



Community conversation gathering in Menz, Ethiopia

Photo A. Habtamu/ILRI

Review of Capacity Development activities within the Livestock Health Flagship of the CGIAR Research Program on Livestock

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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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BACKGROUND

The Livestock Agri-food systems CRP was launched in 2017 and will run to 2021 inclusive, <https://livestock.cgiar.org>. This 5-year program is in part a continuation of research lines initiated within the former Livestock and Fish CRP that was terminated in 2016. It aims to sustainably increase the productivity and profitability of livestock farming, thus making animal food products more available and affordable. The current Livestock CRP brings together a consortium of five core partners: the International Livestock Research Institute (ILRI), the International Center for Tropical Agriculture (CIAT), the International Center for Research in the Dry Areas (ICARDA), the Swedish University of Agricultural Sciences (SLU) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), with ILRI as the coordinating organization.

Important parts of the present Livestock CRP are the crosscutting capacity development (CapDev) activities that will ensure that research results are relevant, practicable and adequately reach the end users targeted. The CapDev aspects include both the capacity to undertake animal health research and to convert the research into practical use utilizing innovative approaches to communication of information.

The Livestock CRP is addressing five major areas of study, designated 'flagships', where CapDev activities within the Flagship Livestock Health (FLH) are the issue for the present review. FLH is organized in four clusters of activity, namely 1) Epidemiology, 2) Herd health, including endemic diseases and reproduction, 3) Vaccines and diagnostics, and 4) Delivery. Cross-cutting themes are 1) Gender and youth, 2) Monitoring and evaluation, and 3) Capacity development. The latter includes extension activities such as courses and training for extension workers and (para)veterinarians (field animal health workers) – and thereby indirectly for farmers – according to the concept 'training the trainers'.

At the Flagship steering committee meeting in Addis Ababa in June 2019 it was settled that a review should be undertaken to assess to what extent CapDev goals were fulfilled and to identify areas for possible adjustments and improvements, thus contributing to refinement of the extension activities. Targets for the review should be extension and training actions linked to small ruminant farmers in Ethiopia and pig farmers in Uganda.

Professor Arvid Uggla, SLU, was selected as an external expert for this task. Prof Uggla is a veterinarian with a background as Professor of parasitology at SLU where he also acted as Dean for the Faculty of Veterinary Medicine and Animal Science and later as Director for the SLU program Agricultural Sciences for Global Development (SLU Global). The present review is based on written documentation from FLH as well as interviews and information that were collected on site in Ethiopia and Uganda during November 2019.

INTRODUCTION

This review does not include a catalogue or assessment of the particular research reports and scientific papers produced within the framework of FLH (Cf. Appendix 1). In my opinion, these papers are of good quality and well meet adequate scientific standards. The doctoral projects included in the program also appear to be relevant, ambitious and forward-looking in terms of building capacity for animal health research with a focus on African livestock. Emphasis in this review will be laid on a valuation of some of the specific extension components within FLH which I deem are particularly innovative and will have the potential to make lasting impressions. One element is the concept of so-called Community conversations (CC) conducted primarily in Ethiopia with smallholder sheep and goat farmers as the target group. A second element is the extension activities carried out in Uganda utilizing the Interactive Voice Recording (IVR) concept and having smallholder pig farmers as main target.

Common to the CapDev operations in both Ethiopia and Uganda is the utilization of printed and/or digitally available extension leaflets that have been produced within the Flagship on topical animal health issues. These materials are used to support the CC and IVR activities and will thus also receive special attention.

EXECUTION OF THE STUDY

Ethiopia

Beside discussions with involved researchers at ILRI/ICARDA I had the opportunity to participate in extension activities at Mehalmeda, Menz Gera district, Amhara region, where I could study the performance of so called Community conversations in detail. In this context the researchers and local extension partners discussed and conducted in-depth interviews with smallholder livestock keepers concerning their attitude towards animal health services, drug treatment of animals, antimicrobial resistance and other aspects of livestock health issues.

ILRI/ICARDA associates during the field exercises:

Dr *Mamusha Lemma Woldegiorgis*, ILRI, process owner Community conversations

Mr *Biruk Alemu Gemed*a, ILRI/ICARDA, doctoral student Addis Ababa University, Debre Zeit

Mr *Mesfin Mekonnen*, ILRI, veterinary researcher

Mr *Tibebu Wube Tekle*, ILRI, factotum

I also had the opportunity to visit and discuss with the staff at the regional Agricultural Research Centre at Debrebirhan, which is a partner to FLH. The centre is involved in animal disease diagnostics and hosts a laboratory equipped for bacteriological, parasitological and serological analyses. I got the impression that this lab, although rigged with some state-of-the-art instruments, lacked the resources to take advantage of its potential.

Local partners at the Debrebirhan Agricultural Research Centre:

Mr *Shambel Besufkad*, animal breeding and genetics researcher and livestock research process owner

Mr *Firdawok Ayele*, animal health researcher

Mr *Shenkute Goshme*, animal breeding and genetics researcher

Mr *Enyew Alemnew*, veterinary officer and researcher (also joined us to Mehalmeda)

At the Menz Gera District Livestock Development Centre at Mehalmeda I participated in discussions with the local Animal Health Team about their experiences and difficulties met in the extension work. Their activity focus was based on local demands including small ruminant pasteurellosis, sheep-pox and liverfluke infection. The importance of reaching and listening to the female animal keepers and taking part of their experiences was particularly emphasized.

Partner Animal Health Team at the Mehalmeda Livestock Development Centre:

Mr *Yifru Demeke*, animal scientist, animal health service team leader

Mr *Mohammed Seid*, district veterinary officer, animal health extension worker

Ms *Tseganesh Kelemwork*, livestock expert with focus on gender issues

Uganda

The FLH CapDev operations in Uganda focus on management and health of the pig which is a popular and increasingly important livestock of smallholder farmers in the country. The activities include training and teaching of extension workers at the regional level, where much emphasis is placed on the management and control of African Swine Fever, ASF. However, also parasitic diseases, respiratory diseases and the prudent use of antibiotics and other veterinary drugs are in focus. Veterinary pharmacists and animal aggregators/traders are also targets for the extension work.

Primary ILRI associates at my work in Uganda:

Dr *Michel Dione*, ILRI Animal Health Flagship country coordinator, Burkina Faso, animal health scientist

Mr *Edwin Kangethe*, ILRI Kenya, digital extension and scaling specialist

Dr *Ben Lukuyu*, ILRI country representative Uganda, animal nutritionist

Dr *Emily Ouma*, agricultural economist (unfortunately on travel during my visit)

In Uganda I had the opportunity to visit a number of smallholder pig farmers as well as a larger pig breeding herd, a couple of pork slaughter slabs and a 'pork joint' serving freshly grilled pork. Together with the local animal health workers we also visited a veterinary pharmacy and a slaughterhouse building under construction by a local pig farmers' cooperative. I also had the opportunity to discuss with the staff at the local animal health center in Masaka about their experiences from the extension work.

Animal Health Team at Masaka:

Mr *Lawrence Mayega*, district veterinary officer, Head of centre, point of contact for the CRP

Mr *Lubeya Stephen Wakulira*, veterinary officer

Mr *Henry Sserwanyiri*, animal husbandry officer, animal health extension worker

I also visited Makerere University, the only university in Uganda with a complete College of veterinary medicine and with which FLH is collaborating on various aspects of the

program. I met with Dr Nsadha Zachary who is involved in the preparation and adaptation of information and training material dealing with porcine issues. Despite the growing importance of the pig industry in Uganda, and its great challenges, it appears that the College does not have an academic chair specialized in porcine management and health.

Dr Nsadha Zachary, lecturer, Makerere University

Mr Peter Oba, doctoral student in herd health, Makerere University

It was a great opportunity to visit the Department of Animal Production of the Ministry of Agriculture, Animal Industry and Fisheries, Entebbe, and to meet with two veterinary experts where Dr Kituuka was specifically involved in pig issues and of course particularly concerned about the growing risks for uncontrolled spread of African swine fever (ASF).

Dr David Nsubuga Kituuka, senior veterinary officer (animal health)

Dr Deogracious Wonekha, senior veterinary officer (primarily dairy issues)

Beside the local experts mentioned above, I had discussions with the management of FLH: *Prof Ulf Magnusson*, SLU, Animal Health flagship leader *Dr Barbara Wieland*, ILRI, Herd health team leader

The following researchers were also interviewed:

Prof Magdalena Jacobsson, SLU, professor porcine medicine

Ms Elin Gertzell, SLU, veterinarian, doctoral student

Ms Elisabeth Genfors, SLU, veterinarian, doctoral student

Ms Ulrika Konig, Swedish Animal Health Service, veterinarian, instructor at post-mortem training courses in Ethiopia

ACKNOWLEDGEMENTS

In conducting this review I especially wish to express my thanks to the Heads of the Flagship

Livestock Health, Prof Magnusson and Dr Wieland, for valuable inputs, and to Edwin Kangethe, Dr Michel Dione, Dr Mamusha Lemma and Biruk Gemedo for inspiring discussions and interactions. I am also grateful to Art director Kjell Lundin, Explicare, for expert comments and advice on information design.

SWOT – STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS

Before conducting a review of the FLH CapDev operations, it may be illustrative with an initial SWOT analysis of the CRP with special reference to livestock health aspects as addressed by the Flagship. Such a SWOT analysis can be summarized as follows.

Strengths

- ILRI – the responsible organization for the CRP – is a well-known international research institute in livestock production and health with an excellent reputation with both donors and end-users
- ILRI's location in Africa and its long-established contacts with national governments and regional extension partners guarantee relevance and focus on crucial issues

- The Livestock CRP brings together expertise from both international and regional universities under ILRI's authority
- Participating staff are recruited impartially based on their personal qualifications
- The combination of regional and international expertise enables participating researchers both to learn from and to influence each other
- The program's activities rest on a scientific basis that is not dependent on short-term political trends or public opinion
- Both ILRI and the participating academic institutions have a tradition of independent and credible reporting of achieved results

Weaknesses

- The short-term funding of the program and its narrow limitation in time
- Much actual time and effort is devoted to applications/proposals and part-time reports
- Lack of competence of recipients at different levels
- Large number of native languages to consider – few from participating staff master the local languages, leading to possible misunderstandings and unnecessary distance between researchers and recipients
- Large geographical distances between participating parties in the consortium

Opportunities

- Growing public and political awareness that an increased animal production is necessary for optimized nutritional supply, poverty reduction and enhanced welfare
- Increasing understanding of the need to develop more efficient livestock production systems with improved animal management and health to mitigate their environmental impact
- Livestock appears presently to be a priority by the governments in both Ethiopia and Uganda
- Many animal diseases can be transmitted to humans. The time is right to focus on livestock health issues – recipients at all levels are well motivated
- Livestock production issues in Africa are clearly gender-dependent and therefore deserve particular attention
- The value and importance that farmers put to their animals is an opportunity in itself
- Animal welfare issues are gaining increasing sympathy globally, especially among young people
- The involvement of several universities in the program enables participating personnel to upgrade their academic skills, leading to a leverage of staff competence

- The continuously increasing utilization of cellphones and smartphones among farmers widens the potential for rapid advances in dissemination of livestock-related knowledge through the use of novel information and communication tools
- A well-executed program creates the conditions for a continuation and expansion of the program concept through extended funding and enabling new players to seek collaboration. ILRI has a great potential to become a hub for even broader, global partnerships in the livestock health field

Threats

- Political unrest in target countries may limit the opportunities to perform necessary fieldwork
- Outbreaks of infectious diseases in humans or animals make travel and practical work in the field impossible
- Partnering national authorities may no longer consider the program relevant
- Unattained results or otherwise weak reports may reduce the interest of donors to fund a continuation of the program
- Campaign based efforts from the government or regional authorities may not be efficient as they lack endurance due to insufficient funding and leadership
- Key researchers may leave the program for other opportunities

A. COMMUNITY CONVERSATIONS

As part of the FLH extension work in Ethiopia, Community conversations (CC) have been tools to reach farmers and community members and to allow involved researchers and local extension partners to take part of their experiences of animal diseases, their treatment and control. The CC have thus been essential tools for the gaining of deeper knowledge of farmers attitudes and basic problems that they meet with their animals. In Ethiopia the CC are focused on problems involving small ruminants and in particular issues related to antimicrobial resistance, zoonotic diseases, parasite control and animal welfare. The exercises also include active dissemination of information from the FLH researchers and their local partners on, among many things, the prudent use of antimicrobials and the virtue of animal welfare measures for the benefit of the animals and improvement of production. Since the regional partners of the Flagship such as local veterinary and animal health workers participate actively in the CC, these exercises create an opportunity and example for these professionals to engage in down-to-earth dialogue with the farmers and to approach their practical problems. This gives necessary insights and strengthens the capacity of local partners in their development work.

An important aspect of the CC has been the gender perspective taking into account that the bulk of management and care of the family's livestock are responsibilities of the women. Consequently, they are invited to the CC on the same conditions as their male associates, and the meetings thus contribute to increase the women's access to

information and it underpins their key role in the development of the livestock industry in Ethiopia.

No doubt CC are tools that are appealing both for research and for active capacity development of farmers and, more importantly, for the local development partners. It has been a pronounced strategy of the Flagship to involve local and regional diagnostic laboratories and animal health workers as partners and intermediaries. The goal has been to support their continuing education and teach them how to independently use these tools.

Dr Mamusha Lemma, process owner of the CC in Ethiopia, has made personal reflections in relation to the CC; cf. Appendix 2.



Members of a Menz community in the Amhara region of Ethiopia gather for a community conversation, led by researchers from ICARDA and ILRI, together with local authorities and national partners. Photo A. Habtamu/ILRI

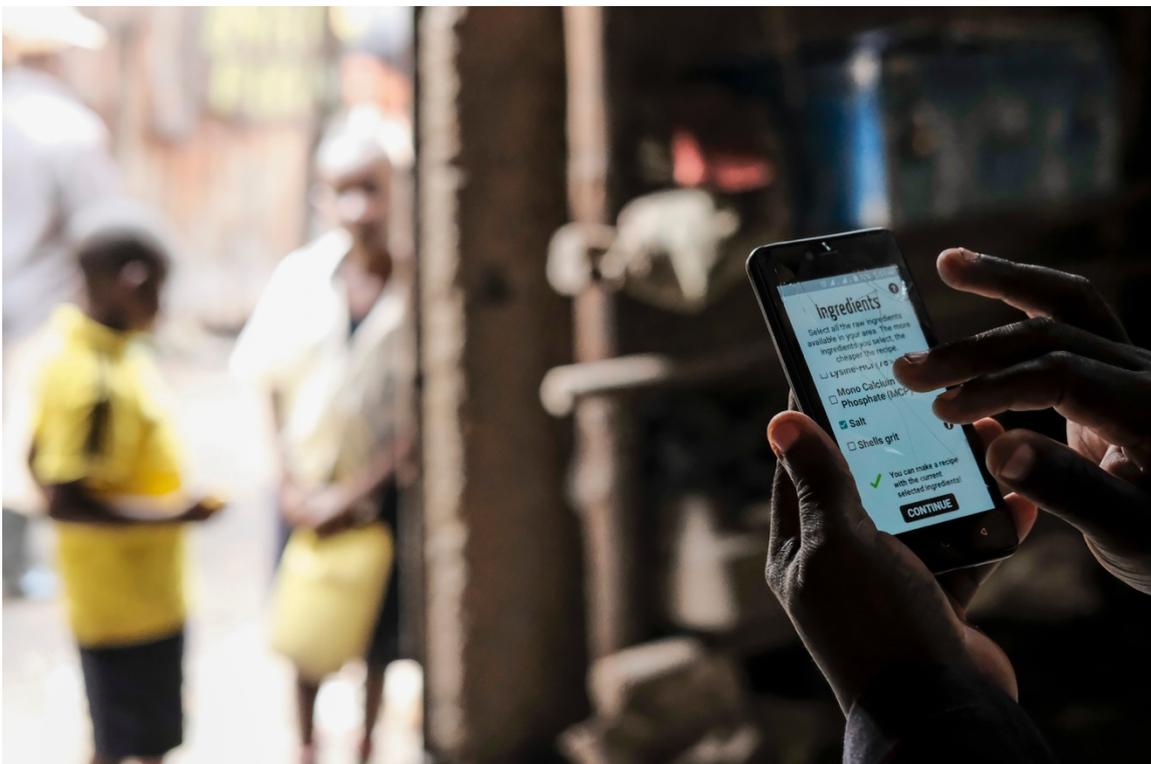
B. INFORMATION AND COMMUNICATION TECHNOLOGY (ICT), WITH SPECIAL REFERENCE TO THE INTERACTIVE VOICE RESPONSE (IVR) PROGRAM

In Uganda a particular activity within the extension work is the interactive voice response (IVR) program that is being developed here as a pilot operation. It is presented in the form of recorded sketches that illustrate different disease situations with pigs where farmers via their mobile phones can get advice and answers to various questions about care and diseases of their animals. The IVR in this context has had its initial difficulties but on the whole the concept has been positively received by the farmers and partner extension workers.

With the increased accessibility of mobile phones and smartphones that can be expected to continue at a rapid pace in Africa, the IVR concept and technology is undoubtedly particularly promising. It can be developed in many ways where a next step could be the

production of animated videos that can be read in smartphones or used with projector at extension activities where farmers gather for informational meetings. Battery-powered projectors could then be used by extension workers to project the videos onto a wall or portable screen. The advantages of animated films compared to using actors are that they are not time-bound in terms of clothing and other cultural expressions and that they could easily be translated into different languages in the target countries. If the animation concept is used, it is also technically relatively easy to continuously make changes to the layout and message when needs arise. The same videos can be used in many different countries if appropriate linguistic, regional and content adjustments are made. In my opinion, this concept has a great potential and I deem it very likely that it would be possible to get significant donors from commercial, NGOs and governmental parts to support a large-scale investment in the further development of this technology.

ILRI's Edwin Kangethe has been a driving force in the development of the IVR activities and he has summarized his visions on a further development in this way: "DVO in Masaka has plans to buy a projector for use in training farmers. Audio-visual animation videos can then be used to moderate the sessions so that the extension agents spend their time answering farmers questions and not passing on raw information. This format also refreshes the extension staff with new information and ensures that a standardized message goes to the farmers every time. These videos can also be saved in mobile phones by extension agents to share with individual farmers." Cf. Appendix 3.



The CapDev team is exploring ways to use mobile phones to interact with farmers and input providers along value chains, to enhance extension services. Digital partners in Uganda are providing these services at reasonable costs. Photo K. Dhanji/ILRI

C. EXTENSION LEAFLETS

It is decisive for successful control of animal diseases that all involved parties possess equal and up-to-date knowledges on how to manage livestock disorders. This is important for the farmers affected, but even more so for the field animal health workers who come into direct contact with the clinical cases and are expected to communicate relevant advice to the livestock keepers.

Consequently, within FLH much work has been devoted to developing information and training materials for use in extension situations. The leaflets that have been produced so far, some of them in the framework of the preceding Livestock and Fish CRP, constitute an ambitious effort. However, an underlying plan for prioritization between topics is not evident and no schedule for a possible serialization of the publications is provided.

Instead of mainly covering specific diseases in the extension leaflets, information which in most cases is already available in textbooks or online, consideration could also be given to discuss the diseases based on their symptoms and how to diagnose them through clinical and laboratory examinations. Particularly important is to emphasize the importance of field adapted diagnostics including post-mortem examinations. The latter has commendably been addressed by FLH in Ethiopia by providing a special training course for veterinarians on necropsy procedures.

Graphic design and how information is presented in printed format is crucial to capture a reader's interest and to make it absorb the message and incorporate the new knowledge. Therefore, the expected recipient of the particular message must be obvious and the information should be designed in a way that gives the best conditions for the intended target group to access the content. The material should thus be presented so that it links to the concepts and experiences of the target group. This means that information aimed at farmers should be designed differently from that aimed at extension workers and others with a background of specialized training.

To reach people who are not fully literate, an option is to more consciously use descriptive illustrations in the format of, e.g. comic strips. The drawings in the printed extension material produced so far are often weak, poorly informative and provide no inspiration for further reading. The photographs used are adequate, but they are often unnecessarily small and seem to be used more as decorative elements than as intentional information carriers. In order to facilitate for a reader, especially one who is not used to take in written information, particularly not in a foreign language, modern graphical tools should be used to support the knowledge transfer. The progress made during recent decades in the field of information design should thus be considered.

Dr Mamusha Lemma has summarized these aspects in the following way (Appendix 2):
“There is a need to strengthen communication and extension material development capacity of local research and development partners. ... Such communication and extension materials should not be produced by technical people alone, it needs to also involve community members and communication experts.”

REFLECTIONS AND RECOMMENDATIONS

Antimicrobial resistance

Much focus in the FLH extension work appears to be laid on the issue of antimicrobial resistance involving both antibiotics and anthelmintics. This is no doubt a global problem of greatest veterinary and medical significance. However, the notion of treatment failure after use of antimicrobial drugs and uncritically linking this outcome to antimicrobial resistance seem to be based on the assumption that medical treatments of animal diseases by definition should be successful. At least this attitude appears to be embraced by the local advisors. However, many medical treatments of diseases that are not professionally confirmed may not be effective simply because the disease in question is not caused by an infective agent at all or by one that is not biologically susceptible to the drug used. Other more obvious causes of treatment failure are adulteration or fraud of drugs purchased from deceitful dealers, or by excessive dilution or otherwise inappropriate calculation of dosages. Thus, far from all treatment failures of animal diseases that have not received a proper diagnosis are due to antimicrobial resistance. A decisive problem in this context is that the capacity to diagnose animal diseases, both clinically in the field and confirmatory in laboratories, is clearly insufficient in most countries involved in the FLH. Local farmers evidently respect skilled professionals but mentioned that animal health workers often did not even touch the animals when attempting a clinical examination.

Reliable diagnostics

Animal health management and control of livestock diseases cannot be effectual and meaningful without an animal health organization that includes trained field workers as well as reliable diagnostic laboratories under the auspices of regional and ultimately a central animal health organization responsible for official supervision and administration of diagnostic data. Effectively functioning such organizations seem to be missing in both Ethiopia and Uganda.

Among community animal health workers as well as the staff in regional laboratories much expectations and credence is given to lab bench diagnostics such as serological tests for various infectious diseases, including ASF. It must however be emphasized that results from these tests must be interpreted with a critical mind if the analyses are not performed or supervised by experienced personnel and if relevant controls are not included for the specific infection under study. Serological results are useless unless they are put into their context on the actual farm, and they are counterproductive both if false positives and false negative results are communicated to the farmers, local animal health workers or regional or national authorities. And if measures are taken (or not taken) due to misleading results this will result in lost confidence for the animal health authorities.

Within the CRP, considerable effort is laid on the development of novel diagnostic assays (and vaccines), although the responsibility for this lies within another Flagship than FLH. No clear breakthrough in this area has been presented, but if it does it is likely to still have a marginal impact on general animal health work in the countries concerned. However, this situation is not due to the absence of certain specific diagnostic assays, but rather to

the fact that the entire infrastructure for the diagnosis of animal diseases at both local, regional and central levels is neglected and under-dimensioned – not least as regards availability of trained and experienced staff. When discussing diagnostic competence, main emphasis within the CRP appears to be laid on the development of laboratory diagnostics. This is no doubt an important component, but the clinical diagnostic capability in the field is, after all, the basic instrument.

Many of the farmers' primary contacts in animal health issues are with the local veterinary drug dealer who scarcely will have the full picture of the case and who would hardly have no other interest than making money selling medicine. It is therefore advisable in the extension work to also pay attention to the important role of the veterinary drug dealers and to involve them even more in these efforts.

Record keeping

In order to establish a diagnosis at outbreaks of livestock diseases, a professional with sufficient skills is required and who is prepared to visit the farm and make the necessary examinations and documentations. The need for all animal health workers to keep records when visiting farms must be emphasized. A digital 'journal template' could be developed and adapted for use for instance with a smartphone.

Animal welfare and humane slaughter

Although it may be outside the scope of this review it is my opinion that animal welfare aspects need to be more clearly included in the CapDev work, not least as regards the slaughter process which has also strong connection with general hygienic measures in this context. Humane slaughter includes decent handling of the animals, stunning before bleeding, and not allowing still live animals to watch the unnecessarily violent handling of their fellows at killing.



Workers from a small abattoir in Masaka, Uganda, clean up a newly slaughtered pig carcass. Photo K. Dhanji/ILRI

A positive development is taking place at Masaka by farmers teaming up to establish a cooperative slaughterhouse which will hopefully replace several of the defective slaughter slabs that currently handle the slaughter of pigs in the provinces. The 'slaughter slabs' with their untrained butchers, blunt knives and non-existent waste management are sources of environmental contamination, food hygienic hazards and animal welfare challenges that make it necessary to replace them with professionally managed abattoirs. The slaughterhouse workers need to be professionalized and trained in humane animal handling and slaughter, meat hygienic measures and proper waste management.

Since traders/aggregators and butchers are key actors in the spread of infections, particularly in the pig production chain, training of these categories should be prioritized and accommodated as an activity within the FLH or its sequel.

Dialogue with the highest political and administrative levels in participating countries It may be unnecessary to emphasize that the development of a functioning livestock health organization in a country must ultimately be based on the establishment of a regional capacity to reliably diagnose and confirm livestock diseases in the field. This must start with the academic training of veterinarians and other animal health professionals and requires long-term investments in higher education and scientific research. The neglected ability of many African governments and universities to fulfill this task is a fundamental problem that creates dangerous obstacles in the development of working national animal health systems.

Of course a livestock health research and capacity building program such as the present CRP cannot alone bear this responsibility, but by providing relevant data and working examples it can contribute to knowledge transfer to decision makers in national governments and regional authorities. Within the framework of FLH such direct contacts with ministries has already been established in an exemplary way, which I could personally witness in Uganda. The CRP could more consistently make available its reputable research organization and provide expert knowledge and scientific advice in dialogue with ministries and authorities in involved countries.

Bring the information leaflet concept up to date

Use the leaflets and other printed material as an integrated part of the FLH activities in a comprehensive and well-reasoned strategy for information dissemination. Publication of the information material should be preceded by an analysis of which kind of information needs that are most urgent. The target group must be made obvious and this should permeate the design of the material. Collaborate actively with a professional graphic designer and create a graphic profile that clarifies the context and signals both who is the messenger and the intended receiver.

Fulfil a translation to local languages and adapt to conditions and thinking frames of the intended receivers. Far from all local animal health service providers are trained

veterinarians. It should be considered to make the extension materials more generic for parallel use in different languages following necessary adaptations.

As a complement, animated videos could be produced with educational messages about the management of livestock diseases. Such films/videos could easily be adapted to different languages and conceptual frames. With today's technology, such videos can be viewed by using a smartphone connected to a battery-powered data projector and projected on a screen in a meeting room or outdoors, thus even without access to fixed electricity.

SUMMARY CONCLUSIONS

- The ultimate goal of the CapDev activities within FLH is to contribute to the build-up of national clinical and laboratory capacities to identify and control animal diseases. A prerequisite for this is the presence of a science-based training of veterinarians and other animal health professionals at the university level. The consortium behind the CRP provides an internationally recognized scientific expertise on relevant animal health and production issues and holds a potential to contribute with expert advice to national authorities, university managements and other decision makers. This capability should be utilized in a systematic way.
- A great challenge in terms of the capacity building activities of the Flagship is the intended up-scaling. This requires both regional and national administrations to become actively involved and explicitly supportive. The CRP and its Flagships can demonstrate commendable examples of activities supporting livestock production and health and involving field animal health workers as well as regional authorities and their laboratories.

In forthcoming CapDev work, the following aspects should be considered:

- The significance of field diagnostic procedures including the clinical and post-mortem examination of diseased animals should be emphasized.
- Proper diagnostic procedures and record-keeping are indispensable in all treatment and control of animal diseases. In the CapDev work the importance of keeping adequate journals must be instilled as a fundamental measure.
- The assessment of laboratory diagnostic analyses should be performed with great care. The extension work should contribute to instill a sound skepticism and caution when interpreting diagnostic data.
- Animal welfare is a cornerstone for a decent and profitable livestock production. This involves all animal handling during the animal's lifetime, from feeding and care to transportation and slaughter. The animal welfare perspective should be included as an integrated part of all Flagship activities.
- Stick more consistently to the principle 'training the trainers' by primarily directing information and teaching efforts to regional partners and the animal health extension workers rather than directly to farmers.
- Develop a strategic plan for which diseases, syndromes or other areas that should be subjects to development of printed/digital leaflets and publish these as a series with clear purpose and recognizable graphic profile. The goal should be for development partners to

have access to a collection of extension leaflets with a logic progression. Involve information design professionals in the further development of printed and digitally presented materials.

- The Livestock CRP Flagship messages should ideally be delivered in a more integrated package in order to become efficient.
- Finally, when it comes to upscaling within the current FLH and its hopeful sequels, ICT including large-scale production of information and training videos is an ultimate tool that should receive wholehearted support for further development. This is a winning concept of the Flagship that is just right in time.

Appendix 1

Herd health capacity development 2017-2019 – written outputs

ETHIOPIA

Hiwot Desta with contributions from Biruk Alemu, Gezahegn Alemayehu and Barbara Wieland. 2018. Anthrax. Extension leaflet. <https://hdl.handle.net/10568/100524>

Gezahegn Alemayehu, with contributions from Biruk Alemu, Hiwot Desta, and Barbara Wieland. 2018. Brucellosis. Extension leaflet. <https://hdl.handle.net/10568/98525>

Barbara Wieland. 2019. Keep goats and sheep free of coenurosis: How coenurosis spreads.

Poster. <http://www.slideshare.net/ILRI/lf-coenurosis-posterjul2016>

Gezahegn Alemayehu with contributions from Biruk Alemu, Hiwot Desta, and Barbara Wieland. 2018. Enzootic abortion. Disease extension leaflet. <https://hdl.handle.net/10568/98529>

Gezahegn Alemayehu with contributions from Biruk Alemu, Hiwot Desta, and Barbara Wieland. 2018. Leptospirosis. Extension leaflet. <https://hdl.handle.net/10568/98526>

Biruk Alemu, Gezahegn Alemayehu, Hiwot Desta and Barbara Wieland. 2019. Preventing Fasciolosis (liver fluke). Extension leaflet. <https://hdl.handle.net/10568/102136>

Biruk Alemu, Gezahegn Alemayehu, Hiwot Desta and Barbara Wieland. 2019. Preventing Haemonchosis. Disease extension leaflet. <https://hdl.handle.net/10568/102137>

Gezahegn Alemayehu with contributions from Biruk Alemu, Hiwot Desta and Barbara Wieland. 2018. Q Fever. Disease extension leaflet. <https://hdl.handle.net/10568/98527>

Gezahegn Alemayehu with contributions from Biruk Alemu, Hiwot Desta and Barbara Wieland. 2018. Toxoplasma: Causes of animal and human abortion. Disease extension leaflet. <https://hdl.handle.net/10568/98528>

Mamusha Lemma, Annet Mulema, Wole Kinati and Barbara Wieland. 2018. Transforming gender relations and reducing risk of zoonotic diseases among small ruminant farmers in the highlands of Ethiopia: A guide for community conversation facilitators. <https://hdl.handle.net/10568/99264>

Biruk Alemu, Gezahegn Ayele, Ulf Magnusson, Ulrika Konig, Hiwot Desta, Barbara Wieland and Mamusha Lemma. 2018. Field postmortem examination training module. <https://hdl.handle.net/10568/100526>

Desta, H., Alemu, B., Wieland, B. and Lemma, M. 2018. Learning module on Coenurosis transmission and control. Nairobi, Kenya: ILRI. <https://hdl.handle.net/10568/100525>

Desta, H., Alemu, B., Wieland, B. and Lemma, M. 2018. Learning module on Anthrax transmission and control. Nairobi, Kenya: ILRI. <https://hdl.handle.net/10568/100524>

ILRI and ICARDA. 2019. Transforming gender relations in rural Ethiopia through community conversations. Poster. Montpellier: CGIAR System Organization. <https://cgspace.cgiar.org/handle/10568/101996>

ILRI and ICARDA. 2019. Assessing and strengthening gender capacities of partners. Poster. Montpellier: CGIAR System Organization.

Wole Kinati, Annet Mulema, Mamusha Lemma and Barbara Rischkowsky. 2018. Gender Issues in Livestock Systems in Ethiopia. Beirut, Lebanon: International Center for Agricultural Research in the Dry Areas (ICARDA). <http://repo.mel.cgiar.org/handle/20.500.11766/9578?show=full>

Kinati, W., Lemma, M., Mulema, A. and Wieland, B. 2019. The role of community conversations in transforming gender relations and reducing zoonotic risks in the highlands of Ethiopia. Livestock Brief 6. Nairobi, Kenya: ILRI. <https://cgspace.cgiar.org/handle/10568/102408>

Mamusha Lemma, Wole Kinati, Annet Mulema, Zekarias Bassa, Abiro Tigabe, Hiwot Desta, Mesfin Mekonnen and Tadios Asfaw. 2018. Report of community conversations about gender roles in livestock. <https://hdl.handle.net/10568/99316>

Mamusha Lemma, Wole Kinati, Zekarias Bassa, Mesfin Mekonnen and Yifru Demeke. 2018. Report on community conversations about transmission and control of zoonotic diseases. <https://hdl.handle.net/10568/99378>

Mamusha Lemma, Annet Mulema, Wole Kinati, Abiro Tigabe and Zekarias Bassa. 2018. Using community conversations to change perceptions of community members about gender relations in the Ethiopian highlands. Blog story <https://livestock.cgiar.org/2018/12/27/usingcommunity-conversations-to-change-perceptions-of-community-members-about-of-genderrelations-in-the-ethiopian-highlands/>

Mamusha Lemma, Wole Kinati, Annet Mulema, Mesfin Mekonnen and Yifru Demeke. 2018. Community conversations reduce the risk of exposure to zoonotic diseases in the Ethiopian highlands. Blog story. <https://livestock.cgiar.org/2019/01/18/community-conversationszoonotic-diseases/>

Revised final drafts 2019

Rebecca Doyle, Mamusha Lemma, Annet Mulema, Barbara Wieland and Mesfin Mekonnen. 2019. Community Conversations on Animal Welfare: A guide for community facilitators.

Rebecca Doyle, Mamusha Lemma, Barbara Wieland, Mesfin Mekonnen and Annet Mulema.

2019. Improving farm animal welfare. Extension leaflet

Biruk Alemu, Mamusha Lemma, Barbara Wieland, Ulf Magnusson and Annet Mulema. 2019. Community Conversations on Antimicrobial Use and Resistance in Livestock: A guide to community facilitators

Biruk Alemu, Mamusha Lemma, Barbara Wieland, Ulf Magnusson and Annet Mulema. 2019.

Antimicrobial Use and Resistance in Animals. Extension leaflet

Biruk Alemu, Hiwot Desta, Gezahegn Alemayehu, Barbara Wieland, Mamusha Lemma and Mesfin Mekonnen. 2019. Learning Module on Community-based Gastrointestinal Parasite Control.

Annet Mulema, Mamusha Lemma, Wole Kinati, Mesfin Mekonnen, Yifru Demeke, Barbara Wieland. 2019. Going to Scale with Community Conversations in the Highlands of Ethiopia. Activity report.

Mamusha Lemma, Wole Kinati, Annet Mulema and Barbara Wieland. 2019. Community Conversations: A community-based approach to transform gender relations and reduce zoonotic disease risks in the highlands of Ethiopia. Synthesis report.

Submitted blog stories

Mamusha Lemma, Wole Kinati and Annet Mulema. 2019. Strengthening capacity of local partners through Community Conversations

Mamusha Lemma, Annet Mulema, Yifru Demeke and Wole Kinati. 2019. Community conversations increase women's access to information in the Ethiopian highlands

Wole Kinati, Mamusha Lemma, Annet Mulema and Yifru Demeke. 2019. Community Conversations transform gender-blind local institutions

UGANDA Published

Emily Ouma, Justus Ochieng, Michel Dione and Danilo Pezo (2017): **Governance structures in smallholder pig value chains in Uganda: constraints and opportunities for upgrading.**

International Food and Agribusiness Management Review. 20 (3): 307-319. doi: <http://dx.doi.org/10.22434/IFAMR2014.0176>

Michel Dione, Charles Masembe, Winfred Amia, Joyce Akol, Joseph Kungu and Barbara Wieland (2018): **The importance of om-farm biosecurity: sero-prevalence of bacterial and viral pathogens in among pigs in smallholder production systems in Uganda.** *Acta Tropica*. 187 (214-221) <https://doi.org/10.1016/j.actatropica.2018.06.025>

Emily Ouma, Michel Dione, Rosemirta Birungi, Peter Lule, Lawrence Mayega and Kanar Hamza (2018): **African swine fever control and market integration in Ugandan peri-urban smallholder pig value chains: an ex-ante impact assessment of interventions and their interaction.** *Preventive Veterinary Medicine*. 151 (29-39) doi: <https://dx.doi.org/10.1016/j.prevetmed.2017.12.010>

Dione, M. M., Akol, J., Roesel, K., Kungu, J., Ouma, E. A., Wieland, B. and Danilo Pezo (2017): **Risk factors for African swine fever in smallholder pig production systems in Uganda.** *Transboundary and Emerging Diseases*. 64 (3): 872–882. doi:10.1111/tbed.12452

Training manuals

Parasite control in pigs: Uganda smallholder pig value chain capacity development training manual. <http://hdl.handle.net/10568/56639>

African swine fever: Uganda smallholder pig value chain capacity development training manual. <http://hdl.handle.net/10568/56789>

Pig marketing and institutional strengthening: Uganda smallholder pig value chain capacity development training manual. <http://hdl.handle.net/10568/56688>

Pig business planning and financial management: Uganda smallholder pig value chain capacity development training manual. <http://hdl.handle.net/10568/56822>

Pig management: Ensuring appropriate husbandry practices for profitability. <http://hdl.handle.net/10568/64960>

Pig feeding strategies: Uganda smallholder pig value chain capacity development training manual. <https://cgspace.cgiar.org/handle/10568/65209>

How to enhance hygiene and biosecurity during pig slaughter.
<http://www.slideshare.net/ILRI/asf-poster-butchers-56326989>

African swine fever: A guide for pork butchers. <http://www.slideshare.net/ILRI/asf-posterbutchers-56326989>

African swine fever: A guide for pig farmers.
<https://cgspace.cgiar.org/handle/10568/69435>

Policy briefs

Dione, M., Nantima, N., Mayega, L., Amia, W., Wieland, B. and Ouma, E. 2017. **Enhancing biosecurity along Uganda's pig value chains to control and prevent African swine fever.** Livestock Brief 1. Nairobi, Kenya: ILRI.

https://cgspace.cgiar.org/bitstream/handle/10568/82665/livestock_brief1.pdf?sequence=1 Ouma, Emily; Dione, Michel; Kawuma, B.; Nyapendi, R.; Kakinda, M.J. (2017):

Enhancing the

Uganda pig value chain through capacity building and multi-stakeholder platforms. *ILRI Research Brief 75.* Nairobi, Kenya: ILRI. <https://cgspace.cgiar.org/handle/10568/80380>

Dione, Michel; Amia, W.; Akol, J.; Kungu, J.; Lule, Peter; Mayega, L.; Nyapendi, R.; Kakinda, M.J.; Ouma, Emily (2017): **Impact of participatory training on biosecurity protocols on the knowledge, attitudes and practices of smallholder pig farmers in Uganda.** *ILRI Research Brief 77.* March. 2017. <https://cgspace.cgiar.org/handle/10568/80381>

Appendix 2

Reflections by Dr Mamusha Lemma on the Community conversations

Changing community groups' knowledge, attitudes, and practices is complex and challenging. Their actions are influenced by several factors. Information provisions by outsiders in traditional format can do little to influence their perspectives, knowledge and practices. Telling community groups what to do does not usually work.

Community groups must feel the pain and take ownership of development challenges by engaging them in participatory learning processes to explore and analyse issues and collectively generate solutions in partnership with local service providers. They need to consider and discuss solutions and think through their implementation, rehearsing the changes that they are likely to make, or perhaps testing out possible solutions.

Participatory processes such as community conversations which engage community groups in sharing information and exploring their own attitudes and practices can lead to changes in attitudes and practices. Community conversations help understand the social and cultural context in which community groups operate. Such understanding is vital to see how technical solutions fit within their cultural practices and realities.

Community conversation is not an end. It is a means to facilitate knowledge sharing and attitudinal change and encourage community groups to take actions. It is not also a standalone intervention; it must be implemented along with other development and learning interventions.

Community conversations facilitate collaborative learning and action among local service providers and community groups. Results and action points from community conversations need to inform/feedback into local level planning processes and interventions. Local research and development partners can use knowledge from community conversations and community actions as the basis for providing continual coaching and mentoring support, thus reinforcing intentions of community groups to take actions.

As community groups may be used to their service providers just telling them what they ought to be doing, they may initially find it difficult to openly dialogue issues and come up with solutions/actions themselves. Using community conversations might seem like hard going at first, but, in time, community members can develop the attitudes and skills necessary to work alongside each other and with local service providers to solve their own problems.

Achieving sustained impacts of community conversations requires ownership and support of local partners through planned interventions. Community actions from community conversations must be linked to and supported by local service providers so that community groups continue learning and sharing, thereby influencing other community groups.

Conclusions and recommendations from the community conversations

We noted the need to conceptualize and localize technical areas in words and expressions that are familiar to men and women community members.

Effective communication with community groups is an important role for local animal health service providers. Development of livestock health extension messages in local context and language can facilitate communication with community groups. There is a need to strengthen communication and extension material development capacity of local research and development partners through a participatory process engaging local partners in collaborative learning and co-creation of local concepts and expressions that are meaningful to community groups. Such communication and extension materials should not be produced by technical people alone; it needs to also involve community members and communication experts. We noted that local partners need capacity in facilitating and encouraging selfreflective learning and sharing among community members. They tended to extract/collect information by asking questions superficially rather than facilitating deeper level of reflection and learning among community groups through contextualising, probing with examples or stories, and summarizing/paraphrasing. New learning and insights into an issue in question happens through dialogic and self-reflective social learning practices, which result in attitudinal changes and motivation to act.

It is important that local animal health service providers are familiar with farmers/agropastoralists' conceptualization and thinking frame. Local people name animal diseases from contributing stress factors, clinical signs and effects on the animal. They also name drugs by their color and relate shape of drugs with objects they are familiar with. For example, farmers in Menz name dewormers 'madaberia' meaning fertilizer, in which they associate the effect of dewormers on thin animals as gaining weight as chemical fertilizers make crops grow and look good.

We noted that women are more interactive and actively participate in community conversations in women-only small groups than in mixed groups. In Menz, men are more knowledgeable/conversant and can explain reasons easier than women. They dominate discussions in mixed groups, and even when women were given the chance to speak, they did not feel confident to express their ideas. Women's interaction in group events is influenced by social comparison. In mixed groups, women may compare themselves with men; while, in women-only groups, they compare themselves with each other. The gender of the facilitation team may also influence how women interact in women-only or mixed groups by reducing or increasing social distance

Conclusions from discussions with development partners

- Development partners recognized the contribution of ILRI and ICARDA in capacity development.

- They found extension leaflets and technical briefs useful and requested to work with them to adapt and translate as local extension and communication materials.
- They needed support in the development of extension materials.
- They also requested capacity development support for improving animal health extension delivery – improved participatory and technology-mediated farmer communication.

Appendix 3

Reflections and recommendations by Edwin Kangethe on the IVR exercises

From the conversations, some farmers actually thought they were speaking to a live person and not a recorded session. This needs to be clear so that future deployments farmers will not report a negative experience blamed on lack of interaction from the other party. If for instance they ask a question and the audio keeps playing, they might think they are being ignored.

Recommendation

Have a more elaborate awareness exercise, reduce the complexity of the service to be as simple as possible to use.

There is demand for IVR as an information source for the farmers. From the farmers we talked to, there were questions on why it stopped. Also, the feedback we got was mainly on areas indicated they wanted more, e.g. some complained they got the same repeat message when they were seeking to go to the next message.

Recommendation

IVR can still be used for specific awareness cases during outbreaks etc.

Farmers were keen on receiving messages at a time they had indicated they would prefer. In cases where the farmer did not receive the IVR call, the call was repeated after 30 minutes and if not picked, the same was done after 24 hours the same time. Farmers decried these new schedules.

Recommendation

Design the service to be on demand only so that a farmer will get the call after an action from their end.

The interactivity of IVR can also be a hindrance to its access as some farmers were not clear with the instructions to respond to questions using pressing keys. They were frustrated that they got the same message since the logic was that they needed to respond for us to know whether they understood the session or not and decide whether to repeat or move to the next one.

Recommendation

Since the interaction from the farmers was for the purpose of doing a post test and offering the farmer the chance to record a questions, I propose to have the post session/lesson questions done via the extension agents instead of via IVR. Also do post-test via extension agents instead of via IVR.

DVO in Masaka has plans to buy a projector for use in training of farmers. Audio-visual animation videos can then be used to moderate the sessions so that the extension agents uses their time answering farmers questions and not passing on raw information. This format also re-freshens the extension staff with new information and ensures a

standardised message goes to the farmers every time. These videos can also be saved in mobile phones by extension agents to share with individual farmers.

Appendix 4

Abbreviations used

ASF	African swine fever
Cap Dev	Community conversations
CC	Consortium of International Agricultural Research Centers
CGIAR	Previously an acronym but is now its actual name, CGIAR is a global partnership that unites international organizations engaged in research about food security
CRP	CGIAR Research Program
FLH	Flagship Livestock Health
ICARDA	International Center for Agricultural Research in the Dry Areas
ICT	Information and Communication Technology
ILRI	International Livestock Research Institute
IVR	Interactive Voice Recording
SLU	Swedish University of Agricultural Sciences