



A REPORT OF THE STAKEHOLDER ENGAGEMENT WORKSHOP ON:
Livestock Vaccine Value chains in South Africa: Linking producers to the
markets and end-users

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1. Background to the project

The Stakeholder Engagement on “*Livestock Vaccine Value chains in South Africa: Linking producers to the markets and end-users*” forms part of the Human Sciences Research Council (HSRC) and the Agricultural Research Council (ARC) IDRC-funded project, *Novel livestock vaccines for Viral Diseases in Africa towards improved food security (CIFSRF phase 2)*, involving a broad value chain of activities and initiatives. The primary objective of this research project is to complete development of a 5-in-1 vaccine for viral diseases of livestock, scale up of the vaccine, field testing, and pathway development to commercialization. A significant task coupled to this project is to assess potential social and economic impacts of the use of the developed vaccine in small-scale livestock farming communities across disease-prevalent parts of Africa.

2. Context of the stakeholder engagement

The UN Food Programme has described food insecurity as one of the critical challenges that is experienced by poor people in the African continent (WFP, 2014). The situation is significantly bleak in sub-Saharan Africa where it is reported that one in three people in the region are unable to obtain sufficient food (House of Commons, 2008). Some of the initiatives that are regarded as well placed to address food security in Africa are associated with the practice of livestock farming, which is generally linked with increasing sustainable livelihoods and poverty alleviation (Peters, 2011).

However, a serious impediment to successful and sustainable livestock farming is the existence of viral diseases that are a problem across many countries in sub-Saharan Africa. For instance, of the 16 animal diseases that have been indicated to be fatal in the world, eight of these mostly occur in sub-Saharan Africa (S. Babiuk 2012, personal communication; Wallace, Mather, Chetty, Goga & Babiuk, 2014). The poignancy of this situation is that some of those eight diseases are zoonotic in nature; in other words, these diseases are able to spread from animals to humans (Rogan & Babiuk, 2005). Indeed, in sub-Saharan Africa where veterinary services are considered not on par with current global standards means that the ability of the countries in the region to handle such outbreaks may be insufficient. The lack of adequate control measures in this regard may result in the morbidity and mortality in both people and in animals (Rogan & Babiuk, 2005). Therefore, the importance of the use of veterinary vaccines goes beyond that of animal health, to include human health.

The concept of livestock value chain is linked to a continuum of activities such as production, processing and delivery of the end product to the consumers (Rota, 2010). Along with this are also the critical aspects of policy and regulation which facilitate the linking of producers to the markets and end-users. In the context of veterinary vaccines the value chain processes in relation to smallholder farmers is fraught with many challenges. For example, the manner in which veterinary vaccinology and vaccine technology advances are driven (Dungu, 2011) has little to do with the inputs of smallholder farmers in this process. In many cases, there is less consideration of farmer's localised knowledge of animal vaccines. Thus, in the value chain analysis of vaccine development a pronounced emphasis has to be placed on the geography and idiosyncratic insights of animal diseases and knowledge of animal medicine which the population of local farmers have. Cognisance of farmers as a resource-based population in the vaccine value chain would help to better understand their attitudes and willingness to use veterinary medicines (Peters, 2011, p. 3). This is especially important in the setting such as found in South Africa where many of the smallholder farmers are not educated and thus may be unaware about the value of vaccines to their livestock. Furthermore, in South Africa a large number of small-scale farmers reside in the rural areas where provision of veterinary services is mostly constrained, further limiting their understanding of such services.

With this in mind, the question is not whether, but how to include the farmers, including smallholder farmers in the vaccine value chain processes. This should be done bearing in mind the gains that farmers might obtain through understanding the different steps involved in vaccine value chains. However, prior to what has been described above can be implemented it is important to address these challenges, which include, but are not limited to:

- Inadequate extension and veterinary services in rural areas
- Low productivity linked to lack of knowledge/skills
- Lack of medicine and veterinary knowledge in rural areas
- Lack/insufficient supply of medicine and vaccines in rural areas
- Low commitment of farmers to vaccinate
- Poor access to information and training
- Lack of proper disease control mechanisms
- Inadequate infrastructure
- the need to build relationships among various value chain actors, to strengthen farmers' organizations and veterinary associations

Even though there are a range of challenges to overcome in this field of vaccine value chains in relation to farmers, especially smallholder farmers, there are signs of potential improvement. Firstly, although it may be true that the government's response to addressing some of the issues identified above has been inadequate, there appears to be a commitment on their part to improving their service and support to the sector. In order to address these challenges government took a decision to fund and implement the Primary Animal Health Care (PAHC) programme and Compulsory Community Service (CCS) programme for newly qualified veterinarians to kick start the provincial focus on rural animal health care. Secondly, some of South Africa's research institutions and universities have partnered with farmers, including smallholder farmers in rural areas, in providing training regarding matters related to animal vaccines and diseases.

3. Objectives of the stakeholder engagement

The aim of the stakeholder engagement was to critically assess livestock vaccine value chains in South Africa in terms of challenges, obstacles and opportunities. The main purpose was to share ideas on producing an effective consorted livestock vaccine delivery strategy for South Africa.

The key objectives of the stakeholder engagement were as follows:

- To understand the livestock vaccine value chains currently in South Africa;
- To understand the performance of the country's livestock vaccine value chains;
- To analyse livestock vaccine production and marketing constraints and needs;
- To discuss problems in the vaccine supply chains and logistics;
- To assess the effectiveness of current policies on livestock vaccination; and
- Provide recommendations on how to develop and implement an effective consorted vaccine delivery strategy for South Africa.

This stakeholder engagement workshop forms part of a series of policy dialogues which have been held under the "*Novel livestock vaccines for Viral Diseases in Africa towards improved food security (CIFSRF phase 2)*" project, to discuss issues around primary animal health care. The first policy dialogue was held in May 2015 and addressed the topic "*Primary Animal Health Care in the context of disease prevention and scaling-up for small-scale farmer communities: Research, policy and delivery*". Its aim was to have discussions on relevant primary animal health care policies and to analyse the impact of new technologies. The second

policy dialogue was held in September 2016 and addressed the topic “*New Generation Vaccines and Animal Health in Africa: Research, policy and delivery*”. It was used as a forum to address issues around investments and resources that are required to increase vaccine production, distribution and delivery to improve access to quality vaccines and also focused on the reasons and causes of low uptake of livestock vaccines among poor farming communities in South Africa. The policy dialogues and the stakeholder engagement workshop have an overall objective of contributing to policies and strategies aimed at using scientific innovation to reduce poverty through better animal health, thereby improving the livelihoods of smallholder livestock farmers.

This report summarises the discussions of the stakeholder engagement on “*Livestock Vaccine Value chains in South Africa: Linking producers to the markets and end-users*” which was held on the 8th of November 2017 in Pretoria.

4. Stakeholder engagement deliberations

The stakeholder engagement was divided into three main themes as follows:

- Theme 1: Context of the project
- Theme 2: Voices from the ground
- Theme 3: Livestock vaccine delivery strategy: Policies, challenges and opportunities

The main speakers in the stakeholder engagement were:

- Dr Arshad Mather (ARC-OVI)
- Ms Zimbini Mdlulwa (ARC)
- Mr Tony Willis (AfriVet)
- Mr Zamikaya Mwezeni (Krakra, Eastern Cape)
- Ms Gugu Zondi (KyD)
- Dr Ndayeni Ndamase (DAFF-Mpumalanga)
- Mr Hans Mathabe (Obaro)
- Mr Kenneth Malahlela (OBP)

Welcome remarks were given by Professor Monde Makiwane, the Research Director in the Human and Social Development unit of the Human Sciences Research Council. Professor Monde welcomed all the delegates and emphasized the importance of livestock farming in rural areas.

4.1 Theme 1: Context of the project

The aim of this theme was to give an overview of the viral vaccine project and to lay a foundation for the discussions of the day.

4.1.1 Context: Overview of the viral vaccine project

The Agricultural Research Council-Onderstepoort Veterinary Institute (OVI) is in the process of developing a variety of recombinant livestock vaccines. The OVI has partnered with Onderstepoort Biological Products (OBP) which is their primary vaccines manufacturer and commercializing partner within the project. The OVI has been responsible for research and conceptualization of the proposed vaccines to be manufactured. One of the motives to undertake the viral vaccine project was to improve food security through improved animal health care. The project addresses six diseases and these are: *peste des petits ruminants* (PPR), lumpy skin disease (LSD), Rift Valley fever (RVF), sheep pox, goat pox and African swine fever (ASF). However, vaccines for five of these diseases (PPR, LSD, RVF, sheep pox and goat pox) are available in the market. In this project, the aim is to minimize the cost of these vaccines by producing a single vaccine requiring only one dose that will protect against these five diseases in different combinations (i.e. in sheep and goats the vaccine will protect against sheep pox, goat pox, PPR and RVF, and it will protect against LSD and RVF in cattle). Apart from cost effectiveness, the vaccine developers are using a live vector platform technology to improve thermostability of the vaccines and this will redress the necessity of a cold chain in their delivery. However, it is worth noting that some of the diseases being targeted are not present in southern Africa (i.e. PPR, sheep pox and goat pox) but are present and of economic importance in areas such as East Africa. The introduction of a single dose may help solve the problem of low usage of animal vaccines among smallholder livestock farmers. Farmers often vaccinate for a while following a disease outbreak, but reduce vaccine usage in subsequent years in the absence of disease, resulting in build-up of a large, highly susceptible livestock population (e.g. RVF). With the use of a single dose combination vaccine, for instance when they vaccinate for LSD on an annual basis, farmers will get dual protection for both LSD and RVF.

4.1.2 Vaccine roll out strategy

The viral vaccine project has two main components; vaccine development (which has been described above) and vaccine roll out strategy development. The aim of the roll out strategy development is to make sure that the vaccines gain market share and are optimally accessible

to and up-taken by the small-scale farmers. The ARC-OVI has undertaken a range of activities as part of the vaccine roll out strategy. These initiatives include the distribution of educational pamphlets and posters to farmers, interaction with farmers at farmers' days and training of farmers. In addition, there are socio-economic studies which have been conducted in conjunction with the HSRC and colleagues in Kenya, where all five of the main livestock diseases being targeted are endemic. These studies are imperative in that they provide a basis for what is happening on the ground, that is, the environment into which the new vaccines will enter. These socio-economic studies include;

- **Cost-benefit analysis:** The results of this study will help decision-makers in realizing the cost-savings of the recombinant vaccines to local and national economies through disease prevention; incomes and food security generated through widespread adoption; understanding the national and provincial contexts in terms of livestock and smallholder farmer numbers
- **KAPP (Knowledge, Attitudes, Practices and Perceptions) study:** The aim of this study is to gain an understanding of the end-users for the vaccines and the possibilities for uptake given the prevailing attitudes, practices, perceptions, and knowledge of smallholder livestock farmers
- **Willingness To Pay (WTP) study:** This study will help in understanding smallholder livestock farmers' willingness to pay for and affordability of the new recombinant vaccines
- **Policy and regulatory framework (vaccine value chain analysis):** This desktop study will assist in identifying the enablers and disablers of the vaccines, their manufacture, testing, registration, delivery, scale up and scale out. This study will also give an indication of the different role players along the value chains.

The results of the socio-economic studies highlight key challenges and benefits that can accrue from using the vaccines. The key challenges facing smallholder farmers, among other things, include the inaccessibility to animal vaccines and lack of information on vaccines. In addition, farmers who adopt the new vaccines should significantly minimize losses.

4.2 Theme 2: Voices from the ground

The purpose of this theme was to give insight on developments and live experiences on the ground with regards to farmers' access to vaccines and the challenges that livestock farmers encounter on a daily basis.

4.2.1 Communication strategies adopted by stakeholders

AfriVet is a vaccine manufacturer and distributor in the animal vaccine market in South Africa. They have instituted a range of communication platforms in order to improve communication with smallholder livestock farmers. These communication platforms include cattle handling manuals and smartphone applications. The cattle handling manual has pictures which depict what the handler needs to observe on a daily basis (i.e breathing and behaviour) and the handler is then able to define the cow's symptoms as normal or abnormal. The use of smartphone applications in communicating with smallholder livestock farmers appears to be the most viable option to disseminate and share information with them. According to Stats SA General Household Survey for 2016, approximately 87% of South African households own cell phones, hence the use of smartphones as a communication strategy can yield fruitful results. Smallholder farmers register on the App and upload information to the App and AfriVet is able to view the data. The sharing of information enables AfriVet to see where a disease outbreak is taking place and also shows the scale of the disease severity. In addition, the local veterinarian can start warning farmers if s/he is also registered in the App (the ARC has developed a similar App, which is also applicable to crop and fruit farmers etc.). On a related note, the ARC has partnered with Access Agriculture in Kenya with the aim of producing short videos which are used to demonstrate to smallholder livestock farmers how to vaccinate their animals, de-horn them, ID-tag them etc. The videos are produced in close collaboration with livestock farmers and this makes it easy for other farmers to understand the message that is being conveyed to them. As part of information dissemination, the OVI has also developed manuals and pamphlets on primary animal health care and a number of these pamphlets have been translated into local languages to accommodate all farmers.

4.2.2 Challenges facing smallholder livestock farmers

Smallholder livestock farmers face a myriad of challenges. In rural areas where farmers share communal grazing land, some farmers vaccinate and others do not and thus it is common that unvaccinated animals, which may already be infected, are introduced into the communal herd and that poses a threat to animals which have not yet been vaccinated. There is therefore a consensus that there is a need for concerted efforts in communal set ups to ensure that all animals are vaccinated when a vaccine is obtained.

Livestock farmers often have to contend with limited grazing land as a result of population growth. Limited land has also resulted in a collapse of breeding programmes in rural areas. The

cost and access to vaccines are thorny issues among smallholder livestock farmers. Farmers often have to travel long distances in order to buy vaccines and this has a negative impact on their use. However, veterinarians contend that the cost of vaccines is not an issue, farmers will buy and use vaccines if they are aware of the inherent benefits that accrue from vaccinating their livestock.

The impedance to free-flow of information is still a compromising factor in the efforts of eradicating diseases. There are gaps in modern knowledge and indigenous knowledge systems. Smallholder livestock farmers comply while their animal health practitioner is still around and do their own parallel practice when the practitioner has left. Animal health practitioners contend that farmers know when to use natural remedies but lack knowledge on vaccines (modern technology). Training in the use of vaccines is critical because some farmers end up e.g. vaccinating pregnant cows using the wrong vaccines. Emerging smallholder farmers feel that some extension officers do not visit their farms because they feel threatened that the information they have is not compatible with modern knowledge. Stakeholders such as government, ARC and AfriVet have been offering animal health care training to smallholder livestock farmers. However, there is no coordination between the stakeholders and hence the training offered to smallholder livestock farmers is not standardized. The way forward is to organize a forum where stakeholders operating in the same space can share information (such as the Gauteng Animal Health Forum).

4.2.3 Gender dynamics in livestock farming

The international development community emphasises the role of women in addressing issues within small-scale livestock farming in achieving food security and socio-economic development in resource-poor contexts. However, culturally, livestock ownership in rural areas is skewed in favour of men. Although progress has been made towards gender equality in South Africa, in terms of parity in education and increased levels of economic and political participation, extreme poverty and durable inequalities persist, as defining characteristics of rural areas with distinct gender characteristics. Women play a critical and potentially transformative role in agricultural growth, but they face persistent obstacles and economic constraints limiting further inclusion in agriculture. In cases where women own livestock farms, men often frown upon them. This is a clear indication of the deeply rooted cultural views on livestock farming. Women usually own livestock when the household head (man/husband) has died. Interestingly, one feature of the South African society is the higher

mortality and mobility of men compared to women. As a result, more industrialised areas of South Africa have higher proportions of men compared to women, whereas rural areas have a higher proportion of women because of male migration to cities in search of paying jobs. For instance, Gauteng has a sex ratio of more than 100 (thus more males than females), but rural provinces, such as the Eastern Cape, Limpopo and KwaZulu-Natal, consistently have a ratio of less than 90 men per 100 women. Fewer women get married as compared to men, due to higher male mortality, compounded by the fact that men generally marry later in life and to younger women; and thus women are likely to survive their mate in marriage (Makiwane, Gumede & Molefi, 2016). In the context of small-scale rural livestock farmers this poses significant challenges for women. Some of them include lack of ownership of assets and land, lack of access to extension services, credit, training, education, government support, control of household income and constraints on women's mobility. In the case of the death of the male spouse, women are left to look after the livestock and to take care of the household, and often do not have the knowledge on how to look after livestock. They are often physically challenged (by age) with regards to performing tasks such as herding, administration of vaccines, and dipping to name a few; this creates room for a man to take advantage of the widow. Moreover, there is a general consensus that women should be included in programmes aimed at assisting rural livestock farmers, as they have been identified as 'the invisible agricultural producers' (Mofya and Chisenga 2000: 128).

4.3 Theme 3: Livestock vaccine delivery strategy: Policies, challenges and opportunities

The aim of this theme was to discuss the policies, challenges and the opportunities that exist within the vaccine value chains and more specifically, how farmers fit in or how they can be integrated into them.

4.3.1 Challenges and opportunities in the vaccine value chains

Livestock vaccine value chains in South Africa consists of vaccine manufacturers (OBP, AfriVet, Deltamune and Zoetis South Africa), veterinarians, wholesalers, cooperatives, agents, distributors and the end users (commercial and smallholder livestock farmers). The animal health industry in South Africa is worth around R6.8 billion and vaccines account for one third of the market value. OBP is a state-owned vaccine manufacturing company and it is the main commercializing partner for the vaccines developed within the viral vaccine project. Currently, OBP manufactures 52 different animal vaccines.

In 2001, OBP partnered with a private company in order to maximize income. However, this private partnership resulted in a number of bottlenecks and impeded OBP's market penetration. The distribution of vaccines was concentrated to commercial farmers and smallholder farmers struggled to access them (vaccines). Moreover, some vaccines were not accessible by both market segments because of stringent cold chain requirements. After the partnership ended, OBP came up with a direct sales strategy in order to improve accessibility to vaccines. Selling points have increased from eight to 555 as a result of this strategy and this has resulted in an increase of OBP's market share locally to 28%.

OBP has also increased accessibility to vaccines in rural areas, in particular, by recruiting Black Economic Empowerment (BEE) partners who are distributing vaccines directly to smallholder livestock farmers. The distributors are trained on how to handle vaccines and are given discounts. These BEE distributors are monitored to ensure that they maintain the vaccine cold chain. According to OBP, this strategy has improved accessibility to livestock vaccines, but not to a meaningful extent. In addition, the demand for vaccines has improved and this has necessitated OBP to increase outputs.

Another obstacle results from the rationalization of vaccine access by distributors, making some vaccines inaccessible, as they choose which vaccine to sell or not, thus creating an "artificial" vaccine shortage. This is so because distributors do not want to sell products that are not in high demand, potentially resulting in income loss due to limited shelf-lives. Some distributors even consider maintaining the vaccine cold chain a liability and prefer that customers order vaccines beforehand. Moreover, there has been an increasing demand for combination vaccines.

Prominent distributors and wholesalers of animal health care products in South Africa include TWK Agriculture, Senwes and Obaro. Obaro in particular offers after-sales vaccination training to farmers and visit them regularly to ensure that the products are used correctly. The main challenge they face is that most smallholder farmers do not have refrigerators and this has a negative impact on maintaining the required cold chain. To counter this problem, Obaro has staff members who are responsible for different regions, so it is easy for them to vaccinate the farmers' livestock, themselves.

5. Conclusion

The discussions held in the stakeholder engagement highlighted key innovations that can improve information sharing between stakeholders and smallholder livestock farmers. The use of smartphone applications can be a viable option to disseminate information to them. However, the farmers still face a myriad of challenges, including high cost of vaccines, inaccessibility to the vaccines and diminishing grazing land. These challenges impede their development as a sector. A variety of stakeholders offer non-standardized training to livestock farmers and this often leads to confusion to the farmers. Gender dynamics and cultural norms are a setback to women who often take over livestock farming once their spouse has died and there is a need to include women in programmes aimed at assisting smallholder livestock farmers.

6. Recommendations

The recommendations emanating from the stakeholder workshop were:

- a) There is a need to improve access to information, whether its product-related, technical or concerning primary animal health care. The information must be accurate so that it caters to the interests of smallholder livestock farmers.
- b) There is a need to initiate a dialogue with smallholder livestock farmers so that stakeholders can have a shared vision or a model for developing the smallholder livestock farming sector. This will enable the stakeholders to jointly form solutions on the current challenges that faces the farmers.
- c) There must be coordinated efforts to assist or service the smallholder livestock sector. This can be done through a variety of channels such as study groups, farmers' days, social media and local radio stations.
- d) There must be a central point of information dissemination within local areas and stakeholders should engage farmer organizations and get cooperatives to work together.
- e) Interventions meant to help smallholder livestock farmers should consider gender and migration dynamics in rural areas.

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Appendix 1: Attendance register

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