future harvest centres that conducts food and environmental research to help alleviate poverty and increase food security while protecting the natural resource base. Building on three decades of experience, ILRI works at the crossroads of livestock and poverty by bringing high-quality science and capacity building to bear on poverty reduction and sustainable development. Capacity is the engine for enhancing the output and performance of individuals and organizations. As part of its research-based outreach and capacity strengthening, ILRI assists its partners by offering opportunities for long- and short-term training for researchers and development practitioners. The Capacity Strengthening unit (CaSt) is designed to build and strengthen the scientific knowledge and capabilities of ILRI's partners in developing countries.

The overall mission of the CaSt unit is to strengthen the capacity of the livestock research and development (R&D) community to contribute to the mission of ILRI to achieve livestock-mediated poverty alleviation. The purpose is to strengthen the capacity of ILRI's partners to apply their skills and resources to accomplish their goals, satisfy stakeholder's needs and improve performance and impact.

Within the broader framework of ILRI's strategy to 2010 and proposed Medium Term Plan (MTP), the five strategic objectives to be pursued by the CaSt unit are:

- Effective integration of capacity strengthening activities into project planning, implementation and evaluation.
- Building sustainable capacity of institutes to build capacity (major shift in focus).
- Test and implement innovative and cost-effective training approaches and delivery mechanisms and develop and disseminate research-based training materials.
- Building skills of individuals and groups.
- Developing a functional need-based monitoring and evaluation system to communicate with partners and to assess the performance and impact of CaSt.

ILRI recognizes that the long-term solution to address the continuous and dynamic nature of capacity strengthening needs is to develop sustainable capacity within the relevant organizations which are mandated to build capacity of the various stakeholder groups engaged in the livestock innovation system. This could be only achieved through building the capacity of the universities and by facilitating the effective integration of research-based learning outputs (tools, methods, approaches and results) into the curricula of learning institutes. ILRI strongly believes that universities must play a pivotal role in providing the human resources for the agricultural led broad based economic growth needed to achieve the Millennium Development Goals in SSA.

However, in terms of building capacity of the educational institutes ILRI would like to complement the ongoing regional and national initiatives; using the principle of subsidiarity. ILRI would like to add value to the efforts of the higher learning institutions in SSA based on ILRI's comparative and competitive advantage. Therefore, it is important to clearly identify the niche in which ILRI could effectively contribute to the efforts of the tertiary educational institutes especially in postgraduate training.

#### *Purpose and objectives*

The overall purpose of this study is to strengthen the postgraduate training and research capacity of the tertiary educational institutes in the livestock sector within SSA. The specific objective is to identify the

gaps in the postgraduate training in animal production and veterinary sciences and to identify the roles and priorities of ILRI in bridging this gap.

In order to achieve this it is proposed to conduct three consultancy studies covering SSA, using the existing geopolitical grouping—SADC, ASARECA, and CORAF.

### *Terms of reference for the consultancy*

The broader terms of reference for the consultancy study are to:

1. Review and document, the role of livestock in the regional economy and the emerging challenges confronting the livestock sector
2. Review and document the current status of postgraduate training in the livestock sector in the region (including an inventory of institutes).
3. Discuss the collaboration and linkage between tertiary educational institutes and research and extension systems and their strengths and weaknesses
4. Identify the critical constraints and challenges facing the agriculture higher learning institutions in the region
5. Identify the missing elements and capacity gaps in the existing curricula (especially at the postgraduate level) to address the emerging needs and challenges of the livestock sector
6. Identify the role and priorities of ILRI in bridging the capacity gaps identified and
7. To make recommendations/suggestions and to move forward.

The consultant is expected to use both the available secondary data as well as primary data collected from key informants to prepare the report. To make sure that the three studies are comparable, a standard questionnaire will be used to collect the primary data (See attached) from the universities.

The consultant is expected to present the findings of the study during a regional multi-stakeholder workshop. Based on the comments and additional information generated during the workshop he/she will be expected to revise the draft and prepare a final report.

### *Expected output*

The expected output of the consultancy study is a report summarizing the findings of the study, clearly identifying the role and priority areas for support by ILRI.

### *Duration*

The consultancy will commence on 15<sup>th</sup> July and the draft report will be submitted by 15<sup>th</sup> September 2008.

## Appendix 2 Questionnaire

Current status of postgraduate training in animal production, veterinary science, strengths, gaps and priority areas for support

(Questionnaire for collecting information from key informants: This information should be collected for each university in the region)

### A) Information about the key informant (person completing this questionnaire)

Name: \_\_\_\_\_

Position: \_\_\_\_\_

Contact details:

Mailing address: \_\_\_\_\_ Phone: \_\_\_\_\_

\_\_\_\_\_ E-mail: \_\_\_\_\_

\_\_\_\_\_ Fax No. \_\_\_\_\_

### B) Information about the university

Name: \_\_\_\_\_

\_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Web site: \_\_\_\_\_

### C) Programs offered

#### C.1 Does your university offer postgraduate training in

a. Animal production      Yes          No   

b. Veterinary science      Yes          No   

#### C.2 If yes, at what level

a. Animal production      MSc        PhD        Others (Specify) \_\_\_\_\_

b. Veterinary science      MSc        PhD        Others (Specify) \_\_\_\_\_

#### C.3 In which year did your university start this program? Please specify the year.

MSc \_\_\_\_\_ PhD \_\_\_\_\_

C.4 Please specify the areas of specializations offered:

MSc

PhD

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

D) Critical constraints:

Please list the critical constraints that your university is facing in implementing the postgraduate program.

_____
_____
_____
_____
_____

E) Collaboration with other departments/universities/institutes in implementing the postgraduate program.

E.1 Does your department/faculty collaborate with other departments in your university in implementing the postgraduate training program?

Yes  No

E.2 If yes, please provide the following information.

Department/Faculty	Nature of collaboration
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E.3 Does your department/faculty collaborate with other universities in implementing the postgraduate program?

Yes  No

E.4 If yes, please provide the following information.

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Name of university and country	Nature of collaboration
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F) Collaboration with research and extension institutes

F.1 Does your university collaborate with your national research system?

Yes  No

F.2 If yes, please list the nature of this collaboration

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F.3 How would you rate this collaboration?

Very good  Good  Weak/Poor

F.4 If yes, please list the nature of this collaboration (Please list the type of action to be taken).

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F.5 Does your university collaborate with your national extension system?

Yes  No

F.6 If yes, please list the nature of this collaboration

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F.7 How would you rate this collaboration?

Very good  Good  Weak/poor

F.8 If yes, please list the nature of this collaboration (Please list the type of action to be taken).

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G. Program strengths/weaknesses/gaps

G1. In which specific areas do you think that your university has a strong academic program? Please list

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G2. Do you see any weaknesses in your current postgraduate program?

Yes  No

If yes, please specify.

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G3. Please indicate whether your current postgraduate training program offers training in the following areas? If not indicate how important to include them in the curriculum.

Skill areas	If no, degree of importance	
	Yes/No	(EI = Extremely important, MI = Moderately important, NI = Not important)
1. Participatory research methods		
2. Leadership and decision making		
3. Strategic planning		
4. Intellectual property right policy		
5. Negotiation and conflict resolution skills		
6. Facilitation skills		
7. Design, implementation and assessment of networks and partnerships		
8. Monitoring, evaluation and impact assessment		
9. Planning and priority setting		
10. Climate change: Implications and adaptation strategies		
11. Poverty, vulnerability and risk analysis		
12. Value chain analysis, market orientations and implications to R&D		

13. Innovation systems perspective and implication to R&D
  14. Interaction of crop–livestock–water
  15. Gender analysis.
  16. Sustainable use of animal genetic resources
  17. Management of gene bank
  18. Convincing proposal writing
  19. Scientific writing
  20. Effective communication
  21. Bioinformatics
  22. Disease surveillance and preparedness
  23. *Ex site* conservation of animal genetic resources
  24. Biosafety
  25. Others (please specify)
- 

G4. Do you think that your current postgraduate program is adequately addressing the current and emerging challenge of the livestock sector?

Yes  No

If no, please indicate the areas that needs improvement

*Policy/institution (specify)*

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*Animal production (specify)*

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*Service delivery (specify)*

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*Processing (specify)*

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*Animal health (specify)*

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*Marketing/value addition/trade (specify)*

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*Others (specify)*

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H) ILRI's potential role in supporting the postgraduate training.

H1. Are you familiar with the International Livestock Research Institute?

Yes

No

H2. How can ILRI assist your university in strengthening the postgraduate training program in animal production and veterinary science? (Please use the gaps and weaknesses identified in section G to answer this).

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I) Any other comments

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Thank you very much for completing this questionnaire. Your response will assist us in identifying the strategic support needed and the role of ILRI in supporting the tertiary educational institutes in SSA.

### Appendix 3 List of individuals and institutes contacted and their contact details

Name	Institutional affiliation	Contact details
Dr Anthony Mugisha	Senior Lecturer and Co-ordinator, MSc Livestock Development and management	Faculty of Veterinary Medicine Makerere University P.O. Box 7062, Kampala Uganda +256772502887 mugisha@vetmed.mak.ac.ug
Dr Kelay Belihu Desta	Associate Dean for Postgraduate Studies and Research	Faculty of Veterinary Medicine Addis Ababa University P.O. Box 34, Debre Zeit Ethiopia +251 11 433 8917 belihudes@yahoo.com
Prof Vedasto Ruta Muganyizi Muhikambebe	Deputy Director, Research and Postgraduate Studies	P.O. Box 3000 Chuo Kuuu Morogoro, Tanzania +255232604388 drpgs@suanet.ac.tz mhika@suanet.ac.tz www.suanet.ac.tz
Dr Calixte Gatali	National University of Rwanda	Faculty of Agriculture P.O. Box 117 Butare, Rwanda Email: cgatali@nur.ac.rw www.nur.ac.rw
Prof Njenga Munene	Dean, Faculty of Veterinary Medicine College of Agriculture and Veterinary Sciences www.uonbi.ac.ke	P.O. Box 2953-00625 Nairobi, Kenya vet@uoni.ac.ke
Dr Bockline Omedo Bebe	Department of Animal Science Egerton University	P.O. Box 2115 Njoro, Kenya obebeb@yahoo.com www.egerton.ac.tz

Appendix 4: The ASARECA region grouping





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