GENDER RELATED CONSTRAINTS AND OPPORTUNITIES ALONG CONTAGIOUS CAPRINE PLEUROPNEUMONIA VACCINE VALUE CHAIN IN MACHAKOS COUNTY, KENYA

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DEDICATION

I dedicate this work to my parents Joel Byalungwa Muzindikwa and Maua Namundeba Nyassa, and my family for their care and encouragement during the pursuit of this degree.

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LIST OF ABBREVIATIONS AND ACCRONYMS

AAHO:	Assistant Animal Health Officer
AHO:	Animal Health Officer
CCPP:	Contagious Caprine Pleuropneumonia
CDVS:	County Director of Veterinary Services
CEC:	County Executive Committee
CEO:	Chief Executive Officer
CO:	Chief Officer
CPD	Continuous Professional Development
CVL:	Central Vaccine Laboratory
DVO:	District Veterinary Officer
DVS:	Directorate of Veterinary Services
FAO:	Food and Agriculture Organization of the United Nations
FGD:	Focus Group Discussion
FIPS:	Farm Input Promotion Africa
ICT:	Information and Communication Technology
IDRC:	International Development Research Centre
KEVEVAPI:	Kenya Veterinary Vaccine Production Institute
KII:	Key Informant Interview
SM:	Stakeholders Meeting
KVB:	Kenyan Veterinary Board
LTKL:	Life Technologies Kenya Ltd
MACPOA:	Machakos County Agricultural Projects
MH:	Minister of Health
MOALF:	Ministry of Agriculture Livestock and Fisheries
NGO:	Non-Governmental Organization
OIE:	Organization of Animal Health
OM:	Outcome Mapping
PANVAC:	Pan African Veterinary Vaccine Center
PPR:	Peste des Petits Ruminants

RVF:	Rift Valley Fever
UDO:	Utooni Development Organization
USAID	United States Agency for International Development
VACNADA	Vaccines for the Control of Neglected Animal Diseases in Africa Project
VMD:	Veterinary Medicine Directorate
VPL:	Vaccine Production Laboratory
VVC:	Vaccine Value Chain
WEAI:	Woman Empowerment in Agriculture Index
WELI:	Woman Empowerment in Livestock Index
WHO:	World Health Organization

ABSTRACT

This work aimed at improving the small ruminant livestock value chains in Machakos by establishing interventions in animal health and women empowerment through their opportunities in vaccine value chain (VVC).The study evaluated the roles, constraints and opportunities for women and men, along the Contagious Caprine Pleuropneumonia vaccine value chain (CCPP_VVC). Focus Group Discussion (FGD), Outcome mapping (OM), focus meal (FM), and key informant interviews (KII) were used to appreciate the context of vaccination in the area. 228 participants were consulted including VVC stakeholders and model farmers. Principal takeholders identified included the vaccine manufacturers, vaccine importers, distributors, agro vets, public veterinary services, private veterinarians, local leaders and farmers. Woman Empowerment in Livestock Index survey was calculated from 300 households whose data was selected from 398 interviewees(KEVEVAPI, distributors in Machakos County agro-vets, vaccinators and, mostly small-scale women farmers). 8% of farmers were found to have access to vaccine but only 1% of them had easy access. 84% of farmers had low access to the vaccine suppliers. The findings revealed that among barriers for access to vaccine are lack of awareness, knowledge about vaccine, lack of finance, government inability to meet the demand and low veterinarians (particularly women) /farmer ration in the public sector. The conclusion was a need to develop an understanding gender disaggregated level of contribution by men and women to the value chain and how the benefits of contribution areshared. Such knowledge is important to empower women's participation in the VVC and also to increase vaccine access to smallholder farmers and consequently improve goats' production and the wellbeing of farmers' families.

Key words: CCPP, Vaccines value chain, Gender, Stakeholder, Machakos.

CHAPTER ONE: INTRODUCTION

1.1.Background information

Livestock sector is an important source of livelihood for about 1.7 billion people worldwide (Distefano and Haan, 2018). In Africa, small livestock are considered as one of the assets that women can possess, take control over, and sell to meet their financial needs. Cattle and camels on the other hand are male assets (Yisehak, 2008; Waitangi *et al.*, 2015). Most smallholder women farmers keep small animals whose productivity is however limited by preventable livestock diseases like Contagious Caprine Pleuropneumonia (CCPP), one of the 12 most devastating livestock diseases worldwide and especially in in the sub-Saharan region (Wallace *et al.*, 2014), where the farmers, especially women, do not have easy access to vaccines (Donadeu *et al.*, 2019).The vaccine regime needs a six-monthly dose with willing farmers vaccinating up to three times per year, any goat beyond three months old to impeach outbreak (Salt *et al.*, 2019).

Poor families, especially those in rural areas, are endlessly confronted with the struggle for food (Habiyaremye *et al.*, 2018). Application of the vaccines by women farmers can improve animal health and offer vigorous animals with better reproductive and productive potential and therefore permit women to increase their herds and get more income (Ndanyi *et al.*, 2014).Gender discrimination defining women roles, access to resources, control over assets and other responsibilities in households' constraints animal health and productivity (Bagnol *et al.*, 2016). A study conducted by Okitoi (2014) in the western part of Kenya showed that men, who own only 19% of the poultry, arethe decision makers over money accruing from poultry keeping, while women, who own up to 63% of the poultry, make only minor decisions pertaining only to management and labor on the farm (Okitoi *et al.* 2007). Women revenue is utilized for family wellbeing, spending up to 90% of their earnings to meet household needs, while men use only 30- 40% (FAO, 2011) on the same. Research show that if women had access to the same level of resources as men, farming productivity would grow by 10-30 per cent and farming productivity would rise by up to 4 per cent (FAO, 2011). Any mediation therefore that aims to improve livestock health of small ruminants through women access to vaccines is expected to offer direct and great benefits to women small-scale farmers (Heffernan

et al., 2011). The value chain concept for livestock vaccines is connected to a variety of activities such as manufacturing, distribution, delivery of the vaccine to the livestock farmer (Dungu, 2011; Maziya *et al.*, 2018). With vast livestock resource, and motivation for household incomes as well as thenational economy, it is imperative for Kenyan small-scale farmers to improve livestock productivity through integration and promotion of women in vaccine value chain.

1.2.Statement of the problem

A survey of farmers in Kakamega and Machakos Counties in 2007-2009 revealed that most of them regarded East Coast fever (ECF), Contagious Caprine Pleuropneumonia (CCPP) and Newcastle Disease (ND) as the most important diseases of cattle, small ruminants and chickens, respectively (Peters *et al.,* 2012). Contagious Caprine Pleuropneumonia (CCPP) is one of the most prevalent infectious diseases affecting small ruminants in pastoral areas, with adverse consequences on livelihoods Eastern Africa (Véronique Renault et al., 2019). In Kenya, the government has and implements bi-annual vaccination campaigns in pastoral areas of northern Kenya where the disease is endemic. A survey by Kipronoh et al., (2016) demonstrated a Sero-prevalence recorded for Turkana West at 63.9%, Kajiado Central at 48.6%, and Pokot East at 29.2% showing that CCPP is widespread and endemic in these areas. Therefore, regions bordering these areas, such as Machakos County, at a higher risk of CCPP.

Although there was a high degree of awareness and past use of vaccines and treatments, these treatments targeted cattle diseases. Disease treatments and vaccination were commonly carried out by veterinarians and by para-veterinarians but also about 1/4 were given by the farmers especially in Machakos (Peters et al., 2012). There was less use of vaccines in small ruminants which stood at less than half of the farmers. CCPP vaccine was the most common vaccine used reflecting its status as the most important small ruminant disease.

Available data regarding CCPP, reveals that the impact of the disease and the cost-effectiveness of its prevention and control are still difficult to assess due to a lack of reliable data occasioned by the dynamic nature of flock population which is particularly common in pastoral communities as well as high illiteracy and limited outreach (Véronique Renault *et al.*,2019). Poor infrastructure, insufficient technical personnel and lack of enabling policies

and support structures are additional constraints to animal health service delivery (Kimani, 2019).

Vaccines are the most effective intervention for reducing animal diseases, livestock deaths and improving human health. Considering the current situation of insufficient public technical personnel, involvement of the private sector players would be an added help. Unfortunately current practices limit the scope of the private sector's participation in vaccination, thus creating an unattractive business environment for them. For example, according to the article by Kimani (2019) there exists a perception, among vaccine value chain actors that the current veterinary regulations restrict delivery of vaccines by the private sector. An analysis of existing statutes by the Accelerated Value Chain Development (AVCD) Program at the International Livestock Research Institute (ILRI) however revealed that this perception has no legal backing (ILRI AVCD, 2017). Unfortunately, it has made livestock keepers, especially pastoralists to rely almost exclusively on the limited and often delayed public sector vaccination services. Consequently, there is widespread self-diagnosis and medication, abundance of counterfeit and substandard drugs and frequent outbreaks of livestock diseases including CCPP.

Luckily, this is set to change given the anticipated issuance of a circular by the director of veterinary services (DVS), following a stakeholder workshop held in Isiolo, Kenya in 2019, that will allow private sector to deliver veterinary vaccines by law. The resolution was arrived at due to recent findings by the ILRI AVCD Program that animal health delivery in extensive systems is unprofitable partly because of restrictions in vaccine delivery by the private sector. The public sector too have recognized the fact that it does not have adequate resources or capacity to deliver all the animal health services needed to control livestock diseases adequately and thus welcomes participation of the private sector. It is expected that these resolutions in the country will guide future provision of animal health delivery to Sector 4 (Village or Backyard) production, as defined by FAO (2007) and ILRI (2007).

Considering that small ruminants are the livestock that small scale rural female farmers are most likely to keep (Yisehak *et al.,* 2008; Waithanji *et al.,* 2015), gender considerations become important in measures undertaken to control their diseases. There is little evidence that any meaningful gender mainstreaming is currently actively pursued at different levels of livestock

disease prevention interventions. It is important therefore to study the role and economic involvement of women in livestock production and the inherent challenges they face, along with barriers brought about due to cultural practices and gender roles.

1.3.Justification of the study

Mapping the CCPP VVC would help to recognize the decision making process in vaccine institution in Kenya. The precedent permitted us to use a system analysis, an analytical method to map relationships among influencers in the decision-making process, test the practicality of system mapping in the local and national VVC and develop a deep understanding of the decision-making process for vaccination which helps to check programs in Kenya and identify opportunities for addressing the challenges confronting the actual vaccine value chain. This would help to improve the efficiency, quality and speed of the decision-making process and offer direct and great benefits to women small-scale goat farmers. The study would also find out different entry points for women integration into the VVC as vaccinators, vaccine distributors, vaccinators, vaccine stockiest, and vaccine end-users. This would help small farmers to have access to vaccine and improve their goat productivity even in local conditions. Integrating women in VVC, is an intervention that aims not only to improve livestock health in small ruminants (Donadeu *et al.*, 2019) but also empower women in general for improved household health that addresses Sustainable Development Goals (SDG) 3 and 5. The study also provided beneficial information to different actors in the vaccine value chain of goat which will act as a preparation and selection tool.This study would also give guidelines for interventions under action research to resolve some problems and avail other solutions of balancing gender roles and profits in vaccine value chain. Some recommendations given will contribute to resolve problems that smallholder farmers and particularly, women meet along livestock (goat) production cycle, profit sharing and decision making. This will enable fight against vulnerability and improve household wellbeing of small farmer's sustainable development goal I and 3. This study aimed at evaluating the contagious caprine pleuropneumonia (CCPP) vaccine value chain and demonstrate its impact on women goat farmers in Machakos sub-county.

1.4.Objectives

General objective

This study evaluated the roles, constraints and opportunities for women and men, along the Contagious Caprine Pleuropneumonia vaccine value chain in Machakos Town Sub- County, Kenya.

Specific were

1. To map the Contagious Caprine Pleuropneumonia vaccine value chain, identifying the key chain actors, and to define role of women along this vaccine value chain.
2. To assess the Contagious Caprine Pleuropneumonia vaccine value chain constraints for women and its contribution to women empowerment.

1.5.Hypothesis

Women and men are equitably involved along the goat Contagious Caprine PleuroPneumonia vaccine value chain in Machakos.

CHAPTER TWO: LITERATURE REVIEW

2.1. Economic importance of livestock to the livelihood

Livestock has very important economic, social and cultural roles for rural households as they help to increase income and comfort of the farmer's family.It offers: the high quality food to smallholder farmers in rural area, raw material to manufacturers and urban clients, revenue and service. Livestock decreases poverty and vulnerabilities in rural systems, strengthen small-scale diversified crop-livestock systems and livelihood openings to millions of livestock owners and thus for valuable development (ILRI, 2012).The increasing price of livestock products and byproducts offer new encouragements and a lot of opportunities for keeping livestock as a tool to support poor persons to move from vulnerability by offering various profits that they need in diverse systems of production (Rangnekar *et al*., 1998; Aklilu *et al.,* 2008). In different rural areas, especially where financial markets are not present, livestock herds are a foundation of asset buildup and an amount of wealth (Bettencourt *et al.,* 2015). Livestock brings income, engender service opportunities and supply food and nutrition security as one of the importance of livelihood, but it appears to have been left out, yet it is very central to many communities the worldwide crossways, varied production systems and lengthways different value chains (Bettencourt *et al.,* 2015). Livestock can also be stored in good season when feed is available and sold in bad times when there is feed deficiency for the purpose of consumption.

2.2. Women and livestock production

A study by Njuki *et al.* (2013) demonstrates that in Mozambique, Tanzania and Kenya, women possess animals acquired through generated revenue or through grants from NGOs. But in spite of that, women don't have decision making ability, or control over the livestock. Women spend 12-16 hours a day on farm related activities. However, not all women who manage farm resources have access to the income accrued from livestock keeping (Sinn *et al.,* 1999). Women farmers face obstacles and financial constraints that limit further their inclusion in agriculture. Furthermore, vulnerable people, especially women and landless poor, often are involved in livestock production, thus underlining the difficulty of promoting livestock keeping as a way to decrease poverty (Heffernan and Misturelly *et al.,* 2000). Several constraints

including but not limited to; less access to land, credit, market and even water; limit their gains from agricultural and livestock activities and consequently limited access to markets and income. Furthermore, and for women in particular, lack of decision making powers due to unequal domestic power dealings (IFAD, 2009) further curtail their access and control of earnings from farm production, specifically livestock and land (Galab and Rao, 2003) means that women are disempowered and cannot contribute efficiently to the supply systems in livestock, production which are masculine (Sinn *et al.*, 1999; Shicai and Jie, 2009). This contributes to the vulnerability of women putting them at nearly 70% of the world's underprivileged and among poor livestock attendants (Kohler-Rollefson *et al.*, 2012).

Socially, women have a lot of difficulties compared to men in accessing financial and government facilities (WHO, 2011). Farm productivity and profitability are in most cases limited by the absence of gender parities in participation and connection to input and services. This is due to some belief linked to some African culture that define and set works repartition, duties differentiation, and resource distribution according to gender (Waithanji *etal.*, 2015). However, research shows that such a traditional culture has been losing more and more as women continue to be involved in some sectors previously dominated by men for example some key positions in the dairy value chain (Njarui *et al.*, 2012). In rural area 70% of the poor are women (WBG, 2018) and this is supported as already mentioned above by lack of resources, land, power decision, and encouragement (Rhodes *et al.*, 2017; Majokweni, 2019). The situation is made worse by less support from institution, and other different services (Yisehak *et al.*, 2008; Rota *et al.*, 2010; Machina and Lubungu, 2018). For any meaningful development to be realized in any developing nation, it is imperative that women are given their rightful place through empowerment.

2.3. Improved food security and nutrition

Food security at household level is a function of the woman. In case of food deficiencies, women sell livestock or livestock products to buy other diet items to supplement household nutrition. Livestock and livestock products are considered as the main source of protein for households. With integration and provision of women's governance over family resources (financial, social assets, livestock management, and land use), there will not only be the

development in the economic life of the family but also better utilization of incomes, such as good nutrition and children education that lead to wellbeing of family in general and in particular woman (Quisunbing, 2003; Waithanji, 2014). The equality of opportunities and women empowerment are fundamental factors to decrease poverty and undernourishment (Abate, 2019).

2.4. Women and vaccine value chains

A value chain considers different structures of production from the farm level, through elementary phases of production, processing, marketing (wholesale and retail sales) and other distributions before getting to the last customer (Kaplinsky *et al.*, 2001).A study done in Kenya by Odongo (2014) revealed that the woman has a key role in smallholder farm production. Both men and women have balancing knowledge on how to treat animal diseases. In fact, women are qualified as greater perceivers of clinical signs during early stage of disease upon a particular animal when the men are stronger in specifying clinical signs of the same animal but at a later phase (Odongo *et al.*, 2015). Gender, as a result, matters in technology adoption for the reason that gender affects farmers' access to labour, land and other assets and this may possibly affect farmers' first choice regarding outputs (Doss *et al.*, 2001). Disease control is a key to improving livestock productivity. The importance of vaccines and vaccine value chains in livestock production cannot therefore be over- emphasized. It follows therefore thatfull involvement and participation of women in the vaccine value chains can add more value to any livestock productivity.

2.5. Contagious caprine pleuropneumonia mortality and morbidity

CCPP is an extremely infectious disease caused by *Mycoplasma capricolum sub. Spp*. capripneumoniae (mccp) (Thiaucourt and Bolske, 1996). The due disease is spread by shortest and close interaction amongst animals with a mortality rate reaching 70% and a morbidity level ranges between 80 and 100% (Lefèvre and Thiaucourt, 2018). It was listed by the World Organization of Animal Health (OIE) as one of the notifiable diseases in small ruminant flocks. In widespread areas and high predominance zones, it is a main threat with severe consequences on people's economic incomes. A lot of reports and studies presents CCPP as one of the main infectious disease touching the goats in the ASALs (Bett et al., 2009; Peyraud et al., 2014;

Kipronoh et al., 2016). By the pastoralists' people, the disease is defined by its clinical signs including respiratory infections with a very high mortality rate recognizable by its pathognomonic necropsy injuries of fibrinous pleuropneumonia (Asmare et al., 2016). These injuries are defined by the pastoralists as "adhesions between lungs and ribs". Since the early 1980s, the Ministry of Livestock supported bi-annual free vaccination operations. The vaccine used, Caprivax TM, is an inactivated vaccine produced locally by the Kenya Veterinary Vaccines Production Institute. From 2010 to 2013, the Vaccines for the Control of Neglected Animal Diseases in Africa Project (VACNADA) improved the vaccine quality produced locally through a better process; the establishment of a quality control procedure and a certification (Pan African Veterinary Vaccine Center of African Union -AU-PANVAC certificate) established to ensure a proper quality of the vaccine (Rurangirwa et al., 1987; Peyraud et al., 2014).

2.6. Importance of vaccine

The fact that, lots of people depend on livestock for their livings and as a basis of food limits policy choices, confuses local and global trade results, and raises governmental sensitivities. It is unavoidable that the world will remain experiencing the rise of new human and animal diseases in the coming periods. This challenge orders the need for the therapeutic, veterinary, and public health societies to make common efforts locally and worldwide. The growth in human and animal populations, with associated environmental conditions of global trade, opportunities for transfer of pathogens within and among species increased. Consequently, diseases are posing more challenges now and will in the future. Fast development of animal vaccines is thuskey in controlling emergent viruses (Singer *et al.,* 2003; FAO, 2010). Veterinary vaccines will continue to be a significant tool to defend animal health, human food security, and food safety (Pastoret *et al.,* 1996; Roth *et al.,* 2011). In fact, it has the most important role in protecting animal health to decrease animal suffering, affecting their productivity to provide food for the growing human population, and greatly reducing the need for antibiotics to treat livestock and companion animals. Prominent instances include rabies inoculations and rinderpest vaccines. Rabies inoculations for livestock and wildlife have approximately eradicated human rabies in developed countries. Recall that the Global

Rinderpest Eradication Program which comprised vaccination, helped to eradicate Rinderpest as the second disease to be globally eliminated (Pastoret et *al.,* 1996; Dungu *et al.,* 2011).

2.7. Vaccine supply chain benefits

A good-designed vaccine supply chain reduces costs and enhances coverage (Acosta *et al.,* 2019). Regardless of its apparently indispensable nature to vaccination activities, the World Health Organization (WHO) states that the supply chain for human vaccines is regularly ignored (WHO, 2014). This remains the case for livestock vaccines for this study. For infantile vaccinations, UNICEF has established a model to estimate demand, but unreliable data can result in inaccurate approximations resultant in excess or lack of vaccines, totaling unnecessary logistical burdens (Kaufmann *et al.,* 2011; Acosta *et al.,* 2019). One of the principal aims of National Immunization Programs is to reinforce and elevate immunization supply chains so that vaccines are delivered to the end receivers successfully, efficiently and sustainably. As a result of investments in global health, international agencies are recognizing the need for vaccine supply chains to function at their best levels (Yadav *et al.*, 2014).

2.8. Vaccine supply chain generic map

The supply chains for vaccines take different forms depending on countries, but generally involve attaining of quantification, packing and stockiest at the fundamental, regional points (Foster *et al.,* 2006; Assi *et al*., 2013). Vaccine is transported from a higher level storage site to the next step. Characteristically, 2-3 ranks of storage happen earlier the vaccine reaches the vaccination service delivery point (WHO, 2013; Yadav *et al.,* 2014). Information systems detention product stream information at each step in the distribution process, whereas each country diverges in the exact organization (Yadav *et al.,* 2014).

2.9. Kenya Veterinary Vaccine Production Institute (KEVEVAPI)

KEVEVAPI was established as a parastatal institution in 1990 following the dissolution of a joint venture between the Government of the Republic of Kenya and the Welcome Trust Foundation of the United Kingdom. The Organization was created by integration of three different institutes that were producing vaccines in Kenya. These were the Vaccine Production Laboratory (VPL), the Vaccine Production Unit at KARI, ofthe National Veterinary Research

Centre (NVRC), and the Vaccine Section of Veterinary Research Laboratory at the Department of Veterinary Services Headquarter (Rurangirwa *et al.*, 1984, Lipner *et al.*, 1995). KEVEVAPI is mandated to organize and take responsibility of all veterinary vaccines manufacture in the country.The institution also develops and produces chemicals and laboratory products for usage in the fabrication of vaccines and other veterinary products.

CHAPTER THREE: CONTAGIOUS CAPRINE PLEUROPNEUMONIA VACCINE VALUE CHAIN ANALYSIS AND MAP

Abstract

In Kenya, small ruminants are an important means for enhanced livelihood through income generation and empowerment of rural women. Regrettably, openings for livestock farmers to tap into these resources, for financial growth are delayed by high endemic diseases such as contagious Caprine PleuroPneumonia (CCPP). Vaccination of goats is crucial for the control of CCPP. However, low access of small farmers to vaccines was recognized by stakeholders of the livestock value chains as the main constraint to fruitful vaccination strategies. The objective of this study was to assess the situation of goat's vaccination in Kenya and evaluate the impact of women incorporation for improvement of vaccination accessibility by smallholder farmers. Outcome mapping (OM), focus meal (FM), and key informant interviews (KII) were developed to appreciate the context of vaccination under total control of the government. Stakeholders addressed included the vaccine manufacturers, vaccine importers, distributors, agro vets, public veterinary services, private veterinarians, local leaders and farmers. Their roles and gains in the development, knowledge of application and assessment dissemination, communication and capacity building among farmers and stakeholders, was documented and noted to significantly influence vaccine access. The study show that only 8.31% participated in the vaccination program whereas farmers (91.7%).On gender basis, 89.7% of the male respondents were willing to have access to the CCPP vaccine suppliers' and. amongst the women, 81.1% of the interviewees reported to be willing to have access. Indeed, 98.99% of respondents reported that it is not easy for them to access the CCPP vaccine even though they would be willing, and only 1.01 % of the respondents accepted that they can access easily. Form the study it was concluded that a sustainable vaccination strategy for Kenya would benefit from public-private collaboration between NGOs and Government to reinforce enhance success.

Keywords: small ruminants, CCPP, VVC, OM, stakeholder.

3.1. Introduction

The Food and Agriculture Organization of the United Nations revealed that 1.5 billion people live in smallholder families in Africa and Asia where smallholders' food production contributes up to 80 percent of the entire food supply (Altieri and Koohafkan, 2008). Kenya is among the tropical areas whose climatic and environments impact small ruminants (Kipronoh *et al.*, 2016). Therefore goat sector one of the prominent economic sub-sector in the country, improves social conditions of many farmers in different rural household (FAO, 2012). Out of the probable 28 million goats in the country, around 12 million are located in the arid and semi-arid lands (Favre *et al.,* 2009). Small ruminants are kept mainly for meat, milk, skin, income, property security, monetary savings, assets, and for many other socio-economic and traditional purposes (Shiferaw *et al.,* 2006). For this reason smallholder farmers and poor populations in Africa are dependent on their small ruminants. Unfortunately, a sigfinicant number of small ruminants do not realize their potential in rural production systems as they die from diseases including CCPP (Donadeu et al., 2019; Asmare *et al.,* 2016).

Contagious Caprine Pleuropneumonia (CCPP) is the most important disease of small ruminants and is endemic in the arid and semiarid regions of Africa (Rurangirwa et al., 1987b; Bett *et al.*, 2009; Peyraud *et al.*, 2014; Kipronoh *et al.,* 2016). It is in Kenya, rated by farmers as one of the top main concern diseases in livestock (Renault *et al.,* 2019). The disease is widespread and endemic in the pastoral production systems in the Rift Valley region and that the neighboring areas are exposed to CCPP (Kipronoh *et al.,* 2016).

It is an extremely infectious disease caused by *Mycoplasma capricolum sub. spp. capripneumoniae (*mccp*)* (Thiaucourt and Bolske, 1996; OIE, 2015). The transmission if done through direct and close contact among animals has a mortality level above 70% and a morbidity rate between 80 and 100% (Kipronoh *et al.,* 2016; Lefèvre and Thiaucourt, 2018).

In effect, vaccination is the best option to limit and control such diseases, but frequently the vaccines do not reach small holder farmers (Maziya et al., 2018; Donadeu *et al.,* 2019).

Both the public, private sector and NGOS play a role in vaccine value chain including: development of vaccine, manufacture, and distribution, the choice to vaccinate and the duty for the purchase and delivery of vaccines. Lack of strict cold chain is challenge (Lipner and Brown,

1995). Therefore, personal initiative is important for effective vaccine acces (Holden *et al.*, 1999; Campbell *et al.*, 2019).

Even with important progresses made so far, results have not shown acceptable vaccination coverage through the country. And this is generally explicated by the low level of involvement of farmers in vaccination (Dione *et al.*, 2019), and the low vaccine production as suppliers are not willing to sell products that are in low demand, theoretically resulting in income loss due to limited shelf-lives (Renault *et al.*, 2019). The situation is a result of many factors including lack of awareness of farmers about the benefits of vaccination, poor strategies of vaccination campaigns, low interaction among the vaccine chain stakeholders (Kiara *et al.*, 2017; Dione *et al.*, 2017; Sadio *et al.*, 2018). The object of this study ws to map the Contagious Caprine Pleuropneumonia vaccine value chain, identify the key chain actors, and to define role of women along this vaccine value chain. The should considerably enhance smallholder farmers to access vaccine and improve their flocks' productivity.

3.2. Materials and methods

3.2.1 Description of the study area

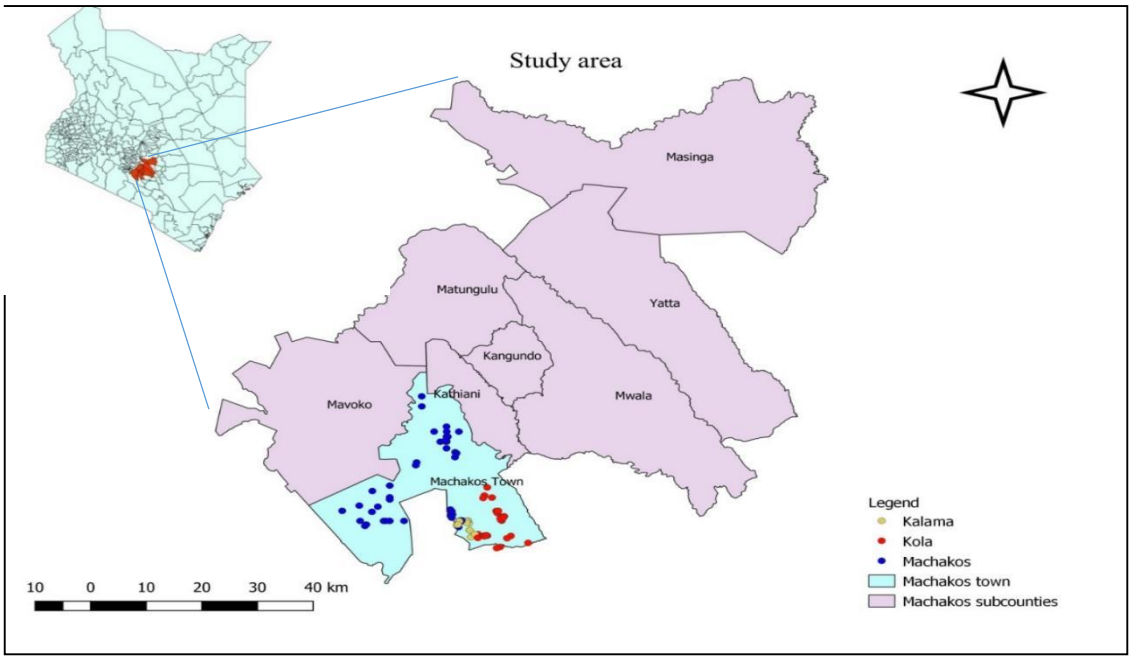

***Figure 1*:Machakos County**

Machakos County (figure 1), in central eastern Kenya (0º45´- 1º31´South and 36º45´ 37º45´ East), has a population of 1.4 million distributed in eight sub-counties. The temperature in Machakos County varies between 18˚C and 29˚C during the year and rainfall between 500 mm and 1250 mm. Almost 20% of the land is cultivated (County M., 2015). Indigenous goats are kept by 67% of the households (Mutua *et al.*, 2018). The study focused on two sub-counties including Machakos-town and Kalama sub-county. And the choice of these two sub-counties was focused on the fact that: (a) Kola and Kalama are considered high risk zones for outbreak of the CCPP disease as they border neighboring Kajiado who experience many outbreaks. Thus they access free vaccines from the government. (b) The site is easily accessible and the villages have a high number of goats.

3.2.2. Description of sampling procedures and methods

3.2.2.1. Data collection methods

Our data were applied the context of focus meeting discussions, stakeholder mapping and analysis exercises, individual interviews with veterinarians and other stakeholders along the value chain of the due vaccine, and quantitative surveys with farmers.

3.2.2.2. Qualitative data

Data collection methods consisted of focus group discussions, focus meals, stakeholder meetings and outcome mapping analysis, key informant interviews and observations.

The study utilized a well-articulated action research strategy that incorporates men and women analysis tools and outlines for research action in value chain analysis. The following resources were used: the five domains of gender analysis done by USAID, the seven steps of action research in value chains from the Danish Institute for international Studies (Riisgaard *et al.*,2010; Ramos-Mattoussi, and Caballero, 2015).

The USAID five domains of gender analysis facilitated the collection of qualitative data as correlated to different obstacles, opportunities and tactics for improving women's entry into goats' proprietorship and vaccine value chain (Spratt, and Lewis, 2020).

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- **Key informant interview (KII):**

Key informant interviews were carried out with non-governmental organization leaders, farmers, and different stakeholders along the VVC.

- **Outcome mapping (OM)**

This is a tool for vaccine value chain planning andanalysis, this was used methodically to identify, and tract critical stakeholders along the VVC concentrating on changes, in their traditional practices, organizational systems, institutional and governance policies. By the end of the day, this facilitated us to discover how the advancement could be towards helping to achieve our purpose.

3.2.2.3. Quantitative data

The Women Empowerment in Livestock Index (WELI) is a quantitative survey tool administered at household level, particularly women and some of their husbands (Stern *et al.*, 2016; Galiè *et al.*, 2019). It is the standardized measure that captures women's participation in livestock sector. The collection of data consisted of all the Ten Modules of WELI, but four modules were concerned with our analysis including: module one, module two, module eight, and module ten.

WELI Sample Size and procedure: The unit of the examination was a household. The sample population was selected using simple random design. This would offer an equivalent occasion for any to be involved in the study. Selection of households was purposefully based upon those keeping goats.

The sample size was 337 goat farmers from different villages. The sample proportion was determined by using the following formula as modified by Dohoo (2003):

$$n = \frac{(\frac{Z\alpha}{2})^2 \quad p * (1 - p^*)}{E^2}$$

With

n= the sample size.

P= proportion (0.50 as estimation of population is unknown).

For a confidence level of 95% and Z-score= 1.96

$$n = \frac{(1.96)^2 * 0.5 * (1-0.5)}{(0.05)^2} = 384$$

Since the population of the Machakos sub-counties is finite, the present sample needs to be adjusted.

$$naj = \frac{n}{1 + \frac{n-1}{N}}$$

naj= adjusted size of the population,

n= sample size if the population in infinite.

N=total population.

$$naj = \frac{384.16}{1 + \frac{384.16 - 1}{2723}} = 336.7734 = 337$$

3.2.3. Data analysis

The collected information from interviews, focus meeting with stakeholder engagements, were transcribed and coded appropriately in an excel spread sheet and the generated qualitative data analyzed. When WELI quantitative data were completed in an Excel spread sheet, and the results analyzed in STATA14, then the results were presented in the form of simple tables and diagrams.

3.3. Results

3.3.1. CCPP value chain mapping exercise

The table 1. Represents the list of the stakeholders of all the animal vaccine value chain found in the area. Some of them are active in the current vaccine supply chain when others are not so active but might intervene in one way or another.

Table 1: Stakeholders list

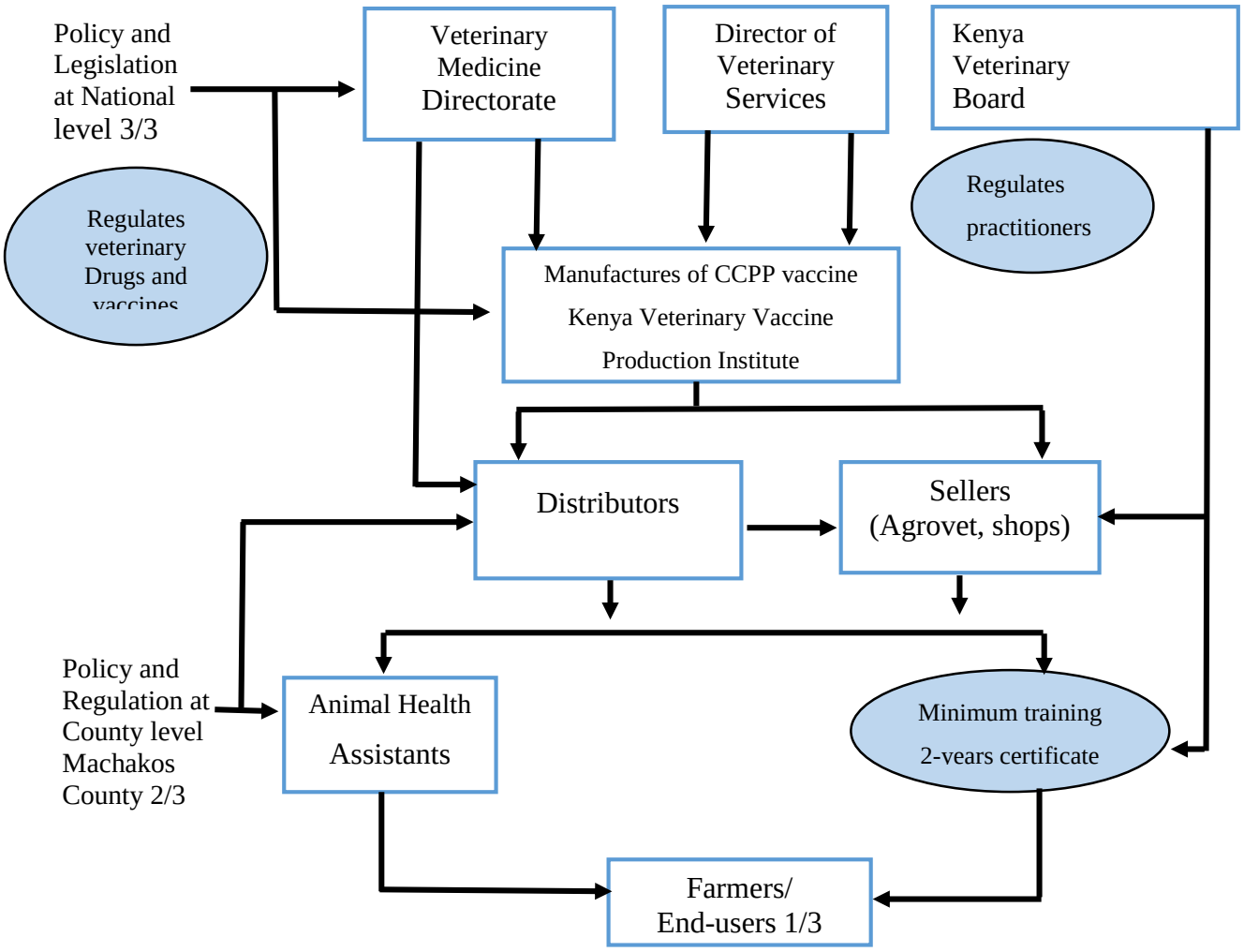
Categories	**Stakeholder partakers**
Regulators	OIE, FAO, MOALF, MH, VMD, KVB, DVS, DVO, AAHO,AHO, Extension vets officers
Vaccine manufacturers	KEVEVAPI, LTKL
Vaccine importers	Aden-Chem Kenya limited, Sidai Africa Limited,
Agro vets	Makamithi Farmers Limited which has technicians, transporters, distributers; other small agro vets and chemist.
NGO	FIPS, MACPOA, UDO
Consumers of vaccines	Large and small farmers

This body building was where the different stakeholders in attendance were broadly grouped into: regulators, manufacturers, public administrators, private sector, vaccine suppliers, agro vets and farmers.

3.3.2. Institutional power mapping and theory of change among stakeholders

The institutional power mapping (figure 2) helped to identify different interactions among stakeholders, their roles and power in the VVC. From both the stakeholders and the farmers' level, we were asking each one to name and give the maximum from one to three. 1 was the lowest important stakeholder whereas three was the most important stakeholder.

Figure 2-CCPP vaccine value chain showing legislation and distribution flow of vaccine from manufacturer to end user



During discussion with the stakeholders of vaccine, vaccine distributors and private veterinary officers revealed that vaccine regulators are the most important stakeholder. Giving them 3/3 after insisting that they are the most powerful to influence the VVC. While private vets officers appointed agro vets 3/3 as able to avail vaccine for them. And farmers reported that vets are the most important stakeholders to avail vaccine to them, as the remaining stakeholders considered that farmers (most of them women smallholder farmers) are the less powerful in the chain with giving them 1/3 mention.

3.3.3. Vaccines regulators and their roles, baselines and supports in VVC

Assessing desired changes in the VVC: This section aimed at helping the stakeholders assess their current situation, what they would expect from different stakeholders present and their expectation or any help from one another. Each category of stakeholders namely regulators, private sector, manufacturers, vaccine suppliers, agro-vets and farmers gave his or her own idea from own experience then the results from the discussion are tabulated as follows:

3.3.3.1. Kenyan Veterinary Board (KVB) and Directorate of Veterinary Services (DVS), Veterinary Medicines Directorate (VMD)

In the interview with stakeholders including KVB, VMD and DVS, these were addressed as the ones mandated to regulate this subdivision to look after the welfare of farmers, the professionals, other participants and the animals as specified in the Veterinary Surgeons and Veterinary Paraprofessionals. On the other hand, they reported the arrangement of this sector to be sometimes troubled by wrong practices where quacks and unqualified persons offer wrong and poor services without regard to expertise and animal welfare. Kenya Veterinary Board is devoted to maintenance of veterinary standards by offering different services among them: response to investigations, annual licensing of veterinary facilities, and registration of veterinary surgeon and paraprofessional, inspection and registration of veterinary conveniences, annual practice license, indexing of students in animal health training institutions, maintenance, and authorization of Continuous Professional Development (CPD) providers, registering of practitioners, inspection of animal health training institutions, registration of CPD activities, resolution of complaints (KOM 2; male CEO_KII 21; KII 25).

When VMD controls the vaccines and drugs manufacture, exportation, importation, registration, circulation, instruction and dispensing of the veterinary medicines services and other livestock health products in the country .

In summary, VMD plays two big functions including, the formulation and implementation quality assurance standards in the production, supply and use of veterinary medicines to safeguard human and animal health; in discussion with the Directorate of Veterinary Services (DVS), standardize the practice of veterinary prescription for the treatment of animals (KII 20, KOM 2; KSM 1, 2).

3.3.3.2. Baseline of vaccine regulators

The stakeholders reported the different problems affecting the current VVC at the regulators level. They include: a) low uptake of CCPP vaccine that is still done below the allowed minimum level, b) vaccination against CCPP done by untrained vets/quacks, c)defective source of transportation for the vaccine hence compromising on the quality of the vaccine, d) inadequate resources and capacity to regulate the practice, e)poor linkages between private vets and the para-vets leading to poor service delivery (KII 20; KOM 2).

3.3.3.3. Regulator supports

When asked about vision of the regulatory stakeholders, they reported that their support is: (a) to ensure eradication of CCPP, (b) targeting at ensuring vaccination is done through an organized, well thought out plan of capacity building through training of vets, farmers and other actors to ensure compliance. And all of this is possible if farmers are trained, and aware. In fact, NGOs can help us doing that work contributing on what the government is working on (KOM 2, 2; KII 20, 21)

3.3.3.4. Kenya Veterinary Vaccines Production Institute (KEVEVAPI)

KEVEVAPI is mandated to organize and take responsibility of all veterinary vaccines manufacture in the country.The institution develops and produces chemicals and laboratory products for usage in the fabrication of vaccines and other veterinary products. They sell and distribute veterinary vaccines locally to public veterinary services and NGOs (KOM 1, 2).

Current doses of CCPP are 100 and more. The firm aims at locally manufacturing the vaccines so as to reduce the country's over-reliance on imported vaccines.When the manufacturers were asked what their concerns were, they requested that farmers be trained on importance of vaccinating their animals, and NGOs to train and help distribute the vaccines (KOM 2; KII 18). 100 000 doses of vaccine stocked but there is low demand of CCPP vaccine from county governments, NGOs, clinics and agro-vets, and shops (KEVEVAPI laboratory assistant_KII 18).

This interviewee gave us very short time, refused audio record, refused to respond to some questions, then recommended us to the one in-charge of marketing and other agents we did not

manage to find. When for gender, we did not manage to have clear answers about number of women and the role they play at different nodes. The gender balance of the stakeholder in the VVC was limited only at the county level where I was able to have precision about all stakeholders' gender.

3.3.4. Vaccine and drugs suppliers and importers

During the exercise we found three principals vaccines suppliers including Aden-Chem, Kenya Limited, Sidai Africa Limited and Fair deals Africa Limited. Among their roles there is vaccine importation and distribution, providing cold storage facilities while the vaccines are at the warehouse, facilitate cold chain transportation from the cold room to intended destination that is agro vets and farmers, training for agro vets owners on the proper storage and application of the vaccines, who in turn trains the end user (KSM 5; CEO_KII 23; agro-vets_ KII 35, 36, 37, 39).

3.3.4.1. Baseline

Their main objective is to ensure adoption of correct vaccination practices among all farmers (KSM 5; KOM 1, 2).

3.3.4.2. Stakeholder support

When it came to support, vaccine suppliers reported that they need (a) Farmers to invest more on training on vaccine use and its importance, (b) Agro-vets to invest more on cold chain infrastructure to ensure that the quality of the vaccine is not compromised, (c) Agro-vets and other vet officers to train farmers on the good husbandry procedures, (d) Regulators to streamline the fees and licenses so as to reduce the cost of doing business and, (e) Regulators to control illegal practices (KSM 1,2 ; CEO_KII 23; agro-vets_ KII 35, 36, 37, 39).

3.3.5. Vaccine stockiest

When came to the vaccine stockiest, finding of this study proved that agro-vets might be one of the most important stockiest as they are licensed to stock any livestock vaccine. They are committed to distribute vaccines to other small agro-vets, to retail vaccines to farmers and private vets, to train farmers on how to administer the vaccines and when to administer it, to

give vaccination programs to customers to help them vaccinate on time, to go out for farm visits to help the farmer diagnose the CCPP in case of an outbreak, to ensure strict adherence to vaccine storage and transportation guidelines as stipulated by the authorities (KSMs, KII 17).

3.3.5.1. Baseline vaccine stockiest

Their objective is to ensure that the farmer realizes the benefits of vaccination to their flock; in order to improve their production which will in turn positively impact on their livelihood.

3.3.5.2. Stakeholder support need

When it came to support to agro-vets, this stakeholder reported that (a) Government should train more on benefits of vaccination and disease identification, (b) KVB and VMD to regulate on who imports and supplies the vaccines to ensure their quality and efficacy, (c) NGOs to facilitate more trainings and education forumsand, (d) Farmers to form farmers group so as to ensure more participation on usage of vaccines (KII 17; AHA_KII 36; agro-vets KIIs).

3.3.6. Private sector

Private veterinary and animal health clinics

They are allowed to handle CCPP vaccine and to treat animal. It's a fully integrated in treating animals, and provide services on animal health at different levels (KII 30; KSM 3).

3.3.6.1. Baseline of private secor

Currently they sell drugs to farmers and treat their animals, they also administer different vaccines. Ability to open clinic for animal health services to farmers.

3.3.6.2. Stakeholder support need

The private sector aims at increasing rural vaccine adoption through local training on disease awareness: (a) Expects vaccine suppliers to timely supply the pre-vaccinations and also to ensure availability of the vaccines to the end user, (b) DVS to come up with policies and legislations on disease control(c) Farmer groups and Sacco to provide a platform for access to vaccination for goats and information about CCPP and bio-security as a whole, (d) Agro-vets and their agents to stock up, increase their investments and improve the market penetration, (e) County governments and NGOs to increase number of vets and para-vets so as to ensure more

vaccine use, (f) any help from NGOs to provide cold chain facilities will resolve a lot of problems (KII 30; KSM 3; KOM 2).

3.3.7. Contagious caprinepleuropneumonia active supply chain

The supply chains for vaccines might take different forms depending on either the customer is an agro-vet, NGOs, Clinic, or a surgeon or a paraprofessional veterinary. In our findings, the chain focuses on the vaccine under total control of the government, distributed for free of charge. It remains the only supply chain in Machakos. Generally, this involves KEVEVAPI manufacturer, the county government (animal health services) which buys vaccine from KEVEVAPI. The vaccination team has five workers all of them men, including two vaccinators, a secretary, a driver and one facilitator (Surgeon vet CDVS_KII 30).

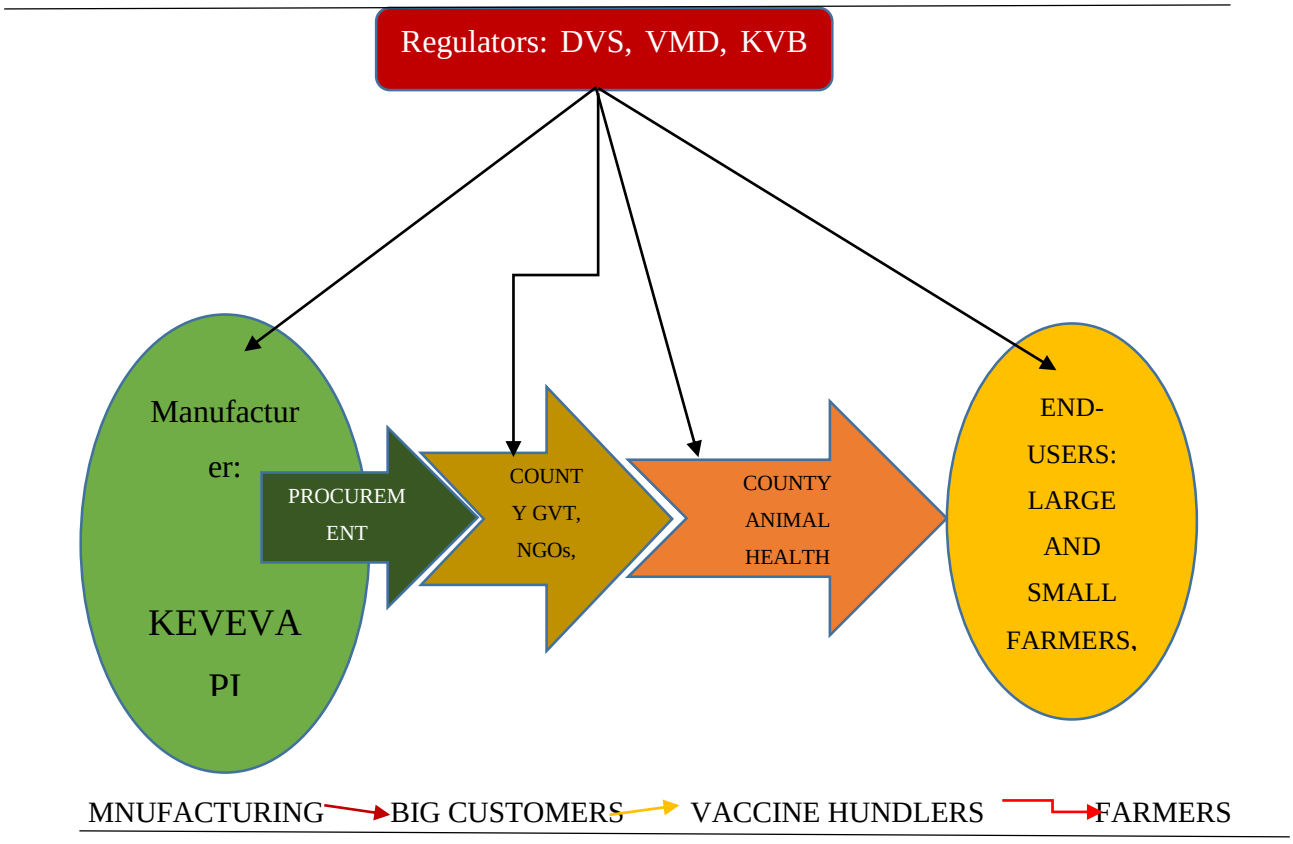


***Figure 2*: Active CCPP Vaccine supply chain**

Vaccines are provided by the government for free and they take care of every cost that is related to the delivery of vaccines to farmers including transportation, communication and training of personnel. The process by which vaccines is delivered to the farmers is as follows; farmers make a demand, CDVS submit the demand to the government, government buys the vaccines from KEVEVAPI which is the manufacturer, relevant county government official collect it from the manufacturer, the vaccines are sub divided into the relevant sub county divisions, from the different sub county delivery points farmers bring their animals to get vaccinated (KII 30). In the area, CCPP is the main prevalent disease and therefore the county is responsible for the control of this disease. The county government has the charge to provide trainings to the farmers on recognition of signs and symptoms of CCPP to enable early identification of suspect cases and provide treatment (Vets KIIs).

3.3.8. County Government Veterinary Services Provision

The head of the county veterinary services is referred to the County Director of Veterinary Services (CDVS). The governance structure of the county's veterinary service is as follows; the County Governor who is the executive at the county level; under him is the County Executive Committee (CEC) who is in charge of policy at county level. The Chief Officer (CO) at County level is head of a ministry. Under the CO are relevant county directors. The CDVS is responsible for veterinary services and is in charge of all frontline workers in the County, sub-counties and the wards.

The CDVS is in charge of all matters relating to vaccine usage, distribution and delivery. Whenever vaccines are available, the county management decides where vaccination campaigns would be carried out, and therefore which communities would benefit. During such campaigns, communication for publicity to farmers about the dates and venue of vaccinations is done using various means such as radios, posters, through churches and schools, and also relevant groups. It was reported that the success of any vaccination campaign is dependent on clear and effective.

Diagnosis of CCPP in the county is mainly based on clinical signs and post mortem signs to identify the disease. For laboratory confirmation, samples are usually taken to Kabete for testing which is fast with results available in a short span of time (KII 30, 24, 25).

3.3.8. Women and men participation along veterinary services chain

In the veterinary service chain, the gender participation observed in the study area is presented in the table 2.

The women's participation along the vaccination value chain is very low in the county and women are more likely to be users of vaccines rather than occupying other higher levels of the value chain. Findings also indicated that men are more trained and qualified to handle vaccines but women spend more time with the animals (women and men FGDs). Informants indicated that involving more women during vaccination campaigns is more successful compared to men because of the patience and keenness that women extension workers show with farmers (KII 30, KFG 9).

The women are not fully involved in the vaccine value chain and according to the (CDVS_KII 30). Women are mostly involved at the rearing level. In the administration of the vaccines women are thought to be more capable of diffusing the news among farmers and convincing them to vaccinate their animals (director of vet services KII 30, 20; KFG 9).

When it comes to the evaluation of women's presence along the VVC, different stakeholders including CDVS reported that through all the long chain, women are left out (KII 30, KSMs).

***Table 2*:Stakeholders gender balance**

	Sex	CEO/Director	Surgeon	Paraprofessional vets	seller	others
County vet services	Male	1	3	19	-	3
	female	0	1	10	-	0
DVS	Male	1	-	-	-	3
	female	-	-	-	-	4
KVB	Male	1	-	-	-	10
	female	0	-	-	-	9
VMD	Male	1	-	-		4
	female	0	-	-	-	6
Private vets	Male	-	8	52	-	-
	female	-	2	25	-	-
Agro vets	Male	5	6	0	2	54
	female	1	2	0	13	22
Importers	Male	3	-	-		1611
	female	0	-	-	-	209
KEVEVAPI	Male	-	-	-	-	-
	female	-	-	-	-	-
LTKL	Male	1	1	-	-	4
	female	0	0	-	-	2

But they are the ones who make the decision to send their animals to be vaccinated. So they are the last consumers of vaccine (stakeholders KIIs, KSMs, KOMs). Farmers and some stakeholders reported that the government did not apply any policy to increase women participation in the VVC (KII 2, 14, 17). However, the ratio of women that have studied veterinary sciences to men is low. At this point 10 women out 80 people also reflected gender imbalance witnessed in the county (CDVS_KII 30).

3.3.8. End usersand access to CCPP vaccine

This class is made of the end users of the vaccines largely occupied by smallholder women farmers

3.3.8.1. Farmers and access to CCPP vaccine information

The study compared households who participated in vaccination across the extent of access to information. Out of those who did not have access to information, 97.04% reported that they did not vaccinate whereas only 2.96% vaccinated their goats against CCPP.

***Table 3*: Farmer's access to information**

	Access to information extent							
Vaccinated	Not at all		Little		Medium		High	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
No	164	97.04	111	85.38	11	84.6	12	92.31
Yes	5	2.96	19	14.6	2	15.38	1	7.69

For those who accessed information at little extent 85.38% of respondents did not vaccinate while only 14% of respondents vaccinated their goats. For the farmers who accessed information at medium extent 84.6% of respondents did not vaccinate whereas 15.38% vaccinated their goats. For those who access information at high extent, 92.31% did not vaccinate while only 7.69% vaccinated their goats.

3.3.8.2. Farmers' willing to have access to CCPP vaccine by gender

***Table 4*: Willing to access vaccine by gender**

Willing-access	Household gender			
suppliers	Freq. male	% male	Freq. female	% female
No	13	10.3	33	18.9
Yes	116	89.7	142	81.1

On gender basis, 89.7% of the male respondents were willing to have access to the CCPP vaccine suppliers and 10.3% of them were less interested to have that access. Amongst the

women, 81.1% of the interviewees reported to be willing to have access and 18.9% were neither willing nor interested to access vaccine suppliers. About farmers willing to have access to vaccine suppliers, most of the interviewees (84.72%) reported that they need to have access to suppliers, whereas only a few of the respondents (15.28%) reported not to be interested in CCPP vaccine suppliers.

3.3.9. Governmental vaccination and level of access to CCPP by small holder farmers

***Table 5*: Farmer's access to CCPP**

Access	pooled		Have easy vaccine-vaccine		Do not have easy access	
	frequency	%	Frequency	%	frequency	%
yes	4	1.01	4	1.01	-	-
no	393	98.99	-	-	393	98.99

For the similarities about someone who can easily access the vaccine, 98.99% of respondents reported that it is not easy for them to access the CCPP vaccine even though they would be willing, and only 1.01 % of the respondents accepted that they can access easily, and don't consider the access to be like a problem.

3.3.10. Participation in CCPP vaccination in the past 12 months

***Table 6*:Access to CCPP vaccine in the past twelve moths**

Vaccinated in the past twelve months	Frequency	Percentage
No	298	91.7
Yes	27	8.3

The study elucidated participation in CCPP vaccination by farmers. The results show that only a few farmers (8.31%) participated in the vaccination program whereas most of the farmers (91.7%) did not vaccinate. This indicates a low level of vaccination among farmers in Machakos County.

3.4. Discussion

This study consisted of mapping the Contagious Caprine Pleuropneumonia vaccine value chain, by identifying the key chain actors, and to define role of women along this vaccine value chain. The results indicate that Contagious Caprine Pleuropneumonia vaccine value chain (CCPP_VVC) is undertaken entirely by government following an outbreak.The vaccine supply is limited to : (a) the international and national policymaker organization including: OIE, FAO, MOALF, MH; (b) regulators: VMD, KVB, DVS; (c) KEVEVAPI manufacturer; (d) Animal

health services which includes veterinary surgeon and paraprofessional veterinary; (e) vaccine end users. The data prove that the current supply chain conducts to the vaccine shortage, and only 8.7% of farmers have acces. Data along the value chain approved that from manufacturers, to the county government, county animal health services, veterinary services and vaccinators, all decision making positions are mainly taken by men and that women are in subaltern position and end users of the vaccine. In opposite with the free vaccine, Accosta demonstrated that the best designed supply chain takes a positive influence on vaccination efforts by dropping costs and enhanced coverage (Acosta *et al.,* 2019). International agencies are recognizing the need for vaccine supply chains to function at their best levels to meet disease control needs. Therefore investments in global health and a wider vaccines use are on the increase (WHO, 2014; Yadav *et al.,* 2014). But locally this may not be the case. This is due to the governmental policy on one side and the second side, it is due to lack of strategy of some of the key stakeholders including the manufacturer and vaccine stockiest who claimed that the market is very restricted, and the vaccine demand is low. When down in the field, 84% of farmers reported the need to access vaccine, 7.7 % has hard access to vaccine and only 1% of small scale farmers had easy access. Regardless of its apparently indispensable nature to vaccination activities, the World Health Organization and Yadav (2014) states that the supply chain for vaccine is regularly ignored (WHO, 2014; Yadav *et al.,* 2014). When Maziya *et al.,* (2018) and Donadeu *et al.,* (2019) insisted on how vaccination is the best option to limit and control most of such diseases, but frequently do not reach small holder farmers (Maziya *et al.,* 2018; Donadeu *et al.,* 2019). In the same scenario Dione *et al.,* (2019) added that it is generally explicated by the low level of involvement of farmers in vaccination (Dione *et al.,* 2019).

The findings revealed that the majority of goat small scale farmers in Machakos are women. In fact, the findings correlated with Yisehak (2008) and waithanji *et al.,* (2015) reporting that small livestock are the main assets possessed by women who are able to sell them to meet their financial needs (Waitanji *et al.,* 2015). Women are mostly involved at the rearing level. In the administration of the vaccines women are thought to be more capable of diffusing the news among farmers and convincing them to vaccinate their animals. However, the ratio of women versus men that have studied veterinary sciences in past days might have affected the gender balance along the value chain.Data suggest that the three regulators are in the most important position to impact the other stakeholders who have direct impact to the end users of the vaccine,

when the government has the monopole to increase gender balance along the VVC. Since vaccine distributors including agro-vets, vaccine distributors and private veterinary officers are near to farmers. Data indicates that, the more many agro-vets stock vaccine, the same way many veterinary officers have access to it. And the more most of farmers will have access to vaccine in the area. As farmers depend most on veterinary officers to have access to animal health services, among them vaccination. Instead of key roles they can play, the willing farmers/vaccine end users appeared the less influent class along the CCPP_VVC.The situation is a result of many factors including lack of strategies among stakeholders. Other studies indicate poor strategies for vaccination campaigns, low interaction among the vaccine chain stakeholders limit vaccine access by the end users (Kiara *et al.,* 2017; Dione *et al.,* 2017; Sadio *et al.,* 2018). Donadeu (2019) reported that strategies are very important to increase vaccine adoption of neglected disease.The various strategies include technical thoughts, policy mechanisms and the involvement of the private sector (Donadeu *et al.,* 2019).

3.5. Conclusion

The government strategy on CCPP vaccination seemed insufficient to resolve the issues confronting farmers and did not guarantee successful eradication of contagious caprine pleuropneumonia in all locations.While vaccine use in general was affected by a diversity of factors, it would appear that poor policy along the value chain main actors would lead to less effective and unsuccessful CCPP vaccination programmes. The CCPP end-users did not have information regarding vaccine and vaccination. This was a key challenge leading to low demand, and low supply /stockingof the vaccine.There was also the attending break in cold chain and distribution networks of the vaccine as barrier to vaccine access by farmers.

3.6. Recommendations

The study has revealed gaps in CCPP prevention and eradication that inform the following recommendations.

There is need to rearrange gender balance along the VVC supply chain to improve CCPP vaccine uptake by smallholder farmers in Machakos. This would push stakeholders to open the field, and develop a strategy that may help farmers to have access to vaccine out of the

government supply chain, but at an affordable price that small scale farmers might manage to pay to vaccinate small ruminants twice per year, instead of the free vaccine as supplied by the government. Manufacturers, suppliers, distributors need to change strategy so as to deliver to small farmers in addition to the traditional big customers (NGOs, and county governments).

CHAPTER FOUR: GENDER CORRELATED BARRIERS AND OPPORTUNITIES IN VACCINE VALUE CHAIN

Abstract

In Kenya, most rural women small holder farmers generate income from the sale of small ruminant animals thereby enhancing their livelihoods. However, diseases such as contagious Caprine Pleuropneumonia (CCPP) are key issues that prevent them from optimizing their earnings. A crucial aspect for the control of CCPP is vaccination of goats. However, access of small holder farmers to vaccination was recognized by stakeholders of the livestock value chains as the main constraint to successful vaccination strategies. For this particular study, we used Focus Group Discussion (FGD), Outcome mapping (KOM), focus meals (KFM), and key informant interviews (KII) to generate data that examines the barriers and opportunities that prevent women from effectively participating and benefiting from vaccine. To appreciate the context of vaccination under total control of the government,a stakeholder analysis of the critical partners in the VVC was done, involving the vaccine manufacturers, vaccine importers, distributors, agro vets, public veterinary services, private veterinarians, local leaders and farmers. Many barriers including limited knowledge of diseases and vaccinations, fake vaccines, high cost of vet services, lack of finances for buying vaccines as women lack control of resources; fake vet officers, lack of awareness on the government programs, few veterinary officers, distance to vaccine and drug stockiest, limited extension staff for animal health services and lack of government capacity to cover the vaccine demand. In fact, opportunities like, thelocal community perception about women service providers and women vaccination campaigns in public sector are not only the suggestions way to resolve the issue, but also helping to integrate women in Governmental services according to the 2/3 gender rule.A sustainable vaccination strategy for Kenya would benefit from combining the efforts of both NGOs and Government in a well-supported and regulated environment.

Keywords: small ruminants, CCPP, VVC, stakeholder, Gender

4.1. Introduction

According to FAO (2018), livestock sector is an important source of livelihood for about 1.7 billion people worldwide (Distefano and Haan, 2018). In Africa, small livestock are considered as one of the assets that women can possess, take control over, and sell to meet their financial needs. Cattle and camels on the other hand are male assets (Yisehak *et al.,* 2008; Waithanji *et al.,* 2015). Poor families, especially those in rural areas, are endlessly confronted with the struggle for food (Habiyaremye *et al.*, 2018). In Africa and Asia most of these are smallholder women farmers keeping small animals. Their productivity is, however, limited by preventable livestock diseases like Contagious Caprine PleuroPneumonia (CCPP). Out of the 12 most devastating diseases worldwide, eight of them impose their damages largely in sub-Saharan region (Wallace *et al.*, 2014) where farmers, especially women, do not have easy access to vaccines (Donadeu *et al.*, 2019). Application of the vaccines by women farmers will improve animal health and offer vigorous animals with better reproductive and productive potential. This will permit women to increase their herds and get more income (Ndanyi *et al.*, 2014).

Gender defining roles, access to resources, control over assets and other responsibilities in households has an impact on animal health and productivity (Bagnol *et al.*, 2016). While women revenue is utilized for her family wellbeing, spending up to 90% of their earnings to meet household needs, men use only 30- 40% (FAO, 2011) on the same. Research show that if women had access to the same level of resources as men, agronomic productivity would grow by 10-30 per cent and farming productivity would rise by up to 4 per cent (FAO, 2011). Any mediation therefore that aims to improve livestock health of small ruminants through vaccination is expected to offer direct and great benefits to women small-scale farmers who, as already mentioned, have low access to livestock vaccines (Heffernan *et al.*, 2011; Salt *et al.,* 2019). This assessment of the unique supply chain of the due vaccine helped to establish constraints for women as smallholder farmers to access vaccine which contribute to their empowerment.

4.2. Materials and methods

4.2.1. Description of the study area

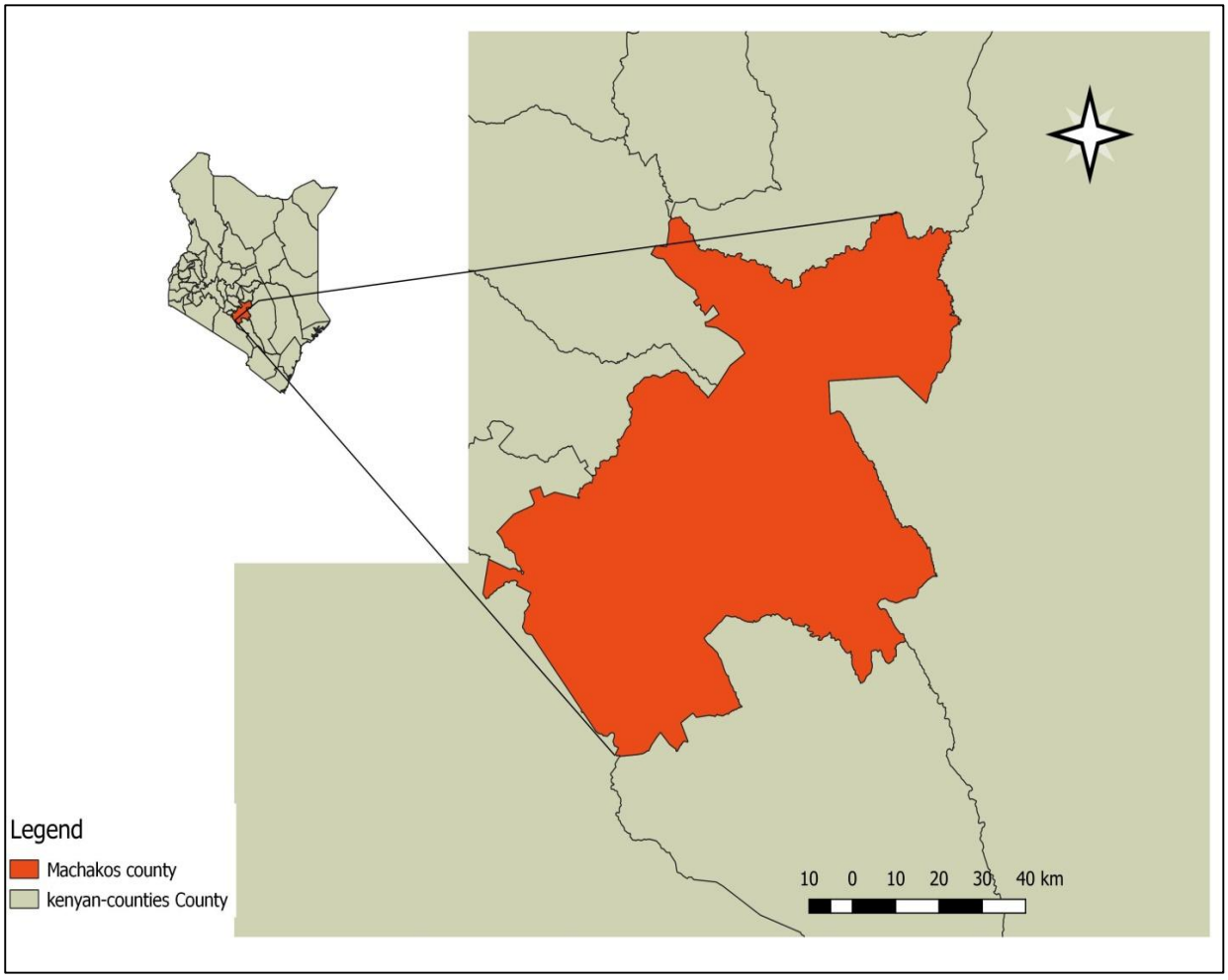


***Figure 3*: Machakos County**

Machakos County (figure 1), in central eastern Kenya (0º45´- 1º31´South and 36º45´ 37º45´ East), has a population of 1.4 million distributed in eight sub-counties. The temperature in Machakos County varies between 18˚C and 29˚C during the year and rainfall between 500 mm

and 1250 mm. Almost 20% of the land is cultivated (County M., 2015). Indigenous goats are kept by 67% of the households (Mutua *et al.*, 2018).

4.2.2. Data collection methods

Data collection methods consisted of focus group discussions, focus meals, stakeholder meetings and outcome mapping analysis, key informant interviews and observations.

The study utilized a well-articulated action research strategy that incorporates men and women analysis tools and outlines for research action in value chain analysis. The following resources were used: the five domains of gender analysis done by USAID, the seven steps of action research in value chains from the Danish institute for international studies (Riisgaard et al., 2010; Ramos-Mattoussi, and Caballero, 2015; Spratt, and Lewis,, 2020).

The USAID five domains of gender analysis facilitated the collection of qualitative data as correlated to different obstacles, opportunities and tactics for improving women's entry into goats' proprietorship and vaccine value chain.

***Table 7*:Tool used, number of events and participants according to their sex appurtenance**

Tools used	Nº of events	Nº of participants		
		Male	Female	Total
Individual interviews (Semi-structured interviews, Key informant interviews)	36	24	15	39
Stakeholders meetings	3	22	14	36
Outcome mapping meeting	2	11	19	30
Focus groups 1	5	21	33	59
Focus groups 2	3	8	27	31
Focus groups 3/VVC	2	17	16	33
Total	51	97	114	228

4.2.2.1. Focus group discussions (FGD)

A total of thirteen focus group discussions (FGD) were done. For this, three categories of principal focus group discussions with guidelines were created. The first FGD guidelines

focused on farmers, and were concerned with decision making over different parameters of production within the farm and home. These FGD identified gender roles, responsibilities, space and time use. They also helped to identify animal health problems related to goats or chicken. The second FGD guidelines focused on USAID domain 4 and 5 that are concerned with decision making power in households. The tool incorporated "sustainable livelihood framework" that analyses five forms of capital for both masculine and feminine gender (social, financial, physical, personal and human). The third FGD guidelines were directed to the different stakeholders in the vaccine value chain (VVC). It helped to identify women barriers to purchasing, delivery and distribution of vaccines. It included observations of the diverse chain actors and drivers in the value chain, and the motivations for the different groups.Data collection was enriched by holding focus group discussions with varying groups, for instance FGD with women goat farmers, FGD with men only goat farmers and a FGD with a mixed men and women group. The FGD with VVC stakeholders was also carried out with different groups and categories. The combined data collected was to deliver information on various aspects of gender analysis in relation to livestock production systems, the vaccine value chain stakeholders, as well as possible indicators of entry points for women engagement in the VVC, and to give an understanding of the behavior, interests, inter-relations influence, resources and effect these stakeholders can have on the entry points.

4.2.2.2. Key informant interview (KII):

Key informant interviews were carried out with community leaders (women group leaders, civic and public leaders, and ecclesiastical elders), non-governmental organization leaders, farmers, and different stakeholders along the VVC. Supplementary data were obtained by utilizing methods like jar voices, case studies and focus meal discussions in different agro vet and small restaurant in the study area.

4.2.2.3. Outcome mapping (OM)

This is a tool for vaccine value chain planning andanalysis, this was used methodically to identify, and tract critical stakeholders along the VVC concentrating on changes, in their traditional practices, organizational systems, institutional and governance policies. By the end of the day, this facilitated us to discover how the advancement could be towards helping to achieve our purpose.

4.2.3. Data analysis

The collected information from FGD, KII, OM, Stakeholder engagementswere transcribed and coded appropriately in an excel spread sheet and the generated qualitative data analyzed.

4.3. Results

The results of the study are organized into three sub-sections. The first section emphasises the demographic characteristics (Table 1). The second focuses on barriers to vaccine uptake observed by both men and women farmers and stakeholders. The third sub-section focuses on the opportunities for women in the VVC.

4.3.1. Demographic characteristics

The following table represents demographic characteristics of our interviewees including their education levels and ages in year.

***Table 8*: Characteristics of study participants in Machakos County**

	Gender		Kola	Kalama	Machakos	Nairobi
		EducationLevel				
1. Participants' education level in percentage	Female	Primary	21	11	18	0
		Secondary	75	83.5	43	0
		Tertiary	4	6	39	0
	Male	Primary	5	8.7	4	0
		Secondary	81	78.3	42.5	100
		Tertiary	14	13	53.5	100
2. Participants' age series in years	Men		35-63	33-69	33-67	35-68
	Women		25-57	22-55	38-65	35-57
	Combined		25-63	22-69	33-67	38-50
3. Participants' age in years	Mean Female		41	38.5	51.5	46
	Mean Male		49	51	50	51
	Combined		45	44.75	50.75	48
	Median Female		29	52	61	56
	Median Male		47	41	23	39

Participant's education level ranged from primary to tertiary. In Kola ward, 5% of men and 21% of women had primary level education; In Kalama it was 8.7% male versus 11% female; in Machakos Town Sub County, 4% of men and 18% of women had primary level of education.

The majority of study participants had secondary level education in Kola, Kalama wards, as well as Machakos Town Sub-County. Table 2 shows that 81% of men versus 75% of women in Kola had secondary level education while in Kalama 78.3% of men versus 83.5% of women had secondary level education. In Machakos Town Sub County, it was 42.5% of men versus 43% of women with secondary level education. Apart from Nairobi County where all stakeholders had tertiary level education, fewer participants at ward and sub-county had tertiary level education as shown by 14% of men and 4% of women in Kola; 13% men versus 6% women in Kalama and 53.5% of men versus 39% women. Participant's age in Kola ranged between 35 and 63 years old for men versus 25-57 years old for women. In Kalama the age range was 33-69 for men versus 22-55 for women. Machakos Town Sub-County participants' age was between 33-67 for men versus 38 and 65 years for women while in Nairobi County, the age ranged from 35-58 years for men and 38-50 for women. Calculated means and median ages for all participants is given in table 2. Cumulatively, male participants were generally older than females.

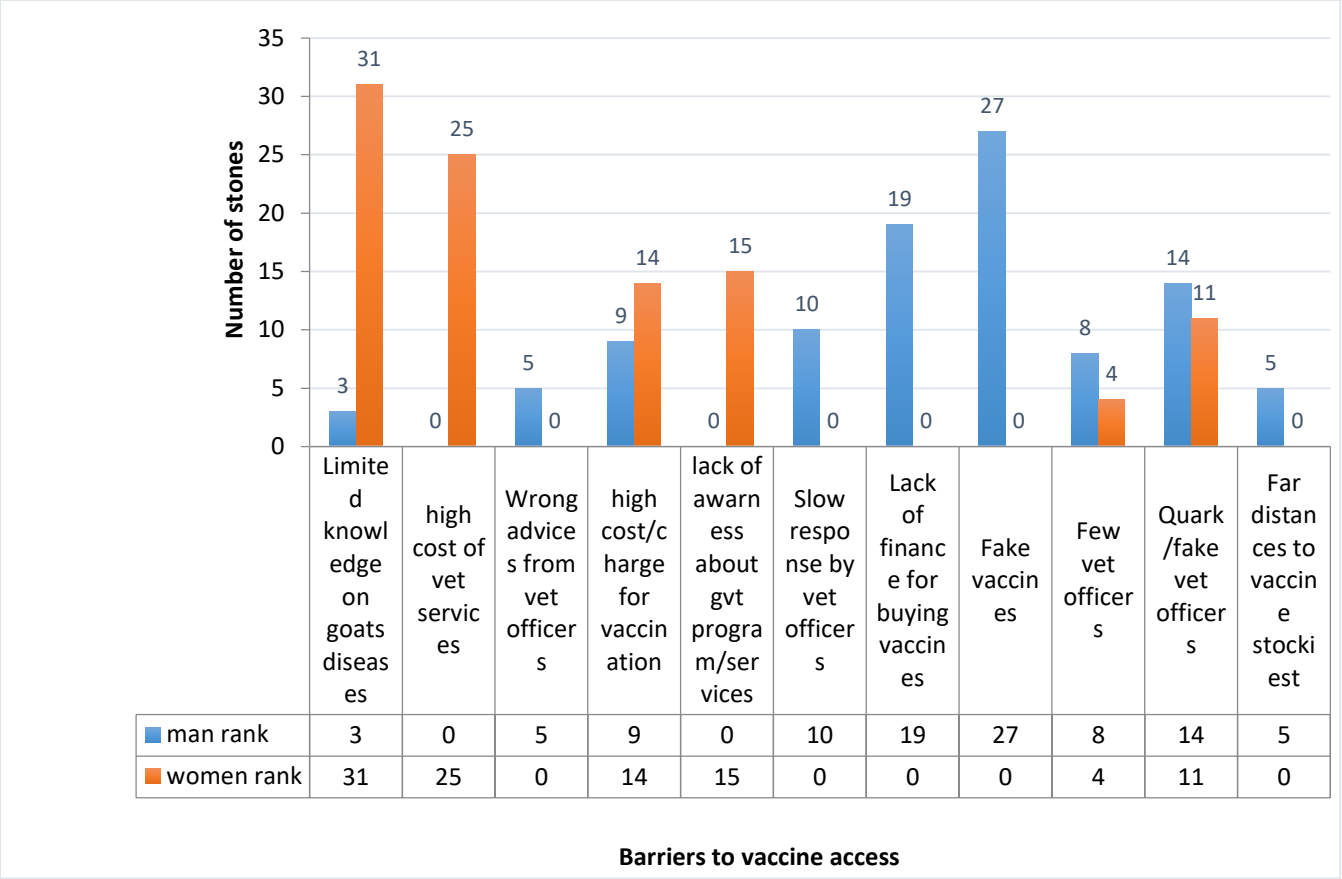
4.3.2. Barriers to goat's vaccine uptake as faced by both men and women farmers

Women farmers in the focus group discussions identified 6 barriers to CCPP vaccine uptake, while men identified 9 major barriers to access the vaccines, five of which were specific to small scale farmers.

The identified barriers that hinder both men and women in one way or another from accessing CCPP vaccines is illustrated in Figure 2, as referred to discussion group in Kalama (women farmers FGD 4, and men farmers FGD 6). Attempts were made during the focus group discussions to rank these barriers on a scale by both men and women famers' participants in terms of their contributions. In fact, after asking participants to say the barriers limiting them to access vaccine; 11 barriers were relevant. Then 200 small stones were distributed between the two focus group discussions with ten members each. Every member got 10 stones, and they were told to share them according to the value any person has given to each barrier.

From the figure it is clear that some barriers are more important to women than men and vice versa. For example, men reported fake vaccines as their biggest problem, followed by lack of finance to buy vaccines quacks or fake vet officers and slow response by the vet officers in the

field (men FGD 6). Women on the other hand ranked limited knowledge about goat diseases as their main problem, followed by high cost of vet services, lack of awareness about government vaccination schedules and the high cost of vaccination (women FGD 4).



	Limited knowledge on goats diseases	high cost of vet services	Wrong advices from vet officers	high cost/charge for vaccination	lack of awarness about gvt program/services	Slow response by vet officers	Lack of finance for buying vaccines	Fake vaccines	Few vet officers	Quark/fake vet officers	Far distances to vaccine stockiest
man rank	3	0	5	9	0	10	19	27	8	14	5
women rank	31	25	0	14	15	0	0	0	4	11	0

***Figure 4*: barrier for men and women smallholder farmers to access CCPP vaccines**

The following are the key obstacles or barriers identified in different groups' discussions, interviewees and stakeholder meetings:

Women farmers in the focus group discussions identified eight barriers to CCPP vaccine uptake. While men identified 6 barriers, some being similar to women's identified barriers. Other barriers were identified by stakeholders. The following are the key barriers/obstacles identified in different groups' discussions and interviews.

(a) Limited knowledge of diseases and vaccinations

Small scale farmers, reported that they don't know much about vaccine and vaccination (KIIs, KFMs, and KFGs). This could explain the reason why the vaccination uptake is low. The county vaccination team informed farmers about the CCPP only in cases of out-breaks: by which time they had sufficient resources for vaccination campaigns (KII 30).

Lack of knowledge was general to livestock health and management, and vets officers reported that farmers looked for services when the disease became untreatable. They lacked knowledge on which disease requiresvaccination and which needed prompt treatment. Some farmers even looked for the vet officers after using the wrong drugs bought from undetermined sources, or from agro-vet on giving some clinical signs to the vendors (KOM 2).Furthermore, the county director of veterinary services reported that in the study area CCPP vaccination is rare, explaining why farmers had limited knowledge on the vaccine (KII 30).

(b) Fake vaccines

Most of men and women farmers raised fake vaccines as one of the issues (male farmers KFG 6, KIIs, and KSMs). They claim that when goats are sick, the farmers are ready to buy whatever is available to treat the animal, and hence they buy even fake drugs and vaccines (Woman farmer KII 5).

(c) High cost of vet services

Farmers' opinions on access to services varied with villages and places (women KFG 9, KIIs). Those having access complained that it was costly: minimum cost is 500 Ksh and this is only fuel for the motorbike before discussing about the treatment (women KFG 4). Men farmers reported insufficient number of veterinary doctors, non-professional vet doctors who often don't find solutions to animal's problems and having suspect qualifications and probably were fake doctors (men farmers KFG 6, KII 17). Others reported that the officers were slow to respond to calls (women KFG 9, 4, men KFG 6). For the cost of CCPP vaccination services, vets said that when vaccine is supplied by the government, it is offered free of any charge to farmers. However farmers can also buy the vaccine at source at a cost of 1200ksh/100doses without including the transport. This was qualified to be expensive (KII 30). Mostly male farmers raised the cost of medicines, vaccines and the less involvement of the government as a factor affecting their goat's health (KFG 6).

(d) Lack of finances for buying vaccines

Along with the high cost of medicines and vaccines, there is also lack of finances in general and this was raised as the main barrier for women to pay for veterinary services, reporting that women farmers have no control over finance (KFG 4), only men control assets that can provide money. This makes women more dependent on their husband as they can't afford themselves to pay vet services or to buy vaccines/medicines (all KFGs).

(e) Quark/fake vet officers

Farmers especially, men reported the presence of non-professional vet doctors who often don't find solutions to animal's problems. They have suspect qualifications and not coming from universities or accredited institutions. These were labeled quark/fake doctors (men farmers KFG 6, KII 17). Slow responses of officers when called, and no access to vet services were added barriers to women (women KFG 9, 4, men KFG 6).

(f) Lack of awareness on the government programs

Concerning access to information before the vaccination campaign, the vets in charge stated that they do publicity in local language, use local leaders, chief and their assistants, church and school leadersto make farmers aware before their teams reached the ground. Regarding access to the CCPP vaccine, the vet surgeon reported that they normally have a program which is sent to the farmers by publishing using various media platforms, and in that program the vaccinators generally indicate the place where the animals will normally be brought. However, the vaccination staff lack communication skills (pictorials and pictures) to deliver clear messages in their posters to farmers on CCPP in goat flocks (KII 30). Still there are those farmers who reported that they are not aware about the vaccination program (KII 4, 5, 29).

(g) High cost charged for vaccine and vaccination

For the cost of CCPP vaccine, vets said that once administered by the government, it is offered free of charge to farmers. However, individual farmers can still access CCPP vaccine from KEVEVAPI and some Agrovets but the cost is prohibitive for most, retailing at the price of ksh1200 for a 100 dose. This was qualified to be too expensive for most small scale farmers (KII 30). Therefore, farmers concurred that the cost of medicines, vaccines and the less

involvement of the government were factors affecting their goat's health. Additionally, the government vaccinators do not get deep into the village forcing some farmers to pay even more in transport costs (KFG 6, 4; KII 17).

(h) Few veterinary officers

Male farmers sited insufficient number of veterinary doctors and lack of veterinary extension services as a big gap (KFG 4, 6, KSM 2, KII 17, 30). Every ward is supposed to have one vet/extension officer but this is not the case. There is only one government veterinary surgeon in Machakos Town sub county who doubles up as the meat inspector.(KII 30, KOM 2, KSM 1), revealing the acute shortage of vet officers. The shortage is made worse by lack of new recruitments to replace the retiring staff members (KOM 2). This pushes the County to recruit private animal health providers to help in case of outbreaks (KII 30). The county government has to internally promote people every three years to try and fill some of the offices even with diploma holders instead of DVM holders because there is no new recruitment (KII 30, KII 17). For the whole campaign, the team consists of five persons. Among them there is a team leader, two vaccinators, the recorder, and the driver (KII 30).

It was also noted that the County lacks enough resources to recruit and train more veterinary officers to offer animal health services with only five staff members two of whom are vaccinators. This leads to overwork and in many cases poor service delivery to the farmers. Added to the already mentioned that some farmers are also not aware of the basics and benefits of vaccination and therefore do not seek vaccinations for their goats, which in contributing immensely to the spread of diseases.

All farmers reported that the absence of veterinary services in the villages pushes especially women to apply traditional methods of treatment consisting of giving either ash or herbal treatment as curative measure for different diseases including "Mabui" (CCPP).

(i) Distance to vaccine and drug stockiest

The distance from farm to agrovets was also reported by mostly women as one of the major challenges since it increases the cost of access to drugs and vaccines (KFGs, KII 2, 4, 5, 17). To take a bus or motorbike from the interior of the village to Machakos town where most

agrovet shops are located costs 300-600 ksh (KII 2, 4). Considering that most of the agrovets stakeholders reported that women are their main customers (stakeholder KII 17, KSM 1, KOM 2) the question of distance to the nearest agrovet was very important as reported by all farmers (all farmers KFGs). The director of animal health services at county level, recalled that CCPP as one of the trade associated diseases can exterminate goat flocks anytime in Machakos, hence the prevention of CCPP through regular vaccination is paramount to prevent an outbreak in the area (KII 30). The agrovets reported that they do not stock any goat vaccines especially CCPP (KII 17, KSM 1, 2), due to the lack of buyers. Meanwhile the active private sector practitioners of veterinary practice reported that they were constrained as agrovets do not stock CCPP vaccine in Machakos (KSM 3).

(j) Few extension staff for animal health services

There is also the shortage of veterinary extension officers in the county which also hinders the effective control of diseases through vaccination. Considering the small average number of goats owned by farmers in Machakos, the CCPP vaccines are rarely sold to individuals but to the government NGOs and agrovets due to the dose package, cold chain facilities and qualified personnel to handle the vaccine. Majority of farmers reported not to have access to vet extension services (women KFG 9, 4, 6, KIIs) hence the lack of vet extension services was cited as a major barrier (KSM 1, 2; KII 17, 30; KOM 2). The CDVS reported that every ward is supposed to have one vet extension officer but this is not the case. Again the shortage of vet officers is made worse by the fact that as they age and retire they are not replaced and yet the aging officers are unable to attend to field work (KOM 2, KII 17). The County/Sub-county is once again forced to recruit private animal health providers to help in case of outbreaks (KII 30).

(k) Limited knowledge of CCPP as goat disease

The stakeholder and stakeholders reported that in the area where the outbreak has not occurred, most of farmers remained ignorant and did not care about CCPP adding that only few farmers are aware of CCPP disease in the goat flocks (KII 30).

"Probably that one is coming from Kalama.But when you go to these prone areas Mwala and Masinga, you'll see that the demand for vaccines is there, and they always call" (KII30).

At the level of small farmers, most of them reported that they don't know anything about CCPP, its vaccine and vaccination (KIIs, KFMs, and KFGs). And this could explain the reason why the vaccination uptake is so little. The government vaccination team admitted that they inform farmers about the CCPP only when they have the resources to bring to the area where the outbreak is reported (KII 30).

(l) No availability of vaccine

Recently (Year 2019) the county government provided around 8820 doses of CCPP vaccine to the whole county. Out of these only 7540 goats were vaccinated. Considering the population of goats in the county at the time was 629,000, the CDVS declared that there was a massive shortage of the vaccine (KII 30). Therefore most goat farmers missed out on that vaccination campaign. In addition to this, the county government focused on high risk areas such as Masinga, Yatta and Mwala Sub-counties which border North Eastern even though the disease remains common in the whole county. However, it is important to also note that even outside the campaign periods, the government does not provide enough vaccination resources to the county and therefore many farmers end up not vaccinating their goats. Farmers therefore do not have access to CCPP vaccines (KIIs, KFGs, and KSMs). The government only intervenes after an outbreak in case a request from farmers reaches the government health services, and this after being pushed by farmers. Eventually the vaccine will be brought and often it will not only be late, but also in insufficient quantity that would not cover the demand of the population (KII 30). When informed in time, farmers willingly bring their animals to the vaccination center (KII 30).

(m) Vaccine packaging

About the CCPP vaccine packaging, stakeholders reported that the smallest dose from KEVEVAPI is 100 doses (KII 30), and farmers have between 1 and 20 goats (farmers KIIs, KFGs). This also affects some of the private sector actors as most of them reported that transport cost and cold chain due to the distance from Nairobi to Machakos is a problem (KSM 3)

(n) Lack of government capacity to cover the vaccine demand

When asked about vaccine availability and vaccination statistics for the last campaign, then the county director of veterinary services reported that the resources had not been adequate. (KII 30). Only one sub-county had access to CCPP vaccine, specifically, where the outbreak had occurred. The distribution of vaccines is only directed to the zones where farmers had alerted authorities (Yatta, Masinga and Mwala) because of lack of resources. The county Director of Veterinary Services reported to have only 20% of the CCPP doses to cover the demand of the region where outbreaks occur (KII 30).

(o) Equipment (storage and transport)

Among the main challenges, different stakeholders and farmers reported that the maintenance of the vaccine cold chain is still a big problem for both private and government sector. For agrovets cold chain is one among conditions set by the government to supply vaccine to farmers (KII 30). Unfortunately, it is complicated by the frequent electricity outages, and this influences some of the sellers to supply bad/impotent vaccines to farmers even after two days without power (KSM 2, 4). Government services too suffers inadequate cold chain equipment and officers often forced to vaccinate goats beyond prescribed periods of exposure, leading to them injecting goats with expired vaccines (KII 30). The private sector vets on the other hand stated inability to operate standard clinics because they lacked adequate funding for storage and transport equipment (KOM 2).

(p) Low demand of CCPP

The stakeholders in private sector, in particular agro vets, reported that there is low demand for CCPP vaccines (KII 17) due to prohibitive costs to farmers although a small number of vets officers reported that there is high demand of the same vaccine in their operational field (KSM 3, KII 30).

(q) Time of vaccination

From different KII and FGD, farmers reported that they are the ones who pushed the government to vaccine their goats. This happens after an outbreak of disease when most of farmers have lost more goats and become frustrated and less interested to vaccinate. Others

reported that they vaccinate both sick and healthy goats and this leads to the death of some of their goats even after being vaccinated. The vets in Machakos, added that vaccination process takes a long time, and vaccinators keep vaccinating goats beyond the specified time.

(r) Lack of training on vaccine and vaccination

When asked about access to training, stakeholders especially county animal health officials reported that they do give training on vaccination to farmers and that the trainings are very helpful as they help to create awareness about CCPP in the whole village (KII 17, 30, KSMs, KOMs). However, the farmers on the other hand denied having any access to training on animal vaccination (KSM 4, KIIs, women KFGs).

***Table 9*: Key observations derived from FGDs, KOM and KIIs**

Key cathegory of result	Specific limiting factor	Source of information
Inadequate knowledge	1. Few training offered at very low frequency	KSM 1,2, 3; women FGDs
	2. Poorly targeted publicity	CDVS_KII 30
	3. Farmers inability to understand	Women FGDs
	4. Unwillingness by vets to share information	Vet officer KII 16
Cost of the vaccine	1. Poor packaging	Surgeon KII 30, KEVEVAPI Lab_KII 18
	2. Low herd size	KSM1, KSM5, FGDs
	3. High cost of the vaccine	Surgeon vet_KII 30, KVB_KII 21
	4. Low empowerment of women	FGDs, KOM, Farmers_KIIs, Surgeon_KII 17, 23
Vaccination policy and strategy	1. No scheduled programs	Animal health services KII 30, KSMs
	2. A little provision of vaccine	CDVS_KII 30, KSM 1,2
	3. Few vaccinators during vaccination	CDVS_30
	4. No women among vaccinators	Animal health services, surgeon vet_KII 30
Cold chain requirements and vaccination equipment	1. lack of electricity	KOM 1
	2. Cold chain equipment cost	CDVS_KII 30
	3. Lack of transport	Surgeon vet_KII 19
	4. Lack of pictorials	CDVS_KII 30
	5. Inappropriate transport mode	Woman vet_KII 24, AHA woman_KII 27 KSM 2, KOM 1, KSM 3
Fake vaccines	1. Lack of strict respect of cold chain	CDVS_KII 30, male vet_KII 17

4.3.3. Practice, including women participation in the CCPP VVC

4.3.3.1. Barrier for women in the Vaccine Value Chains

(a) Few staff members particularly women in the veterinary services sector

The CDVS in VVC reported that not only is the few staff members affecting the public administration but also the number of staff are on their way out due to retirement. So, there is a shortage of staff members that makes the executive team not to focus on gender balance during selection (KII, 17, 30, KOM 2).

"When it comes to the gender we don't focus on, we just use only people who are ready for the work to be done. There is very few women staff to start with (KII 30)".

(b) Number of females training for veterinary medicine degree and related animal health

In the matter of including female veterinarians in university and colleges, the vet surgeon responded that there are already a few number of women taking veterinary medicine at the universities and other animal health institutions (KII 17, 30, KSMs). However, this was challenged because at the University of Nairobi, Faculty of Veterinary Medicine, the number of females students enrolled is more or less equal to that of the males.

(c) Very few women applicants for veterinary jobs

Results of the interviews with CDVS and other stakeholders indicate that there is usually a shortage of ladies candidates applying for veterinary related positions as employees or interns Suggesting that women are less interested in veterinary services as it is perceived to be a male carrier (KII 30, 17).

(d) Length of training periods for female farmers.

Among reasons reported to limit access to training for women were the following barriers: Choice of trainers that favor men to women (KII 30); the veterinary board requirement that training for certificate holders cannot be less than two years, a condition that most married women fail to meet (KII 30). Women leaders reported that there is lack of freedom for women. Most women are pre-occupied with domestic chores and activities and lack time to attend training (FGD 9) besides, married women may not be allowed to be out of their families for

two years as required by the veterinary board to be trained as AHA or vaccinators (KII 30), while men cited financial constraints to send their wives to college (FGD 6). Furthermore, the two year training period and the distance to be traveled to Nairobi, constrained farmers and other stakeholders' participation in training. (KII 30). The director confirmed that two years is the minimum training period to acquire requisite vaccination competence (KII 30).

The director explained that there is no other alternative because to be an animal health service provider including vaccination, it requires enough expertise (KII 30). While requested about the policy and program for women to vaccinate their own animal, the director reported that CCPP is handled only by vets. Insisting that the application of the law obliges anyone who has to extend veterinary services outside their own, to be qualified for the vet services. The CCPP vaccine is exclusively handled by qualified vets (KII 30, KSMs).

(f) Inability of women to perform some roles

Among the factors limiting women in the vaccine value chain in the private sector, there was adoption to work at late hours, drivers attend 10pm when delivering vaccines, and other manual work that women cannot perform (KII 17).

(g) Inadequate government engagement in veterinary services

The government has not employed anyone in the County for the last 3-4 years (KII 30, K0M 2). A veterinary officer in Kalama complained that was engaged as a vet in 1988 and has been riding a bike for more than 30 years. He doesn't want to work anymore as he is unable to ride a motorbike (KOM 2). Others agreed with him that they are seriously exhausted, even as they are short of staff to relieve them (KOM 2, KII 30, and KII 17). The animal health secretary at county level reported that the request to resolve this issue in veterinary services provision and recruit more staff including women, was submitted to the government and the board is still waiting for the response for the last three years (KII 30).

(h) Lack of capital

Some stakeholders in Machakos reported lack of capital as a limiting factor for women to become entrepreneurs in agro vet and vaccine business as it requires a lot of money to pay for

veterinary services and to buy different facilities including cold chain (KII 17, 30, 39). A women running a small agro vet in Muumandu added that lack of capital to attend veterinary training is another issue curtailing her empowerment (young woman agro vet owner KII 39, director of vet services KII 30). This is supported by the following figures showing the level of access to and control over assets and resources including financial, social, personal, and physical as in land and human assets for men and women.

Control over is the freedom that either man or woman has to decide to do his/her will like starting a business, taking a job opportunity without consulting his or her partner. Access means having the possibility of utilizing an asset or resource with or without consulting the partner who is supposed to decide on the utilization.

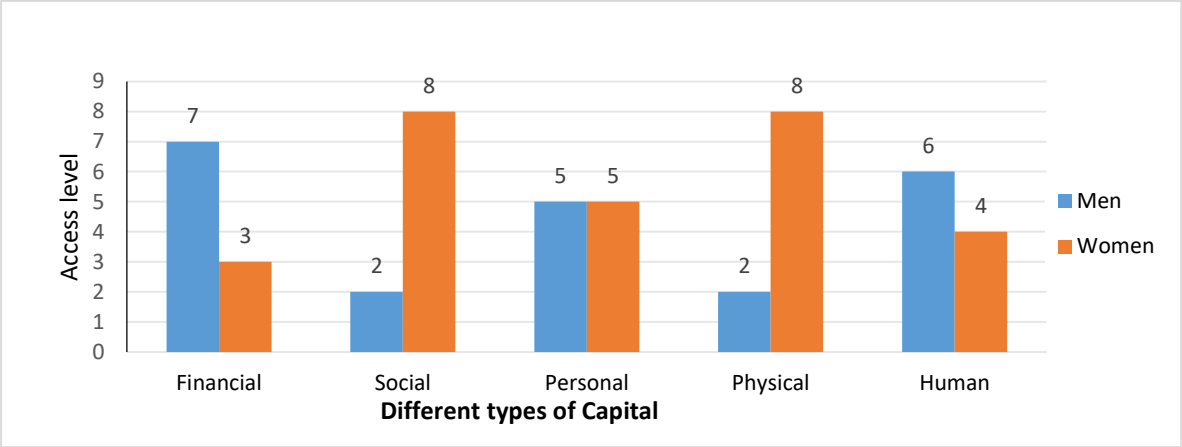


***Figure 5*: Access to resources**

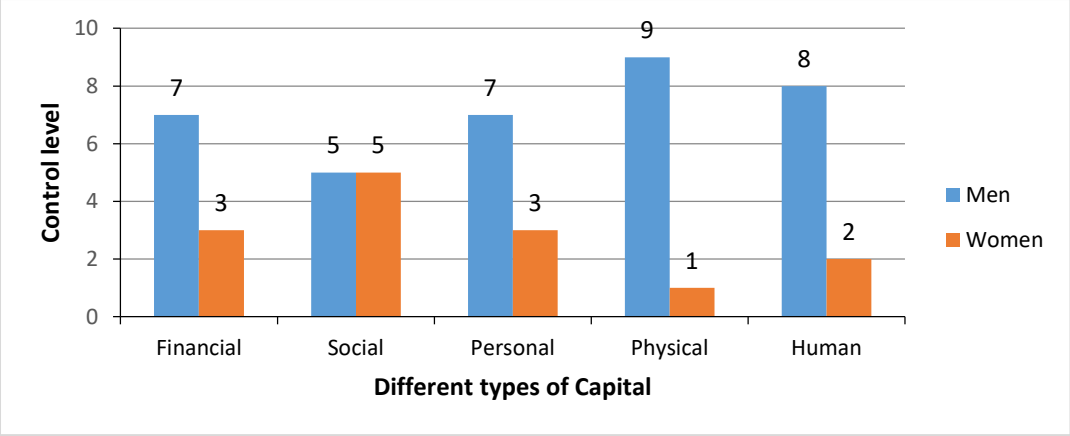


***Figure 6:* Control over resources**

Figure 6 shows that men have more access to financial, personal, and human resource, while women have more access to social and physical resources. Women and men have the same access to personal resources. About control of assets and resources, men have control over financial, personal, physical, and human assets while women have control only over social assets be it in equal measure to the men.

***Table 10*: Summary of barrier for women to participate in other nodes of the VVC**

Key barrier category	Specific aspect of the barrier	Source of information
Government engagement and lack of gender balance	1. Few staff members	CDVS_KII 30, surgeon vet_KII 17, KSMs, KOM 1
	2. No replacement of the retired members	KOM 1, KSMs, CDVS_KII 30, KII 30
	3. Very few women among staff members	CDVS_KII 30, surgeon vet_KII 17, Female surgeon vet_KII 24
Duration of training to become vaccinator	1. Limited number of female in veterinary training	CDVS_KII 30, MOALF female AHA_KII 27, female agro-vet owner_KII 39
	2. Very few women among interns	Animal health services_KII 30
	3. Low chance for ladies to be engaged	Secretary animal health_KII 30
Discrimination against women	1. Perception that women are unable to perform some works	Male vet_KII 17, male CEO_KII 23, KFM 1, 3
	2. Women don't work later hours	Male vets_KII 17, 16
	3. Dependence on men	KOM 2, CDVS 17, men FGD 6
Lack of finance	1. Don't have finance to open agro-vets	Male CEO_KII 20, 23; woman KII 36, 39; KII 35
	2. Lock of finance to pay for training	KSMs, FGDs, KOMs

4.3.3.2a. Opportunities for women in the CCPP VVC

a)Job opportunities in public sector

Opportunities for government VVC jobs are advertised openly so that all may apply, and those qualified are interviewed. Both women and men can apply when they meet conditions set. However, it is competitive and not based on gender (KII 30). Still, with many wards understaffed and others poorly staffed, there are expectations that soon places will be offered for many potential extension officers (KII 30, KOM 2, and KII 17). On gender opportunities, the veterinary department respondent reported that the need for the women in the directorate is high. Given that, if the County government had to engage in the veterinary services, following the one third gender rule, then many women would be hired into the directorate (KII 30).

(b) Local community perception about women service providers

In general, all women and male farmers reported that men appreciate and are happy whenever their wives buy drugs for their animals (KFG 9, 6) and all the farmers in KFGs, and KIIs reported that they preferred women vaccinators.

When asked about training women to provide veterinary services, most of farmers said that training on vaccination is so much important because it helps them to treat their own and neighbors animals, becoming able to buy drugs at cheap price, reducing the treatment cost for their animals, availability of vet services to small farmers (women leaders KFG 9, KIIs). Male farmers reported that training would increase farmer's knowledge on animal health (men KFG 6). Similarly many farmers reported that women are better than men in the field, because they don't speak lies, can't administer a bad vaccine or drugs, don't ask for a lot of money for any service the way men do and furthermore, farmers believe that most of the time women are available in the village (KII 2, 4, KFGs, KFMs). Women in the Kyangala said that they have another advantage as they can visit any household while men cannot culturally do that. This helps them to spread message very fast because in the village people do not pretend to ask women many questions (KII 2).

(c) Women and vaccination campaigns in public sector

Concerning the access for women to VVC, the executive officer and the director of the veterinary services at the county level reported that all along the VVC, women are left behind (KII 30, KSMs) and yet according to him, women are the ones who often make the decision to send their animals to be vaccinated besides being the consumers of vaccines (stakeholders KIIs,

KSMs, KOMs). Farmers and some stakeholders reported that despite all this, the government doesn't apply any policy to increase women participation in the VVC (KII 2, 17). Farmers in Kyangala reported that deprivation from opportunities limit women's chances to prove their capacity (KFG 9).

The director also raised an important point about women, summarizing that whenever the vaccination team works with women in the field their success was greater (KII 30), because most of farmers are women, and have greater capacity to convince other women to vaccinate their goats (KII 30; KII 2,17; KFG 9).

(d) Benefits of training women to provide veterinary care

Farmer training is important: it increases knowledge in animal health and helps them to treat their own animals reducing the cost of treatment (women leaders KFG 9, KII, men KFG 6). Also, farmers reported preference for women veterinarians, reportedly because they were more skillful, honest (don't tell lies), and reliable enough to deliver correct and viable vaccines or drugs. They also are more accessible and do not go for excessively high profit (KII 2, 4, KFGs, KFMs). Furthermore, one woman in Kyangala reported that women have another advantage as they can visit any household to do either veterinary services or to share any vaccination message, something men cannot do culturally because of village norms. This can enable faster spread of correct messages very fast by women (KII 2). Finally, the female ability to multitask is an asset, they are kinder and attend to several problems at the same time (KFG 9). However, women lack opportunities and space to practice (KFG 4, 6).

Women in Kyangala raised a point that it encourages them whenever they see a lady working like an officer in veterinary services (KFG 9). In Kyngala, women farmers justified men to give them control over everything including goats, field, and cattle, but only when they believe that their wives are very kind (KFG 9, KII 5).

(e) Government engagement and the application of the 2/3 gender rule

Coming to job opportunities, the governmental stakeholders responded that the only procedure to engage staff members in the VVC is through interviews. This is an open process advertised

by the government and both women and men can apply when they meet conditions set (KII 30). The vet in charge of animal health in MOALF reported that the only opportunity is the expectation for the action to be taken by the county government so that many extension officers may be employed to cover all the different wards (KII 30, KOM 2, and KII 17).

About gender opportunities, the veterinary services reported that the need for the women even at the directorate is high. Stating that if the government were to engage in the veterinary services, following the two third gender rule, then there could be quite a number of women in the directorate (KII 30). Other private sector actors said that they prefer women because they take on some roles that men do not do (KII 39). For the private sector, the recruitment is based on the choice of the agro-vet owners. These reported to have many women in the selling and customer care services and men in the manual hard works and transport sector (KII 17, KSMs).

In most cases women are encouraged to apply for these vacant positions to ensure that they bridge the gender gap. However, all prospective candidates must pass through an interview where their capabilities are judged in relation to the requirements of the position they applied for. The constitution provides for 'two thirds gender rule'. However, this is usually complicated by lack of applicants especially women. Therefore the gender rule has not been realized in most cases in the veterinary service sector. It has also been noted that there is a personnel gap between livestock and crop sectors and therefore there is need to have a livestock extension officer in every ward to ensure that the gap is bridged. The replacement of personnel is also wanting as has been stated before. The government inability to replace retired personnel is blamed on budgetary constraints forcing the government to hire less qualified people for higher position such as replacing doctors with diploma holders or in some cases even leaving the position vacant (KII 21, 30, KSM 5).

(e) Training for women

Different participants and stakeholders reported that training impacts ladies in the entrepreneurship field and beyond by uplifting their living standards. It also encourages the men to release their wives more, when the training is in entrepreneurship as this has the potential to uplift the family living standards (KII 30, KFG 9). Farmers insisted that training

will bring improvement in farming like crop production, and goat farming. This in turn will improve the wellbeing of the whole household and others agreed (KFG 9). On the same point, other farmers and stakeholders in Kola and Kalama raised a point that training help women to consider and take up livestock keeping as a serious economic activity (KOM 2, KSM 1).

Women claimed to lack access to training (KSM 1, 4; KII 2, 4 and KFG 4, 9, KOM 2). According to stakeholders, training is helpful for creating awareness on CCPP (KII 17, 30, KSMs, KOMs). When asked about access to training, stakeholders reported to give training on vaccination to farmers, but the same farmers denied receiving any training on animal vaccination (KSM 4, KIIs, women KFGs).

***Table 11*: summary of opportunities for women in the VVC**

Key opportunity category	Specific examples of opportunity	Source
Public sector jobs	1. Replacement of the retired personals	CDVS_KII 30, DVS_KII 25, VMD_KII 20, KVB_21
	2. Respect of 2/3 gender rules	CDVS_KII 30, DVS_KII 25, VMD_KII 20, KVB_21
Community support, beliefs and perception	1. Increasing of vet services for small farmers	Women and men FGDs, farmers KIIs; CDVS_KII 30
	2. Women are honest, right, eloquent	Women FGDs, men FGDs, farmers KIIs
	3. Ability to convince more farmers to accept vaccine	Male CDVS_KII 30, KFD 9
Training	1. Knowledge improvements	All KFGs, KSMs, KIIs, KOMs
	2. Empowering women	All KFGs, KSMs, KIIs, KOMs
	3. Creating awareness	All stakeholders_KIIs, KOMs, FDGs
	4. Increase access to vaccine	FGDs 9; CDVS_30, KII 17

4.3.3.2b. Private sector policies on employment of women

The private sector is not uniform. Some of them are importers of the CCPP vaccine (Aden chem) while others are retailers and still some do not deal with goat vaccines due to low demand (KII 17, KSM 1, 2, KSM 3). Recruitment is based on the choice of the agro-vet owners. These reported to have many women in the selling and customer care services and men in the manual works and transport sector (KII 17, KSMs). There were reported difficulties in women adopting roles that were not usual for their gender and this may have been a factor limiting women employment in the vaccine value chain in the private sector, where they work until late hours, or drive beyond 10 pm when delivering vaccines (KII 17).

4.4. Conclusion

Smallholder farmers still facing many challenges to access vaccine including high cost of vet services, lack of finances, knowledge and awareness on disease management, vaccine availability, and poor vaccination programs. Lack of resources, mismanagement and poor policy are the main factors reducing access to vaccine from the government and private sectors. If women are empowered to participate in the CCPP_VVC, access to vaccines can be enhanced.

Our results show preference for have women veterinarians in spite of the lack of gender balance in veterinary services, reportedly because they were more skillful, honest and reliable enough to deliver correct and viable vaccines and good quality of drugs. They also were more accessible and less costly.

Smallholder goat farmers need to be better linked to the VVC to maximize the value chain benefits and increase their chance to access CCPP vaccine.

In fact, as women's roles in the society are being recognized and appreciated more, and as their public sector work achieving more, it is then suggested that more opportunities and resources should be extended to women to improve gender equity in farming activities and VVC.

4.5. Recommendations

1. To improve equity in gender roles in vaccine value chain, more education and training opportunities on animal health should be availed to women.

2. Farmers should be encouraged to embrace vaccine technology out of the governmental supply chain to increase more access to the vaccine.

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1. Discussion

This study exposes gender related issues in the livestock sector and specifically the livestock vaccine value chain. It highlights the cultural background against which gender based barriers exist to constrain and limit farmers, especially women farmers from accessing services related to livestock keeping including but not limited to vaccine access. This study that was conducted in Kola and Kalama wards of Machakos town Sub-county demonstrated the existence of barriers encountered in laws, regulations, culture, finances and services for small scale farmers seeking to rear goats and access the CCPP vaccine as end users or play other entrepreneurial roles along the vaccine value chain. Goat rearing is hampered by the prevalence of CCPP which is a vaccinable disease. Despite the CCPP vaccine being availed by the government free of charge in Machakos County, this does not guarantee access for every small farmer. In the KIIs and KSMs done with stakeholders and farmers, many of them concurred that generally, the major barriers to CCPP vaccine adoption were lack of awareness about the disease and its vaccine, response of the livestock sector to an outbreak, none availability or inadequate supply of vaccine and the high cost of veterinary services.

There were several similarities and some differences in the barriers reported by men and women farmers and other stakeholders that can be attributed to the roles each play in the goat rearing venture and along the vaccine value chain. Women in Machakos reported that they are the ones in charge of buying goats using their own small money from women groups. Furthermore they spend more time with goats as most of the men live away from their homes on employment of business. Those who stay at home do not invest much on goat farming activities as goats are considered female livestock as reported also by Waithanji (Yisehak *et al.*, 2008; Waithanji *et al.*, 2015).

CCPP vaccine is only availed free of charge during a reported outbreak. Otherwise farmers can access the vaccine from agro vet shops but at a high cost. Women in the study area reported that the lack of finances for buying vaccine as well as the high cost of veterinary services as their major barriers to accessing the vaccine especially when the flock is small. Many of the small scale farmers, especially women, will therefore refrain from seeking veterinary services and hence risk the spread of the disease. The recent study on the adoption of goats' vaccine in

Kenya demonstrated that contagious caprine pleuropneumonia (CCPP) is ranked by goats' keepers as one of highest priority disease in livestock, higher than contagious bovine pleuropneumonia and yet the vaccine is still quite expensive when compared to other animal vaccines (Salt *et al.,* 2019). Renault Veronique's research in the ASAL zones of Kenya demonstrated that in a normal herd of 100 goats, the annual economic losses due to CCPP was projected at around 1,712.66 € per year (Renault *et al.,* 2019).

Both the County animal health services and private sector vet services agree that the vaccine offered free of charge by the government is not sufficient to cover the demand of the county, because it reaches farmers as treatment measure and not as a preventive measure since the service providers often arrive after outbreak has occurred and not before. Consequently, more farmers lose their flock before and after vaccination. Therefore, the next vaccination campaign has to result in low response particularly among those farmers who already do not have basic knowledge on the disease and how the vaccination is supposed to be done (majority of small farmers). Since farmers are usually willing to pay for vet services including transport, once the vaccine becomes available and less costly, the cost of vaccination will be reduced and guaranteed for everyone after all, the adoption of vaccine requires its availability and accessibility to respond to the demand of farmers (Donadeu *et al.,* 2019).

Interviews with veterinary services providers and other stakeholders revealed that the involvement of women in vaccination campaigns positively impacts the community to vaccinate their goats. Result demonstrated that whenever the CCPP vaccination teams work with women in the field their success was greater, because most of farmers are women, and have greater capacity to convince others to vaccinate their goats. A study done in Mali on the vaccination of PPR demonstrated that the incomplete involvement of women in vaccinations was considered as one of the main challenges in the implementation of vaccination (Dione et *al.,* 2019). The present study further corroborates other findings that women are caretakers of their animal health in different societies (Kristjanson *et al.,* 2014; Ekele and Obademi *et al.,* 2018) suggesting that they should not be sidelined in vaccination activities.

In Kola, farmers reported that the presence of a woman veterinarian officer in the livestock market stimulates more farmers to seek vet services, and both males and female farmers reported that female vets were more preferred than their male counterparts. During the

KII in Machakos town, the Director of Veterinary Services revealed that there is need to increase vet officers and specifically, women in order not only comply with the constitutional provision but also in recognition that women involvement in livestock sector results in better results that would translate to better vaccine uptake particularly in area like Machakos where the farmers especially women do not have easy access to vaccines (Donadeu *et al.*, 2019).
Data from the present study on opportunities for women along the VVC demonstrated that training women in vaccinating animals is of great importance because it makes it possible for farmers to not only treat their own but their neighbor's animals as well, which in turn reduces the treatment costs and avails veterinary services to the interior of the villages. Considering the current situation in animal health services provision, small scale farmers expect in vain for a lot to be done by both public and private sectors services providers. According to this study, among the barriers to access vaccines, were lack of extension vet officers who are supposed to train farmers about endemic diseases, limited knowledge on disease, lack of awareness, limited knowledge of disease, fake veterinarian officers, slow response of vet services, high cost of vet services, lack of finance, fake vaccines, and long distance to access drugs/vaccines. Some of these barriers present opportunities for instance, when more farmers and especially women were to be trained, the knowledge acquired would overcome many of the barriers and make the farmers self-reliant.

Eradication of a contagious and endemic disease becomes a challenge when the government is the sole supplier of medication and vaccine as is the case with CCPP vaccine in this study. Other studies done in similar diseases insist that the eradication require a serious involvement of all stakeholders in the VVC for increased and improved vaccine adoption including the private sector, NGOs, and public sectors and farmers themselves (FAO, 2015; Rathod *et al.*, 2016).

In developing countries and Africa in particular, results have not shown acceptable vaccination coverage through the countries. The reason given is the low level of involvement of farmers in vaccinations (Dione *et al.,* 2019), and the low vaccine production as suppliers are not willing to sell products that are in low demand, theoretically resulting in income loss due to limited shelf-lives (Renault *et al.,* 2019). This was demonstrated very well in this study where agro-

vet shops declined to stock CCPP vaccine because of its low demand due mainly to its prohibitive high cost.

5.2. General conclusion

The results highlighted important innovations that can improve information distribution among stakeholders and small holder livestock farmers. For effective control of CCPP, more supplementary resources including time, public staff in vet services will need to be committed by the government and other sectors implicated in small ruminant disease prevention and delivery of the vaccine and other treatment. However, the issue is more than basically finding additional resources to carry out investigation. Vaccine implementation, adoption, and diffusion do not depend only on how beneficial it is, but also on its considered value when applied and adopted by the end users. Enlarged livestock and goat production is beneficial to the Kenyan's growing population, and women play a critical role in this sector. All stakeholders in the livestock industry and other related industries should be encouraged to promote gender equity and empower women as part of accomplishing a greater improvement in livestock sector. The CCPP vaccine is among the vaccines whose adoption faces challenges because of a poorly coordinated vaccine value chain actors. The integration of women in the CCPP vaccine value chain will contribute to the implementation and adoption of the vaccine by smallholder farmers. This will not only develop and empower women but also the entire society, contribute towards the development goal of eradicating extreme poverty.

5.3. Recommendation

a. The government should increase its strategy by engaging more veterinary officers, particularly women, in different wards where farmers don't have access to veterinary services.

b. Gender sensitization should be done alongside the campaigns for farmer awareness on CCPP to enlighten the society on gender equity and achieve some balance in terms of opportunities.

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APPENDICES

Appendix 1. Gender Analysis- USAID five domains of gender Analysis Framework

Domain	**Activity (how do we measure)**	**Tool (what tool do we use?**	**Research questions (what questions we need answers to** **Determine the format we want to use to get answers to these questions?)**
Identify and analyze the barriers, opportunities and strategies for improving women's entry and participation in livestock ownership and VVC in Rwanda, Uganda and Kenya. ● What gender, social, cultural, political, economic, technical barriers and perceptions impede women's effective participation, define livestock ownership, decision making and prevent women from being beneficiaries of livestock vaccines as users, service providers and entrepreneurs? ● What factors and opportunities are needed or exist to enhance women's participation in the VVC to increase livestock productivity and improve household food security?			
Literature review: Laws, Policies, Regulations Institutional/household/individual Practices- from reports at districts, sub-county offices, ministries, and internet. Quantitative data disaggregated by sex on employment in different institution (position, salary, education level, etc.), access (to training, transport, vaccine, etc.). Key informant interviews.			

1.Laws, Policies, Regulations and Institutional Practices/culture **(**How are they treated by both the customary and legal systems and structures) **Structures** (are factors such as social class, religion, gender, ethnicity, custom etc.) which limit or influence the opportunities that individuals have.	Use Focus group discussions and Key informant interviews Literature review	In FGD and KII: use the Gender tree tool to analysis this domain at household, community and country/national level Individual interviews (Semi-structured interviews, Key informant interviews, and Unstructured interviews Participant observations	**Questions**: Are men and women likely to be owners of property that gives them access to collateral for a business loan? Do they have equal rights to inheritance, to own land, , to own land, to own livestock, to buy and sell or even to travel without their husbands consent? Legislation and customary law concerning widows Are the differences dependent on marital status of women? What accounts for the differences (if any) in ownership and management of livestock and their products? Are women and men treated equally in legislation related to the VVC? What legal impediments exist to participation or access to outcomes in and from the VVC? Number of men and women in the institution?

			Positions of men and women? Qualification of men and women in the institution? How are ad for recruitment of personal wriTten? (are they clearly encouraging women)? Who is participating in the recruItment of staff? is there a gender policy in the institution? What is the composition of all the different committees? What structural barriers exist (social class, religion, gender, ethnicity, customs which limit or facilitate the opportunity to engage in the VVC? What legal impediments exist to participation or access to outcomes in and from the VVC? Which diseases are legally reportable? Which vaccines are controlled by the government?

			What diagnostic tests for livestock disease are available? Who does the testing, and at what cost? How do people know which diseases the animals have? Do men and women have different knowledge about animal disease? About zoonotic disease? What licensing is required to buy and sell vaccines? To vaccinate animals for pay? To train farmers? Are there any special benefits or restrictions in the legal or regulatory framework that explicitly or indirectly target women or men Are there any restrictions in the legal or regulatory framework that explicitly or indirectly target women or men? Are men and women equally protected under law?

			Are women's rights recognized or/or protected? Do married women have more legal or societal protection than single women? How do wages for men compared to women? Is literacy a requirement to be a vaccinator? A CAHW? An agrovet shop owner? What are the literacy rates of males and females in the target area, stratified by age (<25 yrs, 25-50, >25)? Are there funds or places reserved for women in the VVC? (Including from International pharmaceutical companies)?
2.Access to and Control over Assets and Resources	Harvard Analytical Frame-work, Gender Empowerment matrix)	Individual interviews (Semi-structured interviews, Key informant interviews, and Unstructured interviews FGD/focus meals	**Question:** Women's education, access to communication means, knowledge on reproduction/HIV (DHS), violence against women

	Access to and Control over Assets and Resources including income, employment, and assets such as land, Gender Roles	Literature review Focus group **Exercise 1: Access control and benefit** 5 types of capital for women and men (social, financial, physical, natural and human) **Exercise 3: Prioritization of problems related to vaccines** **Exercise 4: communication profile** First set of Vaxxer Calendars will be given out during the WELI survey **Exercise 5:Ranking of barriers to vaccination, decision making, norms and beliefs**	Do women have control over/ own land? How does this relate to the livestock type that they own? To decision making in and benefits from livestock vaccines? Do men and women have equal access to resources related to vaccine: vaccines, deliverers, distributors, purchasing power, credit, training, information? Which groups do women belong to and which do men belong to? Do men and women have equal access to formal and informal networks that share information related to vaccine value chain, vaccine sales, entrepreneurship and access? Do men and women have equal access to technologies and services that are relevant to being active in the vaccine value chain including training and other opportunities for skill development

		- **Ranking of opportunities** Vaxxer calendar Jar voices/chalk talks Photovax	Do women and men use what they own differently?
3.Gender Roles, Responsibilities and Time Use and space	Activity profiles/Daily calendar Responsibilities and Time Use Division of both productive and reproductive labor	FGD **Exercise 2: Activity profiles/men and women roles: Seasonal calendars** **24 hour day: men and women respond to each others' diagrams** 10 Photovax equipment for each country will be given out during the focus group meetings. Ask them to take pix of healthy and sick animals, as well as their homes, families, and what makes them hopeful (or	**FGD** What are men's and women's responsibilities daily? are they related to cultural norms and expected How much free time do women (and men) have away from their productive and reproductive roles? Does this vary during the year? If women have greater responsibility, will they be able to participate in project activities Where do they typically spend their day? Is it in places or locations that would make it difficult for them to participate in entrepreneurship activities related to vaccines as deliverers, distributors, users? Who can help

		worried)for the future. Vaxxer calendar can be used to collect information on seasonality of diseases Jar voices Photovax KII (leaders, elders):	with daily household chores if they need to travel for training or to sell vaccines? What animal health training is currently available and who makes use of it? Where is it held? What type of training do women and men want? Who is a source of animal health information? What projects are taking place in the community? Who manages them, pays for them, participates in and manages them? What have been successful and unsuccessful projects? Why?
4.Knowledge, Cultural Norms , Beliefs and perceptions (types of knowledge that men and women know, beliefs that shape gender identities and		FGD/Focus meals Heard it/Said it/Practice it (to identify the extent and depth of gender stereotypes) Literature review Focus group	**Questions:** what are the gender stereotypes? Do they function as either facilitator or barrier for men and women in VVC engagement? Are there views about training, business engagement that could be considered in the community as roles for either women or men;

behavior, perceptions that guide how people interpret aspects of their lives		Key interviews, unstructured interviews Vaxxer calendar Jar voices Photovax participant observations	eg only men can be trained to own agrovets or be extension workers. If so are these views barriers to women's engagement in the VVC Will training on skills like leadership, financial literacy and management therefore help women engage in VVC Do men or women's self-perceptions,attitudes or levels of self-confidence function as either facilitators or barriers to their engagement in the VVC? Do men and women have unequal education and/or knowledge in areas that are important for successful engagement- vaccine access, distribution? Which women? Stratify by age, education and whether they have young children at home? Do men and women value the use of vaccines differently in

			livestock health as opposed to other in puts. Do men and women have equal access to and knowledge about the vaccine market that would be available if they became service providers? What knowledge is need to be successful, and how do newcomers get this? Will gender awareness training be required to ensure that husbands, families and communities support women entrepreneurs? If so, who are contacts for community theater and NGOs that promote gender awareness? Are men and women equally likely to have access to and to participate in training sessions? What do men think about the money that women earn? What do they know about women's expenses and their need for cash? What are their fears about women having cash?

5.Patterns of Power and Decision-making: **Ability of people to decide, to influence, to control, and to enforce** **Agency** is the capacity of individual humans to act independently and to make their own free choices. Exercise power over one's body and within an individual's household	Household patterns of power and decision making Power mapping at household, community and country level	Individual interviews (Semi-structured interviews, Key informant interviews, and Unstructured interviews: Household decision-making models- Unitary and collective/cooperative conflict models) Literature review Focus group Livelihood analysis tool: 5 types of capital for women and men (social, financial, physical, natural and human) 1.For household resource ownership and decision-making, in an FGD, participants will be guided to draw a	Data on representation of women in leadership position Do women have the power to make decisions about economic activities, what to purchase and sell' and what to spend their earnings on. Is society requiring women to follow men 's decision, to ask men's permission? Will women have control over and benefit from the funds and assets they may accrue if they participate in the project? Do they have the power to make decisions about what activities to engage in- entrepreneurship, vaccine distribution? Do women actively participate in formal decision-making structures or bodies in the VVC. Do women and men hold an equal no of decision-making positions in these entities e.g. government extension, drug distributors, vaccine deliverers

		resource matrix, and then the matrix will be interrogated and probed, using the checklist questions.. WELI **Power mapping tool:** Can be done in FGD and also in key informant interviews: Steps in FGD- list all individual and organizational actors.This does not only include formal decision-makers but also other groups such as service users, advisors, donors etc. Mapp, Add range of action cards/tools Jar voices	What are the different groups in the community (churches, schools, health or income generating projects, elders, etc…and the gender breakdown? include some of the WELI questions in the focus groups

		Photovax-take images of what they consider are power maps	

Appendix 2. Key Informant Interview of a Farmer

Time	Activity/Topic	Facilitator Instructions
60 min	**Introduction**	• This KII aims to collect information on gender issues related to vaccination of target species against diseases (primarily NCD, PPR or RVF, depending on the country, but also CCPP in goats, or Marek's or Gumboro in chickens) at the community level. **Objectives** are to: • Identify the number of goats and chickens in the households • Identify knowledge about each disease (clinical signs, traditional knowledge, cause, transmission and prevention) • Identify access to, control over and benefits from resources generated by poultry and goats in the household. **Preparation** Record the interview or use a note taker (or both). You need a facilitator, a note taker, a translator and an observer. Bring copies of Informed Consent and Project Information Sheet. NameofInterviewer_____ Sex oftheinterviewer

		_____ _____ Location: Village: _____ District: _____ Country _____ Date:_____ Characteristics of respondent_____ Respondent's sex_____ Respondent's age_____ Respondent's number of children _____ Respondent's formal education _____ Type of roof on house (wealth indicator) _____

Step 1: Introductions and informed consent

- The facilitator introduces the group to the farmer, and then asks the farmer to introduce themselves.
- The facilitator will briefly explain the project, and the purpose of today's visit (to understand the goat and chicken vaccination chain, and the involvement of men and women). We want to validate if women are sidelined than men in each value chain, and if so, how to improve it.
- Ask the respondent to sign the Informed Consent Form, and to keep the Project Information Sheet.

Step 2: Interview

Here are some sample questions to get you started. Probe or ask more questions to get clarification. Ask the question in a different way if it is not answered. Feel free to ask additional questions depending on the information you learn from the conversation. Try to save some time at the end to inspect the animals and their housing if possible.

The **note taker** can interrupt if they do not understand something, and ask for clarification.

1. What type of livestock does your household keep?
2. How many of each animal?
3. What is the main source of income for this household? Which part of the farm brings in the most income? (crops, livestock, other).
4. Of the goats, how much is used for home consumption, and how much for sale? Of the chickens?
5. Who owns the goats? Who owns the chickens? (self, husband, joint)
6. Do your goats ever get sick? What happens? What does it look like? What is the cause? What about the chickens?
7. What do you do when the goats get sick? When the chickens get sick?
8. Are your goats vaccinated against any diseases? PPR? RVF? CCPP? Your chickens against Newcastle Disease? If so, which type (injection, eye drops or drinking water?)
9. What is the difference between a vaccination and a medicine like an antibiotic?
10. How do you get your goats vaccinated? (List all the steps, if they are vaccinated. Skip if not vaccinated). Your chickens (if vaccinated)?

11. Who in the HH decides whether to vaccinate the goats? The chickens? (husband, wife, both, other? Where does the cash come from to pay for vaccine? (self, husband, other)
12. Do most women in the community also vaccinate their goats? Their chickens? Do most men vaccinate goats (chickens) if they have them? Why or why not?
13. Do you ever see women involved with goat vaccines, as information providers (formal or informal), distributors, vaccinators (formal or informal), vets, extension agents? Do you think women would like to be more involved? Same for chickens, or different?
14. Who (local group? Local leader? Vet? Government?) can help improve women's involvement? What should they do?
15. Do you belong to any groups? Both formal or registered, as well as informal like women circle, or merry-go round? Which ones?
16. Are you satisfied with the production of your goats and chickens? If not, what would you like to improve? How can you learn to do this? What other resources do you need? What can help you access those resources?

At the end of the interview, ask if you can see the animals if near the home, or the place where they sleep at night. Ask if they mingle with other people's goats if they are out grazing, or if they stay on the farm.

Thank the respondent for her time, and wish her good luck on her activities.

Notetaker: Transcribe the notes within 48 hours, while the memory is still fresh. Confirm the accuracy with the interviewer and

KII for VVC stakeholders:

(What economic, socio-cultural, familial, legal, political and psychological networks shape the current VVC at the micro, meso and macro levels?)

Name of organization/group: **Name of interviewee:**

Position in the organization/group:

What is the governance structure of the organization?

What are the distribution channels of the vaccine?

What support mechanism from your organization (central government, local government and NGOs is available) to the distributors, delivers, and users of the vaccines?

What are your incentives and drivers for the role you play?

Who makes the decisions (financial, programmatic) related to vaccine usage, distribution, delivery or use?

In your organization, what role do women play?

What role would you like them to play?

How can women's visibility be enhanced in the (VVC)your organization?

Do women hold decision making positions in the VVC?

What are the opportunities for women engagement(depends on if they are distributor, deliverer, manufacturer, seller?

What are the barriers to women's engagement (same as above)?

What is the level of involvement by men and women in the VVC?

What in your opinion is affecting women's participation in the VVC?

At what level is women participation most, distribution, delivery, use?

How can their participation at?

- Distribution
- Delivery
- User level be enhanced?

Who are the influencers and how can we influence them to empower women?

What do you think are potential entry points for women in the VVC?

What can we do to make you invest in women in the VVC?

Gender dimensions of organization

Number of men and women in the institution?

Positions of men and women?

Qualification of men and women in the institution?

How are ad for recruitment of personal written? (Are they clearly encouraging women)?

Who is participating in the recruitment of staff?

is there a gender policy in the institution?

What is the composition of all the different committees?

What structural barriers exist (social class, religion, gender, ethnicity, customs which limit or facilitate the opportunity to engage in the VVC?

What legal impediments exist to participation or access to outcomes in and from the VVC?

Livestock diseases and vaccines

Which diseases are legally reportable? Which vaccines are controlled by the government?

What diagnostic tests for livestock disease are available? Who does the testing, and at what cost? How do people know which diseases the animals have?

Do men and women have different knowledge about animal disease? About zoonotic disease?

What licensing is required to buy and sell vaccines? To vaccinate animals for pay? To train farmers?

Are there any special benefits or restrictions in the legal or regulatory framework that explicitly or indirectly target women or men

Regulatory framework (mostly for government)

Are there any restrictions in the legal or regulatory framework that explicitly or indirectly target women or men? If yes, what restrictions?

Are men and women equally protected under law? If now, why? If yes, how?

Are women's rights recognized or/or protected? If yes, how?

Do married women have more legal or societal protection than single women? Or female headed households? Please elaborate

How do wages for men compared to women?

What are the requirements for being a vaccinator (Literacy, training, and others?? A CAHW? An agrovet shop owner?

What are the literacy rates of males and females in the target area, stratified by age (<25 yrs., 25-50, >25)?

Are there funds or places reserved for women in the VVC? (Including from International pharmaceutical companies)?

Do women and men organize informal and formal meeting to debate on the laws, policies and regulations governing the value chains? Or do women participate in any of these meetings if any are held

Do they take part to the elaboration of laws and policies or are they consulted by authorities when there is a need of elaborating laws and policies?

I would like to know what are in your opinion the main constraints for small farmer use and adoption of the vaccine? What can be the strategies to resolve this situation and increase access of the vaccine to small farmers m specifically women? (Mapping constraints and potential solutions)

Step 1

Get the information on the number of men and women in the different position in the organization

Actors at each node	Description of activities	Responsibilities / roles		Number		Education		Constraints that limit access and control of resources for the activity carried out	
		M	F	M	F	M	F	Male	Female

Step 2

List and analyze activities carried out by the different actors identified in step 1 and mark who is responsible and the degree of responsibility per gender (male and female; you could add categories, e.g. youth). Use X: a little active; XX: active and XXX: very active.

Actors at each node	Responsibilities / roles		Number		Education		Causes/factors leading to constraints	Consequences	Actions to address gender based constraints
	M	F	M	F	M	F			

Take over the identified constraints from table 1 and put them in column 1. Specify to which target group (male, female) the constraint applies.

Analyze the consequences of the constraints on the efficiency of the value chain. Add as many rows as needed.

Identify potential actions pertaining to the factors causing the gender-based constraints; fill in the last column of table.

Recommendations for the process

When identifying the constraints, keep in mind the following challenges/ inequalities faced by women at different levels:

At organizational/ group level/ access to services:

How do women participate in different associations/groups? Do they face any constraints in participating? Why? What are the consequences of not participating?

Which services do men and women get within the chain and how? Do women have access to training, meetings, markets, market information? If not, why?

KII of community leaders including women (women group leaders, chiefs, community leaders, church elders, NGO leaders)- 15 interviews

Name of organization/group

Name of interviewee

Position in organization/group

What role are women and men playing in the vaccine value chain in the area?

How are women and men benefiting from the vaccine value chain?

If there are differences in benefits, what causes those differences?

How much power do women have to make decisions about economic activities, what to purchase and sell and what to spend their earnings on? We need to avoid the questions that will result into yes or no especially if there are no follow up questions for probing. The most appropriate questions are, what, why, how?

How do they make decisions about what activities to engage in- entrepreneurship, vaccine distribution?

How are women participating in formal decision-making structures or bodies in the VVC?

What is women and men representation like on decision-making positions in these entities e.g. government extension, drug distributors, vaccine deliverers?

What are the different groups in the community (churches, schools, health or income generating projects, elders, etc. and the gender breakdown?

How do women view themselves in terms of capabilities in influencing things and making good decisions in VVC?

How do women consider men's abilities to make good decisions compared to theirs?

How do men consider themselves visa-vis women in terms of influencing things and making good decisions in VVC?

Do women feel they must consult men before making decisions in VVC? If yes, why? If no, why not?

Do men think that there is no need to consult women in making decision because they are adding nothing? If yes, why? If no, why not?

Do men and women have unequal education and/or knowledge in areas that are important for successful engagement-?

- Vaccine access,

- Distribution

-Information

-training

If yes, why?

Do men and women value the use of vaccines differently in livestock health as opposed to other in puts: YES/ NO Explain

Do men and women have equal access to and knowledge about the vaccine market that would be available if they became service providers?

In your view, what are the barriers to this equal access to knowledge?

In your opinion, what knowledge is needed to be successful, and how do newcomers get this?

What are the restrictions in the legal or regulatory framework that explicitly or indirectly target women or men?

How are men and women protected under the law?

How are women's rights recognized or protected?

Do married women have more legal or societal protection than single women? Or female headed households? If yes, how?

How do wages for men compare to women?

What are the requirements to being a vaccinator? A CAHW? An agrovet shop owner?

What are the literacy rates of males and females in the target area, stratified by age (<25 yrs., 25-50, >25)?

Are there funds or places reserved for women in the VVC? (Including from International pharmaceutical companies)? Please elaborate.

Do women and men organize informal and formal meeting to debate on the laws, policies and regulations governing the value chains? Please elaborate.

Or do women participate in any of these meetings if any are held? Please elaborate.

Do they take part to the elaboration of laws and policies or are they consulted by authorities when there is a need of elaborating laws and policies?

The survey

Note to survey designers: The information in module G1 can be captured in different ways; however there must be a way to: (a) identify the proper individual within the household to be asked the survey, (b) link this individual from the module to the household roster, (c) code the outcome of the interview, especially if the individual is not available, to distinguish this from missing data, and (d) record who else in the household was present during the interview. This instrument must be adapted for country context including adding relevant examples and translations into local languages when appropriate.

Note to enumerators: *This questionnaire should be administered separately to the primary and secondary respondents identified in the household roster of the household level questionnaire. You should complete this coversheet for each individual identified in the "selection section" even if the individual is not available to be interviewed for reporting purposes. For some surveys (such as those focusing on nutrition outcomes), the female respondent may be the beneficiary woman or mother or primary caregiver of the index child (also the respondent for the pro-WEAI nutrition module). Please make sure that she is also the person interviewed for this questionnaire and that the male respondent is her spouse/partner (if applicable).*

Please double-check to ensure:

- You have completed the roster section of the household questionnaire to identify the correct primary and/or secondaryrespondent(s);
- YouhavenotedthehouseholdIDandindividualIDcorrectlyforthepersonyouareabouttointerview;
- You have gained informed consent from the individual in the householdquestionnaire;
- Youhavesoughttointerviewtheindividualinprivateorwhereothermembersofthehouseholdcannotoverhearorcontributeanswers.
- Donotattempttomakeresponsesbetweentheprimaryandsecondaryrespondentsthesame—itisokayforthemtobedifferent.

MODULE G1. INDIVIDUAL IDENTIFICATION

G1.01. HOUSEHOLD IDENTIFICATION:	☐☐☐☐☐☐	**G1.04 TYPE OF HOUSEHOLD**	MALE ANDFEMALEADULT ..... 1 FEMALEADULTONLY 2
G1.02. NAME OF RESPONDENT CURRENTLY BEING INTERVIEWED (ID CODE FROM ROSTER IN SECTION B HOUSEHOLD ROSTER): **SURNAME, OTHERNAME:**_____	☐☐	**G1.05. OUTCOME OF INTERVIEW:** **CIRCLE <u>ONE</u>**	COMPLETED ..... 1 HOUSEHOLDMEMBERTOOILLTORESPOND/COGNITIVELYIMPAIRED...2 RESPONDENT NOT ATHOME/TEMPORARILYUNAVAILABLE ..... 3 RESPONDENT NOT ATHOME/EXTENDEDABSENCE ..... 4 REFUSED ..... 5 COULDNOT LOCATE 6
G1.03. SEX OF RESPONDENT:	MALE ..... 1 FEMALE 2	**G1.06. ABILITY TO BE INTERVIEWED ALONE:** **CIRCLE <u>ONE</u>**	ALONE ..... 1 WITH ADULTFEMALESPRESENT ..... 2 WITH ADULTMALESPRESENT ..... 3 WITH ADULTS OF BOTHSEXPRESENT ..... 4 WITHCHILDREN PRESENT ..... 5 WITH ADULTS OF BOTH SEX ANDCHILDRENPRESENT 6

HOUSEHOLD ID			
RESPONDENT ID			

MODULE G2: TIME ALLOCATION

G2.01: PLEASE RECORD A LOG OF THE ACTIVITIES FOR THE INDIVIDUAL IN THE LAST COMPLETE 24 HOURS (STARTING YESTERDAY MORNING AT 4 AM, FINISHING 3:59 AM OF THE CURRENT DAY). THE TIME INTERVALS ARE MARKED IN 15 MIN INTERVALS. MARK ONE ACTIVITY FOR EACH TIME PERIOD BY ENTERING THE CORRESPONDING ACTIVITY CODE IN THE BOX.

G2.02: CHECK THE BOX BELOW IF THE RESPONDENT WAS CARING FOR CHILDREN WHILE PERFORMING EACH ACTIVITY.

Now I'd like to ask you about how you spent your time during the past 24 hours. We'll begin from yesterday morning and continue through to this morning. This will be a detailed accounting. I'm interested in everything you did (i.e. resting, eating, personal care, work inside and outside the home, caring for children, cooking, shopping, socializing, etc.), even if it didn't take you much time. I'm particularly interested in agricultural activities such as farming, gardening, and livestock raising whether in the field or on the homestead. I'm also interested in how much time you spent caring for children, especially if it happened while you did some other activity (e.g., collecting water while carrying a child or cooking while watching after a sleeping child).

		Night								Morning				Day																																			
		4:00				5:00				6:00				7:00				8:00				9:00				10:00				11:00				12:00				13:00				14:00				15:00			
G2.01 Activity **(WRITE ACTIVITY CODE)**																																																	
G2.02 Did you also care for children?	YES .... CHECK BOX NO.........LEAVE BLANK	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		Day								Evening				Night																																			
		16:00				17:00				18:00				19:00				20:00				21:00				22:00				23:00				24:00				1:00				2:00				3:00			
G2.01 Activity **(WRITE ACTIVITY CODE)**																																																	
G2.02 Did you also care for children?	YES.......... CHECK BOX NO.........LEAVE BLANK	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

ACTIVITY CODES FOR G2.01

A..... Sleeping and resting B..... Eating and drinking C..... Personalcare D.....School (incl. homework) E..... Work asemployed F ..... Own business work	H ....Horticultural (gardens) or high value crop farming I .....Large livestock raising (cattle, buffaloes) J ..... Small livestock raising (sheep, goats, pigs) K..... Poultry and other small animals raising (chickens, ducks, turkeys) L ..... Fishpond culture	N..... Commuting (to/from work or school) O.....Shopping/gettingservice(incl.healthservices) P.....Weaving / sewing / textile care Q .....Cooking R.....Domesticwork(incl.fetchingwaterandcollectingfuel) S Caring forchildren	U.....Traveling(notforworkorschool) V.....Exercising W .....Social activities andhobbies X.....Religiousactivities Y……Other(specify)

G2.03 In the last 24 hours did you work (at home or outside of the home including chores or other domestic activities) less than usual, about the same as usual, or more than usual?	**FOR FEMALES ONLY: DOES RESPONDENT HAVE A CHILD UNDER 5 YEARS OLD?**	**G2.04.** If you wanted to do something (livelihood-related, training-related, self-care) and could not take your child with you, is there someone who could care for your child in your absence?	**G2.05.** Who?	**ID #1**	**ID #2**	**ID #3**
LESSTHANUSUAL.....1 ABOUT THE SAMEASUSUAL.....2 MORETHAN USUAL.....3 **IF RESPONDENT IS MALE → MODULE G3**	YES.....1 → G2.04 NO.....2 → MODULE G3	YES.....1 → G2.05 NO.....2 → MODULE G3	**ENTER UP TO THREE (3) MEMBER IDs** **OTHER CODES:** NON-HHMEMBER ..... 94 NOT APPLICABLE 98			

HOUSEHOLD ID						
RESPONDENT ID						

MODULE G3: ROLE IN HOUSEHOLD DECISION-MAKING AROUND PRODUCTION AND INCOME

Now I'd like to ask you some questions about your participation in certain types of work activities and on making decisions on various aspects of household life.		Did you [NAME] participate in [ACTIVITY] in the past 12 months (that is, during the last [one/two] cropping seasons), from [PRESENT MONTH] last year to [PRESENT MONTH] this year?	When decisions are made regarding [ACTIVITY], who is it that normally takes the decision? **ENTER UP TO THREE (3) MEMBER IDs** **IF RESPONSE IS MEMBER ID (SELF) ONLY → *G3.05*** **OTHER CODES:** NON-HHMEMBER .....94 NOT APPLICABLE.....98 → ***NEXT ACTIVITY***			How much input did you have in making decisions about [ACTIVITY]? **USE CODE G3↓**	To what extent do you feel you can participate in decisions regarding [ACTIVITY] if you want(ed) to? **CIRCLE ONE**	To what extent are you able to access information that you feel is important for making informed decisions regarding [ACTIVITY]? **CIRCLE ONE**	How much input did you have in decisions about how much of the outputs of [ACTIVITY] to keep for consumption at home rather than selling? **USE CODE G3↓**	How much input did you have in decisions about how to use income generatedfrom [ACTIVITY]? **USE CODE G3↓**
ACTIVITY		**G3.01**	**G3.02**			**G3.03**	**G3.04**	**G3.05**	**G3.06**	**G3.07**
			ID #1	**ID #2**	**ID #3**					
A	Staple grain farming and processing of the harvest: grains that are grown primarily for food consumption (rice, maize, wheat, millet)	YES.....1 NO.....2 → ***ACTIVITY B***					NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT .....3 TO A HIGH EXTENT ..4	NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT .....3 TO A HIGH EXTENT ..4		
B	Horticultural (gardens) or high value crop farming and processing of the harvest	YES.....1 NO.....2 → ***ACTIVITY C***					NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT .....3 TO A HIGH EXTENT ..4	NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT .....3 TO A HIGH EXTENT ..4		
C	Fishpond culture	YES.....1 NO.....2 → ***ACTIVITY D***					NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT .....3 TO A HIGH EXTENT ..4	NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT .....3 TO A HIGH EXTENT ..4		

D	Non-farm economic activities (running a small business, self-employment, buy-and-sell)	YES..... 1 NO.....2 → ***ACTIVITY E***					NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 TO A HIGH EXTENT ..4	NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 TO A HIGH EXTENT ..4		
E	Wage and salary employment (work that is paid for in cash or in-kind, including both agriculture and other wage work)	YES..... 1 NO.....2 → ***ACTIVITY F***					NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 TO A HIGH EXTENT ..4	NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 TO A HIGH EXTENT ..4		

F	Large, occasional household purchases (bicycles, land, transport vehicles)	YES..... 1 NO.....2 → ***ACTIVITY G***					NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 TO A HIGH EXTENT ..4	NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 TO A HIGH EXTENT ..4		
G	Routine householdpurchases (food for daily consumption or other householdneeds)	YES..... 1 NO.....2 → ***ACTIVITY H***					NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 TO A HIGH EXTENT ..4	NOTATALL .....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 TO A HIGH EXTENT ..4		
H	Obtaining agricultural inputs (e.g. fertilizers, feed) and services (veterinary, advisory)	YES..... 1 NO.....2 → G4								

CODE G3
LITTLE TO NO INPUTINDECISIONS..... 1
INPUT INTOSOMEDECISIONS..... 2
INPUT INTO MOST ORALLDECISIONS..... 3
NOT APPICABLE / NODECISIONMADE..... 98

ROLE IN HOUSEHOLD DECISION-MAKING AROUND LIVESTOCK

Now I'd like to ask you some questions about your participation in certain types of work activities and on making decisions on various aspects of household life. The questions cover a range of activities, with special emphasis on livestock raising.

QUESTION	RESPONSE

G3.08. Which of the following species of livestock are raised in your household	CIRCLE ALL APPLICABLE	LARGE RUMINANT (DAIRY LOCAL) …1 LARGE RUMINANT (DAIRY IMPROVED BREEDS) …2 LARGE RUMINANT (BEEF OR MIXED LOCAL) …3 LARGE RUMINANT (BEEF OR MIXED IMPROVED BREEDS)…4 SMALL RUMINANT (SHEEP, GOAT LOCAL)….5 SMALL RUMINANT (SHEEP, GOAT IMPROVED BREEDS)…6 POULTRY (LOCAL)….7 POULTRY (IMPROVED BREEDS)….8 PIGS (LOCAL)…9 PIGS (IMPROVED BREEDS).....10 CAMELS….11 OTHERSSPECIFY….
G3.09 Please select the one most important species for your household livelihood	CIRCLE ONE	LARGE RUMINANT (DAIRY LOCAL) …1 LARGE RUMINANT (DAIRY IMPROVED BREEDS) …2 LARGE RUMINANT (BEEF OR MIXED LOCAL) …3 LARGE RUMINANT (BEEF OR MIXED IMPROVED BREEDS)…4 SMALL RUMINANT (SHEEP, GOAT LOCAL)….5 SMALL RUMINANT (SHEEP, GOAT IMPROVED BREEDS)…6 POULTRY (LOCAL)….7 POULTRY (IMPROVED BREEDS)….8 PIGS (LOCAL)…9 PIGS (IMPROVED BREEDS).....10

		CAMELS….11 OTHERS SPECIFY….
G3.10 Please select the most important species for your own livelihood	CIRCLE ONE **(CAN BE THE SAME AS FOR G3.09)**	LARGE RUMINANT (DAIRY LOCAL) …1 LARGE RUMINANT (DAIRY IMPROVED BREEDS) …2 LARGE RUMINANT (BEEF OR MIXED LOCAL) …3 LARGE RUMINANT (BEEF OR MIXED IMPROVED BREEDS)…4 SMALL RUMINANT (SHEEP, GOAT LOCAL)….5 SMALL RUMINANT (SHEEP, GOAT IMPROVED BREEDS)…6 POULTRY (LOCAL)….7 POULTRY (IMPROVED BREEDS)….8 PIGS (LOCAL)…9 PIGS (IMPROVED BREEDS)…..10 CAMELS….11 OTHERSSPECIFY….
G3.11 Is there any other species that you feel is important for your livelihood that your household does NOT keep?	CIRCLE ALL APPLICABLE	LARGE RUMINANT (DAIRY LOCAL) …1 LARGE RUMINANT (DAIRY IMPROVED BREEDS) …2 LARGE RUMINANT (BEEF OR MIXED LOCAL) …3 LARGE RUMINANT (BEEF OR MIXED IMPROVED BREEDS)…4 SMALL RUMINANT (SHEEP, GOAT LOCAL)….5 SMALL RUMINANT (SHEEP, GOAT IMPROVED BREEDS)…6 POULTRY (LOCAL)….7 POULTRY (IMPROVED BREEDS)….8 PIGS (LOCAL)…9 PIGS (IMPROVED BREEDS)…..10 CAMELS….11 OTHERS SPECIFY….

QUESTIONS G3.12-G3.20 (A-R) SHOULD BE ASKED FOR EACH OF THE TWO SPECIES OF LIVESTOCK INDICATED BY QUESTION G3.09 AND G3.10

		Did you [NAME] participate in [ACTIVITY] in the past 12 months (that is during the last [one/two] cropping seasons), from [PRESENT MONTH] last year to [PRESENT MONTH] this year?	How many hours a week do you spend on [ACTIVITY] CODES: Above 40 hours …0 20-40 hours ….1 10-20 hours…..2 5-10 hours….3 0-5 hours…4 None…5	When decisions are made regarding [ACTIVITY], who is it that normally takes the decision? **ENTER UP TO THREE (3) MEMBER IDs** **IF RESPONSE IS MEMBER ID (SELF) ONLY -> G3.16** **OTHER CODES:** NON-HH MEMBER…94 NOT APPLICABLE…98 **→ NEXT DECISION**			How much input did you have in making decisions about [ACTIVITY] if you want(ed) to? **USE CODE G3** ↓	To what extent do you feel you can participate in decisions regarding [ACTIVITY] if you want(ed) to? **CIRCLE ONE**	Who would you prefer made the decisions about [ACTIVITY]? ENTER UP TO THREE (3) MEMBER IDs **OTHER CODES:** NON-HH MEMBER…94 NOT APPLICABLE…98			To what extent are you able to access information that you feel is important for making informed decisions regarding [ACTIVITY]? **CIRCLE ONE**	How much inputdid you have in decisions about how much of the outputs of [ACTIVITY] to keep for consumption at home rather than selling? **USE CODE G3** ↓	How much input did you have in decision s about how to use income generate d from [ACTIVITY]? **USE CODE G3** ↓
ACTIVITY		G3.12	G3.13	G3.14			G3.15	G3.16	G3.17			G3.18	G3.19	G3.20
				ID 1	ID2	ID3			ID 1	ID2	ID3			
A	Animal feeding (collect, purchase, prepare or bring feed to animals)	YES…1 NO…2 -> **ACTIVITY B**						NOT AT ALL….1 SMALL EXTENT …2 MEDIUM EXTENT…3 TO A HIGH EXTENT…4				NOT AT ALL….1 SMALL EXTENT …2 MEDIUM EXTENT…3 TO A HIGH EXTENT…4		
B	Animal watering (collect or bring water to animal)	YES…1 NO…2 -> **ACTIVITY C**												
C	Animal grazing (taking animal out of the farm for grazing)	YES…1 NO…2 -> **ACTIVITY D**												
D	Check animal health	YES…1 NO…2 -> **ACTIVITY E**												
E	Carry out disease preventive measures (e.g. spraying, deworming, or taking animals to dip)	YES…1 NO…2 -> **ACTIVITY F**												
F	Carry out curative measures (e.g. give medicines to heal sick animals)	YES…1 NO…2 -> **ACTIVITY G**												

G	Milking animals	YES…1 NO…2 - >**ACTIVITY H**												
H	Selling milk	YES…1 NO…2 - >**ACTIVITY I**												
I	Cleaning animals, shelter or utensils	YES…1 NO…2 - >**ACTIVITY J**												
J	Slaughter animals	YES…1 NO…2 - >**ACTIVITY K**												
K	Prepare animal meat, eggs, milk into food	YES…1 NO…2 - >**ACTIVITY L**												

L	Breeding animals in own flock (1 choose female and male animals to parent the next generation; 2 nurture the selected parents through better care; 3 separate males and females and arrange their mating at appropriatetimes)	YES…1 NO…2 - **>ACTIVITY M**													
M	Arrange for artificial insemination (1. contact the AI provider; 2 choose the animals to parent the next generation; 3 arrange to receive AI service)	YES…1 NO…2 - **>ACTIVITY N**													
N	Receiving sire service (1. look for others to provide male animal for breeding; 2 choose the animals to parent the next generation; 3 arrange to receive sire service)	YES…1 NO…2 - **>ACTIVITY O**													
O	Deciding how much product from [ANIMAL] to put aside for household consumption	YES…1 NO…2 - **>ACTIVITY P**													
P	Livestock and livestock product marketing	YES…1 NO…2 - **>ACTIVITY Q**													
Q	Selecting which species and which breeds to rear	YES…1 NO…2 - **>ACTIVITY R**													
R	Sharing livestock workload among	YES…1 NO…2 - **>ACTIVITY S**													

	household members														
S	Providing this livestock as collateral to access credit	YES…1 NO…2 -> **ACTIVITY T**													
T	Using dung from livestock or using livestock as draft power	YES…1 NO…2 **->ACTIVITY G4**													

	CODE G2
	LITTLE TO NO INPUTINDECISIONS.....1 INPUT INTOSOMEDECISIONS .....2 INPUT INTO MOST ORALLDECISIONS .....3 NOT APPICABLE / NODECISIONMADE 98

HOUSEHOLD ID						
RESPONDENT ID						

MODULE G4(A): ACCESS TO PRODUCTIVE CAPITAL

Now I'd like to ask you specifically about your household's land.

QUESTION		**RESPONSE**		
G4.01. Does anyone in your household currently own or cultivate land?		YES .....1 NO.....2 → ***G4.06, ITEM A***		
G4.02. Who generally makes decisions about what to plant on this land?	**ENTER UP TO THREE (3) MEMBER IDs** **OTHER CODES:** NON-HHMEMBER..... 94 NOTAPPLICABLE 98	**ID #1**	**ID #2**	**ID #3**
G4.03. Do you [NAME] solely or jointly cultivate any land?	**CIRCLE <u>ONE</u>**	YES,SOLELY.....1 YES,JOINTLY.....2 YES, SOLELYANDJOINTLY .....3 NO.....4		
		ID #1	**ID #2**	**ID #3**

G4.04. Who generally makes decisions about what to plant on the land that you yourself cultivate?	**ENTER UP TO THREE (3) MEMBER IDs** **OTHER CODES:** NON-HHMEMBER.....94 NOTAPPLICABLE 98			
G4.05. Do you own any of the land owned or cultivated by your household?	**CIRCLE <u>ONE</u>**	YES,SOLELY.....1 YES,JOINTLY .....2 YES, SOLELYANDJOINTLY .....3 NO.....4		

Now I'd like to ask you about a number of items that could be used to generate income.		Does anyone in your household currently have any [ITEM]?	Do you [NAME] own any [ITEM]? **CIRCLE ONE**	For assets you own (solely), which of the following can you do on your own, without consultation? **CIRCLE ALL APPLICABLE**	For assets you own jointly, with whom do you co-own [ITEM]? **CIRCLE ALL APPLICABLE**	For assets you own (jointly) with someone else, which of the following can you do on your own, without consultation? **CIRCLE ALL APPLICABLE**:	For all assets that you own (solely or jointly), which of the following can your spouse do on his/her own, without consulting you? **CIRCLE ALL APPLICABLE**
ITEM		**G4.06**	**G4.07**	**G4.08**	**G4.09**	**G4.10**	**G4.11**
A	Large ruminant (dairy)	YES.....1 NO.....2 → ***ITEM B***	YES, SOLELY.....1 → ***G4.08*** BETWEEN 1 AND 10.....A BETWEEN 10 AND 50…B MORE THAN 50…C YES, JOINTLY.....2 → ***G4.09*** BETWEEN 1 AND 10.....A BETWEEN 10 AND 50…B MORE THAN 50…C YES, SOLELY AND JOINTLY.....3 → ***G4.08*** NO.....4 → ***ITEM B***	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6 → ***G4.11***	SPOUSE.....1 OTHERHHMEMBER.....2 NONHH-MEMBER.....3	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6
B	Large ruminant (beef or mixed)	YES.....1 NO.....2 → ***ITEM C***	YES, SOLELY.....1 → ***G4.08*** BETWEEN 1 AND 10.....A BETWEEN 10 AND 50…B MORE THAN 50…C YES, JOINTLY.....2 → ***G4.09*** BETWEEN 1 AND 10.....A BETWEEN 10 AND 50…B MORE THAN 50…C YES, SOLELY AND JOINTLY.....3 → ***G4.08*** NO.....4 → ***ITEM B***	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6 → ***G4.11***	SPOUSE.....1 OTHERHHMEMBER.....2 NONHH-MEMBER.....3	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6
C	Small ruminant (Sheep, goats)	YES.....1 NO.....2 → ***ITEM D***	YES, SOLELY.....1 → ***G4.08*** BETWEEN 1 AND 10.....A BETWEEN 10 AND 50…B MORE THAN 50…C YES, JOINTLY.....2 → ***G4.09*** BETWEEN 1 AND 10.....A BETWEEN 10 AND 50…B MORE THAN 50…C YES, SOLELY AND JOINTLY.....3 → ***G4.08*** NO.....4 → ***ITEM B***	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6 → ***G4.11***	SPOUSE.....1 OTHERHHMEMBER.....2 NONHH-MEMBER.....3	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6

D	Poultry	YES.....1 NO.....2 → ***ITEM E***	YES, SOLELY.....1 → ***G4.08*** BETWEEN 1 AND 10.....A BETWEEN 10 AND 50…B MORE THAN 50…C YES, JOINTLY.....2 → ***G4.09*** BETWEEN 1 AND 10.....A BETWEEN 10 AND 50…B MORE THAN 50…C YES, SOLELY AND JOINTLY.....3 → ***G4.08*** NO.....4 → ***ITEM B***	LOOK AFTER LIVESTOCK... .1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6 → ***G4.11***	SPOUSE.....1 OTHERHHMEMBER.....2 NONHH-MEMBER.....3	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6
E	Pigs	YES.....1 NO.....2 → ***ITEM F***	YES, SOLELY.....1→ ***G4.08*** BETWEEN 1 AND 10.....A BETWEEN 10 AND 50…B MORE THAN 50…C YES, JOINTLY.....2 → ***G4.09*** BETWEEN 1 AND 10.....A BETWEEN 10 AND 50…B MORE THAN 50…C YES, SOLELY AND JOINTLY.....3 → ***G4.08*** NO.....4 → ***ITEM B***	LOOK AFTER LIVESTOCK ....1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6 → ***G4.11***	SPOUSE.....1 OTHERHHMEMBER.....2 NONHH-MEMBER.....3	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6	LOOK AFTER LIVESTOCK.... 1 GIVEASGIFT.....2 SELL.....3 LOAN TOSOMEONEELSE.....4 PLEDGEASCOLLATERAL.....5 SLAUGTHER.....6
F	Fish pond or fishing equipment	YES.....1 NO.....2 → ***ITEM G***	YES,SOLELY.....1 YES,JOINTLY.....2 YES, SOLELYANDJOINTLY.....3 NO.....4				
G	Non-mechanized farm equipment (hand tools, animal-drawn plough)	YES.....1 NO.....2 → ***ITEM H***	YES,SOLELY.....1 YES,JOINTLY.....2 YES, SOLELYANDJOINTLY.....3 NO.....4				
H	Mechanized farm equipment (tractor-plough, power tiller, treadle pump)	YES.....1 NO.....2 → ***ITEM I***	YES,SOLELY.....1 YES,JOINTLY.....2 YES, SOLELYANDJOINTLY.....3 NO.....4				
I	Non-farm business equipment (solar panels used for recharging, sewing machine, brewing equipment, fryers)	YES.....1 NO.....2 → ***ITEM J***	YES,SOLELY.....1 YES,JOINTLY.....2 YES, SOLELYANDJOINTLY.....3 NO.....4				

J	House or building	YES.....1 NO.....2 → ***ITEM K***	YES,SOLELY.....1 YES,JOINTLY.....2 YES, SOLELYANDJOINTLY.....3 NO.....4				
K	Large consumer durables (refrigerator, TV, sofa)	YES.....1 NO.....2 → ***ITEM L***	YES,SOLELY.....1 YES,JOINTLY.....2 YES, SOLELYANDJOINTLY.....3 NO.....4				
L	Smallconsumer durables (radio, cookware)	YES.....1 NO.....2 → ***ITEM M***	YES,SOLELY.....1 YES,JOINTLY.....2 YES, SOLELYANDJOINTLY.....3 NO.....4				
M	Cell phone	YES.....1 NO.....2 → ***ITEM N***	YES,SOLELY.....1 YES,JOINTLY.....2 YES, SOLELYANDJOINTLY.....3 NO.....4				
N	Other land not used for agricultural purposes (pieces/plots, residential or commercial land)	YES.....1 NO.....2 → ***ITEM O***	YES,SOLELY.....1 YES,JOINTLY.....2 YES, SOLELYANDJOINTLY.....3 NO.....4				
O	Means of transportation (bicycle, motorcycle, car)	YES.....1 NO.....2 → ***MODULE G5(B)***	YES,SOLELY.....1 YES,JOINTLY.....2 YES, SOLELYANDJOINTLY.....3 NO.....4				

MODULE G4(B): ACCESS TO FINANCIAL SERVICES

		Next I'd like to ask about your household's experience with borrowing money or other items (in-kind) in the past 12 months.	Would you or anyone in your household be able to take a loan or borrow cash/in-kind from [SOURCE] if you wanted to?	Has anyone in your household taken any loans or borrowed cash/in-kind from [SOURCE] in the past 12 months? **CIRCLE ONE**	Who made the decision to borrow from [SOURCE] most of the time? **ENTER UP TO THREE (3) MEMBER IDs** **OTHER CODES:** NON-HHMEMBER .....94 NOT APPLICABLE.....98			Who makes the decision about what to do with the money or item borrowed from [SOURCE] most of the time? **ENTER UP TO THREE (3) MEMBER IDs** **OTHER CODES:** NON-HHMEMBER..... 94 NOT APPLICABLE.....98			Who is responsible for repaying the money or item borrowed from [SOURCE]? **ENTER UP TO THREE (3) MEMBER IDs** **OTHER CODES:** NON-HHMEMBER.....94 NOT APPLICABLE.....98		
LENDING SOURCES		**G4.12**	**G4.13**		**G4.14**			**G4.15**			**G4.16**		
					ID #1	**ID #2**	**ID #3**	**ID #1**	**ID #2**	**ID #3**	**ID #1**	**ID #2**	**ID #3**
A	Non-governmental organization (NGO)	YES.....1 NO.....2 → ***SOURCE B*** MAYBE.....3	YES,CASH.....1 YES,IN-KIND .....2 YES, CASHANDIN-KIND .....3 NO.....4 → ***SOURCEB*** DON'T KNOW.....97										
B	Formal lender (bank/financial institution)	YES.....1 NO.....2 → ***SOURCE C*** MAYBE.....3	YES,CASH.....1 YES,IN-KIND .....2 YES, CASHANDIN-KIND .....3 NO.....4 → ***SOURCEC*** DON'T KNOW.....97										
C	Informal lender	YES.....1 NO.....2 → ***SOURCE D*** MAYBE.....3	YES,CASH.....1 YES,IN-KIND .....2 YES, CASHANDIN-KIND .....3 NO.....4 → ***SOURCED*** DON'T KNOW.....97										
D	Friends or relatives	YES.....1 NO.....2 → ***SOURCE E*** MAYBE.....3	YES,CASH.....1 YES,IN-KIND .....2 YES, CASHANDIN-KIND .....3 NO.....4 → ***SOURCEE*** DON'T KNOW.....97										
E	Group based micro-finance or lending including VSLAs / SACCOs	YES.....1 NO.....2 → ***SOURCE F*** MAYBE.....3	YES,CASH.....1 YES,IN-KIND .....2 YES, CASHANDIN-KIND .....3 NO.....4 → ***SOURCEF*** DON'T KNOW.....97										
F	Informal credit / savings groups (e.g., merry-go-rounds, tontines, funeral societies, etc.)	YES.....1 NO.....2 → ***G4.17*** MAYBE.....3	YES,CASH.....1 YES,IN-KIND .....2 YES, CASHANDIN-KIND .....3 NO.....4 → ***G4.17*** DON'T KNOW.....97										

G4.17	An account can be used to save money, to make or receive payments, or to receive wages or financial help. Do you, either by yourself or together with someone else, currently have an account at any of the following places: a bank or other formal institution (e.g., post office)?	YES .....1 NO .....2 DON'T KNOW 97

HOUSEHOLD ID							
RESPONDENT ID							

MODULE G5: GROUP MEMBERSHIP

Now I'm going to ask you about groups in the community. These can be either formal or informal and customary groups.		Is there a [GROUP] in your community?	Is this group composed of all male or female or mixed-sex members?	Are you an active member of this [GROUP]?	To what extent do you feel like you can influence decisions in this [GROUP]?	To what extent does this [GROUP] influence life in the community beyond the group activities?
GROUP CATEGORIES		**G5.01**	**G5.02**	**G5.03**	**G5.04**	**G5.05**
A	Agricultural / livestock / fisheries producer's group (including marketing groups)	YES.....1 NO.....2 → ***GROUP B*** DON'T KNOW.....97	ALLMALE.....1 ALLFEMALE.....2 MIXEDSEX.....3 DON'T KNOW.....97	YES.....1 NO.....2 → ***GROUP B***	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4
B	Water users' group	YES.....1 NO.....2 DON'T KNOW.....97 ***GROUP C***	ALLMALE.....1 ALLFEMALE.....2 MIXEDSEX.....3 DON'T KNOW.....97	YES.....1 NO.....2 → ***GROUP C***	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4
C	Forest users' group	YES.....1 NO.....2 DON'T KNOW.....97 ***GROUP D***	ALLMALE.....1 ALLFEMALE.....2 MIXEDSEX.....3 DON'T KNOW.....97	YES.....1 NO.....2 → ***GROUP D***	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4
D	Credit or microfinance group (including SACCOs / merry-go-rounds / VSLAs)	YES.....1 NO.....2 DON'T KNOW.....97 ***GROUP E***	ALLMALE.....1 ALLFEMALE.....2 MIXEDSEX.....3 DON'T KNOW.....97	YES.....1 NO.....2 → ***GROUP E***	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4
E	Mutual help or insurance group (including burial societies)	YES.....1 NO.....2 DON'T KNOW.....97 ***GROUP F***	ALLMALE.....1 ALLFEMALE.....2 MIXEDSEX.....3 DON'T KNOW.....97	YES.....1 NO.....2 → ***GROUP F***	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4
F	Trade and business association group	YES.....1 NO.....2 DON'T KNOW.....97 ***GROUP G***	ALLMALE.....1 ALLFEMALE.....2 MIXEDSEX.....3 DON'T KNOW.....97	YES.....1 NO.....2 → ***GROUP G***	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4
G	Civic group (improving community) or charitable group (helping others)	YES.....1 NO.....2 DON'T KNOW.....97 ***GROUP H***	ALLMALE.....1 ALLFEMALE.....2 MIXEDSEX.....3 DON'T KNOW.....97	YES.....1 NO.....2 → ***GROUP H***	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4

H	Religious group	YES.....1 NO.....2 DON'T KNOW.....97	***GROUP I***	ALLMALE.....1 ALLFEMALE.....2 MIXEDSEX.....3 DON'T KNOW.....97	YES……1 NO……2 → ***GROUP I***	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4

I	Milk/dairy marketing group	YES.....1 NO.....2 → ***GROUP J*** DON'T KNOW.....97	ALLMALE.....1 ALLFEMALE.....2 MIXEDSEX.....3 DON'T KNOW.....97	YES.....1 NO.....2 → ***GROUP J***	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4
J	Other(specify):_____	YES.....1 NO.....2 → ***MODULE G6*** DON'T KNOW.....97	ALLMALE.....1 ALLFEMALE.....2 MIXEDSEX.....3 DON'T KNOW.....97	YES.....1 NO.....2 → ***MODULE G6***	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4	NOTATALL.....1 SMALLEXTENT.....2 MEDIUMEXTENT.....3 HIGHEXTENT.....4

HOUSEHOLD ID							
RESPONDENT ID							

MODULE G6. PHYSICAL MOBILITY

		During the past 12 months, how often do you generally go to [PLACE]?	Were you ever prevented from going to [PLACE] when you wanted to?	If you wanted to go to [PLACE], but couldn't, why not? **USE G6.03. RESPONSE CODES. LIST ALL CODES APPLICABLE.** **DO NOT READ RESPONS OPTONS ALOUD. LISTEN TO RESPONDENT AND SELECT APPROPRIATE CODE.**	Does your spouse/partner object to you going alone to [PLACE],?	Do these objections prevent you from going alone to [PLACE]?
PLACE		**G6.01**	**G6.02**	**G6.03**	**WOMAN ONLY** **G6.04**	**WOMAN ONLY** **G6.05**
A	Urban center	EVERYDAY .....1 EVERY WEEK ATLEASTONCE ..... 2 EVERY 2 WEEKS AT LEAST ONCE....3 EVERY MONTH AT LEAST ONCE.....4 LESS THAN ONCEAMONTH ..... 5 NEVER.....6 NOTAPPLICABLE 98	YES.....1 NO.....2→ ***G6.04***		YES.....1 NO.....2 → ***PLACEB***	YES.....1 NO..... 2
B	Market / haat / bazaar	EVERYDAY .....1 EVERY WEEK ATLEASTONCE ..... 2 EVERY 2 WEEKS AT LEAST ONCE....3 EVERY MONTH AT LEAST ONCE.....4 LESS THAN ONCEAMONTH ..... 5 NEVER.....6 NOTAPPLICABLE 98	YES.....1 NO.....2→ ***G6.04***		YES.....1 NO.....2 → ***PLACEC***	YES.....1 NO..... 2
C	Visit family or relatives	EVERYDAY .....1 EVERY WEEK ATLEASTONCE ..... 2 EVERY 2 WEEKS AT LEAST ONCE....3 EVERY MONTH AT LEAST ONCE.....4 LESS THAN ONCEAMONTH ..... 5 NEVER.....6 NOTAPPLICABLE 98	YES.....1 NO.....2→ ***G6.04***		YES.....1 NO.....2→ ***PLACED***	YES.....1 NO..... 2
D	Visit a friend / neighbor's house	EVERYDAY .....1 EVERY WEEK ATLEASTONCE ..... 2 EVERY 2 WEEKS AT LEAST ONCE....3 EVERY MONTH AT LEAST ONCE.....4 LESS THAN ONCEAMONTH ..... 5 NEVER.....6 NOTAPPLICABLE 98	YES.....1 NO.....2→ ***G6.04***		YES.....1 NO.....2→ ***PLACEE***	YES.....1 NO..... 2

E	Hospital / clinic / doctor (seek health service)	EVERYDAY .....1 EVERY WEEK ATLEASTONCE ..... 2 EVERY 2 WEEKS AT LEAST ONCE....3 EVERY MONTH AT LEAST ONCE.....4 LESS THAN ONCEAMONTH..... 5 NEVER.....6 NOTAPPLICABLE 98	YES.....1 NO.....2→ ***G6.04***		YES.....1 NO.....2→ ***PLACEF***	YES.....1 NO..... 2
F	Extension office/veterinarian	EVERYDAY .....1 EVERY WEEK ATLEASTONCE ..... 2 EVERY 2 WEEKS AT LEAST ONCE....3 EVERY MONTH AT LEAST ONCE.....4 LESS THAN ONCEAMONTH..... 5 NEVER.....6 NOTAPPLICABLE 98	YES.....1 NO.....2→ ***G6.04***		YES.....1 NO.....2→ ***PLACEG***	YES.....1 NO..... 2
G	Business group meetings (SACCO meetings, etc.)	EVERYDAY .....1 EVERY WEEK ATLEASTONCE ..... 2 EVERY 2 WEEKS AT LEAST ONCE....3 EVERY MONTH AT LEAST ONCE.....4 LESS THAN ONCEAMONTH..... 5 NEVER.....6 NOTAPPLICABLE 98	YES.....1 NO.....2→ ***G6.04***		YES.....1 NO.....2→ ***PLACEH***	YES.....1 NO..... 2
H	Training or capacity building in dairy production, handling, or sale	EVERYDAY .....1 EVERY WEEK ATLEASTONCE ..... 2 EVERY 2 WEEKS AT LEAST ONCE....3 EVERY MONTH AT LEAST ONCE.....4 LESS THAN ONCEAMONTH..... 5 NEVER.....6 NOTAPPLICABLE 98	YES.....1 NO.....2→ ***G6.04***		YES.....1 NO.....2→ ***PLACE I***	YES.....1 NO..... 2
I	Somewhere other than your home for one or more nights	EVERYDAY .....1 EVERY WEEK ATLEASTONCE ..... 2 EVERY 2 WEEKS AT LEAST ONCE....3 EVERY MONTH AT LEAST ONCE.....4 LESS THAN ONCEAMONTH..... 5 NEVER.....6 NOTAPPLICABLE 98	YES.....1 NO.....2→ ***G7.01***		YES.....1 NO.....2→ ***G7.01.***	YES.....1 NO..... 2

G6.03 RESPONSE CODES	
1	TRANSPORTATION TOO EXPENSIVE
2	I DID NOT HAVE THE PROPER DRESS/CREDENTIALS
3	NOT ENOUGH TIME
4	I THOUGHT IT WAS UNSAFE
5	OTHERS TOLD ME IT WAS UNSAFE
6	FORBIDDEN TO GO BY SPOUSE/PARTNER
7	FORBIDDEN TO GO BY THE FAMILY OF MY SPOUSE/PATRNER
8	FORBIDDEN TO GO BY OWN FAMILY MEMBER
9	FORBIDDEN TO GO BY AN AUTHOIRTY
10	**(DO NOT READ ALOUD)** SOCIETAL NORM
11	OTHER,SPECIFY:_____

HOUSEHOLD ID							
RESPONDENT ID							

MODULE G7: INTRAHOUSEHOLD RELATIONSHIPS

Now I'd like to ask you some questions about how you feel about some of other people in your household or family group and how you think they feel about you. **ENTER MEMBER ID FOR EACH RELATION** **OTHER CODES:** NON-HHMEMBER.....94			Do you [NAME] respect your [RELATION]?	Does your [RELATION] respect you?	Do you trust your [RELATION] to do things that are in your best interest?	When you disagree with your [RELATION], do you feelcomfortable telling him/her that you disagree?	**IS [RELATION] THE OTHER RESPONDENT WITHIN THIS HOUSEHOLD?**	Is there a co- wife within your household?
RELATION G7.01			**G7.02**	**G7.03**	**G7.04**	**G7.05**	**G7.06**	**G7.07**
A	Husband / wife	**ID #**	MOST OFTHETIME .....1 SOMETIMES.....2 RARELY.....3 NEVER.....4	MOST OFTHETIME.....1 SOMETIMES.....2 RARELY.....3 NEVER.....4	MOST OFTHETIME.....1 SOMETIMES .....2 RARELY.....3 NEVER.....4	MOST OFTHETIME ..... 1 SOMETIMES ..... 2 RARELY ..... 3 NEVER..... 4	YES.....1 → ***RELATION C*** NO 2	
B	Other respondent within the household	**ID #**	MOST OFTHETIME .....1 SOMETIMES.....2 RARELY .....3 NEVER 4	MOST OFTHETIME.....1 SOMETIMES.....2 RARELY.....3 NEVER.....4	MOST OFTHETIME.....1 SOMETIMES .....2 RARELY.....3 NEVER.....4	MOST OFTHETIME ..... 1 SOMETIMES ..... 2 RARELY ..... 3 NEVER..... 4		
C	**IF RESPONDENT IS MALE:** Father (or adapt this category to capture other important relationship) **IF RESPONDENT IS FEMALE:** Mother-in-law	**ID #**	MOST OFTHETIME .....1 SOMETIMES.....2 RARELY .....3 NEVER 4	MOST OFTHETIME.....1 SOMETIMES.....2 RARELY.....3 NEVER.....4	MOST OFTHETIME.....1 SOMETIMES .....2 RARELY.....3 NEVER.....4	MOST OFTHETIME ..... 1 SOMETIMES ..... 2 RARELY ..... 3 NEVER..... 4 ***IF RESPONDENT IS MALE → MODULE G8(A)***		YES.....1 NO.....2 → ***MODULE G8(A)***
D	Most senior co-wife (the person who was in the household just before you, or, if you are the senior wife, the one who married into the household after you)	**ID #**	MOST OF THETIME .....1 SOMETIMES.....2 RARELY .....3 NEVER 4	MOST OFTHETIME.....1 SOMETIMES.....2 RARELY.....3 NEVER.....4	MOST OFTHETIME.....1 SOMETIMES .....2 RARELY.....3 NEVER.....4	MOST OFTHETIME ..... 1 SOMETIMES ..... 2 RARELY ..... 3 NEVER..... 4		

HOUSEHOLD ID							
RESPONDENT ID							

MODULE G8(A): AUTONOMY IN DECISION-MAKING

Now I am going to read you some stories about different farmers and their situations regarding different agricultural activities. This question format is different from the rest so take your time in answering. For each I will then ask you how much you are like or not like each of these people. We would like to know if you are completely different from them, similar to them, or somewhere in between. There are no right or wrong answers to these questions. **READ ALOUD EACH STORY, SUBSEQUENT QUESTIONs, AND RESPONSE CODES. NAMES SHOULD BE ADOPTED TO LOCAL CONTEXT AND BE MALE/FEMALE DEPENDING ON THE SEX OF THE RESPONDENT. THE ORDER OF TOPICS A-D SHOULD BE RANDOMIZED, AND WITHIN EACH TOPIC, THE ORDER OF STORIES 1-4 SHOULD BE RANDOMIZED.**			Are you like this person? **CIRCLE ONE**	Are you completely the same or somewhat the same? **CIRCLE ONE**	Are you completely different or somewhat different? **CIRCLE ONE**
STORY			**G8.01**	**G8.02**	**G8.03**
Livestock raising	**A1**	*"[PERSON'S NAME] cannot raise any livestock other than what she has. These are all that do well here."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME....1 → **A2** SOMEWHAT THE SAME.....2 → **A2**	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2
	A2	*"[PERSON'S NAME] raises the types of livestock she does because her spouse, or another person or group in her community tell her she must use these breeds. She does what they tell her to do."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME....1 → **A3** SOMEWHAT THE SAME.....2 → **A3**	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2
	A3	*"[PERSON'S NAME] raises the kinds of livestock that her family or community expect. She wants them to approve of her as a good livestock raiser."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME....1 → **A4** SOMEWHAT THE SAME.....2 → **A4**	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2
	A4	*"[PERSON'S NAME] chooses the types of livestock that she personally wants to raise and thinks are good for herself and her family. She values raising these types. If she changed her mind, she could act differently."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME....1 → **B1** SOMEWHAT THE SAME.....2 → **B1**	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2

READ ALOUD EACH STORY, SUBSEQUENT QUESTIONs, AND RESPONSE CODES. NAMES SHOULD BE ADOPTED TO LOCAL CONTEXT AND BE MALE/FEMALE DEPENDING ON THE SEX OF THE RESPONDENT.			Are you like this person? **CIRCLE ONE**	Are you completely the same or somewhat the same? **CIRCLE ONE**	Are you completely different or somewhat different? **CIRCLE ONE**
STORY			**G8.01**	**G8.02**	**G8.03**
Taking crops or	**B1**	*"There is no alternative to how much or how little of her crops or livestock [PERSON'S NAME] can take to the market. She is taking the only possible amount."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME....1 → **B2** SOMEWHAT THE SAME.....2 → **B2**	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2

livestock (incl. eggs or milk) to the market (or not)	**B2**	*"[PERSON'S NAME] takes crops and livestock to the market because her spouse, or another person or group in her community tell her she must sell them there. She does what they tell her to do."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME….1 → **B3** SOMEWHAT THE SAME…....2 → **B3**	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2

	B3	*"[PERSON'S NAME] takes the crops and livestock to the market that her family or community expect. She wants them to approve of her."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME….1 → ***B4*** SOMEWHAT THE SAME…....2 → ***B4***	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2
	B4	*"[PERSON'S NAME] chooses to take the crops and livestock to market that she personally wants to sell there, and thinks is best for herself and her family. She values this approach to sales. If she changed her mind, she could act differently."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME….1 → ***C1*** SOMEWHAT THE SAME…....2 → ***C1***	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2
How to use income generated from agricultural and non-agricultural activities	**C1**	*"There is no alternative to how [PERSON'S NAME] uses her income. How she uses her income is determined by necessity."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME….1 → C***2*** SOMEWHAT THE SAME…....2 → C***2***	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2
	C2	*"[PERSON'S NAME] uses her income how her spouse, or another person or group in her community tell her she must use it there. She does what they tell her to do."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME….1 → C***3*** SOMEWHAT THE SAME…....2 → C***3***	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2
	C3	*"[PERSON'S NAME] uses her income in the way that her family or community expect. She wants them to approve of her."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME….1 → C***4*** SOMEWHAT THE SAME…....2 → C***4***	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2
	C4	*"[PERSON'S NAME] chooses to use her income how she personally wants to, and thinks is best for herself and her family. She values using her income in this way. If she changed her mind, she could act differently."*	YES...1 NO.....2 → ***G8.03***	COMPLETELY THE SAME...1→***G8.04*** SOMEWHAT THE SAME….2 →***G8.04***	COMPLETELYDIFFERENT..... 1 SOMEWHATDIFFERENT..... 2

MODULE G8(B): NEW GENERAL SELF-EFFICACY SCALE

Now I'm going to ask you some questions about different feelings you might have. Please listen to each of the following statements. Think about how each statement relates to your life, and then tell me how much you agree or disagree with the statement on a scale of 1 to 5, where 1 means you "strongly disagree" and 5 means you "strongly agree." (**Note: Randomize order of statements**)

	STATEMENTS	G8.04
A	I will be able to achieve most of the goals that I have set for myself.	STRONGLYDISAGREE .....1 DISAGREE .....2 NEITHER AGREENORDISAGREE .....3 AGREE .....4 STRONGLYAGREE 5
B	When facing difficult tasks, I am certain that I will accomplish them.	STRONGLYDISAGREE .....1 DISAGREE .....2 NEITHER AGREENORDISAGREE .....3 AGREE .....4 STRONGLYAGREE 5
C	In general, I think that I can obtain outcomes that are important to me.	STRONGLYDISAGREE .....1 DISAGREE .....2 NEITHER AGREENORDISAGREE .....3 AGREE .....4 STRONGLYAGREE 5

D	I believe I can succeed at most any endeavor to which I set my mind	STRONGLYDISAGREE .....1 DISAGREE .....2 NEITHER AGREENORDISAGREE.....3 AGREE .....4 STRONGLYAGREE 5
E	I will be able to successfully overcome many challenges.	STRONGLYDISAGREE .....1 DISAGREE .....2 NEITHER AGREENORDISAGREE.....3 AGREE .....4 STRONGLYAGREE 5
F	I am confident that I can perform effectively on many different tasks.	STRONGLYDISAGREE .....1 DISAGREE .....2 NEITHER AGREE NORDISAGREE .....3 AGREE .....4 STRONGLYAGREE 5
G	Compared to other people, I can do most tasks very well.	STRONGLYDISAGREE .....1 DISAGREE .....2 NEITHER AGREENORDISAGREE.....3 AGREE .....4 STRONGLYAGREE 5
H	Even when things are tough, I can perform quite well.	STRONGLYDISAGREE .....1 DISAGREE .....2 NEITHER AGREENORDISAGREE.....3 AGREE .....4 STRONGLYAGREE 5

MODULE G8(C): LIFE SATISFACTION

The following questions ask how satisfied you feel with your life as a whole, on a scale from 1 to 5, where 1 means you feel "very dissatisfied" and 5 means you feel "very satisfied."

	STATEMENTS	**G8.05**
A	Overall, how satisfied are you with life as a whole these days?	VERYDISSATISFIED ..... 1 DISSATISFIED ..... 2 NEITHER SATISFIEDNORDISSATISFIED ..... 3 SATISFIED ..... 4 VERYSATISFIED 5
B	Overall, how satisfied with your life were you 5 years ago?	VERYDISSATISFIED ..... 1 DISSATISFIED ..... 2 NEITHER SATISFIEDNORDISSATISFIED ..... 3 SATISFIED ..... 4 VERYSATISFIED 5

C	As your best guess, overall how satisfied with your life do you expect to feel 5 years from today?	VERYDISSATISFIED ..... 1 DISSATISFIED ..... 2 NEITHER SATISFIEDNORDISSATISFIED ..... 3 SATISFIED ..... 4 VERYSATISFIED 5

HOUSEHOLD ID						
RESPONDENT ID						

MODULE G9. Attitudes about Domestic Violence

Now I would like to ask about your opinion on the following issues. Please keep in mind that I am not asking about your personal experience or whether the following scenarios have happened to you. I would only like to know whether you think the following issues are acceptable.		In your opinion, is a husband justified in hitting or beating his wife in the following situations?
SITUATION		**G9.01**
A	If she goes out without telling him?	YES ..... 1 NO ..... 2 DON'T KNOW 97
B	If she neglects the children?	YES ..... 1 NO ..... 2 DON'T KNOW 97
C	If she argues with him?	YES ..... 1 NO ..... 2 DON'T KNOW 97
D	If she refuses to have sex with him?	YES ..... 1 NO ..... 2 DON'T KNOW 97
E	If she burns the food?	YES ..... 1 NO ..... 2 DON'T KNOW 97
F	If some livestock is lost	YES ..... 1 NO ..... 2 DON'T KNOW 97
G	If she sells one livestock without consulting	YES ..... 1 NO ..... 2 DON'T KNOW 97

ADDITIONAL VACCINE WELI MODULE

(Based on Theory of Change and M&E's)

1. Access to Vaccines
2. Barriers to Vaccine Purchase (demand and regulatory)

Question: **[AUTO-POPULATE]**	**Answer Options:**	**Type:**
Have your [ANIMAL] been vaccinated for [DISEASE] in the past 12 months?	YES or NO	1
Who participates in vaccinating [ANIMAL] for [DISEASE]? Check all that apply:	• Family roster listed • Neighbor or family friend • Veterinarian • Government worker • Paid assistant • Other	1
Who participates in physically purchasing vaccine against [DISEASE] for [ANIMAL]? Check all that apply.	• Family roster listed • Neighbor or family friend • Veterinarian • Government worker • Paid assistant	1

	• Other	
Even if you [NAME] do not purchase vaccines do you have access to vaccine suppliers against [DISEASE] for [ANIMAL]?	YES or NO	1
Which mode of transport is most feasible if you [NAME] were to travel to a vaccine supplier for vaccine purchase? Check all that apply.	• Car • Bus • Motobike • Bicycle • Walk	1
Can you [NAME] afford the vaccine against [DISEASE] for [ANIMAL]?	YES or NO	1
Who pays for vaccine against [DISEASE] for [ANIMAL]?	• Family roster listed • Government • NGO	1
	•	
Do you [NAME] have access to cold chain/vaccine storage?	YES or NO	1
How many of your [ANIMALS] died from [DISEASE] last year?	FILL IN	1
What percentage of your [ANIMALS] that died were vaccinated?	FILL IN	1
What is the best time of year to purchase vaccines against [DISEASE] for [ANIMAL]?	• Rainy season • Dry season • I don’t know • Depends	2

How knowledgeable are you about [ANIMAL] health?	• Not at all (1) • Small extent (2) • Medium extent (3) • High extent (4)	2
Do you have access to training seminars about [ANIMAL] health?	YES or NO	2
If Yes, have you attended a training seminar about [ANIMAL] in the past 12 months?	YES or NO	2
Do you have access to information on vaccinating [ANIMAL] for [DISEASE]?	• Not at all (1) • Small extent (2) • Medium extent (3) • High extent (4)	2
Do you know where to purchase vaccines against [DISEASE] for [ANIMAL]?	YES or NO	2
Can farmers such as yourself vaccinate [ANIMAL] against [DISEASE]?	• Yes • No • I don't know	2
Are there regulations about who is allowed to vaccinate [ANIMAL] against [DISEASE]?	• Yes • No • I don't know	2
Does the government play a role in vaccinating [ANIMAL] against [DISEASE]?	• Yes • No • I don't know	2

The end