



RESEARCH
PROGRAM ON
Livestock

More meat, milk and eggs by and for the poor

Delivery of animal health services in extensive livestock production systems

Report of a stakeholder workshop, Nairobi, 9-10 March 2017

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CGIAR is a global partnership that unites organizations engaged in research for a food-secure future. The CGIAR Research Program on Livestock provides research-based solutions to help smallholder farmers, pastoralists and agro-pastoralists transition to sustainable, resilient livelihoods and to productive enterprises that will help feed future generations. It aims to increase the productivity and profitability of livestock agri-food systems in sustainable ways, making meat, milk and eggs more available and affordable across the developing world. The Program brings together five core partners: the International Livestock Research Institute (ILRI) with a mandate on livestock; the International Center for Tropical Agriculture (CIAT), which works on forages; the International Center for Research in the Dry Areas (ICARDA), which works on small ruminants and dryland systems; the Swedish University of Agricultural Sciences (SLU) with expertise particularly in animal health and genetics and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) which connects research into development and innovation and scaling processes.


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Executive summary

The social and economic importance of livestock in extensive pastoral systems is well known. Though livestock production is often the only source of livelihood in such systems, livestock keepers face a myriad of challenges, including poor access to animal health services. The delivery chain for livestock services in these areas is often very long and costly given the nomadic nature of the pastoralists and the expansiveness of the regions.

The animal health flagship of the [CGIAR Research Program on Livestock](#) has identified delivery of health services as a key priority. The International Livestock Research Institute (ILRI), which leads the program, has partnered with TechnoServe's Innovation in Outcome Measurement (IOM) project to pilot a case study that will test innovative service delivery approaches in extensive livestock production systems. The study, Innovative animal health services in extensive livestock production systems, will be implemented in five counties of Kenya—including Wajir, Turkana, Garissa, Isiolo and Marsabit—and will test the following innovations:

- Mobile animal health service delivery supported by strong disease surveillance in extensive livestock systems.
- Geospatial data collection and analysis tools to assess and design service delivery strategies.

Barriers to expanding commercial distribution will be identified and assessments will be done to establish how services can be bundled for profitability for pastoralists, distributors and veterinary service providers. The role of public sector support will also be assessed, and how to balance that assistance with the need to create a sustainable commercial sector. Measurement innovations will provide insights that can help identify successful approaches to service delivery, while also guiding future assessments of distribution strategies in sub-Saharan Africa. Measurement efforts will focus mainly on collecting and analysing data on livestock location, density and health, in addition to data on distances between farming households, input distribution nodes and livestock markets.

The range of services currently available will be catalogued; competition among providers, involvement of public sector and barriers to broader use in extensive production systems will be identified. The study will also consider how the entry of additional providers and embedding services in an expanded menu of product offerings could affect uptake by pastoralists. It is hoped the lessons learned could be applied in the provision of other services such as human health, education and other services.

The first project workshop on delivery of animal health services in extensive livestock production systems was held on 9-10 March 2017 at the International Livestock Research Institute (ILRI) in Nairobi. Participants included stakeholders from the private sector, regulators, development agencies and professional bodies such as the Kenya Veterinary Paraprofessionals Association and the Agrochemicals Association of Kenya. They deliberated on major challenges and opportunities to commercialization of animal health services in extensive systems. Experiences in running animal health services from Botswana and Mali and Kenya were also shared at the meeting to see how lessons from the other countries could inform options being explored in the study. Later, participants reviewed and contributed to the design of a proposed TechnoServe-ILRI case study, and how it will contribute to the priorities of the stakeholders at the meeting.

It was noted that the constraints and challenges facing the livestock sector are numerous and recurring. Key among these include poor information flow and communication among actors, resulting in limited stakeholder interaction and collaboration, hence very low uptake of available technologies and solutions available. Inclusive stakeholder involvement was highlighted as a key option in ensuring sufficient information flow and engagement among the actors.

Devolution was noted to have presented several opportunities for improving service delivery at the local levels; it allows room for tailor-made solutions based on context and players are able to tweak their activities based on identified priorities.

A resounding consensus from the workshop was the need to set up cross-sector partnerships with strong linkages between private sector and government institutions, as a key solution to these challenges.

The proposed case study will test a model where the public sector could partner with the private sector to deliver animal health services. It will evaluate whether this model is both sustainable and profitable. The workshop concluded that involving and working with Kenya's County governments was critical to its success. It was further highlighted that it was important for the study to also test viable ways of establishing business linkages between animal health service providers and community-based disease reporters for sustainability in managing disease outbreaks.

Workshop objectives

The workshop brought together 30 participants from Kenya, Botswana and Mali with the following objectives:

- Generate and share insight on major challenges and opportunities to commercialization of animal health services in extensive livestock production systems and seeking effective ways to increase coverage with livestock vaccines
- Contribute to the design of the proposed TechnoServe/ILRI case study on the private animal health service delivery to gather evidence for decisions makers.
- Networking and stimulating discussion on a shared vision for a delivery of animal health services within the region.



Summary of participants' expectations:

Challenges in delivery of animal health services is an old problem. I hope that now we can make some concrete steps towards addressing the complex issues faced

This workshop is opportune to bring on board expertise on innovation and private sector experience. It is time to produce commercial solutions to drive transformation in livestock production.

To realize success in providing targeted livestock services, we require accurate reports on livestock locations and stocking range. We need to discuss and see how to achieve this.

The communities in extensive pastoral systems grapple with not only with challenges in livestock services, but also other services such as human health, water and education. We need to explore viable options on working with other sectors to bundle services required by these communities.

How can we tap onto big data technology to bring solutions for these old persisting challenges?

What role can paraprofessionals play in facilitating sustainable delivery of animal health services?

The Kenya Veterinary Paraprofessionals Association represents more than 8,000 paraprofessionals in Kenya. Their involvement in the delivery chain has a potential to revolutionize the sector.

Opening remarks

Iain Wright, Deputy Director General, ILRI

The partnership between ILRI and Technoserve in this project is highly valuable. Effective delivery of animal health services requires all actors to work together- from local to global, private to public, non-government to government- to capture all interests and perspectives. Delivery of animal health services in pastoral livestock systems is an old challenge because of the remoteness of the extensive production systems, the poor infrastructure, lack of facilitates, low literacy levels of communities, low capacity of local organizations, politically marginalized communities, high mobility of people and animals.

Historical lack of investment in these areas- including in research is a major key factor. Further, the potential of the arid and semi-arid lands in contributing to economic development has not been fully appreciated by governments. Most efforts are employed at attempts to sedentarize these populations and eliminate pastoral mobility.

But, the productivity of these systems compares favourably to other systems if they are properly managed and invested into. As such, innovative thinking and investment is needed to overcome these challenges.

For example, there is a dire need to explore different models to see what works where and when e.g. in thermostabilization of vaccines. Use of the emerging Information and Communication Technologies (ICT) could also provide new ways of data collection and disease diagnosis. Breakthroughs have been achieved in plant health issues- how we adopt the models employed in these areas?

In addition to livestock services, pastoral communities also face similar challenges in the delivery of other services including in public health and education sectors. Thus, it may be strategic to look beyond animal health services, and explore ways of bundling services to best suit their needs and conditions. This will also significantly reduce the cost of delivery of the services.

Perhaps it is time to look beyond livestock services and determine ways of cross-sector collaborations that can bring together all sectors working on service delivery to people who depend on livestock in extensive systems.

David Galaty, TechnoServe East Africa Regional Director

The Innovation in Outcome Measurement (IOM) Program is funded by the Bill and Melinda Gates Foundation. Led by Technoserve, it focuses on identifying business solutions to poverty. The project seeks to establish commercial solutions that will drive transformation of agriculture and reduction of poverty.

The focus is on examining the fundamental disconnect between technology advancement (e.g. remote sensing) and lack of access to these technologies by decision-makers in agriculture/ag investment. They aim to bridge this gap and link technologies to processes used by decision-makers.

The partnership between ILRI and TechnoServe provides a great opportunity for a livestock project since most of their work has been with crops. Livestock being a critical sector in the

arid and semi-arid areas, we look forward to forging a solution that will help advance technology and market systems that work for these communities.

Vish Nene, Co-leader, ILRI's Animal and Human Health Program

The new Animal and Human Health program of ILRI, created in January 2017, was an effort to unify animal and human health research projects and initiatives at ILRI. The program has four themes:

1. **Heard health**- Seeks to understand and prioritize breeding constraints and mobility, and identify scalable solutions
2. **Food safety**- Looks at issues of pathogen contamination of animal source foods and chemical contamination and residues from agricultural practices and identifies safer practices for good quality food
3. **Zoonoses and emerging infectious diseases**- this theme is concerned with transfer of pathogens from livestock to humans in light of increased threats due to agricultural intensification, and how to prevent/predict emergence of diseases and mitigate. They focus in identifying how to use surveillance data to predict outbreaks before they occur.
4. **Vaccines and diagnostics**- Focuses on five major diseases including African Swine Fever (ASF), East Coast fever (ECF), Contagious caprine pleuropneumonia (CCPP), Contagious bovine pleuropneumonia (CBPP). The focus here is on improving vaccines and developing next generation vaccines- thermostable or thermo tolerant –and identifying new disease constraints. Vaccines and diagnostics- on 5 major disease...ASF, CBPP, ECF, CCPP

Henry Kiara, AVCD Livestock

The Feed the Future Kenya Accelerated Value Chain Development program (AVCD) seeks to advance technologies and innovations for increased productivity and improved livelihoods of small holder farmers and pastoralists in Kenya. The livestock component of AVCD works in five Counties- including Isiolo, Marsabit, Wajir, Garissa and Turkana- to increase income from sales of livestock by 50% by 2018 (over current levels), lifting an additional 60,000 households out of poverty and improving their nutritional status. To achieve this goal, the project seeks to accomplish 3 objectives, each with key expected outputs that include:

Objective 1: To enhance market access for 60,000 pastoralists, ex-pastoralists and smaller traders, through three expected outputs that include:

Output 1.1: Improved market management through co-management model (CMM) facilitating 15 stakeholder forums and supporting 30 LMAs

Output 1.2: Enhance market vibrancy through supporting 5000 individual/enterprises within and outside the livestock markets

Output 1.3: Increase in prevalence and use of market information systems to directly reach 25,000 traders and producers

Objective 2: To increase livestock productivity for 30,000 producers, by supporting interventions under the following outputs:

Output 2.1: Enhanced livestock value chain through improvement in the availability of and access to fodder and forage

Output 2.2: Improved surveillance and control of diseases for increased livestock production and trade

Output 2.3: Improved productivity through better herd management of small ruminants working with 5000 producers from 15 markets.

Objective 3: To improve nutrition of women and children among 60,000 households. The activities planned under this objective will realize the following outputs:

Output 3.1: Improved accesses to diverse and quality food and change in nutrition related behaviour, through increased home consumption of milk with 10% increase among children in 60,000 households' regularly consuming milk throughout the year.

Output 3.2: Improved consumption of nutrient rich foods by women, with a 10% increase in regular consumption of milk and meat by women of childbearing age in 60,000 households.

Synergies between AVCD and the proposed case study in this project are seen under the output 2.2, which seeks to create demand for livestock services and establish a disease reporting and tracking system to improve surveillance.

Delivery of animal health services in extensive livestock production systems: Lessons from Kenya

Thomas Manga, Directorate of Veterinary Services

There have been a few notable success in livestock services (mainly breeding) in pastoral areas. For instance, in the 1970s, with immense success, the Kenya Agricultural Research Institute (KARI) introduced the Sahiwal and the Maasai breeds in the southern parts of Kenya. However, in the recent past extensive production in rangelands has continued to face serious challenges, with big portions of the land now being used for human settlement and farming. In addition, extensive pastoral systems do not lend themselves to easy service delivery due to the low human and livestock density in the regions, weak monetary economy and the harsh terrain and poor communication infrastructure.

Despite these challenges, there are several opportunities which can be tapped to improve livestock services in extensive production systems. There are now veterinary officers stationed in the counties, spread across the sub-counties and sub-locations. However, their coverage is sporadic for example in response to drought emergencies or vaccination campaigns, and they also lack exposure to the latest standard operating procedures or clear guidelines on professional practices. There is need to standardize operation procedures- especially for small stock; the Department of Veterinary Services has issued guidelines on delivery of veterinary services and is now in the process of producing a policy that will provide the legal framework to guide delivery of veterinary services within the devolved system of government framework.

Some innovative approaches have been noted in the private animal health delivery models: For instance, in Turkana County there is the use of barter trade where pastoralists are able to give animals (e.g. a goat) in exchange for drugs or services. There has been an increase in community and private Veterinary stores in trading centres and outposts. However, the increased involvement of private sector has also presented additional challenges; the illegal cross boarder movement of drugs has increased. This needs to be regulated /streamlined to avert possible use of adulterated and counterfeit drugs, and false allure of low prices. Community-based animal health delivery is difficult without formal training for lay people, hence the model is not commonly used.

As part of improving the efficiency of services in this sector, we propose the following approaches:

- Veterinary field days to facilitate allow contact and interaction between veterinary officers and other animal health services practitioners, producers, and animals.
- Implementation of a veterinary internship program which will give graduate veterinarian and other paraprofessionals an opportunity to work in the field and learn from others working there.

Discussion session

It was noted that there is need to employ strategies to shift the mind set of pastoral producers towards preventing disease rather than reacting to disease and get them to routinely vaccinate their livestock.

Devolution of governance has presented some opportunities in increased resource mobilization for animal health services but varies between counties. For instance, Samburu County is offering free vaccines.

It was noted that besides emergency interventions, involvement of county governments' vets and vaccination levels are very low. As such, emphasis was placed on the need to initiate partnerships and collaborations between the government and private sector, to upscale their involvement. While it was highlighted that there is need to coordinate existing structures between government and private sector, some participants noted that the government needs strong private sector partners which it can trust.

Delivery of animal health services in Botswana: Opportunities and challenges in the extensive systems

G. Gaopatwe- Botswana

Botswana has approximately 2.6 million cattle, 1 million goats, 500,000 sheep, 200,000 donkeys, 50,000 horses and 50,000 pigs, with 80% of these in kept by small farmers under communal/ extensive farming.

Animal health services in Botswana are the Directorate of Veterinary services. It has the mandate of disease control for a healthy herd and improved farmers' livelihoods, Extension services provision relies on extension agents (most with certificates and diplomas in animal health) located in the villages to be in constant contact with farmers for immediate response when needed. Botswana's disease control infrastructure comprises 22 districts headed by vets, and 47 disease control fence maintenance camps with 314 staff.

The Directorate of Veterinary Services approves all vaccines in the country and regularly facilitates programs such as vaccination campaigns. Farmers have free access to public disease control infrastructure including vaccination and extension services on animal health issues. Vaccination campaigns are offered three times a year for certain diseases such as Foot and Mouth disease and anthrax. Other services provided include livestock identification and traceability, issuance of movement permits for export and import control, monitoring, control and prevention of outbreaks, and clinical diagnosis and treatment of animals.



Extension service provision also relies on training programs, radio and television programs, magazines and newsletters to pass across important messages to farmers.

Traceability is a requirement for farmers to access export markets. The system was initiated in 2001 under the Livestock Identification and Trace-back System (LITS).

In 2014 the government developed and rolled out a digital electronic system –known as the

Botswana Animal Information and Traceability System (BAITS)-which allows all animals to be uniquely identified. BAITS, which replaced LITS, enables farmers to access and upload information into the BAITS data base including name, address, extension area, crush point, colour of animal, sex, age, owner brand etc. Other transactions by farmers such as transfer of ownership, arrival of animals at new crush point, treatment records etc. are also captured by BAITS.

The challenges faced in Botswana include; low income of small-scale farmers hinders their ability to purchase vaccines, slow uptake of technologies such as BAITS, the vast disease control zones make it difficult to control livestock diseases in extensive production systems.

Animal health service delivery systems in Mali: Participatory diagnosis

Michel Dione, Ibrahim Traore and Abdou Fall

An overview of ILRI's four-year USAID's Feed the Future funded study that seeks to assess the current situation of the animal health delivery systems in livestock value chains in Mali was presented. Currently in its first year, the study will suggest recommendations for improvement.

According to 2012 statistics, Mali has the highest ruminant population in ECOWAS countries with 9,438,181 cattle, 12,458,525 sheep and 17,348,577 goats (2012 statistics). Livestock is main source of income for over 30% of population and 85% of people in rural households own livestock, with women owning the majority.

The burden of livestock diseases is immense in Mali, with a high prevalence of Contagious Bovine Pleura-pneumonia (CBPP), Peste des Petits Ruminants (PPR) and Food and Mouth Diseases (FMD). Parasitic infections such as Strongylosis, Distomatosis (Fashiolosis) and Trypanosomosis are also high especially in humid zones. Anthrax and Blackleg (Blackquarter) was considered to be highly prevalent in pastoral areas). In addition, high abortions rates are experienced in both cattle and small ruminants: In central Mali, abortions rates are estimated at 3.3% of all parturitions and total deaths at 31.6% in cattle of 4 years of age.

Like in many other developing countries, delivery of animal health services has several challenges. For instance, vaccine shortage, poor storage, lack of incentives to carry out vaccinations, inappropriate strains, conflicts of interest between herd keepers and owners of animals and poor evaluation of vaccination campaigns are among the myriad of challenges faced. In addition, the roles of different actors in veterinary professions and animal health delivery chain are not clearly defined or underpinned by legal frameworks. The veterinary associations are not strong enough, and there lacks a regulatory framework in the production and supply of livestock vaccines between stakeholders.

The veterinary sector is largely privatized: Vaccines are produced by the Laboratoire Central Veterinaire (LCV) - a semi-private entity who in turn sells to the Direction Nationale des Services Veterinaires (DNSV) and other private companies locally or in the sub-region. Private veterinarians can also purchase the vaccine directly from LCV through their associations. Vaccination is carried out by the private veterinarians called "mandataires", each with a specific area of coverage. Vaccination costs are subsidized by the government.

To manage veterinary drugs and other products, a set of private companies are licensed by the government to import and distribute veterinary products in the country. Drug stores are operated by licensed vets and animal husbandry engineers. However, networks of retailers are clustered around the towns, not covering remote areas and hence the reach is not sufficient for the expensive production systems.

To address the shortfalls and challenges faced in the delivery of animal health services under this arrangement, the ILRI study is promoting a number of interventions:

- Animal health multi-stakeholders platforms to; facilitate information flow among all stakeholders in vaccine supply chain, coordinate and evaluate vaccination campaigns, collect data on animal populations, induce changes in practices in behaviors and attitude
- Support business models for Mandataires through facilitation of contractual arrangement between mandataires and banks to access credit facilities
- Public private partnerships for example make thermostable vaccine for some private companies to develop and produce locally

Opportunities for using geospatial technology in animal health delivery

Catherine Pfeifer, Spatial Analyst ILRI

What role can geospatial technology play in delivery of animal health services?

Noting the myriad of challenges faced in delivery of animal health services, geo-spatial technologies can play a huge role by helping to generate more accurate livestock population estimates, understand disease spatial-temporal risk better and support early warning systems

The main challenge faced in Kenya and in most African countries is the lack of accurate data on livestock populations, their spread and distribution. The commonly used statistics to generate the global livestock distribution maps by the United Nations Food and Agriculture Organization (FAO) does not capture the mobility of animals especially in the extensive livestock production systems.

It is crucial to have an accurate understanding of spatiality of diseases which is important to help deduce where an outbreak is most likely to occur and produce response strategies (e.g. plan when to send vaccines and drugs).

ILRI is implementing activities that are geared towards getting the livestock numbers right and understand the spatiality of diseases to map risks

and vulnerability of diseases such as Rift Valley fever, East Coast fever and Avian Influenza. For example, a study that seeks to provide solutions towards near real time outbreak predictions through virtual environmental observatories is being implemented, to produce temporal risk maps for the East Coast fever in Laikipia County of Kenya. The maps are based on data from satellite images and reports from farmers about their herd.

How can drones be of use to facilitate delivery of animal health services?

Drones can help to get validation points on the ground for improved livestock count, understand livestock/wildlife interactions and movement of animals, assess animal health with thermal images and facilitate quick delivery of vaccines including to areas with poor accessibility.

However, several limitations pose challenges in the use of drones. For example, it is difficult to count the livestock in sheds in the intensive livestock production systems. It also currently impossible to differentiate livestock from wildlife. In accounting for livestock movement, information regarding where the livestock are from and to may not be available.

At the discussion session, a participant noted that in the past (early 1970S) there was the Kenya Rangeland Ecological Monitoring Unit ([KREMU](#)) that produced very accurate reports about livestock locations, stocking range, etc. It was suggested that investigations should done to assess how to collaborate with this unit which is now under the Department of Resource Surveys and Remote Sensing ([DRSRS](#)) at the Ministry of Environment and Natural Resources.

Demand and supply of services and vaccines, and implications of devolved government system

Participants were divided into four groups to discuss the following:

1. What are the constraints and opportunities in demand of animal health services?
2. What are the constraints and opportunities in supply of animal health services?
3. What are the opportunities, challenges and possible solutions in delivering animal health services in a devolved system of government?
4. What are the opportunities and challenges in delivery of livestock vaccines in extensive production systems and how can these be overcome?

Constraints and opportunities in demand of services

A weak information and knowledge system that hampers timely flow of information between the actors emerged as one of the main challenges. Participants highlighted that pastoralists have limited access to information on what animal health services and products are available, where and how to use them. As a result demand and uptake of these services is limited.

Poor infrastructure and limited access to skilled personnel was identified to have significant influence on demand. With poor road infrastructure and communication network, the regions in which extensive livestock production occur are inaccessible and in most cases less attractive for business.

Participants argued that the socio-economic dynamics in these production systems are a major factor influencing demand of animal health services: In most cases, the livestock keepers in extensive production systems do not have sufficient disposable income to enable them pay for animal health services. In addition, the social structures and cultural settings of these systems are not supportive for provision of animal health services hence limited presence of suppliers. For example, some of the areas are prone to conflicts and some communities have a risk management culture that encourages more investment in increasing the herd size as opposed to maximizing offtake.

The activities of some development agencies in these regions was identified as a major factor that limits producers' demand of animal health services. Participants noted that in most areas where development agencies are implementing projects that provide free services, the pastoralists tend to be reluctant to investing in animal health services. As a result, the markets for animal health services and products are distorted and suppliers/service providers do not find it attractive.

All these challenges notwithstanding, participants noted that there are some opportunities in influencing demand if the actors persisted in trying to penetrate these systems to improve uptake.

The large number of animals in these production systems and the demand for services during outbreak of diseases and mass vaccination campaigns present an opportunity for increasing demand for animal health services that suppliers can exploit.

There have been increased partnerships between private sector and government, especially under the devolved government systems which has empowered local economies to invest in provision of these services albeit at a small scale.

Development of new technologies in provision of animal health services and strengthening of extension services through the pluralistic approach that facilitates collaboration between government and non-government actors was highlighted as key in influencing pastoralists to demand for services.

In the recent past, communities are increasingly mobilized to collectively work towards specific issues such as strategies for watersheds. Participants noted that these forums can be identified and used as avenues for concentrating services for increased demand.

Constraints and opportunities in supply of services

Poor information flow and communication among actors recurred as a challenge in supply of animal health services. Participants noted that the poor state of infrastructure limited communication and interaction between suppliers and producers, as well as with other stakeholders in the delivery chain.

High mobility and transhumance of the producers in extensive systems was identified as the major challenge in supply of animal health services. Further, lack of accurate numbers or extent of potential market was noted to hamper private sector's interest and entry in these systems.

Participants also noted that producers in these extensive production systems are highly dependent on government for provision of free animal health services, and they also have less financial resources given that their only source of funds come from sale of animals, to afford animal health services.

Due to the nature of production system in these settings where numbers matter to the producers more, there is lack of a business approach in livestock production. As a result, private sector are not motivated to venture into these areas because in most cases the producers do not appreciate the need to invest in animal health. In addition, there are few trained personnel able to deliver animal health services in these areas.

It was noted that for a long time, the livestock sector has not been prioritized as much as the crop farming sector. As a result, less effort has been put in establishing systems to facilitate supply of animal health services especially in extensive production systems which are also prone to insecurity.

Participants highlighted that the large herd sizes and demand for services in extensive production systems are a great starting point to improve supply. It was noted that pastoralists are very passionate about their main source of livelihood- livestock production- and will invest in it if the services are available.

Discussions pointed the tremendous increase in demand for animal source foods in developing countries as a motivating factor for producers to continue venturing in livestock production. This could pave way for improved supply to producers who are keen in

maximizing profits. There has been an increase in investment in infrastructure in the arid and semi-arid lands of northern Kenya which could potentially open the areas.

Animal Health delivery under devolved system of government

Participants in this session, most of whom were representatives from the County departments of veterinary services, noted shortage of personnel and financial resources as a huge challenge in meeting their obligations of animal health service delivery. While devolution of government functions such as agriculture now mandates the counties to develop the budgets, there is a conflict of interest because the same people involved in resource allocation are also the direct beneficiaries. Bureaucracy in disbursement of funds and approval of activities also severely hamper counties' activities. Participants noted that in some cases, there are no clear lines drawn between the role of national and county governments.

However, devolution was noted to have presented several opportunities for improving service delivery at the local level. For example, the counties have room to tailor context-specific legal frameworks to guide provision of services: Some strides have been made in placing policy frameworks to guide operations for provision of livestock services. For example, in Isiolo County, the Livestock strategy is already in place and they are currently working on the policy. They have also produced a sale yard Bill to guide livestock market operations. Under the devolved government systems, room has been created to spread management and decision-making roles to the people on the ground.

Opportunities were also identified in the [regional pastoral livelihoods project](#) which has enabled the counties to harmonize and coordinate their approach in delivery of services. Counties now initiate and manage vaccination campaigns at the local level, which has in turn led to decreased disease outbreaks. They also have room to produce packages that are specific for their regions. E.g. they can produce and give incentive packages to veterinarians and other investors.

Challenges in delivery of livestock vaccines

Participants noted there is limited knowledge of the vaccines available and their benefits. Producers have no information on where and how to access available vaccines. As a result, there is low demand for the vaccines.

There is also a huge challenge in maintaining vaccine quality from production to delivery due to poor infrastructure in the regions. There is very limited skilled staff with capacity to handle and administer vaccines in the extensive livestock systems.

Participants noted that in most cases there is no coordination or follow up post vaccinations to ascertain their performance and effectiveness. Hence, it is difficult to establish where there could be need to increase supply and initiate increased demand. Little effort has been placed on public communication on the effectiveness of the vaccines, thus, while on the one end there are increased efforts towards producing and availing vaccines to manage livestock diseases, on the other hand the anticipated response from producers in terms of use of the vaccines is very low.

Participants also pointed the unclear policy regarding private sector participation in the delivery of vaccines. Whereas the law allows private sector participation policies of the veterinary department restricts private sector actors in the delivery of vaccines.

Discussions on how to upscale the uptake of vaccine use identified several opportunities that can be explored: Presence of private sector in the vaccine delivery chain in the regions; strategic partnerships with the private sector can be very convenient in addressing the gaps. Further, the large numbers of livestock in these production systems presents a potential for increased demand from communities, if they are aware of the vaccines and benefits. As such, efforts should be placed on education and creating awareness among the producers. Production of user friendly vaccines e.g. thermostable vaccines can be very instrumental in addressing the challenges of maintaining vaccine quality due to the poor structure and challenge of maintaining the cold chain.



Actors' involvement in delivery of animal health services

Participants went into groups to discuss how the challenges identified can be addressed by involvement of different actors in animal health services. Three broad groups of actors were identified to include:

1. Regulators
2. Private Sector
3. Development agencies

Private sector participation

The group was requested to address the following questions:

- *How can the private sector address the issue of inadequate supply of vaccines?*
- *How can the private sector tap into the huge livestock markets in extensive systems?*
- *What kind of information does the private sector require to enable them invest in extensive livestock systems?*

Participants agreed that while the government has the sole mandate of supplying and administering vaccines for notifiable diseases such as Foot and Mouth Disease, the private sector has the freedom to supply and deliver vaccines for other diseases. It emerged that the inadequate supply is not just as a result of inadequacies in delivery, but also in availability. The vaccines manufactured in the country are not sufficient and the gap cannot be met by imports alone. Even though there are some companies licensed and certified by PANVAC to produce vaccines, there is still a huge need for the government to expand production.

The restrictions in terms of who can manufacture and supply vaccines are purely regulatory to ensure quality of vaccines is not compromised. However, entry and maximum participation of the private sector in manufacture and supply of vaccines is hampered by lack of a framework within which this can be implemented. Participants noted that there is no working contract between KEVEVAPI and the counties. As such it was highlighted that it is fundamental for the private and government actors to work very closely to address the gaps identified while meeting the requirements stipulated in the vaccine chain.

To enable the private sector to tap into the huge livestock market in extensive systems, a working profitable model is paramount. Suggestions identified included leveraging public-private partnerships (PPPs) where the government can sub-contract private sector to deliver certain vaccines.

For the private sector to fully penetrate the extensive systems and invest in delivery of animal health services, they require accurate information on livestock populations and spread across the vast regions. Participants also noted that accurate information on extent and size of demand and delivery models that can be explored to meet this demand are highly fundamental to maximize private sector investments. It was suggested that this information can be best generated through the involvement of professional market surveyors or market research companies. Discussions revealed that there is disconnect in flow of information between paraprofessionals and county governments as well as other

actors such as NGOs. The Kenya Veterinary Paraprofessional Association with more than 8,000 members can play a crucial role in mobilizing and reaching producers to deliver animal health services. Inclusive stakeholder involvement was highlighted as a key option in ensuring sufficient information flow and engagement among the actors. County government representatives noted that there are regular County Strategic Group meetings, which can be leveraged to bring on board all actors. For consistent supply of accurate livestock data, use of satellite data was suggested as feasible in the long term. Suggestions presented included the need to consider how to collaborate with the IGAD Centre for Pastoralist Areas and Livestock Development ([ICPALD](#)) who are using some tools to collect this kind of data.

Participation of development agencies

The group was requested to address the following questions:

- *How can development interventions with subsidy arrangements be implemented without hindering private sector growth in the same environment?*
- *What are the available opportunities for development partners to coordinate with other actors?*

While development actors mostly implement their programs in emergency interventions, it emerged that in most areas where development agencies have offered free animal health services, pastoralists tend to avoid paying for the same services offered by private sector. This makes it difficult for the private sector to establish business oriented service provision. As result, consistent provision of animal health services is severely interrupted. Discussions highlighted the need for development actors to work closely with private sector, to influence pastoralists to appreciate the cost of services offered. It was suggested one way in which this can be effected is by developing 'smart subsidies' where pastoralists have to make a contribution in any form or kind; for example, they could offer their time in the programs, their animals in exchange for services and animal health products. Participants highlighted that for sustainability, it is highly fundamental for development agencies to ensure they subsidize only the cost of delivery and the cost of product. That way, private sector is still able to offer their services when the development projects exits. The most profound option that was highlighted was the need to invest in building resilient systems that will not be dependent on emergency responses in case of shocks and stresses.

Coordination with other actors in animal health service delivery was identified as highly invaluable in improving livestock services in extensive production systems. This will not only promote cross-collaboration in development objectives, but will also ensure sustainability of these interventions beyond donor-funded projects. Participants noted that development and implementation of the proposed smart subsidy programs is one way through which development actors can coordinate with private sector and government actors. Discussions also highlighted the need to explore opportunities of market integration of different services required by communities in extensive livestock production systems.

The role of regulators

Discussions revealed that in playing their role of ensuring quality is maintained in the manufacture of vaccines and other animal health products, along with ethical use of products and provision of services, regulators play a huge role in restricting maximum

participation of private sector in delivery of vaccines. Participants also identified regulators as the actors that can sustainably address the issue of the rampant access to and use of counterfeit products observed and reported in the extensive livestock systems. In addition, discussions also focused on what role regulators can play in maximizing information flow between actors.

It was highlighted that the restrictions enforced by the regulators are aimed at preventing introduction of new strains of pathogens for quality control. Further, vaccination of notifiable diseases is government controlled for effective coverage/control. Participants presented that it is only advisable for all actors to work within existing regulations to maximize service delivery.

To address the issue of access to and use of counterfeit products, participants noted that sufficient efforts need to be placed on behavior change communication to educate livestock keepers on how to identify legitimate products and differentiate them from counterfeits, the risks associated with using counterfeit products, why it is important to invest in quality products and where they can access legitimate products. It was highlighted that the regulators should invest in more surveillance to enforce strict use of legal products. Participants also suggested the need to explore the production of a well-known mark of quality for veterinary drugs- which should be a labeling requirement by all manufacturers or importers.

To maximize information flow among actors, it was suggested that livestock information resource platform should be developed, owned and maintained by the government in close collaboration with actors such as research institutions. Forums such as field days to promote available services and regular stakeholder meetings such as the county-level strategy/steering group meetings were also identified as useful for information sharing and engagement of actors.

Case study on innovative animal health services in extensive livestock production systems

Henry Kiara, ILRI

A case study to answer two questions was proposed:

1. Can a profitable private animal health service delivery be established in ASALs?
2. What conditions (policies/regulations) would enhance their viability?
3. E.g. bundling of services to make the system profitable.

The proposed approach involves partnering with private sector to create regular clinical veterinary runs, through high livestock concentration points such as markets, watering points, grazing areas. It was noted that even though the case study's focus was on animal health service delivery, eventually the results could contribute to the entire livestock service portfolio and even other services such as human health and education.

In groups, organized according to types of actors, namely regulators, development partners and the private sector, participants discussed how the case study would contribute to their objectives and what role they can play.

Regulators

Participants expressed their support for this study, noting that it would be very opportune in helping to bridge the gaps presented by the constraints in extension services. Participants highlighted the need to include abattoirs as one of the nodes in the clinical runs, linking to the abattoir surveillance PP2 forms which are used to trace incidences of CBPP. Discussants were concerned about the type of private partners to be included in the study, and whether these would be local or external companies.

The County Directors of Veterinary Services sought to establish their role in the study; they expressed their interest in providing technical backstopping as needed.

Probing the study's model which proposed to use interns, the participants asked if the focus would be on already deployed interns or if they would engage new interns. They further stated that it would be more sustainable for the study to engage qualified animal health assistants rather than interns.

Development actors

Participants in the group also expressed support for the study, noting that partnership with the animal health service providers is the best approach. Participants were keen on obtaining information regarding the selection process of the partners. Discussions noted the need to include both dry and wet seasons in the study as they provide different challenges in service delivery. Representatives from the Kenya Markets Trust (KMT) were keen on partnering in the study, to piggy back on their on-going activities in Turkana County.

Participants also expressed their concern on engagement of interns, noting that this may not be sustainable because interns may not be available in the long run. They suggested that instead, the study should work with local animal health assistants with an interest in

establishing business enterprises out of animal health service provision. They also suggested that on engagement of the CDRs, the study should identify those who are already engaged in some form of business-oriented service provision, to ensure they will be interested in implementing the identified models once the study concludes

Participants suggested that the study should consider inclusion of other services in the run, as a way of exploring the option of services bundling for communities in extensive livestock systems

Private sector

Private sector representatives also expressed their support for the study, highlighting that the proposed model would significantly reduce cost of delivery of services. They stated that the study should only work with the animal health service providers who are registered by the Kenya Veterinary Board.

Discussions highlighted that the study should produce terms of engagement for the various partners. This, they said, would define the roles of each entity and will ensure continuous engagement with the regulators.

Participants noted that livestock producers face a myriad of challenges not just in livestock production, but in other sectors as well; they presented that the study should explore how to include other services in the proposed models, noting that bundling of services offered will increase business returns for the private sector. For example, the study could consider how to include provision of the full range of livestock services including feeds, extension services, tick control etc.

County government

Representatives of the county government articulated that the study will significantly contribute to their objectives and targets, and can be an entry point for delivery of other services to the communities. Noting that the delivery of animal health services had faced immense challenges in delivery due to high transport costs and lack of access to finances, participants believed that the clinical runs would help address some of the challenges.

They suggested that in designing the routes for the clinical runs, possible migration of livestock should be considered.

Participants suggested that choice of private sector involvement should be influenced by their availability and ability to participate in the study to completion. They maintained that vaccine regulation would still continue to avoid misuse

They stated that they would be willing to contribute their time and will be happy to appoint an officer in the sub-counties of operation.

Conclusions

Discussions noted that delivery of animal health services had faced serious challenges due to high delivery costs and an assumption that pastoralists are poor and will not invest in animal health services. They maintained that this is a notion that needs to be discarded because pastoralists know the value of their animals and will invest in protecting them. The main hurdle they face is lack of timely access to information and knowledge on where to get services and how to use available products

Participants suggested that investments need to be made in the meeting points such as water points, cattle dips and markets, where producers regularly converge. That way, service providers can efficiently access producers and bundle services.

Participants were in agreement that the proposed study was a major step in bringing together all actors in animal health service provision, and will help to identify synergies in efforts towards improving delivering livestock services in extensive production systems

It was noted that significant efforts need to be placed on awareness creation to encourage producers to converge at the identified meeting points. Planning should also be based on the seasonal calendars and shared with major stakeholders

Annex 1: Workshop program

Delivery of animal health services in extensive livestock production systems

9 and 10 March 2017

Day 1			
Session 1			
Objectives:	<ol style="list-style-type: none"> 1. Generate and share insights on major challenges and opportunities to commercialization of animal health services in extensive systems and seeking effective ways to increase coverage with livestock vaccines 2. Contribute to the design of the TechnoServe/ ILRI case study on the private animal health service delivery to gather evidence for decision makers 3. Networking and stimulating discussion a shared vision for the delivery of animal health services 		
Host:	ILRI and TechnoServe		
Venue:	ILRI, Nairobi		
Time	Session Description	Objective	Responsible
08:00-9:00	Registration/ Refreshments	Networking; Guide participants to venue	Rosekellen
Session 1: Introductions			
09:00-9:20	Welcome, Introduction of participants and objectives of the meeting	Stakeholders introduce themselves and their institutional affiliation	Facilitator
09:20-9:30	Official Opening	Welcome the participants and make a few introductory remarks	Iain Wright, Deputy Director General, ILRI
09:30-9:50	Introduction to TechnoServe and IOM	Introduce TechnoServe and provide an overview of the IOM project to convey understanding of the IOM initiative, the livestock study and the workshop goal and their role as stakeholders	David Galati: Regional Director-East Africa
9:50-10:00	Introduction to ILRI AHH/AVCD	Provide overview of the ILRI AHH program	Vish Nene: AHH Program Director
10:00-10:10		Overview of AVCD Livestock Program	Henry Kiara-Scientist Animal Health Program
Session 2: Delivery Issues			
10:10-10:40	Delivery of animal health services in extensive livestock production systems	Delivery of Animal Health Services: Opportunities and challenges in the extensive systems	Kenya Botswana Mali
10:40-10:50		Opportunities for using geospatial technology in AH delivery	Catherine Pfeifer
10:50-11:10	Coffee break		
11:10-12:10	Constraints and opportunities in demand of services	Group 1: Participants lay out their context, then list out key constraints and opportunities on the demand side as they see them and possible solutions	Facilitator

	Constraints and opportunities in supply of services	Group 2: Participants lay out their context, then list out key constraints and opportunities on the supply side as they see them and possible solutions	
	Anima Health delivery under devolved system of government	Group 3: Participants list opportunities and challenges of AH delivery in a devolved system of government and possible solutions	
	Challenges in the delivery of livestock vaccines	Group 4: Participants list the opportunities and challenges of delivery of livestock vaccines in extensive livestock systems and how they could be overcome	
12:10-1:00	Plenary presentations by groups		Facilitator
1:00-2:00	Lunch Break		
Session 3: Specific Issues			
2:00-3:00	Specific issues directed to relevant groups to offer solutions	Group activity addressing specific challenges and opportunities raised: Gp1: regulators GP2: Private sector GP3: Development Agencies	Facilitator
3:00-4:00	Feedback from group discussions	<ul style="list-style-type: none"> Regulators Private sector Development agencies 	Groups appoint presenters
4:00-4:30	Close day 1	Wrap up of key points on discussions held: constraints; opportunities; shared vision	Facilitator
5:00-7:00	Cocktail reception	Networking	Rosekellen
Day 2			
Time	Session Description	Objective	Responsible
08:00-08:30	Refreshments	Networking; Guide participants to venue	
08:30-09:00	Welcome, Introduction of new participant(s)	Recap day 1	Facilitator
09:00-09:20	Proposed case study	Key study questions, geography, respondents, role of government and private sector, outputs	Henry Kiara
09:20-10:30	Group Comments on design of case study	Group deliberations: <i>"How can the study help your sector fulfill its mandate/priorities?"</i>	Groups appoint a lead person
10:30-10:45	Coffee Break		
10:45-12:00	Group presentations on suggestions for study	Group 1: Regulators What are your specific comments on the study?	Group presenter and Q&A
		Group 2: Private sector: What are your specific comments on the study?	
		Group 3: Development: What are your specific comments on the study?	

Time	Session Description	Objective	Responsible
12:20-12:40	Next steps	ILRI provides a guide on the next steps	Henry Kiara
12:40-1:00	Wrap up	Closing remarks from selected participants	Facilitator
1:00	Lunch and departure		

Annex 2: Participants

No	Name	Email contact	Sex	Country of origin	Country Classification (Developing/Developed)	Institution/Title
1	Ali Noor Mohamed	cdvsmandera@gmail.com	M	Kenya	Developing	CDVS-Madera county government
2	Michel Mainack Dione	mdione@cgiar.org	M	Uganda	Developing	Scientist-ILRI
3	Jackson Mwai Kinyua	jacksonkinyua@yahoo.com	M	Kenya	Developing	CDVS-Garissa county
4	Mohamed Yussuf	Mohamed.m.yussuf@gmail.com	M	Kenya	Developing	Consultant-Kenya Markets Trust
5	Daniel Chege Macharia	dcmacharia12@yahoo.com	M	Kenya	Developing	CDVS-Samburu
6	Boku Bodha	mbtcountyvet@gmail.com	M	Kenya	Developing	CDVS-Marsabit County
7	Benson Etelej Longo'r	benson.longor@turkana.go.ke	M	Kenya	Developing	CDVS-Turkana county government
8	Gareutlwane Gaopatwe	ggaopatwe@gov.bw	M	Botswana	Developing	Dept. of Veterinary Services - Botswana
9	Kenneth Makubate	kmakubate@bmc.bw	M	Botswana	Developing	Executive Manager-Botswana meat commission
10	Stephen Ndungu Kinyiia	skinyiia@yahoo.co.uk	M	Kenya	Developing	CEO- Kenya Livestock Finance Trust
11	Christie Peacock	Christie.peacock@sidai.com	F	Kenya	Developing	Founder-Sidai Africa Ltd
12	Thomas Manga Njoroge	thomasmanga@yahoo.com	M	Kenya	Developing	Asst. Director Veterinary Services, Kenya
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14	Miriam Wanza Mulei	mmulei@kenyamarkets.org	F	Kenya	Developing	Intervention Manager-Kenya Markets Trust
15	Mary Waithira Ngogu	info@kupa.co.ke	F	Kenya	Developing	Kenya Veterinary Para Professional Association

16	Martin David Muinde	mdmuinde@kenyavetboard.or.ke	M	Kenya	Developing	Kenya Veterinary Board
17	Kieran Avery	kieranavery@gmail.com	M	Kenya	Developing	Livestock Specialist-NRT
18	Wilhelm Duehnen	duehnen@vsfg.org	M	Kenya	Developing	Managing Director-VSFG
19	Paul Ngugi	pngugi@ths.org	M	Kenya	Developing	Project Analyst-TechnoServe
20	Joseph Njoroge Karanja	info@agrochem.co.ke	M	Kenya	Developing	Agrochemicals Association of Kenya
21	David Galaty	N/A	M	Kenya	Developing	Technoserve
22	Dorine Odongo		F	Kenya	Developing	ILRI
23	Paul Karaimu		M	Kenya	Developing	ILRI
24	Henry Kiara		M	Kenya	Developing	ILRI
25	Muthoni Njiru		F	Kenya	Developing	ILRI
26	Catherine Pfeifer		F	Kenya	Developing	ILRI
27	Vish Nene		M	Kenya	Developing	ILRI
28	Laura Katana		F	Kenya	Developing	TechnoServe
29	Ambrose Munene		M	Kenya	Developing	TechnoServe
30	Adelaide Ruri		F	Kenya	Developing	TechnoServe