# Viral diseases of food security and livelihood importance

Here, Professor Sharadhuli Kimera from Sokoine University of Agriculture, focuses on viral diseases of food security and the importance of livelihood

According to studies by the World Bank, World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO), World Organisation for Animal Health (OIE) and others, infectious diseases account for a half of morbidity and mortality in humans, while for animals they constitute a major constraint to livestock dependent livelihoods and is the single most important barrier to export of African livestock commodities to the lucrative markets of the OECD and G20 countries. 12 of the 15 transboundary animal diseases are found in Africa. The situation in Africa has worsened in recent years with the further spread of diseases, such as peste des petits ruminants (PPR), tilapia lake virus disease (TiLVD) and African swine fever (ASF). In recent years, there have been numerous outbreaks of livestock diseases costing individual countries billions of dollars, for example, ASF in the European Union, Russia and China. The UN Sustainable Development Goals (SDGs) and African Union Agenda 2063 have targets for reducing poverty and hunger, but these are compromised by livestock diseases. In most developing regions in Africa, where the impacts of infectious disease are greatest, there is now little hope of meeting any of these targets unless we exploit the advances in science, technology and innovation outlined in STISA 2024. Since outbreaks of disease can move rapidly and spread across a country, across regions and, in some cases, become global, the best strategy is to stop the disease 'in its tracks' as early as possible. For this to happen, extremely rapid detection and accurate identification of the pathogens has to be undertaken; this would facilitate the correct control measures to be put in place. In those early stages, and thereafter, understanding where the outbreak is and its progress through the region are critical for control; thus, effective monitoring surveillance and directed epidemiology provide the authorities with key information to target appropriate control measures. Often, this is not done until livestock diseases spread and spin out of control, for example, a localised introduction of ASF virus in Georgia from Madagascar has now spread to China, the major pork producer in the globe; localised PPR virus in Ivory Coast has now spread throughout Africa and Asia. With the recent advances in technology, it is possible to rapidly detect infectious diseases at source, thanks to the exploitation of the power of genomics and bioinformatics, nanotechnology, novel information technologies for the capture, analysis and modelling of data and field- deployable portable 'lab-on-a-chip' devices.

The focus our Community of Practice for Viral Diseases of Food Security and Livelihood Importance is to develop innovative approaches through science and technology-driven by genomics, molecular biology and analytical epidemiology in order to improve the risk management of transboundary Viral Epidemics of Animal Stocks (VESAS) i.e. on foot-and-mouth disease (FMD) affecting cattle, Peste des Petits Ruminants (PPR) affecting sheep and goats, African swine fever (ASF) affecting domestic pigs, Newcastle disease (ND) affecting poultry and Tilapia lake virus (TiLV) affecting tilapia fish. Some of these diseases, PPR, ASF, ND and TiLV affect short-cycle animal stocks and disproportionately constraining female participation in profitable animal agriculture, reduce household income and animal protein food for children. More specifically, these animal disease impediments restrict the realisation of the Africa Union Agenda 2063 and Sustainable Development Goals of the United Nations.

## The Community of Practice Composition

The Community of Practice is led by Professor Sharadhuli Kimera of the Sokoine University of Agriculture (SUA). Scientists working with the Community of Practice from SUA are Professors Gerald Misinzo, Christopher Kasanga and Peter Msoffe. Nationally, the Community of Practice works with scientists from the Ministry of Livestock and Fisheries, Tanzania Veterinary Laboratory Agency (TVLA), Tanzania Wildlife Research Institute (TAWIRI) and the Country Office of the FAO. Regionally, the CoP works with the University of Zambia, Lilongwe University of Agriculture and Natural Resources, Botswana Vaccine Institute, Botswana; International Centre for Insect Physiology and Ecology, Kenya and the International Livestock Research Institute (ILRI).

Internationally, we work with the Royal Veterinary College of London, United Kingdom; Ghent University, Belgium; Vrije Universiteit Brussel, Belgium; Korea Institute for Science and Technology, Republic of Korea; The Pribright Institute, United Kingdom; Swedish University of Agricultural Sciences, Sweden; Animal Health Research Centre (CISA) of the National Institute for Agricultural and Food Research and Technology (INIA), Spain; and Lancaster University, United Kingdom.

## Research and training of bright young Africans

The Community of Practice for Viral Diseases of Food Security and Livelihood Importance hosts SACIDS-ACE (SACIDS Africa Centre of Excellence for Infectious Diseases) and RSIF PASET students from across Africa for research and training under the theme of Food Security. The Regional Scholarship and Innovation Fund (RSIF) is an Africa-focused fund that aims to help create a critical mass of highly skilled scientists, professionals and innovators in the Applied Sciences, Engineering and Technology (ASET) fields. It is an initiative of the Partnership for skills in Applied Sciences, Engineering and Technology (PASET), an Africa-led initiative with the objective of strengthening the science, technology and engineering capability in the sub-Saharan Africa region to further its socio-economic transformation. Strategic placement of RSIF PASET PhD students is done at our partner institutions, mainly the Korea Institute of Science and Technology in the Republic of Korea.

Photo legend: Short-cycle animal stocks (goat, sheep, domestic pigs, poultry and fish) provide household income and food security and provide an opportunity for female and children participation in profitable animal agriculture. A child from a pastoral community is pictured grazing sheep and goats in Ngorongoro, Tanzania.

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