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Hearing their voices: Action research to support women's agency and empowerment in livestock vaccine distribution, delivery and use in Rwanda, Uganda and Kenya

VACCINE VALUE CHAIN BASELINE ASSESSMENT REPORT FOR UGANDA

By

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Table of Contents

1. INTRODUCTION

This is a baseline study which is part of a broader research project entitled "Hearing their voices: Action research to support women's agency and empowerment in livestock vaccine distribution, delivery and use in Rwanda, Uganda and Kenya." It focuses on the VVC analysis in Uganda under objective 2, which states "To conduct a Vaccine Value Chain (VVC) analysis focusing on Peste des Petits Ruminants (PPR) and Newcastle Disease (NCD) in Uganda, RVF in Rwanda and NCD in Kenya to determine if the VVC supports women empowerment and gender equality". The study purposes to generate evidence and formulate strategies that help position women to effectively and efficiently contribute to and benefit from livestock vaccines and to enhance their participation in livestock distribution, delivery and use which is paramount for women empowerment and gender equality.

Five major aspects are established in this study. These are:

1. The existing policies and local and national laws that influence vaccine development and distribution in Uganda.
2. The economic, sociocultural familial legal and political and psychological networks in Sembabule district –Uganda that shape the current VVC at micro meso macro levels and how these networks impact women smallholder farmers.
3. The VVC key players along the vaccine distribution and delivery chain, their gender capacities (skills, knowledge, perceptions , attitude, behavior) and how the players impact women empowerment and gender equality.
4. The role women play in the VVC as entrepreneurs, distributors and user and their potential roles.
5. The factors that hinder effective women empowerment and gender equality in the poultry and small ruminant livestock systems in Uganda.

1.1 Background

Over the past two decades, livestock-related research has shifted towards a gender perspective to examine women empowerment, participation, and benefit in the various aspects of livestock production. According to Galiè et al., 2017, empowerment is the process by which an individual acquires the capacity for self-determination to have choice and control over their lives. The major driver of this paradigm shift is the realization of women's gigantic contribution to livestock production (FAO, 2011 ; IFAD, 2009 ; Yemisi and Aisha, 2009; World Bank, 2003). In addition, past studies have shown evidence that livestock programs which involve women are likely to succeed compared to those that do not consider them as key stakeholders (Berti et al., 2004; Price et al., 2018).

In the vaccine value chain, multi-stakeholder's platforms can play a central role in sustainable climate-resilient agriculture by promoting inclusivity, providing information, enabling local-level innovation and planning, encouraging investment, offering services, and providing market linkages to enable small-scale farmers, women, and poor resource-dependent communities to adopt and benefit from climate resilient agriculture (FAO, 2019).

In Uganda, one of the major economic agricultural activities is livestock farming (UBOS, 2018), with the bigger section of these farmers situated within the cattle semi- arid corridor of which Sembabule is one of the districts. Women mainly operate small-scale and rear small ruminants (goats, pigs and sheep) and poultry in district. These ruminants are majorly attacked by Peste des Petits Ruminants and Newcastle Disease which are highly contagious disease that reduces on the productivity of the small-scale farming.

About 752 million of the world's poor keep livestock to produce food, generate income, and build assets. Women represent two-thirds (~400 million people) of low-income livestock keepers.[1] Diseases are a major issue preventing livestock keepers from optimizing production earnings. However, much of the animal-associated disease burden is preventable through vaccination.[2]

Barriers and limitations impeding women from participation and/or fully benefiting from the livestock vaccine chain are widespread and need to be established. For example: 1) in Uganda, 75% to 90% of small-scale poultry farmers are women. Their flocks are frequently decimated by Newcastle disease (NCD) despite availability of an effective NCD vaccine. Packaging, service providers and reliable structures for vaccine delivery remain an obstacle to vaccine uptake and use by women farmers.

In Uganda, the study was carried out in Sembabule District. The district was purposively selected because of its communities' engagement in poultry and small ruminant livestock rearing and having a history of PPR outbreaks. Eighty-six (86%) of the people of Sembabule district are engaged in peasant agriculture growing crops like coffee, bananas, maize, and millet and rearing animals like goats and chicken. Ninety-seven (97%) are engaged in crop husbandry, while 43% are engaged in animal husbandry, and 2% practice fish farming. Land under cultivation covers 72,490 hectares.

[1]Food and Agricultural Organization. Animal Production and Health: Empowering women livestock keepers key to food security. http://www.fao.org/ag/againfo/home/en/news_archive/2013_Empower_women_livestock_keepers_key_to_food_security.html

[2]Baselle B.R, Kushwaha P., Mosha R., Woolley R, Al-Riyami L. and Gammon N. Assessing the impact of a novel strategy for delivery of animal health services. Journal of Preventive Veterinary Medicine 147:108-116, 2017

Sembabule District borders with Mubende and Kyenjonjo district in the Northwest and Mpigi in North, Kiruhura and Lyantonde in the Southwest and Masaka in the East and South (Map1). The district covers a total surface area of 2,319.2 km^2 with a population of 252,597; 50.2% males and 49.8% females of which 93.2% are rural (Ministry of Trade Industry & Cooperatives, 2019).

The District has two counties, namely, Mawogola and Lwemiyaga Counties with 16 lower local governments (Sub-counties). Lwemiyaga County consists of 4 sub-counties and 1 town council, and Mawogola County is made up of 9 sub-counties and 2 town councils. Sembabule's weather is comprised of a bi-modal rain distribution ranging between 750mm to 1200mm and high temperatures ranging between 17^0c to 32^0c. The rainfall distribution is higher in Matete and Lwebitakuli Nyabitanga, Bulongo sub-counties recording between 1000mm to 1200mm per annum, while the rest of the district records as low as 750mm. The district's two major seasons of rainfall are March to May and September to December. The rest of the year is dry which exhibits semi-arid conditions.

1.2. Study Objectives

1.2.1 Overall Objective

The overall objective of this particular baseline assessment is to carry out a VVC analysis focusing on PPR and NCD in Uganda to determine if the VVC supports women empowerment and gender equality.

1.2.2 Research Questions

The following research questions guided the VVC analysis focusing on PPR and NCD in Uganda to determine if the VVC supports women empowerment and gender equality:

1. What economic, socio-cultural, familial, legal, political, and psychological networks shape the current VVC at the micro, meso and macro levels and how do these impact women smallholder farmers?
2. Who are the VVC key players and how do they impact women empowerment and gender equality?
3. What are the gender capacities (skills, knowledge, perceptions, attitudes, behavior) of the actors along the VVC?

The baseline assessment aimed to identify potential entry points/models which would support women's entry into the VVC and their impact on empowerment and livelihoods. These entry points / models would be tested, guided by the following research questions:

1. What entry points exist along the VVC and how can they enhance women's participation?
2. What women's agency and empowerment models address entrepreneurship, self-reliance, and cooperation?
3. How can these models support women's participation in and benefit from the VVC?
4. What test models can support women's entry and participation in the LVVC?

5. What is the impact of the models and what components have the potential to be scaled out and adapted to other community settings?

1.3. Expected Outcomes

I. Visibility for women in the VVC. Data and information on the role women play or can play in the VVC is limited to non-existent. Livestock vaccine research has predominantly focused on technical aspects of vaccine development, distribution, and adoption. The study cast a spotlight on women in the VVC their visibility and how it can be increased. Within the 12 months, data was synthesized to provide information to women themselves, as well as vaccine development funders, policy makers, vaccine developers who inform development, policy, legislation, programs, financing, and distribution of vaccines.

II. Empowerment of women through the participatory nature of the project. Through the innovative tools used, women had an opportunity to become data collectors through the Vaxxer calendars, and Jar Voices. They freely shared ideas and strategies for increased participation in the VVC presenting results of the research in their own voices.

III. Information on women in the VCC at different entry points: the number and level of participation of women at different nodes as users, entrepreneurs, distributors, service/product providers and decision makers were evaluated and measured.

IV. Transformative gender training of the research teams and stakeholders, creating a project where team members comfortably integrated gender analysis and technical aspects of the project. Detailed methodology lead by gender experts and a checklist/process were developed and helped researchers to be transformative and play a dual transdisciplinary role in projects.

2. RESEARCH METHODOLOGY

2.1. Ethical Issues

Ethical approval for human subjects research was obtained locally in Uganda (country clearance via Uganda National Council for Science and Technology #RESCLEAR/01 4March2019; ethical approval via Makerere University College of Humanities and Social Sciences Research Ethics Committee #MAKSS REC 03.19.274) and through the Tufts University Social Behavioral & Educational Research Institutional Review Board (#1907033) prior to commencement of research activities.

2.2. Methodologies

2.2.1 Desktop review

This was a preliminary activity that was done prior to going to the field. It included reviewing documents and maps related to the project study area with the intention of accessing the population size and setup, homesteads, the governmental structures, the sub-counties therein and hierarchy of authority.

2.2.2 Document review

Literature review was a main key to establish the relevance of our project by ascertaining the work that has been previously done in Sembabule district.

2.2.3 Memo writing

After a day's field work, the research team met to review achievements for the day after work and brainstormed on the key findings, challenges and lessons learned in the field.

2.2.4 Focus Groups Discussions (FGDs)

A homogenous group of 8-12 women either keeping chicken or goats was engaged for about 1-2 hours, where participants were facilitated to discuss and analyze the issues of concern in the vaccine value chain within their district and area. Each group was guided by a facilitator and a note taker. All the focus group discussions for domain 1-5 were guided by checklist tool questions. Participants in the focus group discussions were purposively selected.

2.2.5 Key Informant Interviews (KIIs)

Key informant interviews were conducted with the Ministry of Agriculture Animal Industry and Fisheries, extension workers, vaccinators, agrovet owners and attendants, livestock feed store owners and workers, and farmers. The KII tools were organized as a semi structured interview and helped in identifying: 1) policies and activities that affect vaccination of goats and chickens; 2) women's roles in stakeholder organizations; 3) opportunities to increase women's roles and benefits from VVC; 4) the number of goats and chickens in the households; 5) knowledge about chicken and goats diseases (clinical signs, traditional knowledge, cause, transmission and prevention); and 6) access to, control over and benefits from resources generated by poultry and goats in the household.

2.2.6 Focus Meals

In the field, impromptu focus group discussions over a meal were conducted. Participants were selected randomly within the villages and a guided interview was conducted over a meal with more emphasis focusing on the different concerns within the vaccine value chain. The provision of meals in a semi-public setting (e.g. marketplace setting, trading center, watering point, drug shop, milk collection center, or worship place) was used as an incentive for people to share their stories and ideas. The group discussions took place over lunch and was limited to 45 minutes to one hour. These groups were open to all community members of different genders, making space for those who otherwise may not have participated in the project.

2.2.7 Jar Voices

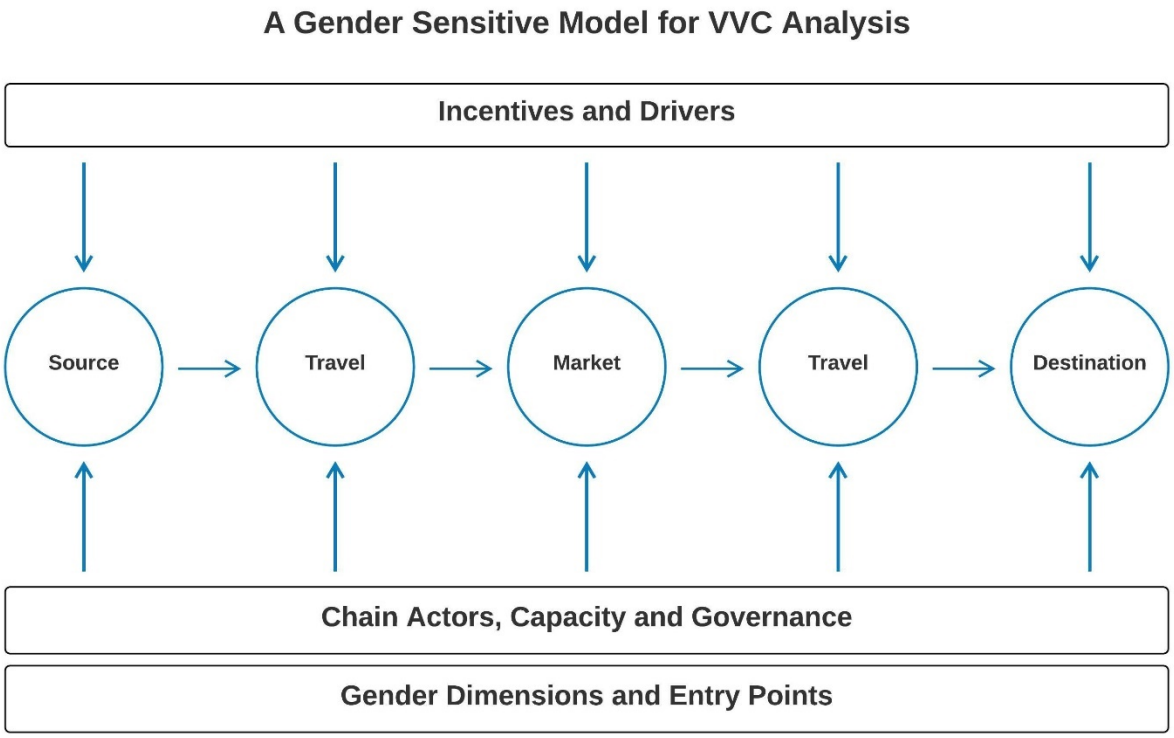
Jar Voices were conducted. Jar voices were set up to capture opinions and ideas of people about the ownership of livestock, constraints, and participation in vaccination of the animals. They were framed around a simple question that was written on charts and hanged on walls at points of purchase such as agrovets and vet drug shops, livestock feed stores or mobile money distributors. People were

requested to answer or draw a picture as they pass by, and to place their anonymous response in a jar. Blank charts were provided daily to capture different answers to different questions.

2.2.8 Stakeholders Analysis

Different methodologies were used to identify PPR and NCD key actors at the national, district and community level. VVC stakeholders, both men and women, at national[3] district[4] and community level were identified, and key critical actors were mapped along the vaccine value chain using different tools. The outcome mapping tool, key informant interviews and focus group discussions contained questions and/ or processes that identified the key actors, their roles in vaccine distribution, delivery and use, and the barriers and opportunities for women engagement along the vaccine value chain and at the institutional or organisational level. The outcome mapping was done using a VVC continuum illustrated in Figure 1. The KIIs involved veterinary drug shops operational within sub-counties, government sub-county veterinary officers, and private veterinarians, while the FGDs comprised chicken and goat farmers.

Figure 1



[3]Representatives from government agencies including policy makers and regulators (MAAIF, NDA), animal health service providers (including DVOs, VOs and Veterinary association), private sector players both manufacturers and importers/ distributers (Brentec, ERAM, MTK), research and training institutions (Makerere university,), and livestock farmer association

[4]District veterinary officers and sub-county Vet officers, animal health service providers (public and private vets), farmer representatives

The VVC institutional mapping was done at national and district level to find out the VVC chain actors. All the institutions and stakeholders in the animal health sector in Uganda were identified, their interactions mapped, and the effect of their interactions on animal health service delivery outcomes were discussed.

The VVC analysis used questions relating to domains 1 and 5 of the USAID Five Domains of Gender Analysis Framework. These are:

- Domain 1: Laws, policies, regulations, and institutional practices
- Domain 5: Patterns of power and decision making

2.3. Sample expected

Table 1: Methodologies and sample sizes expected at baseline

Tools used	Nº of events	Nº of participants			
		Male	Female	Male and female (Mix)	Total
Key informant interviews	11	5	6	0	11
Stakeholder's meetings	2	0	0	21	42
Outcome mapping meeting	1	0	0	18	18
Focus groups (Domains 1-5)	7	24	60	0	84
Jar voices	2	0	0	10	20
Focus meal	3	0	0	20	20

2.4. Training of Researchers

Training began in May 2019 at a core team meeting in Nairobi-Kenya to outline the objectives and methodology of the research. In July 2019, a regional gender analysis training for the research teams of the three participating countries, namely Uganda, Rwanda, and Kenya, was held in Mbarara-Uganda. The teams were trained on gender concepts, methodologies, and tools on gender analysis and VVC analysis that would be used in the study and research ethics. The ethics training provided complemented the required online ethical trainings that were completed by all team members. Field testing of all the qualitative and quantitative instruments was conducted. A similar training for students, their supervisors and stakeholders was completed at country level in September 2019.

2.5. Outcome Mapping Training

This was a workshop held at national level that involved different stakeholders of the VVC. During this training the stakeholders were asked to break down the bigger vision of the SheVax+ project from one catchy phrase into smaller more action centered and stakeholder encompassing statements. The aim of this was to enable stakeholders to fit in the bigger picture of how women empowerment along the VVC can be achieved in their different capacities.

2.5.1 National Stakeholder Workshop

This workshop was held in September 2019 at Makerere University for VVC stakeholders that were identified during the outcome mapping training. These included policy makers from government (Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and National Drug Authority (NDA)), Importers and manufacturers of vaccines, universities, private practitioners, and farmers.

2.5.2 District Stakeholder workshop

This was held at the district with a good representation of most of the different sectors of the District Administration especially the veterinary department, farmers, and veterinary shop owners.

2.6. Data Analysis

All the interviews and focus groups were audio-recorded, transcribed verbatim and translated into English. All transcripts made from across the sub-counties of Sembabule district were coded according to a framework of codes developed in a data analysis training workshop carried out between the 24-26 February 2020 in Nairobi, Kenya. Three members of the Uganda research team participated in this workshop. At the workshop, participants were involved in the process of labeling, coding, and organizing their qualitative data to identify different themes and the relationships between them. Once the framework was agreed upon, each country research team coded their transcripts accordingly and developed their analysis.

3. RESULTS

The Uganda research team comprising of three students and four multi-disciplinary researchers carried out data collection in the two counties of Sembabule district, namely Lwemiyaga and Mawokota counties, between November and December 2019.

3.1. Sample achieved

Table 2

Tools used	Nº of events	Nº of participants			
		Male	Female	Male and female (Mix)	Total
Key informant interviews	11	5	6	0	11
Stakeholder's meetings	2	0	0	21	42
Outcome mapping meeting	1	0	0	18	18
Focus groups (Domain 1-5)	7	24	60	0	84
Jar voices	2	0	0	10	20
Focus meals	3	0	0	20	20

In total, 195 participants were engaged in the different qualitative data collection methods. Seven (7) FGDs on the NCD and PPR VVC were conducted. Two (2) FGDs focused on chickens and/or

goats (FGD1-5), 3 were female participants chicken/goat owners, 2 were male participants chicken/goat owners, and we did not have any FGD for mixed gender.

Eleven (11) key informant interviews (KIIs) were conducted. Three (3) KIIs were with goat and chicken farmers, 3 with veterinary officers, 3 with veterinary shop owners, 2 with community leaders. Three (3) focus meals were conducted; one in each of the three sub-counties, namely Mijwara, Mateete, and Lugusulu. Jar voices were conducted on two days. Twenty (20) participants engaged in the conducted jar voices.

3.3. Informed Consent

A standardized written informed consent document was developed and used for selected participants to obtain their consent to participate in the study, prior to their participation. One participant was chosen by the participant to sign on the consent form on their behalf. Consent forms were only available in English and for the local language, a team member or a participant was picked to help in the interpretation. In the case of illiteracy, consent forms were read verbatim to participants. Consent included the ability to take and use audio, video, and photo documentation for research and publicity purposes. The signed consent form was stored securely by the Country Lead, and the participant was given an information sheet which provided an overview of the project and contact information for the PI, the Co-PI and the ethical review board at the country level. Participation of the interviewees was completely voluntary and anyone that was not interested was excluded.

3.4. Confidentiality and Organization of the Data

Participants and focus groups were given codes, and personal identifiers were not stored directly with the data. Because many of the participants will also engage in the intervention and post-assessment, a list of names and contact information is maintained by the PI for follow up participation, but this information is not stored with the data. Raw data/transcripts, cleaned databases, data summaries, photos, audio files, and data analysis documents are labeled using codes on a google drive that the researchers have access too. Only the Country Lead has access to personal identifiers/contact information for participants

3.5. The legislative and policy framework for vaccine development and distribution

3.5.1 Legislative framework

3.5.1.1. Legislative framework governing vaccine development

Uganda, as a country, mainly relies on imported vaccines to control livestock diseases, although over the years, it has been realized that not only is this expensive but difficult to guarantee quality of the vaccines and other biologicals that the animal industry requires. There is no specific legislation that deals with livestock vaccine development. However, the National Drug Authority (NDA) is the Government agency mandated by law to ensure the availability of efficacious and cost-effective drugs and vaccines to the animal populations in the country. The NDA derives its legal mandate from the National Drug Policy and Authority (NDPA) Act of 1993, it deals with the development and

regulation of the pharmacies and drugs in the country, controls the importation, exportation and sale of pharmaceuticals, and is responsible for licensing vaccine importation for veterinary use. Prior to issuing an import license, the Authority ascertains that the facility in which the vaccines are manufactured, complies with the internationally accepted Good Manufacturing Practice Guidelines as adopted by the NDA. Even under special circumstances when the government's Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) imports vaccines, the NDA must get involved for purposes of quality assurance and safety. The NDPA Act is silent on gender issues that may affect manufacture and importation of veterinary health care products including vaccines. It is therefore not surprising that the industry is male dominated. According to results of an outcome mapping report by the SheVax+ project, policy makers and regulators including NDA and MAAIF indicated that they lack policies that would encourage gender mainstreaming in their functions.

The study established the existence of some private vaccine manufacturing companies in Uganda with established businesses including manufacturing of Newcastle Disease Vaccine. These include, Brentec Vaccines Ltd and MTK Uganda Ltd. Brentec indicated that one of their prides is their signature thermo stable NCD vaccine. Most of these vaccine companies indicated that they are gender accommodative although they do not have specific gender policies in place. Besides nonexistence of gender policies, both MTK and Brentec indicated existing institutional gender responsive practices within their organizations; both companies have women in key leadership positions who elaborated the challenges and opportunities of women involvement in their organizations as well as the general challenges for women involvement in the vaccine value chain.

3.5.1.2 Legislative framework governing vaccine distribution

Veterinary vaccine distribution, especially for NCD and PPR, is largely done by the private sector. All this is done under the watchful eye of the National Drug Authority (NDA). The major pharmaceutical companies normally have distribution agents in all livestock keeping areas of the country. However, when the government is the owner of the vaccine, District Veterinary Officers (DVOs) are used to distribute the vaccines. This is done under the watch of NDA and MAAIF.

3.5.1.3. Legislative framework governing vaccine delivery

The Department of Animal Health (DAH) of the Directorate of Animal Resources (DAR) under the MAAIF is the public agency entrusted with ensuring the health and wellbeing of livestock and other animals in the country. Its function involves ensuring provision of satisfactory health care and safeguarding the appropriate use of drugs and vaccines for animal health. It does this through a network of field staff supervised by the DVO in each district. As observed by the outcome mapping exercise undertaken by this project[5], the deployment of these field staff is 'gender blind'. The veterinarian's job is largely regarded as a man's job and has a preference for urban centres and farmers who own large livestock and can comfortably pay for the services.

[5]An IDRC-funded project entitled "Hearing their voices: Action research to support women's agency and empowerment in livestock vaccine distribution, delivery and use in Rwanda, Uganda and Kenya". Grant No. 109061-001 and 109061-002. It is code named SheVax+ project.

In addition to the NDPA Act, other legislations that impact on livestock vaccines and its delivery include the Animal Diseases (Amendment) Act 2006 which makes provisions with respect to measures to control diseases affecting animals, and the Veterinary Surgeons Act 1958 which makes provisions for the registration of veterinary surgery and for other matters connected to the practice of veterinary surgery. Under this Act, the Uganda Veterinary Board was established by an Act of parliament as the profession regulatory body, the Animal Breeding Act 2001 which established the National Animal Genetic Resources Centre and Data Bank, to provide for the promotion, regulation and control, marketing, import and export, and quality assurance of animal and fish genetic materials and generally to provide for the implementation of the national breeding policy in Uganda.

3.5.2 Policy framework

Since the 1990s, the Government of Uganda has pursued macroeconomic policies of liberalization and privatization to improve the economic performance of the country. Support policy frameworks like decentralization, civil service reform and good governance were also put in place. This resulted into substantial reduction in public sector involvement in the livestock sub-sector and abolition of subsidies on farm inputs like vaccines. Prior to this, animal disease control was a responsibility of the government through the District Veterinary Officers with the staff under them. Government would provide free extension services, and heavily subsidized inputs like drugs, vaccines, and equipment. Following the reforms, animal disease control became the responsibility of the farmer except for 4 diseases, namely rinderpest, foot and mouth disease, contagious bovine pleuropneumonia, and rabies. For these, government retained the responsibility of procuring, distributing, and administering them at no cost to the farmer. The rest of the diseases including PPR and NCD were deemed 'private good' and therefore the responsibility of the farmer individually. Studies have shown that chickens and goats are the main livestock enterprises that women keep. Hence women appear to be the main targets for NCD and PPR vaccines, as observed by stakeholders in Sembabule.

The policy changes meant reduced access to veterinary services as provided by the government. This left most farmers to rely on agrovet shops and other private operators, some of which had questionable ability to offer the needed services. For instance, it was reported at a district stakeholder engagement meeting in Sembabule that most farmers are unable to access PPR and NCD vaccines and that one veterinary officer was responsible for offering extension and clinical services in three sub-counties, each with about 10,000 households. As a result, many farmers have lost their livestock. It was further reported that the district was faced by a PPR outbreak, yet there was lack of veterinary services and heavy losses of livestock due to PPR. One female farmer in Lugusulu sub-county for example, lost 86 goats in 2 weeks allegedly due to PPR. However, it also came out during the stakeholders' discussions in Sembabule that some farmers do not want to pay for veterinary services. They still carry a mind-set of free services provided by the government as it used to be in the past.

Vaccines are one of the most cost-effective and sometimes the only means to prevent disease in livestock populations and any vaccines aimed at improving animal health in poultry and goats is likely to provide benefits particularly to women smallholder farmers (Donadeu M, et al, 2019). A

stakeholders' engagement exercise in Sembabule revealed that there is low adoption of use of PPR and NCD vaccines for goats and chicken respectively. This is related to inadequate extension services mentioned earlier, but also other factors like lack of a reliable cold chain, long distances from the source of the vaccines and presence of quacks who dupe unsuspecting farmers with ineffective products plus limited knowledge about vaccines among farmers. Government through the liberalization policy is encouraging the private sector, for instance, Brentec to produce thermo-tolerant vaccines like Kukustat®, against NCD.

As a public institution charged with animal health and wellbeing, MAAIF developed two key policy documents that were to guide in ensuring effective delivery of animal health in the country, namely:

1. The National Policy for Delivery of Veterinary Services (2001), and the
2. The National Veterinary Drug Policy (2002). (Under review by MAAIF).

These policy frameworks were not taken into account when the national legislation governing veterinary pharmaceuticals which is the National Drug Policy and Authority Act (1993) was being formulated. Other policy documents that have a bearing on veterinary vaccines, especially how they are delivered are the National Agricultural Policy and the National Agricultural Extension Policy.

3.6. Mapping and characterization of vaccine value chain actors and their interactions

With the liberalization policy, livestock disease management in Uganda including vaccination is both a public and largely a private good. Save for a few vaccines under public good (foot and mouth disease, rinderpest, contagious bovine pleuropneumonia, and rabies), both PPR and NCD are under the jurisdiction of the private sector who must operate within prescribed national laws and guidelines. However, PPR is still perceived to be a public good according to district and lower-level stakeholders. National vaccine legal regimes for manufacturing and distribution of livestock vaccines in the country, as elaborated above, provide clear roles and responsibilities of different actors along the vaccine value chain. Given the public-private nature of livestock disease management, there are several chain actors involved from manufacturing, distribution, delivery, and use of both PPR and NCD vaccines as summarized in Figures 2 and 3 below. These actors are at policy and operational levels at national and decentralized lower levels of government.

3.6.1 Chain actors and their linkages/interactions

Five broad categories of VVC actors were identified by the different stakeholders at national, district and lower local government levels. These include:

1. Policy makers and regulators,
2. Manufacturers that include Ugandan companies and manufacturing companies from other countries especially Kenya was a main source for many distributors at the district level,
3. Importers/ distributors. These include relatively big to small private companies and local governments (districts) veterinary officers who also operate private businesses as individuals,
4. Vaccine deliverers including private companies, public veterinary officers at the district and sub-county level, individual private veterinarians, veterinary drug shop owners, and

5. Vaccine users who include commercial farmers, smallholder farmers both as individuals and groups and poultry breeding companies.

Following the identification of the five broad categories of VVC actors, the different stakeholders identified specific roles of each actor as follows:

3.6.2 Policy makers and regulators

Government through the Ministry of Agriculture Animal Industry and Fisheries (MAAIF) was identified by national and district level stakeholder as the government line ministry responsible for formulating policies to ensure animal health and certifying and enforcing compliance of veterinary regulations including those that guide vaccine importation and exportation. The ministry has a government central store at the national level located in Wandegeya, Kampala for storage of vaccines within the public domain like PPR. The laws, policies and guidelines governing vaccine development and distribution are elaborated in section 4.1 and were relatively well articulated by national stakeholders.

The National Drug Authority (NDA) was identified as a corporate body responsible for regulation and control of the quality of human and veterinary medicines including vaccines entering the country and its use within the country. NDA ensures availability of efficacious vaccines for humans and animals. Its broad mandate of quality control was well known by stakeholders at all levels from national, district to sub-county level. Though its broad mandate was well understood, at the district and sub-county level, participants raised concerns about the agency's effectiveness in quality assurance at the lower levels of government in Sembabule because the agency has no decentralized structures.

At the district level, stakeholders identified two laws, the NDA Act and the disease control Act that provide policies and laws on vaccines. Most of the agrovet shop owners and attendants interviewed did not have a full understanding of the regulations and licensing requirements for buying and selling vaccines, a good number of them were not very certain of the specific category of licenses required. For instance, a government veterinarian stated, *"I don't know license requirements. I hear of class B, C but I don't need any license to buy vaccines"*. Similarly, a private agrovet shop owner observed, *"I don't know, we only know ours which is class C"*. Knowledge of existing laws, guidelines, rules, and requirements by vaccine deliverers at that level is a major gap in Sembabule district which poses a challenge to vaccine users on the quality of service. This was largely attributed to lack of capacity of the national regulatory body (NDA) for enforcement. NDA does not have decentralized structures and there is no existing mechanism for coordination with the district veterinary department which could support this function.

Private sector players with a major role in the manufacturing, distribution, and delivery of vaccines as guided by national laws have institutional policies, practices and structures that impact gender equality. Most privates sector actors at the national level described themselves as being gender

accommodating during the national stakeholder meeting. Further discussions however revealed that they were more gender neutral as they had no policies nor approaches that were responsive to gender differences, norms or inequities between men and women in their institutions. However most of them were receptive to any support that would enable them to attain this aspiration.

Despite the existence of elaborate national gender policies, strategies and plans, vaccine policies and regulations are still gender blind. The opportunity for realizing gender integration in vaccine distribution and delivery in the public domain lies in the government efforts to enforce gender budgeting with both incentives and punitive measures for local governments that embrace gender equality in their district plans and budgets.

3.6.3 Manufacturers

Clinical veterinary services were privatized and decentralized in the 1980s, apart from vaccination of animals against epidemic diseases. The role of the private sector in Uganda is therefore prominent including vaccine manufacturing, they also own warehouses at the national level where vaccines and drugs are stored for distribution. Some companies like ERAM Uganda Ltd also have distribution points in districts. Brentec Vacccines Ltd, ERAM Uganda Ltd and MTK Uganda Ltd were identified as some of the main vaccine manufacturing companies in the country. These manufacture both PPR and NCD vaccines and distribute them along with drugs and other animal products to distributors. Brentec indicated that for purposes of opening up new markets, they can also offer training services to farmers as a measure to open up new markets. Other vaccine manufacturers identified by stakeholders, especially private veterinarians, were Kenyan companies where they buy from.

3.6.4 Distributors

At the national level, the distributors were mainly categorized as the relatively big or medium scale sized companies that are either manufacturers or importers of vaccines, these store them at distribution points in Kampala and major district points; e.g. Masaka is the nearest center with distribution points to Sembabule district. This was indicated to be the case for NCD vaccines only because PPR is presumably not authorized for the private sector though it was indicated that procedures were being relaxed for PPR as well. Major distributers listed by Sembabule stakeholders were ERAM, MTK, Ever Victory, private wholesale companies based in Kampala, some veterinary officers based at the sub-county and district level, and veterinary drug shops. In a few instances, commercial farmers were indicated to play a role when smallholder farmers approached them to buy for them vaccines as they buy theirs.

Transporters including air transport, cold chain vehicles, buses, or private company vehicles, and "boda bodas" (hired private motorcycles for public transportation) were identified as the key actors in the vaccine transport delivery chain. Imported vaccines are transported by air to the airport and using government-owned cold chain vehicles, government-procured vaccines are delivered to the government central stores in Kampala from where they are distributed to districts. Following requisitions by District Veterinary Offers (DVOs) and using defined procedures and protocols,

district vehicles transport vaccines from the central store to district stores and thereafter by government-owned motorcycles to the lower local governments (the sub-counties). Imported vaccines by private distributors are transported by buses from Kenya by private or public vehicles to private distribution points either in Kampala (such as the container village) or in districts at agrovet shops. From the districts, they are transported by boda boda to the end users either through public extension service systems and or directly to farmers by private service providers. Some farmers also buy vaccines directly from agrovet shops mainly from Sembabule and Masaka districts.

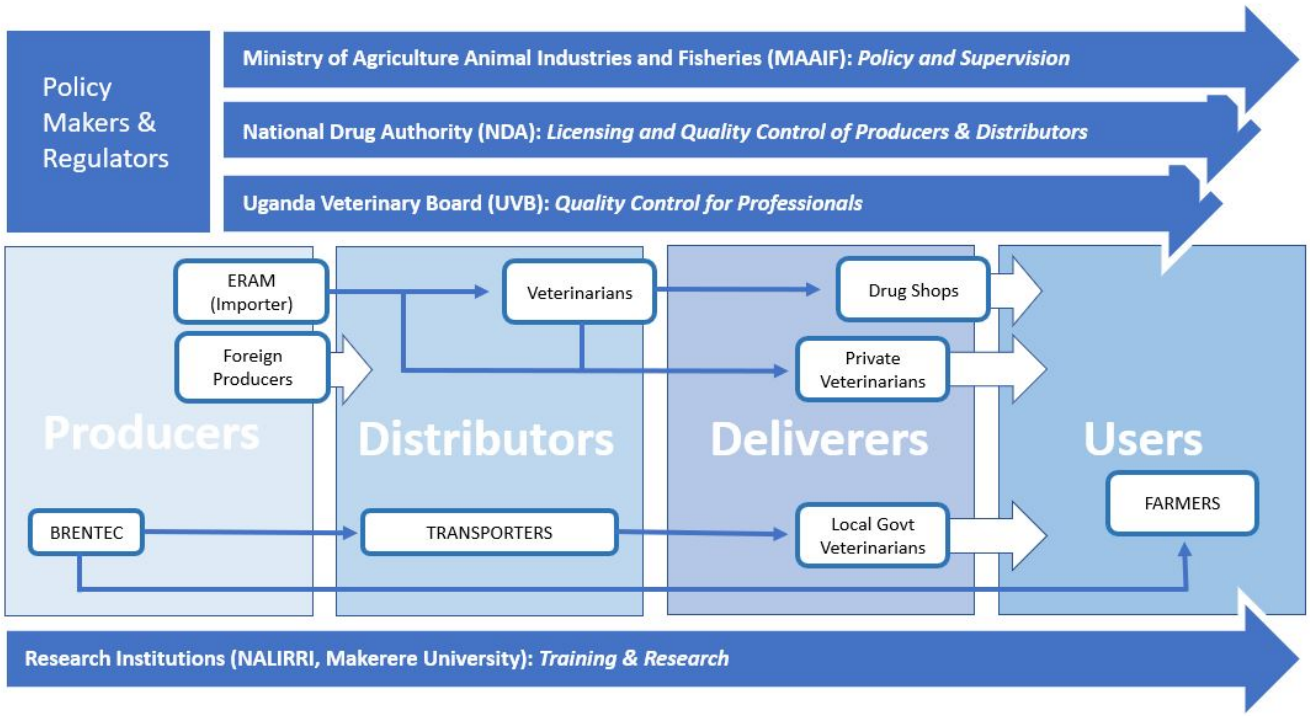
3.6.5 End users

Vaccine end users were mainly men and women farmers, either as individual farmer households or as farmer groups, although vaccine use was indicated to be limited. There are many women farmer groups involved in chicken rearing, a few of which involve men. Men are mainly involved in goat farming given government encouragement for commercialization of goats. At both the household and group level, men/husbands were identified to play a key role in buying the vaccines as well as vaccinating livestock. Chicken breeders like Ugachick and Biyinzika were also listed among the users of vaccines as they administer the 1st vaccination dosage for day old chicks. In addition they give vaccination advisory services to farmers who buy chicks from them.

3.7 Existing relationships, structures, and coordination mechanisms between the actors

3.7.1 Typical NCD Vaccine Value Chain

Figure 2

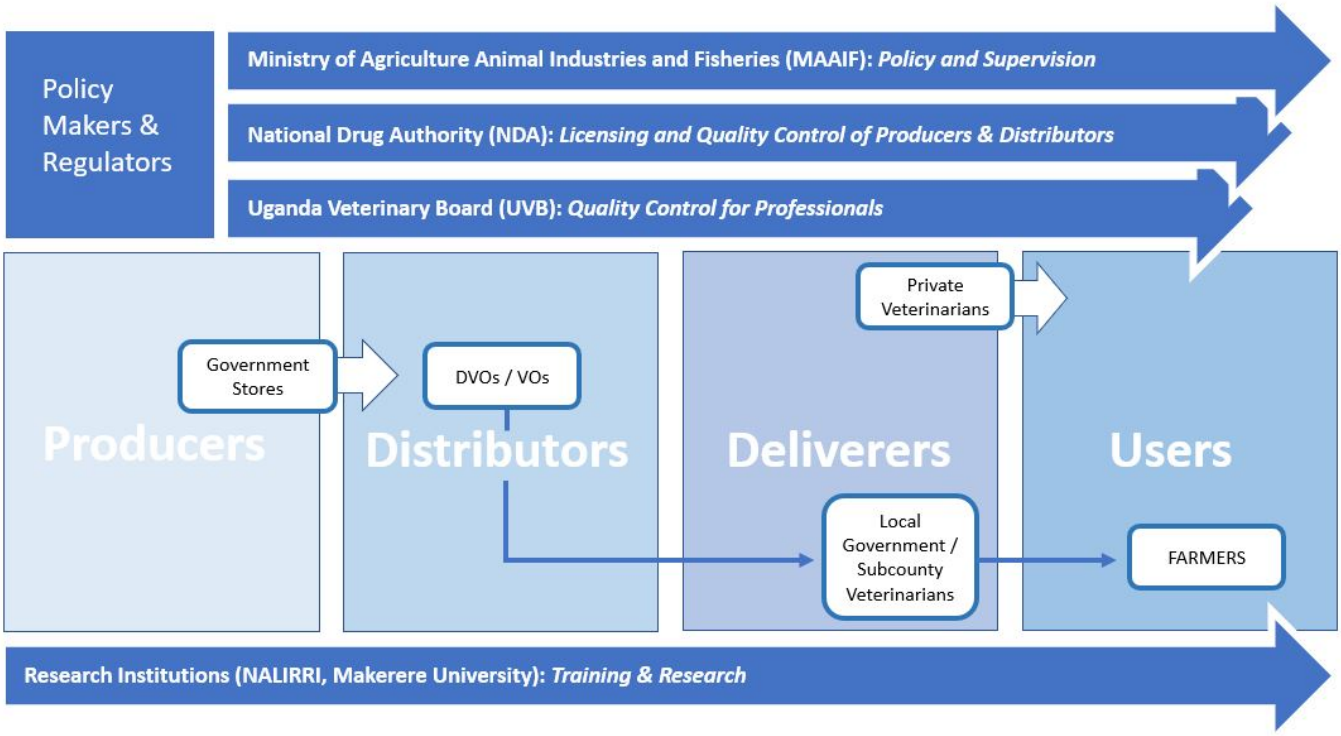


Apart from the policy makers and regulators who have distinct roles of policy making, supervision of veterinary service delivery and licensing of lawful operators, the rest of the vaccine chain actors operate almost at different levels of the NCD VVC at distribution and delivery. Vaccine manufacturers, for instance, indicated that they operate almost at all levels including delivering directly to farmers especially whenever there is a new product on the market to introduce. Vaccine manufacturers also indicated possibilities of offering trainings to farmers if organized on vaccines and vaccine use in order to open up new markets.

Vaccine users as indicated in the illustration do interact with all vaccine chain actors. This is because NCD is a private good. However, there is no mechanism in place (public or private sector led) to coordinate all the actors. The district production office indicated that they were to embark on a process to register all private sector players and support them to have leadership in place.

3.7.2 Typical PPR Vaccine Value Chain

Figure 3



The difference between PPR and NCD Vaccine Value Chains lies in the fact that the PPR vaccine is still a public good, thus the chain is more linear while NCD was privatized and therefore there are many actors involved. According to the DVO, PPR in Uganda is misunderstood to be a Karamoja sub-regional disease, while on the ground, most cattle corridor districts including Sembabule have been hit by PPR outbreaks, yet the vaccine is not being provided by Government to the district.

3.8. Gender dimension in the VVC

3.8.1 Visibility of women

On the positioning and visibility of women in the PPR and NCD vaccine value chain (VVC), data show that women were largely involved at the end user level, mostly as farmers and to a lesser extent, as poultry breeders/suppliers (end user). Of the very few farmers who vaccinated their goats and chicken, three categories of women farmers emerged. These were: those who did the NCD vaccination themselves, either as individuals or as a group; those who reared already vaccinated chicken; and those who left the vaccination to the men, who could be their husbands or hired labor. In all the focus group discussions, women farmers ranked themselves, both as individuals and as groups, as the most important stakeholder in the VVC since they were the owners of the chickens and goats, as small-scale chicken breeders and suppliers, and as the reared the chicken rearers themselves.

At the manufacturer and distributor level, women were more visible as employees of the manufacturing firms and as dispensers or attendants at distributor outlets; attendants at agrovet/ veterinary drug shops in some of the Sembabule trading centers and in small- to large-scale vet drug distributor outlets in large towns, including Masaka and Kampala city. A few female veterinary extension agents, including one female veterinarian, were largely poultry vaccinators at the household and community level. Only one woman was a shareholder (part of the owners) of a large distributor outlet. In some cases, the women attendants were wives of the drug shop owners. The attendants sold / dispensed veterinary drugs and to a lesser extent, vaccines and provided vaccine information and advice to the farmers, including how to use vaccines and drugs. At a Kinyenya drug shop, for instance, the attendant observed that the shop attendants of this particular drug shop were always women. Apart from being owners of the drug shop, men also were engaged as hired labor for tasks that required physical strength, for instance carrying the heavy things to and from the shop store.

3.8.2 Perception of actors on gender equality

Both men and women were involved in goat and chicken rearing. Even when the goats and chicken belonged to the men, some men expected the women in their households to rear them. Women and men farmers attitudes and beliefs about women's involvement in vaccination varied. Some of the farmers believed that it was the responsibility of men to vaccinate their livestock as demonstrated by the following quotes:

> *"Generally it is the men that are responsible for that kind of work at home"* (**female farmer (R14), FGD - Lugusulu women chicken farmers**)
>
> *"Naturally, women cannot vaccinate in our setting and that has been for a long time now"* (**LC Chairperson, FGD - Lugusulu women chicken farmers**)

A majority of men and women smallholder farmers and veterinary extension agents had negative attitudes and beliefs about the involvement of women veterinary extension agents in vaccination of goats and cattle and in the treatment of diseased livestock. They argued that the nature of the job

could not allow for women engagement. The job itself requires physical strength, especially if it entails administration of injection, willingness and commitment to travel to and work on farms, many of which could easily be accessed by motorcycles. The female agents seldom rode for fear of being stigmatized and accidents.

Most respondents noted that men were more involved in vaccination and treatment of livestock, depending on experience and willingness to engage in field work, which includes vaccinating livestock. The extension agents, both male and female, during key informant interviews, observed that many qualified female veterinarians preferred to do lighter work, such as being dispensers at vaccine and drug outlets, while men conducted field work, including vaccination. They claimed that the qualified female agents were more inclined to obtain convenient work which was "soft" and "clean" and work in urban centers. They felt that the female agents tended to have fear, lacked self-confidence and willingness to engage in field work. They observed that their claims were backed up by the large numbers of female veterinary professionals who were currently being employed at the distributor outlets in urban areas. They noted that some female extension workers suffered from stigma when they engaged in vaccination of goats and cows, and when they rode motorcycles for field work:

> *"… but what I have discovered women who are brave enough to go to the field are very few. If you scan around in this area, you can't find another female vet. She finishes school and aims at sitting in a drug shop and will tell me I don't want to go to the field."* (**Female paravet, Focus Meal**)
>
> *"In most cases, women prefer simple life; when she hears of going to the field to treat a cow, she will feel bothered."* (**Male farmer 6, Focus Meal**)
>
> *"One of the biggest challenges that my sister faces is accidents and kicks from animals. This has in turn created stigma among women, hence not involving them in the process."* (**Farmer, Focus Meal 28**)
>
> *"You can vaccinate a farmer's animals when there is failure, they won't blame the vaccine but the woman who will have vaccinated. If it's a man, he won't be blamed. Women fear to ride motorcycles or do field work. They prefer to sit at drug shops."* (**Female Veterinary Assistant, Sembabule Veterinary drug shop**)
>
> *"It is due to the nature of work which requires a person to be energetic, continuous movements, secondly the employers e.g distributors won't give a woman to drive a route for a whole month distributing drugs. For instance, this morning I was called to go to farm 8km away then rush back here to attend to you, then after here I have to go to another farm that is 10km away. Sometimes we go hungry and on empty stomachs these are thing. In fact most of the women I studied with are at container village selling drugs. According to me, women are most distributed in the selling and dispensing of drugs."* (**Male government veterinarian**)

Several farmers preferred male veterinarians to female veterinarians to attend to their goats due to cultural issues, which affects their beliefs and perceptions. In one of the discussions during a focus meal, all of the farmer participants agreed that "*It is a man* [that is preferred] *because the animal might be powerful, and it is a man to handle it and also inject it".*

One of the male veterinary extension agents however observed that some female extension agents were as competent as their male counterparts:

> "*Doctor, that question you have asked, it is both sided because sometimes I go with this female colleague of mine and farmers wonder, eeh a woman treats animals they have never seen it. But in deeds, you find she's*

better than some men if she has handled animals well, used drugs and dosages well and the animal recovers quickly which is possible for the man to fail to treat the animal—so it falls both sides. Our people have that thinking of long ago." (**Male para-vet, Focus Meal 29**)

3.8.3 Enhancement of visibility of women

On enhancement of visibility of women in the VVC, at the delivery level, some participants felt that the female drug shop attendants can potentially be involved in vaccination and in field extension work, if their capacity can be built and gender barriers are overcome. Some respondents observed that parents could play an important role of encouraging their girl children to study veterinary sciences.

A majority of women farmers perceived themselves as being involved in the VVC at the end user and distributor level and as chicken suppliers. With support, they could join the agrovet/ vet drug enterprises as a means to generate more income and to have access to more knowledge and skills in poultry management. As indicated below by one of the participants in a FGD:

"I see women only fitting in the farming section alone because they stay home mostly. Women farmers see themselves in the agrovet business mostly as well as the young chick's selling; this in the long run will help them to learn more and acquire skills when it come to the poultry business." (**woman chicken farmer, FGD - Lugusulu women chicken farmers**)

"I foresee the opportunity of chicken supplier and agrovet business ownership because it looks like a money-making opportunity." (**woman chicken farmer, FGD - Lugusulu women chicken farmers**)

Barriers to enhancement of visibility of women in the VVC largely included lack of education, experience, entrepreneurial skills, and capital to operate poultry enterprises. Women's involvement in poultry and livestock agrovet / vet enterprises was also constrained by having too many responsibilities at home, which did not free them up to engage in activities outside of their homes. Enhancement of women involvement at the marketing and distributor chain level could be through boosting their capital, supporting them to set up outlets that are closer to the communities, and building their self-esteem and their capacity to engage with communities.

3.8.4 Gender capacities of the actors along the VVC

With the use of the gender equality continuum tool, participants of the national stakeholders engagement workshops at the district and national level perceived that their institutions were largely gender aware as a result of the several gender trainings that they had received. Assessments on positioning of the institutions along the gender equality continuum showed that the gender aware institutions were either gender exploitative or gender accommodative. None of the institutions was considered as being gender blind or gender transformative.

Policy makers and regulators: From the stakeholder engagement discussions held, national and local government efforts to integrate gender at the planning, programming, and monitoring and evaluation of policy maker institutions, such as MAAIF and the local government / district offices

were reported. Some of the institutions had received gender awareness training, but application of the knowledge and skills gained was lacking. In circumstances where gender considerations were taken into account by some institutions, women employees were assigned as the gender focal persons, since "gender" was perceived to be a woman's domain that is about women. At the Sembabule district office, an enabling environment at the workplace for nursing female staff was observed, in the form of a breastfeeding room for nursing mothers and a crèche for their babies. MAAIF reported that gender was being put into consideration in their revision of their outdated laws. Participants were appreciative of the fact that these efforts did not appear to be systematic and institutionalized. They attributed the presence of gender-sensitive initiatives to efforts from external partners, like foreign donor partners, who encouraged and supported government institutions to be gender sensitive and provided conditional financial resources to put such initiatives in place.

Lack of documentation, supportive systems to demonstrate institutionalized gender transformational initiatives, political will and structures which address the existing gender differences and inequalities, were mentioned as indicators of institutions that are not gender transformative. Participants provided examples of lack of appreciation and commitment to promoting gender transformational initiatives which included existence of a gender policy at a municipal council which was not operationalized and enforced; and lack of sex- and gender-disaggregated data collection tools being in use.

Service providers: These institutions tended to be gender accommodative since they worked around existing gender differences and inequalities. These included Uganda Veterinary Association (UVA), UVPPA and Uganda Prisons (UP). They ensured provision of promotion opportunities for qualified and competent female workers and deployed female workers basing on their personal circumstances. They lacked clear documentation of practices which promote gender equity or equality.

Manufacturers and Distributors: Brentec was rated as being gender aware owing to a number of gender trainings that they had received. Following the training, a deliberate decision to transform the enterprise through integrating gender considerations in their work was taken, although consensus had not been built yet on what gender aspects should be addressed. The enterprise structure was perceived as being gender sensitive, although there wasn't a gender policy formulated yet. Although Eram, a distributor enterprise, was in the process of formulating a gender policy, its staff recruitment, promotion, and remuneration did not bear any gender considerations.

3.8.5. Barriers and Opportunities

3.8.5.1 The legislative environment

To own an agrovet shop, the National Drug Authority (NDA) requires a person to have at least a diploma in animal husbandry or a bachelor's degree in veterinary medicine. The NDA requires that a person attending at a vet drug shop has to have a certificate in animal production and management, a diploma in animal husbandry or a bachelor's degree in veterinary medicine. In reality however, there were no specific restrictions for vaccinators, as long as the vaccinators know how to vaccinate animals and the farmers request for the vaccination services. Farmers could not easily tell who the qualified

veterinarian is. They tended to depend on recommendations from their peers, which were largely based on the veterinarian's past experience of successfully treating their sick goats and chickens, thereby averting deaths.

3.8.5.2 The production and manufacturing chain

Barriers:

At the national stakeholders' engagement, participants from the production and manufacturing chain identified the prohibitive cost of starting up and operating a vaccine manufacturing plant, as indicated in the following quote:

> "*Heavy investment is needed to engage in the manufacturing stage along the vaccine value chain. Women may not have this heavy capital to invest in this stage"*

The available vaccines were packaged in a vial of hundred (100) doses in order to counteract expensive production costs.

Production of biological vaccines requires technical competence which the women professionals would gain through advanced training. Their career paths, however, are adversely affected by societal expectations of a female student to get married soon after graduating. This jeopardizes her ability to take up scholarship offers when she has just gotten married, as explained:

> *"There is a small age bracket that has been set for the women to compete for these scholarships (less than 35years) women, it is hard for especially African women whose full-time expectation in marriage and age to get married is between (24-35years). This hinders women at the point of advancing their studies that would make them potential proprietors and proprietor managers"*

Their placements in these enterprises are dependent on their academic qualifications and experience. Most of the women professionals therefore tend to occupy comparatively low positions which attract salaries that would not enable them to pursue the advanced training.

3.8.5.3 The marketing and distribution chain

Barriers:

Limited vaccine supply: In Sembabule district, there were no agrovet or veterinary drug shops which stocked PPR vaccines, while a few agrovet/ vet drug shops stocked NCD vaccines. This was attributed to lack of cold chain facilities, including refrigerators, cooler boxes, erratic electricity supply, low farmer demand, and unavailability of the PPR vaccine. Farmers largely used ice in polythene bags to transport their NCD vaccines, a few others carried it in flasks. Both the NCD and PPR suppliers bought the vaccines from far, largely from larger distributors in Kampala city and Masaka town, thus affecting operational costs. Limited PPR distribution outlets could be partly attributed to the existing laws and regulations which specify some vaccines, including PPR vaccines, as a preserve of government at the distributor level.

Limited vaccine supply was also affected by low vaccine demand generally throughout the year. The vaccine suppliers, however, observed that vaccine demand tended to fluctuate according to seasons;

with their highest sales being during the festive seasons (Easter and Christmas) when farmers stocked larger numbers of chickens to respond to the high demand of chicken consumers.

The available vaccines tended to be expensive and packaged in large (100-dose vials), which were unfavorable for smallholder farmers. The shops resorted to re-constitute vaccines for farmers so that they could buy what they could afford, according to the number of chickens that they reared, raising questions of vaccine safety and efficacy. In addition, farmers lacked viable vaccine carriers.

Cold chain facility: Few agrovet and veterinary shops had a cold chain facility to safely maintain their NCD vaccines bought largely from Indonesia. The shop owners did not consider investing in the cold chain facility due to the low vaccine demand by farmers, especially the smallholder farmers.

In Sembabule district, electricity supply was deemed erratic, hence affecting the limited cold chain of the few agrovet/ vet drug shops. The shops which traded in vaccines, could only buy small stock of vaccines for a week to ensure the vaccines were safe.

Negative perceptions and attitudes of distributors: On women's entry in VVC at the marketing and distributor level, negative perceptions and attitudes were observed. Several distributers (agrovet owners and veterinarians) at the district level, felt that women were not suitable as distributors/ vaccine deliverers since they "fear injecting a goat", lack self-confidence and were "lazy and naturally handicapped" and therefore they could not engage in "hard" tasks, such as fetching water for their livestock and in jobs which require mobility. They also observed that lack of capital, the multiple domestic roles of women, especially the married women tended to limit their entry in the VVC at the distributer level. One female noted that typically women who owned drug shops started off with very little money to buy stock, and in some cases they could not meet farmers' needs when they could not stock expensive drugs. Some of the female veterinary extension workers were reluctant to ride motorcycles.

Capital intensive requirements to set up vaccine distribution outlets: The capital-intensive requirements for starting vaccine enterprises were indicated to be a limitation by many women according to female participants during the national stakeholder workshop. To operate a vet drug shop, you are required to have a license. The system of acquiring licenses tended to be bureaucratic, licenses were expensive and difficult to acquire from Kampala, requiring the professionals to move back and forth their workplaces to follow up the processes. A female key informant explained that this process disfavors women, since it required them to have sufficient funds to facilitate their travels, spending nights out of their homes to acquire these licenses.

Veterinarians' lack of specialized knowledge on poultry disease control and management: Farmers expressed their concerns about the lack of specialized knowledge and skills among the veterinarians and extension workers to effectively control diseases and manage poultry. These professionals too, recognized this limitation:

"But before offering any service, they disclaim the fact that they don't know much about poultry keeping and would only use intuition as doctors." (**R6, FGD-Kyera men goat farmers**)

This contributed to a lack of farmers trust of the professionals and the tendency to depend on themselves to treat their poultry.

Opportunities:

Sensitization on importance of vaccines: Many small-scale farmers did not know that local chicken and goats are vaccinated. As a way of increasing demand for vaccination, agrovet and vet drug shops engaged in sensitizing farmers on the need and importance of vaccination and on the vaccine availability in their respective shops. In a few cases, farmers bought vaccines from them through farmer referrals. There were some women vaccinators with motorcycles who went to the farmers directly to provide vaccination services, which included sensitization.

Vaccine supply: PPR and NCD vaccines were made available through a private supply chain. In the absence of agrovet drug shops selling PPR vaccines, a male government veterinarian **had taken on supplying the PPR vaccine, as a private business in Sembabule district.**

The concept of "village agents" (an equivalent of community animal health workers) identified as lead farmers to be capacitated by professional veterinarians with the aim to support vaccination at farmer level was discussed during the district stakeholder meeting as an opportunity in the pipeline that will support vaccine delivery and vaccination services for farmers, this was indicated as an opportunity to address an existing gap of veterinary service providers at the community level.

Cold chain as service delivery: In Sembabule district, there are two government-owned and operated cold chain facilities; one at the district headquarters and the other at a distant county. These facilities, however, did not meet the farmers' demands. Their functionality and sufficiency were hindered by some operational issues such as energy options available to them. Solar energy was the cheapest source of energy, but its use was not recommended due to theft of solar panels installed at the government sites. The government was using gas for the cold chain. Although gas is more expensive than solar energy, it proved a more secure option. A limited number of cold chain facilities was largely a result of budgetary constraints. One government worker said, "… *it would take us about 8 years to cover the whole sub county*".

3.8.5.4 The end user chain

Barriers:

Traditional production system: Poorer households tended to maintain the traditional production system of rearing few local goats and chickens which were easier and cheaper to rear under the free-range system. Based on their past experience, the farmers believed that local goat and chicken breeds did not require vaccination or treatment since they rarely fell sick, they were largely kept to meet their subsistence needs and their occasional emergency needs, when sold. As a result, the traditional

production system has highly contributed to limited women involvement in VVC and farmer benefit from vaccines.

Land ownership: Land ownership was highly dominated by the men. This is a limitation for women to grow their poultry and goat enterprises. Few women, especially widows and unmarried women, owned and controlled land, while some had sufficient land for poultry and goat rearing hence no intrusion and more safety from potential infectious diseases from neighboring farms. These tended to freely participate in most development and health projects that were brought to the district.

Animal health seeking behavior: From all focus group discussions, it was observed that very few farmers vaccinate their chickens and goats. The majority used local concoctions for disease treatment including herbs, ash, waragi, pepper, human medication, and cattle drugs. Women were expected to seek for permission from their husbands before interacting with male veterinarians in order to avert family/ marriage conflict. Reasons farmers provided for not vaccinating their goats and chickens included lack of knowledge about vaccines; belief that local breeds do not require vaccines, despite their admission that significant deaths were registered when chicken were infected with NCD and goats were infected with PPR; the vaccine cost was unaffordable, especially when packaged with large doses which the farmers could not consume, given the small number of chickens that they were rearing. The smallest available NCD vaccine was a vial which covered 100 birds, yet majority of the smallholder farmers had less than 100 birds. Some women farmers in particular could not afford to pay for the vaccines. Some of them depended on their husbands to pay for the vaccine even when the goats belonged to the women.

Vaccine and disease knowledge, attitudes, and perceptions among women: In all focus group discussions, women farmers reported lack of knowledge on the importance and effectiveness of vaccines. Majority of farmers did not know that local goats and chicken needed vaccines, unlike exotic goats and chicken. Some were unable to differentiate between vaccination and treatment of disease conditions. Some believed vaccines and veterinary drugs were a domain of veterinarians, in use, importation and storage, a perception that made it very hard for women to get involved in the VVC.

Both female and male small-scale farmers lacked knowledge about livestock and poultry health, diseases, and disease control and management, including vaccination. Knowledge was largely got from chicken suppliers, agrovet and vet drug shops. The obtained information was very specific to the product that the farmers were purchasing or to the product that the chicken suppliers and drug shops were marketing, such as vaccines. This information was inadequate for effective disease control and management. Knowledge was also obtained from fellow farmers based on experience:

> *"We do meet and interact with fellow farmers and learn that even local herbs can actually work in addressing these disease challenges."* (**R8, FGD - Lugusulu women chicken farmers**)
>
> *"True the birds die, a time reaches and they have to die. So I also time them; during July when the dry season is starting, I reduce them I sell about 40 to remain with a few. When they increase again and the way trees being many they sleep; I don't have a chicken house."*

"Yes, I left them once (in July) and they died so many so I now reduce since my neighbours are far away…" "The birds are on farm. By the time Newcastle comes from other places. When they are many, they are infected very fast but if few the disease spreads slowly. I discovered the problem like that; that's my little science." (**Male farmer VI, Focus Meal 29**)

Yet, there was a tendency for low farmer participation and motivation in attending farmer trainings and meetings which were organized by local government departments. Some husbands tended to restrict their wives' involvement in training and other useful forum. Such fora presented farmers with an opportunity to increase their knowledge and skills on improved livestock productivity and production and improved quality of life of the women and their families.

The majority of the male and female farmers could not differentiate between vaccination and treatment: "*I buy very young chicks as well as vaccines and rare them up to one month and then start selling off. I usually call a doctor to vaccinate for me but still; sometimes they become weak and fail to eat. This constitutes calling the doctor back to give other vaccines."* (**Respondent, FGD 28**)

High disease burden and deaths: Almost all male and female farmers reported a high disease incidence and high mortality rate among the goats and chickens, as a result of PPR and NCD. In particular, at the time of conducting FGDs, the district was faced with a PPR outbreak which had caused huge goat losses. NCD in chickens was leading to several chicken losses in particular seasons.

A majority farmers reported that despite the disease treatment of livestock diseases that they got from the veterinarians, there was still a high mortality rate among goats and chickens. As a result, a majority of the farmers tended to mistrust the veterinary services provided by both government and private veterinarians: "*Most times the diseases goats suffer from are for guessing and the vets keep trying different drugs which don't work. We need those facilities for testing. Challenges with goat diseases are still there; it is still hard to tell the disease you are vaccinating against. We do all we are told to do for example they say drench, next time they say try the injection; then there is that for injecting in the muscle. You use all that but still find losing goats."* (**Male farmer, Focus meal 29**)

Poultry keepers emphasized the tendency of veterinarians to prioritize treatment for cattle. They observed that the cattle treatment bias could be evidenced by the drug stock in vet drug shops which was largely for cattle treatment.

Poultry non-disease losses: Other heavy losses were attributed to theft by humans and vultures, stray village dogs, particularly for local breed that were reared under the free-range system and in cases where farmers lacked secure housing for their chickens. Human thefts were commonly experienced at night and during festive seasons. In many cases, farmers cited lack of capital to construct chicken houses as a problem that they faced.

Gender norms, culture, and tradition: Pastoral women who were engaged in keeping inferior livestock and poultry suffered from inferiority complex among the Bahiima ethnic group. Within this

ethnic group, which is predominantly a pastoral community that rears cattle, a goat owner is not respected as much as a cattle owner. Also in this community, culturally a woman is not supposed to interact with any man without consent from her husband. Decision making on women's goats required involving the men, therefore the male veterinarian had to engage the men sometimes in order to access the female farmers. As a result, male veterinary extension agents were constrained by not being able to deal directly with the female farmers at household level.

Stereotypes such as "*anything commercial in a home is controlled by the man"* tend to result into exclusion of women from the production process all the way, including vaccination. Discussions pointed to traditional/ cultural beliefs and practices which disfavored women involvement in the VVC. For instance, among the Bahiima pastoralist communities, men are responsible for treatment of livestock, relegating women to inferior positions. Several discussions painted images of a female veterinarian who usually does not like to engage in "dirty work" and "work that required physical strength". This affects girl education and professional choices. Unlike male veterinarians, female veterinarians needed to prove their competence to male farmers before they were accepted and respected in these communities.

Women groups: Although women groups were viewed as a vehicle for women empowerment and a platform that enhanced women involvement in VVC and benefit from vaccines, women groups were faced with several challenges. Challenges included issues of group dynamics, self-interest motivated members that were considered as being with *"bad hearts, jealous and envy"*; lack of transparency; rumor mongering; loan defaulting and absence of enforcement/ accountability; inadequate capital in the groups; lack of safety of group finances; land shortage which limits business; and insecurity of larger farms.

Inadequate veterinary service provision: Participants of the focus group discussions reported that the numbers of both government and private veterinarians was inadequate, particularly the further away the farmers were located from the district headquarters. Available government veterinarians and extension workers lacked transport, drugs and were paid poorly, so they tended to focus more on cattle treatment and operating small livestock enterprises, which presented them with an opportunity to boost their incomes. Private veterinarians were used, particularly for those who could afford their services.

A majority of the veterinarians used clinical signs to determine the diseases among goats and chickens. In a few instances, the veterinarians "*would pick samples and send to labs in Mbarara or Makerere, Kampala"* (**KII 4**). In the past six months, however, the district had opened a lab in Ntusi and Nabitanga sub-counties where lab technicians tested samples. In spite of these diagnostic facilities, animal sample testing was largely done for cattle and the service was expensive. A veterinarian who owned a veterinary drug shop cited an example of the routine cost of 150,000 Uganda shillings (about $40) that he charged for picking samples and organs on 3 cows from a farm. This cost included transportation costs. One veterinarian who owned a vet drug shop observed: "*We don't have kits. We*

have a lab I think it is for goats and cattle, the lab is in Nabitanga. It is for MOBIP. We take samples either to Nabitanga or Makerere (university in Kampala).” (**KII 4**)

Abuse of drugs by the private practitioners was cited as another constraint by government veterinarians.

> *“Some farmers were unable to buy a whole bottle of vaccine because of low capital or few animals and as a result, the private practitioner keeps the remaining drug of vaccine and administers it to another farm even when they know it is no longer viable in order to recover all the money he invested in buying the vaccines and getting a little profit.”* (**KII 3**)

Poultry and goat markets: Lack of markets and low prices for the chickens and eggs were cited as major constraints which demotivated farmers to engage in poultry and goat enterprises.

Opportunities:

Purchase of older chicken: Farmers resorted to purchasing older chickens that were already vaccinated from chicken suppliers. This provided an opportunity for farmers to rear livestock and chicken with a less likelihood of contracting disease, and reduced mortality, especially when they were very young. Therefore, vaccine benefits were registered.

Women groups: members of women groups were more inclined to vaccinate their chicken, were largely knowledgeable about vaccination (from chicken suppliers) and easily mobilized resources from their savings for vaccination. Funds were pooled together to invest in poultry enterprises, which would not have been possible for an individual. Savings and investment groups fostered members' increased incomes and accumulation of capital. Through these, members received loans to solve their immediate domestic problems and emergencies. The groups provided a platform for sharing information and generating ideas aimed to maximize group benefits and empowerment of women. Groups acted as a motivation to grow women enterprises; allowed for opportunities to work together; and derived benefits therefrom which included building women's self-esteem, self-efficacy and motivation, generated more income, and learnt more about disease control and management, improved livestock and poultry productivity and production, improved social relations, and discipline, as a result of working together.

Male involvement in women farmer enterprises: For efficiency, reduced work for women farmers, and to minimize domestic conflict/ violence with reduced suspicion of the woman's source of income, women groups resorted to involving men in their group operations.

> *“No, we do involve some men because some of the things are done better by them, for instance, quick transport on boda bodas, careful handling of vaccines and vaccination itself.”* (**RX, FGD-Mijwara women chicken farmer**)
>
> *“We vaccinate every after one week: first week we vaccinate against Newcastle disease, week two Gomboro, Brintitus and on week four, we repeat Newcastle vaccination. This is done collectively in the group brooder.”* (**Respondent, FGD-Mijwara women chicken farmer**)

"Suppliers of young chicks interact with the buyers (Farmers), describe and explain about the vaccines and other chicken medications and this involves application and how they work." (**R14, FGD - Lugusulu women chicken farmers**)

Role of local governments: In addition to chicken suppliers, the local government departments conducted sensitization meetings and farmer trainings, when resources allowed. Farmers were trained on the relevance of vaccination. After the training or sensitization meetings, veterinarians and extension workers demonstrated how to mix the vaccines and use.

For improved quality assurance, coordination, regulation, enforcement, tracking and monitoring, the local government initiated an exercise of registering all the private veterinarians. The local government plans to provide identity cards for all practitioners. These could assist farmers to distinguish between qualified professionals and quacks.

Changing economic trends: goat and chicken rearing have increasingly become commercialized. There was increased demand for local chicken breed at a greater price than exotic breed. Commercialization of goats is evident as societies evolve with time and get exposed to alternative economic opportunities from neighboring communities and through government and NGO programs. Goats were a "quick" source of household income which was used to meet emergency needs such as family medical care, school fees for children and basic necessities, purchase of acaricides and drugs especially for cattle. New better breeds of goat were available for farmers to keep and crossbreed and these tended to have a higher value and market.

Ownership of the enterprise: Women's involvement in the VVC depended on ownership of the enterprise at household level. At least 80% of women owned poultry in homes. Some men had no interest in the birds, which tended to be few, thus several women farmers were the decision makers on their poultry.

Private NCD VVC provided an opportunity for women to deal with fewer barriers since they engaged in vaccinating the chicken themselves. Many women farmers, involved in poultry rearing as individuals or as groups, found it easy to administer the vaccine through the eye, since it did not require technical skills. They found it cheaper to vaccinate the chickens themselves, without having to hire veterinary services.

4. DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

The study purposed to generate evidence and formulate strategies that would help position women to effectively and efficiently contribute to and benefit from livestock vaccines and to enhance their participation in livestock distribution, delivery and use which is paramount for women empowerment and gender equality.

Enhanced positioning and visibility of women in the PPR and NCD vaccine value chain (VVC), can occur through supporting a shift for some women from the end user chain to the delivery chain. Women farmer involvement when determining and shaping the potential entry points is critical, given their perceived roles as being the most important stakeholder in the VVC at the district and community level. At the delivery level, female drug shop attendants can potentially be involved in vaccination and in field extension work, if their capacity can be built and gender barriers are overcome. Viable farmer-distributor networks can be promoted and nurtured for increased vaccine accessibility; knowledge about vaccines and livestock disease prevention and control; and increased vaccine uptake.

Enhanced women participation in livestock distribution, delivery and use can be realized by addressing identified barriers and building on the identified existing opportunities. The potential entry points are related to supporting women farmers, vaccine deliverers, distributors to increase their personal and household incomes by supporting them to run viable and profitable business enterprises, increased disease and vaccine-related knowledge, building their gender capacities and addressing the identified gender-related barriers to women participation and positioning in the VVC. Low vaccine uptake in particular requires robust educational/ training interventions that address the identified knowledge gaps. Although all the institutions participating in the VVC at the distributor and delivery chain, were gender aware, their gender capacities need to be strengthened, by moving beyond the evident tokenism that is fostered by the funding and development partners to embracing a more institutionalized gender transformative approach. For better results, all the intervention entry points should aim to move beyond reaching and benefitting women, and foster women empowerment, as shown in the Reach-benefit-empowerment framework.

Drawing from the findings and participant recommendations, it is recommended that the Uganda project uses a model which combines strategies that aim to increase vaccine accessibility and vaccine demand to foster increased vaccine adoption and women empowerment. This recommendation is supported by a number of studies that underscore the importance of accessibility and demand in increasing vaccine uptake by smallholder farmers. Potential entry points for women empowerment and increased vaccine adoption and women empowerment include:

I. Increased Vaccine Accessibility

- ❑ Farmers proposed establishment of a support mechanism which would differentiate between specialized veterinarians for the different types of livestock including poultry.
- ❑ Increasing the number of veterinarians, by placing at least one per parish.
- ❑ Incentivization of the field extension agents by facilitating their transportation needs and better remuneration.
- ❑ Use of village health teams as a link between farmers and the veterinary extension agents. A phone system would be used to increase efficiency and to rapidly respond to the farmers' needs.

- ❑ Training for qualified vaccinators on vaccine handling and administration and how to deal with the gender barriers that they face.
- ❑ An intentional mechanism to link the distributors to farmers and to increase farmers demand for vaccines could boost vaccine sales and vaccine uptake.
- ❑ Cold chains should be demystified and opportunities for ownership of cold chains by women should be promoted.
- ❑ Village vaccinators/ agents with vaccination kits, legal recognition, and training under supervision of a veterinarian
- ❑ **Create partnerships with the government for improved service delivery and to boost livestock production and productivity. At the district level:**
    - At district level, Government should provide an enabling environment for the private sector to function for an efficient and effective vaccine supply chain which meets the farmers' needs.

II. Increased Vaccine Demand

- ❑ Capacity building of the veterinary professionals would not only increase farmer trust, but it would also provide for improved service delivery, improved disease prevention and response and avert several deaths.
- ❑ Use of vaccines for illustration during the training to increase demand. After the exercise, women start ordering for the vaccine and not the service.
- ❑ Sensitization talks and training for both women and men farmers should be conducted in targeted locations and audience (including women groups, churches, villages, established platforms which ordinarily attract huge numbers) and addressing several topics including:
    - diseases and disease management
    - gender stereotypes and negative mindset cleaning
    - cold chain issues
    - creating an enabling environment for VVC actors
    - vaccination issues including differentiation between vaccines and treatment drugs, importance of vaccination, how and when to vaccinate
    - poultry and goat enterprise viability and profitability
    - Group formation, sustenance, dynamics, and viability
- ❑ Government interventions for increased vaccine demand and women empowerment
    - Conduct sensitization talks for communities on the benefits in engaging in the animal husbandry sector, being sensitive to gender-related barriers which hinder women involvement in VVC.
    - Provide incentives for compulsory vaccination as was done in the 1980s and 1990s with punitive measures for those who don't vaccinate.
    - Jointly organize gender-sensitive district training by the technical and political leadership which would help to improve farmer knowledge and skills; improve farmers uptake of vaccines and gender equity.

III. Women Empowerment

- ❑ Women commodity groups to enhance group viability and sustainability. Women groups should be turned into commodity groups and not as groups formed around political interests, as they currently are. These groups would provide a platform for awareness raising among communities and for motivating communities to engage poultry enterprises. The groups should nurture role models.
- ❑ Professional female veterinarians could serve as role models who mentor girls to undertake veterinary sciences and address the constraints to female involvement in field work and in the VVC.
- ❑ Advanced education opportunities for female veterinary graduates. This includes providing gender-sensitive scholarships; targeting husbands of the female veterinarians to create an enabling environment for their qualified wives to practice and further advance their profession and to engage in profitable goat and poultry enterprises.
- ❑ Support female extension agents with opportunities to increase their personal and household income. These opportunities could include providing them with a startup package of chickens and goats, vaccines for sale, equipping female distributors and farmers with a cold chain as part of a starter kit to facilitate their enterprises and to increase vaccine supplies. Solar refrigerators were preferred for areas without electricity, for example in Ntusi and Bulongo sub-counties, and those with fluctuations in electricity.
- ❑ Increase gender capacities of the VVC actors for women empowerment and gender equality.
- ❑ Groups should be grown into viable commodity groups with support from the extension works at sub-county level.
- ❑ Increase the women farmers' goat and chicken stock or partnering with those providing stock to support women-run viable and profitable enterprises. A mechanism for supervising and supporting beneficiaries should be established. This could be a motivation for more women to engage in poultry enterprises.
- ❑ Build on the projects that women are already engaged in through addressing the gender barriers that they are confronted with. An example that was cited revolved around initiatives that would reduce the high NCD incidence and mortality. Successful interventions would not only motivate the poultry farmers to increase their stock but motivate other farmers to engage in poultry enterprises.
    - Support government to create viable partnerships for improved service delivery and to boost livestock production and productivity.
    - Support the local government workers (technical leaders) and local leaders including local councils (political leaders) to set up and maintain a responsive and efficient mechanism to address community needs. For instance, issues of theft, stray dogs' intervention to eliminate dogs which the farmers ranked high as major challenges that they are faced with.

The role of policies and legislations is emphasized in many vaccine studies in increasing vaccine adoption especially for smallholder farmers and marginalized populations. Donadeu et al indicates that government policies support and encourage vaccination by reducing barriers. Policies should also encourage cooperation among farmers. This study revealed that although there is no specific legislation on vaccine development, a number of policies and legislations that support vaccine development and delivery do exist. However, a further review of these policies and laws indicated that they are gender blind. Uganda has several gender policies, laws and strategies that support gender responsive service delivery that provide opportunity to support gender responsive vaccine delivery initiatives.

With liberalization policy as the main driver for vaccine distribution and delivery, the private sector players are the main actors in vaccine delivery for small ruminants and poultry in the district while government and its related policy organs like NDA largely play the role of policy and legislation provision. Most of these vaccine chain actors who constitute policy makers, manufacturers, distributors, and end users (both private sector and government veterinary service providers) do exist but there is no mechanism in place for coordinated interactions or a forum which is a key mechanism for knowledge sharing, capacity building, and coordinated service delivery. Without such mechanisms amidst private sector as the major driver for vaccine distribution and delivery, the role of women in the distribution chain was found to be mainly as end users or as workers within the agrovet companies. The main thrust of this project, therefore, aims to place women at all levels of the vaccine distribution chain. This will go a long way to empower women. At the national level, however, there are two manufacturing companies that have women directors that were passionate about giving women opportunities and very eager to mentor women. This is an opportunity that should be harnessed.

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