

Public-Private Partnership (PPP) for delivery of animal health service

PPP model development and planning

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Contents

Acknowledgements	III
I. Background to PPP	1
1.1 Proclamations and rationalization road map	1
1.2 The World Organization for Animal Health (OIE)	1
1.3 The HEARD project	1
II. PPP model development process	1
2.1 Gap analysis	1
2.2 Site selection and field visits/consultation	2
2.3 Regional PPP Taskforce formation	3
III. PPP models	3
Model I: Private vaccination service	4
Description of the model	4
Partners and roles/responsibilities	5
Model II: Sanitary mandate with woreda private sector partners for vaccination service	7
Description of the model	7
Partners and roles/responsibilities	7
Model III: Sanitary mandate with linked regional- <i>woreda-kebele</i> private sector partners for vaccination service	9
Description of the model	9
Partners and roles/responsibilities	9
Model IV: Mobile clinical service	11
Description of the model	11
Partners and roles/responsibilities	11
Model V: Clinical service by linked regional- <i>woreda-kebele</i> private clinics	13
Description of the model	13
Partners and roles//responsibilities	13
Model VI: Community-based women vaccinators for NCD control	15
Description of the model	15
Partners and roles//responsibilities	15
Model VII: Strategic community-based endo- and ecto-parasite control by private service providers	17
Description of the model	17
Partners and roles/responsibilities	18

Model VIII: Leasing <i>kebele</i> public health posts to jobless veterinary graduates.....	19
Description of the model.....	19
IV. Business case	19
Private service providers	19
Marketing	20
Business viability.....	21
V. Sustainability and success factors	26
Sustainability	26
Needs, benefits and impacts	27
Governance	27
VI. Planning	28
Households and Livestock populations in pilot sites.....	28
Resource and budget requirements.....	28
Work plan	29
Monitoring and evaluation.....	34
Annex I: Priority diseases and health services.....	0
Annex II: Willingness to pay for services	14

I. Background to PPP

1.1 Proclamations and rationalization road map

Two proclamations issued by the Government of Ethiopia lay the policy basis for introducing PPP in the delivery of animal health services. The “Public Private Partnership Proclamation No. 1076/2018” issued on the 22nd of February 2018 establishes a favorable legislative framework to promote and facilitate the implementation of privately financed infrastructure projects by enhancing transparency, fairness and long-term sustainability. The major objective of the proclamation is to create a favorable framework for promoting and facilitating the implementation of privately financed projects to support Ethiopian economic growth. The “Animal Diseases Prevention and Control Proclamation No. 267/2002” issued on 31st January 2002 directly relates to PPP in animal health service delivery. The proclamation article 17.3 and 17.4 state ‘the MoA shall create favorable conditions for the promotion of private animal health service delivery’ and ‘the Ministry shall, based upon the nature of the services, define the role and responsibilities of the public and the private sector in the delivery of animal health services’.

Following Proclamation No. 267/2002, the Ministry of Agriculture produced Veterinary Services Rationalization Road Map in 2014. The road map outlines a proposal for increased participation of the private sector in veterinary service delivery. The road map is yet to be ratified by the Government of Ethiopia.

1.2 The World Organization for Animal Health (OIE)

The World Organization for Animal Health (OIE) is the international apex body providing the scientific and technical concepts for PPP in the veterinary domain. The HEARD project followed the OIE ‘Guidelines for Public-Private Partnerships in the veterinary domain’ for designing alternative PPP models. The guideline outlines:

- the strategic rationale for PPP: the potential benefits and positive impacts of PPP in delivering services in the veterinary domain and the political and organizational commitments essential to delivering them,
- Alternative approaches: different PPP approaches and the principles and key success factors for ensuring successful application of PPP to deliver sustainable services in the veterinary domain, and
- Implementation guide: how to make successful PPP happen in practice.

1.3 The HEARD project

The alternative PPP models designed and presented in this document are part of the HEARD project Result 2: Technical competences (knowledge, skills and attitude) and incentives for veterinary service providers improved to deliver better and rationalized services), Activity 2.1 Pilot the veterinary service rationalization roadmap and sub-activity 2.1.3 Pilot novel models for veterinary service delivery involving public and private sector.

II. PPP model development process

2.1 Gap analysis

Gaps from service provider’s perspective: To assess the gaps in animal health services from service providers perspective, two stakeholder workshops were organized. Twenty-five and

41 participants attended the first and second workshops, respectively. The participants represented the public and private veterinary service providers, educators, non-governmental organizations, international organizations, and donors. By institution, EU, OIE (World Organization for Animal Health), MoA, regional bureaus of agriculture from and HEARD project component 1 coordinators from the three regions (Amhara, Oromia and Somali regions), ATA, FAO, NVI, Gondar University, Haramaya University, Jigjig University, Brook Ethiopia, private clinics and drug stores and a global service provider Zoetis were represented.

The workshops aimed to discuss and prioritize gaps in veterinary service delivery in Ethiopia and identify possible public-private partnership models to address these. The specific objectives were to understand public-private partnership (PPP) and PPP typologies, map gaps to possible PPP typologies and agree on way forward in defining and setting up PPPs.

The workshop was organized in three sessions. In the first part of the workshop, a series of presentations were made to introduce the workshop's aims and objectives and the tasks in the three sessions of the workshop, the gaps identified in veterinary service delivery in the first stakeholder workshop held in April, 2019, the principles and operations of the PPP typologies, PPP experiences from Ethiopia, Kenya and globally presented from OIE. The gaps identified included limitations in policy and strategy (policy makers attention, legal and regulatory frameworks, vaccination strategy, extension service on animal diseases and veterinary service, and disease reporting system) and poor access to services and inputs (drugs in quantity, quality, variety and affordability).

For the second session of the workshop, participants were divided into four groups, each group consisting of the different stakeholder categories (public, private and NGOs). Following OIE guidelines, the groups exercised mapping of the gaps to possible PPP typologies based on the presentations in session 1. An OIE handbook on PPP models reprinted with the permission of OIE and with the support of the ILRI were distributed to each of the participants to facilitate the exercise and for future reference in implementing PPP models. The third session was devoted to discussing the gap-PPP typology mapping outcomes from group works and finally on the way forward with the HEARD project PPP activity.

Gaps from livestock keepers' perspectives and WTP for services: The base situation in animal health service delivery and disease problems were assessed to target priority diseases and services in the PPP models. The assessments were conducted in four *woredas* in each of Amhara and Oromia regions using household surveys and in two *woredas* in Somali region using FGDs. The assessment in Somali also included pastoralists willingness to pay (WTP) for health services. The results are documented in two reports. A summary of the priority diseases, status of health services and pastoralists' WTP for services are presented in Annex I and II.

2.2 Site selection and field visits/consultation

Two *woredas* from each of Somali (Hargelle and Deghabour *woredas*), Oromia (Negelle Arsi and Dire Inchini) and Amhara (Bati and Banja) were selected for piloting alternative PPP models. See the *woreda* sin subsequent section of this document. Field visits were made to the *woredas* and *kebeles* to provide feedbacks on disease priorities identified by the baseline surveys and FGDs (Section II.1) in their *woredas* and assess the opportunities and constraints for introducing/piloting PPP models for improved delivery of health services. The consultations were held with the heads of *woreda* livestock offices and veterinary departments, private service providers and livestock keepers.

2.3 Regional PPP Taskforce formation

Regional PPP taskforces consisting of 12-13 members, led by a chairman from the public sector and a secretary from the private sector, were officially formed in Somali, Oromia and Amhara regions. The task force membership consisted of the private service providers (clinics, drug shops, veterinary input suppliers), livestock producers, public health service providers (veterinarians from regional and *woreda* offices including regional health service directors), laboratories and Universities. ToRs were developed for the taskforce. The taskforce formation is documented in a report (link). The tasks include:

- The task force will serve as a platform for communication between the public and private sector
- Identify the challenges faced by the private sector and present for policy makers
- The task force will oversee the activity of HEARD project in relation to piloting of public-private partnership models
- Suggest ideas on PPP models for policy formulation and regulation.
- Identify the needs for capacity building
- Identification existing PPP models and evaluate their efficiency and effectiveness
- Monitoring and evaluation of the PPP activities

III. PPP models

According to their stipulated tasks in the ToR, namely developing PPP models feasible for the regions, the taskforces identified eight models (Table 1). Service providers from the public and private sectors from the selected pilot *woredas* also participated in these sessions. The identified models were described, and detailed plans were laid following OIE guidelines. The taskforces also described the benefits/impacts, opportunities and barriers, resource requirements, service fees, and work plans.

The public-private partnership arrangements discussed during the regional PPP taskforce's workshops in the three HEARD project regions were categorized and described into eight PPP models (Table 1). The criteria used to classify the arrangements were the service type or objective of the PPP arrangement, the types, numbers and interactions among the private sector partners, the public sector partners involved, and the interaction between the public and private sector partners (e.g. funding, ...).

Table 1. PPP models identified by regional PPP taskforces

PPP models	Region	<i>Woreda</i>	<i>kebele</i>	Services/objectives
Model I: Private vaccination service	Amhara	Banja	Akena rural <i>kebele</i> ; Koso Ber town & environs	Rabies, Anthrax, Black leg vaccination
	Amhara	Bati	Cacatu	O. & B. Pasteurellosis
	Oromia	Dire Inchini	Waldo	O. & B. Pasteurellosis
		Negelle Arsi	Gambelto	O. & B. Pasteurellosis

Model II: Sanitary mandate with <i>woreda</i> private sector partners for vaccination service	Somali	Deghabour	Bulale	Camel pox, O. Pasteurellosis
Model III: Sanitary mandate with regional- <i>woreda-kebele</i> private sector partners for vaccination service	Somali	Hargelle	Oman	Camel pox, Pasteurellosis, Sheep and goat pox, CCPP
Model IV: Mobile clinical service	Oromia	Dire Inchini	Waldo hindho,	Clinical service,
		Negelle Arsi	Gambelto	Clinical service
Model V: Clinical service by regional- <i>woreda-kebele</i> private clinics	Somali	Hargelle	Oman	Clinical service
Model VI: Community-based women vaccinator for NCD control	Amhara	Banja	Akena <i>kebele</i> , Banja town & environs	NCD vaccination
Model VII: Strategic community-based endo- and ecto-parasite control by private service providers	Somali	Deghabour	Bulale	Ectoparasite control
	Oromia	Dire Inchini	Waldo hindho,	strategic deworming & spraying
Model VIII: Leasing <i>kebele</i> public health posts to jobless veterinary graduates	Amhara			Clinical service

Model I: Private vaccination service

Description of the model

Vaccination in Ethiopia is exclusively provided by the public sector. This model involves a collaborative partnership between the public and the private sector. The public sector designates the private sector to provide vaccination service for specific diseases and in specific geographic locations (*kebeles*). The public sector does not fund the service but would set enabling environment for the private sector including authorizing/certifying the service, facilitating access to facilities and input delivery as appropriate, and monitoring and evaluating the services. The private sector provides the service to livestock producers at

cost. The model will be piloted in Oromia and Amhara regions in three *woredas* and *kebeles* shown in Table 1. The roles of the public and private partners may vary across the pilot sites.

The various partners involved in the PPP model (Table 2) will facilitate and coordinate the supply chain for inputs and services, community mobilization and coordination of the vaccination program and creation of enabling environment and regulation/quality control of the services provided. The roles and responsibilities of the partners are shown in Table 2.

Catalyzing the PPP model: PPP for the delivery of services in the veterinary domain does not exist in Ethiopia. Thus, certain costs need to be covered during the initial phase by an external source till the PPP arrangement takes root. However, arrangements need to be made to recover costs within short duration of the pilot project to lay the ground for a sustainable PPP model. To catalyze the PPP arrangement, and till farmers adopt strategic preventive measures, Voucher system will be introduced for the first six months to share the cost of vaccination service between HEARD project and the farmer as well as to strengthen private clinical services by creating favorable business environment. The cost shares are shown in Table 14. The lab costs for pre- and post-vaccination serological tests will also be covered by the HEARD project.

Partners and roles/responsibilities

Table 2. Partners/stakeholders and roles for private vaccination service in Amhara (Banja and Bati *woredas*) and Oromia (Dire Inchini and Negelle Arsi *woredas*) regions, Ethiopia

Partners/stakeholders	Roles/responsibilities
HEARD project	Provide voucher to share the cost of vaccination with farmers for the 1 st 6 months
	Awareness creation and training for farmers on the role of vaccination in disease prevention and control
	Supporting diagnostic capacity of the regional laboratory
	Supporting private actors' capacity to implement the model effectively
	Settling payment for the private sector based on vouchers provided
Oromia and Amhara PPP taskforces	set enabling environment and regulations for the private vaccination service.
	M & E of implementation of PPP model
Oromia and Amhara regional Livestock office	set enabling environment and regulations for the private vaccination service
	Certification/temporary waiver for the participation of private actors in the woreda vaccination program for specified locations and diseases
	M & E of implementation of PPP model
Woreda livestock offices	Enforce implementation of regulation

	Procure & Provide vaccines (Banja only) & vacc calendar for the private clinics
	Provide Cold chain facilities for vaccine storage
	Support mobilization for vaccination campaign
	Monitor the vaccination campaign
Kebele administrations, health posts and livestock offices	Consult with the community on the vaccination calendar
	Collect vaccination costs from farmers in advance & mobilize vaccination campaign
	Work with HEARD project on awareness creation activity
	Support M & E activity in collaboration with concerned partners
Regional laboratories	Asella Lab - seroprevalence & seroconversion tests in Dire Inchini & Negelle Arsi
	Kombolcha Lab - Seroprevalence & seroconversion tests in Bati woreda
	Bahir Dar Lab - Seroprevalence & seroconversion tests in Banja woreda
	Involve in M & E of model implementation
Farmers	Actively participate in the training program
	Actively participate in vaccination campaign to insure proper unitization of vouchers
	Share the cost of vaccination with ILRI/EVA and pay their share to the private sector after vaccination
Private drug shops/clinics	Procure vaccines for PD (Bati and Dire Inchini woredas)
	Procure Rabies vaccines
	Provide vaccination service on the day of campaign to the farmers
	Provide extension service for the farmers
	Provide information of the vaccination campaign to the <i>woreda</i> animal health department
	Collect vaccination cost shared by the farmers.
	Collect vouchers properly for vaccination service provided to the farmers

	Provide voucher to ILRI/EVA receipt, and attachment for purchased vaccine from NVI on purchase date and any other necessary information before payment
	Report any observed animal disease outbreak to the <i>woreda</i> office
NVI	Produce and supply vaccine at cost

Model II: Sanitary mandate with *woreda* private sector partners for vaccination service

Description of the model

The typology of this model assumes transactional modality. The public sector contracts the private sector at *woreda* and kebele level to provide vaccination service for specific diseases and in specific geographic locations (*kebeles*). Vaccines will be provided by the public sector up to *woreda* level to private clinics, who would link with kebele animal health posts and/or kebele human health clinics for cold chain facilities and with CAHWs at kebele level to provide the vaccination services. The model will be piloted in Somali region.

There is a persistent trend to deliver free vaccination services in the region. However, this arrangement may not be sustainable, especially for List B (production) diseases for which vaccines are provided at higher costs. In the current proposed PPP arrangement, vaccination will be provided to pastoralists at cost for both categories of vaccines, though vaccines for “List A diseases”/transboundary diseases are provided for free as a policy. This PPP approach requires a strong cooperation of concerned actors to create public awareness towards cost-recovery of vaccination services. The pastoralists expressed willingness to pay for vaccination services (See Annex 1).

The public sector creates enabling environment for the private sector including authorizing/certifying the private partners vaccination service, facilitating access to facilities and input delivery as appropriate, and monitoring and evaluating the services (Table 7).

Catalyzing the PPP model: As a policy, vaccination for certain national priority diseases is provided free of charge in Ethiopia, such as in diseases eradication programs. The cost of the vaccination program in such cases is covered by the government. For the pilot phase of the HEARD project, the pastoralists are encouraged to contribute 20-30% of the costs. Their contribution is expected to grow in subsequent vaccination seasons. The HEARD project’s share of the cost of List A diseases will be taken over by the public sector at the end of the project. The lab costs for pre- and post-vaccination serological tests will also be covered by the HEARD project.

Partners and roles/responsibilities

Table 7. Partners/stakeholders and roles for private vaccination service in Deghabour *woreda* of Somali region of Ethiopia

Partners/stakeholders	Roles/responsibilities
HEARD project	Provide voucher to share the cost of vaccination with pastoralists for the 1 st 6 months

	Awareness creation and training for pastoralists on the role of vaccination in disease prevention and control
	Supporting diagnostic capacity of the regional laboratory
	Supporting private actors' capacity to implement the model effectively
	Settling payment for the private sector based on vouchers provided
Somali region PPP taskforce	set enabling environment and regulations for the private vaccination service.
	M & E of implementation of PPP model
Oromia and Amhara regional Livestock office	set enabling environment and regulations for the private vaccination service
	Certification/temporary waiver for the participation of private actors in the woreda vaccination program for specified locations and diseases
	M & E of implementation of PPP model
Woreda livestock offices	Enforce implementation of regulation
	Procure & Provide vaccines & vacc calendar for the private clinics
	Provide Cold chain facilities for vaccine storage
	Support mobilization for vaccination campaign
	Monitor the vaccination campaign
Kebele administrations, health posts and livestock offices	Consult with the community on the vaccination calendar
	Collect vaccination costs from pastoralists in advance & mobilize vaccination campaign
	Work with HEARD project on awareness creation activity
	Support M & E activity in collaboration with concerned partners
Jigjiga Regional laboratory	Blood sampling and seroprevalence & seroconversion tests
	Involve in M & E of model implementation
Pastoralists	Actively participate in the training program
	Actively participate in vaccination campaign to insure proper unitization of vouchers
	Share the cost of vaccination with ILRI/EVA and pay their share to the private sector after vaccination

Private drug shops/clinics	Link with CAHWs to provide vaccination service on the day of campaign
	Provide extension service for the pastoralists
	Provide information of the vaccination campaign to the <i>woreda</i> animal health department
	Collect vaccination cost shared by the pastoralists.
	Collect vouchers properly for vaccination service provided to the pastoralists
	Provide voucher to ILRI/EVA receipt, and attachment for purchased vaccine from NVI on purchase date and any other necessary information before payment
	Report any observed animal disease outbreak to the <i>woreda</i> office
NVI	Produce and supply vaccine at cost

Model III: Sanitary mandate with linked regional-*woreda-kebele* private sector partners for vaccination service

Description of the model

The typology of this model assumes a transactional modality. The public sector commissions big private sector partners with high level of capacity at regional level to provide vaccination services for specified diseases and in specified geographic locations (*kebeles*) in Somali region. The regional private actor contracts its private partners at *woreda* level who in turn contract partners at *kebele* level (CAHW) to provide the vaccination service.

The PPP arrangement is that vaccines will be procured by the public sector from the NVI and provided at NVI cost to the regional private partner, who will transport the vaccines to the *woreda* private partner, who will in turn to CAHWs.

A business arrangement is agreed among the private partners at the various administrative level. Although vaccination is normally provided free of charge in Somali region, pastoralists are encouraged to pay for the service in the current PPP arrangement. The HEARD project will play a catalyzing role as described under Model II.

Partners and roles/responsibilities

Table 8. Partners/stakeholders and roles for private vaccination service in Hargelle *woreda* of Somali region of Ethiopia

Partners/stakeholders	Roles/responsibilities
HEARD project	Provide voucher to share the cost of vaccination with pastoralists for the 1 st 6 months
	Awareness creation and training for pastoralists on the role of vaccination in disease prevention and control
	Supporting diagnostic capacity of the regional laboratory

	Supporting private actors' capacity to implement the model effectively
	Settling payment for the private sector based on vouchers provided
Somali region PPP taskforce	set enabling environment and regulations for the private vaccination service.
	M & E of implementation of PPP model
Somali regional Livestock office	set enabling environment and regulations for the private vaccination service
	Certification/temporary waiver for the participation of private actors in the woreda vaccination program for specified locations and diseases
	M & E of implementation of PPP model
Woreda livestock offices	Enforce implementation of regulation
	Procure & Provide vaccines & vacc calendar for the private clinics
	Provide Cold chain facilities for vaccine storage
	Support mobilization for vaccination campaign
	Monitor the vaccination campaign
Kebele administrations, health posts and livestock offices	Consult with the community on the vaccination calendar
	Collect vaccination costs from pastoralists in advance & mobilize vaccination campaign
	Work with HEARD project on awareness creation activity
	Support M & E activity in collaboration with concerned partners
Jigjiga Regional laboratory	Blood sampling and seroprevalence & seroconversion tests
	Involve in M & E of model implementation
Pastoralists	Actively participate in the training program
	Actively participate in vaccination campaign to insure proper unitization of vouchers
	Share the cost of vaccination with ILRI/EVA and pay their share to the private sector after vaccination
Kulmiye vet service cooperative	Coordinate the vaccination activity and business arrangement from the private sector side
	Deliver vaccines and drugs to Hargelle woreda

Private drug shops/clinics at Woreda level	Link with CAHWs to provide vaccination service on the day of campaign
	Provide extension service for the pastoralists
	Provide information of the vaccination campaign to the <i>woreda</i> animal health department
	Collect vaccination cost shared by the pastoralists.
	Collect vouchers properly for vaccination service provided to the pastoralists
	Provide voucher to ILRI/EVA receipt, and attachment for purchased vaccine from NVI on purchase date and any other necessary information before payment
	Report any observed animal disease outbreak to the <i>woreda</i> office
NVI	Produce and supply vaccine at cost

Model IV: Mobile clinical service

Description of the model

The proposed mobile clinic service PPP model can be categorized as a transformative modality following OIE PPP classification. This involves partnership between the public sector providing enabling environment and regulatory service, the private sector providing mobile clinical service to villages on request and the livestock producers paying for the full cost of the service. The model is planned to be piloted in Oromia region, Dire Inchini woreda.

- The regional and woreda livestock offices and regional PPP taskforce will set an enabling environment. This includes facilitating and supporting the private service provider to obtain license for mobile clinical service and drug sales since the service providers in the pilot woredas are all licensed as drug shops. The other option would be to get a waiver from the woreda office for the drug shop to practice mobile clinical services.
- The woreda animal health unit will enforce implementation of regulation and quality control of services

Catalyzing the PPP model: The private service provider will be strengthened (See Planning section, resource requirements).

Partners and roles/responsibilities

Table 9. Partners/stakeholders and roles for private mobile clinic service in Dire Inchini woreda of Oromia region of Ethiopia

Partners	Specific NAMES	Role
ILRI/EVA		Supporting the private sector with equipment
		Awareness creation on disease prevention and control strategies (farmer training)

		Refresher training for the private sector
		Provide voucher for strategic deworming campaign for the 1 st intervention year
		Settling payment for the private sector based provided vouchers
PPP Task force and regional livestock health office		Work in setting supportive regulation required for the PPP
		Certification of the private sector involved in mobile clinical service delivery with renewable certificate allowing to work within specified area
Woreda animal health department	Dr. Hachalu Tasamma	Enforce implementation of regulation
		Provide spray and deworming calendar for the private sector
		Support mobilization for deworming and spray campaign
		Monitor the service provided by the private sector
Kebele administration	Waldo hindho kabale administrations and DA	Work on controlling illegal mobile clinical service providers
		Discuss with the community to decide on-deworming and spray campaign date.
		Work with ILRI/EVA on awareness creation activity
		Support monitoring and evaluation process by collaboration with ILRI/EVA
		Mobilize community for community-based deworming and ecto-parasite spray campaign
Farmers		Pay for the clinical service they are provided by the private sector
		Actively participate in the training program and deworming campaign
Private sector (specify name of business)	Teferi kebede drug shop and mobile clinical service	Procure drugs
		Provide quality, timely and ethical mobile clinical service for the farmers
		Provide extension service for the farmers
		Charge farmers for the service he provides, except for strategic deworming program
		Collect vouchers properly for deworming service he provides to the farmers

		Provide voucher to ILRI/EVA, receipt for anthelmintic purchase; any other necessary information before payment
Regional laboratory	Assela	Pre and post treatment EPG assessment

Model V: Clinical service by linked regional-*woreda-kebele* private clinics

Description of the model

The typology of this model assumes a transformative modality. The public sector role is to create enabling environment for the private sector to provide all clinical services in designated kebeles in Somali region. The regional cooperative clinics (Kulmiye) will supply clinical supplies (mainly drugs) to woreda clinics who are linked to kebele CAHWs who will deliver the clinical services to pastoralists.

The public sector also creates enabling environment for the private sector including authorizing/certifying the service, facilitating access to facilities (e.g. health post facilities in kebeles), and monitoring and evaluating the services.

Partners and roles//responsibilities

Table 10. Partners/stakeholders and roles for private clinical service in Somali region of Ethiopia

Partners	Specific NAMES	Roles and responsibilities
ILRI/EVA		Covering cost of vaccination for the pastoralists
		In collaboration with regional governed, awareness creation on the role of vaccination in disease prevention and control (pastoralists); Technical capacity building for vaccine delivering personnel;
		Supporting diagnostic capacity of the regional laboratories
		Vaccination equipment and protective tools
PPP Task force		Work in setting supportive regulation required for the PPP
		Oversee the PPP activities in line with the ToR of the taskforce
		Recognition of the regional taskforce; recognition for the private sector involved in clinical services and

Regional livestock Resources office (Bureau)		vaccination program with renewable certificate for specified disease within specified area
		In collaboration with regional Lab, monitor and follow-up vaccination effectiveness
		In collaboration with EVA/ILRI, awareness creation for pastorals about the importance of vaccination, the need for gradually engage the community in cost recovery of vaccination services; and capacity building for veterinary personnel;
		Supply List A vaccines for the project woredas
Woreda livestock and pastoral office		Enforce implementation of regulation
		Provide vaccination calendar for the private sector; Also closely monitor Woreda vet drug shops and CAHWs to ensure proper storage and handling of vaccines
		Support mobilization for vaccination campaign
		Monitor the vaccination campaign
		Supply list B vaccines for private sectors, while list A vaccines are to be supplied by regional livestock bureau
Kebele administration and health sector staff		Mobilize vaccination campaign
		Discuss with the community to decide on vaccination date
		Work with ILRI/EVA on awareness creation activity
		Support monitoring and evaluation process in collaboration with ILRI/EVA and regional laboratories
Regional laboratories		Conduct sero-prevalence (pretest) and seroconversion test for the specified diseases
Pastoralists		Actively participate in the training (awareness creation) program; mobilize their animals for clinical services;
		Actively participate in vaccination campaign to insure proper unitization of vouchers
	Kulmiye vet-agri-cooperative (Dr. Ismail Mahmed-	Cooperate with regional and Woreda livestock office to facilitate vaccine supply;
		Provide vaccination service on the day of campaign to the pastoralists
		Provide monthly report and other necessary information about the vaccination campaign to the woredas livestock office

Private sector (specify name of business)	General Manager)	Provide voucher to ILRI/EVA, receipt and attachment for purchased vaccine from NVI on purchase date and any other necessary information before payment issuance.
		Supply various drugs for Woreda private clinics (the two pharmacies above)
	Iftin Vet Pharmacy (Ismail Ali Ahmed) and Roti Vet Drug shop (Ahmed Abdi Rage)	<ul style="list-style-type: none"> ➤ Receive vaccines and drugs from Kulmiye clinic and supply to CAHWs to serve the community; ➤ Store vaccines in appropriate cold chain (collaboration with Woreda Public or Private medical clinics/Hospitals)
NVI		Produce and make available vaccines, based on regional demand

Model VI: Community-based women vaccinators for NCD control

Description of the model

The typology of this model assumes a contractual partnership between the private and public sectors. The public sector recruits and trains women residing within the communities (where the service is planned to be delivered) to provide community-based vaccination service for the control of NCD at predetermined fees. The women are also provided with vaccination kits. The model will be piloted in Amhara region, Banja woreda, Akele rural kebele and the woreda capital Koso ber. Planning and implementation of this activity is coordinated with a similar activities by the regional HEARD component. Coordination with other similar projects by the MoA and Kayeema project is underway.

The public sector also creates enabling environment for the private sector including authorizing/certifying the service, facilitating access to facilities (e.g. health post facilities in kebeles), procuring and delivering vaccines, and monitoring and evaluating the services.

- The regional livestock office procures and delivers vaccines to women vaccinators through woreda and kebele livestock offices
- Cold chains are provided by the woreda livestock offices
- Revolving fund and vaccination gear to be provided by the HEARD project (Vaccination needles (12 and 16 G), Ice box, Needle holder, Forceps, Gawn)

Partners and roles//responsibilities

Table 11. Partners/stakeholders and roles for NCD vaccination by women vaccinators in Amhara region of Ethiopia

Partners/stakeholders	Roles/responsibilities
HEARD project	Provide voucher to share the cost of vaccination with farmers for the 1 st 6 months

	Awareness creation and training for farmers on the role of vaccination in disease prevention and control
	Recruit women vaccinators (Amhara HEARD)
	Train and provide necessary equipment for women vaccinators
	Supporting diagnostic capacity of the regional laboratory
	Supporting private actors' capacity to implement the model effectively
	Settling payment for the private sector based on vouchers provided
Amhara PPP taskforces	set enabling environment and regulations for the private vaccination service. M & E of implementation of PPP model
Amhara regional	Coordinate NCD vaccination by different stakeholders in the region
Livestock office	set enabling environment and regulations for the private vaccination service Certification for the participation of private actors in the woreda vaccination program for specified locations and diseases M & E of implementation of PPP model
Woreda livestock offices	Enforce implementation of regulation Procure & Provide vaccines & vacc calendar for the private vaccinators Support mobilization for vaccination campaign Monitor the vaccination campaign
Kebele administrations, health posts and livestock offices	Consult with the community on the vaccination calendar Collect vaccination costs from farmers in advance & mobilize vaccination campaign Work with HEARD project on awareness creation activity Support M & E activity in collaboration with concerned partners
Bahir Dar University	Train women vaccinators
Regional laboratories	Bahir Dar Lab - Seroprevalence & seroconversion tests in Banja woreda Involve in M & E of model implementation
Farmers	Actively participate in the training program

	Actively participate in vaccination campaign to insure proper unitization of vouchers
	Share the cost of vaccination with ILRI/EVA and pay their share to the private sector after vaccination
Women vaccinators	Collect vaccines from regional or woreda Livestock office
	Provide vaccination service on the day of campaign to the farmers
	Provide extension service for the farmers
	Provide information of the vaccination campaign to the <i>woreda</i> animal health department
	Collect vaccination cost shared by the farmers.
	Collect vouchers properly for vaccination service provided to the farmers
	Provide voucher to ILRI/EVA receipt, and attachment for purchased vaccine from NVI on purchase date and any other necessary information before payment
	Report any observed animal disease outbreak to the <i>woreda</i> office
NVI	Produce and supply vaccine at cost

Model VII: Strategic community-based endo- and ecto-parasite control by private service providers

Description of the model

The model involves partnership between the public livestock offices of Dire inchini Woreda in Oromia region and Deghabour woreda of Somali region with clinics/drug shops in the woreda towns to provide strategic community-based deworming and spraying against external parasites. The public sector facilitates enabling environment and regulatory service.

- The regional and woreda livestock offices and regional PPP taskforce will set an enabling environment. This includes facilitating and supporting the private service provider to obtain license for mobile clinical service (especially at Dire Inchini). The other option would be to get a waiver from the woreda office for the drug shop to practice mobile clinical services.
- The woreda animal health unit will enforce implementation of regulation (quality control of services) including providing calendar for strategic deworming and spraying program.
- The kebele animal health posts mobilize farmers for deworming campaigns and collect deworming fees from farmers in advance.

- Regional laboratories will assess the effect of strategic deworming program on animal health and production. In addition, they will consult the kebele on strategic deworming calendar.

Catalyzing the PPP model: PPP for the delivery of services in the veterinary domain does not exist in Ethiopia. Thus, certain costs need to be covered during the initial phase by an external source till the PPP arrangement takes root. However, arrangements need to be made to recover costs within short duration of the pilot project to lay the ground for a sustainable PPP model. To catalyze the PPP arrangement and till farmers adopt strategic preventive measures such as deworming which is to be introduced for the first time into the pilot sites, 50% of service fees will be by the HEARD project for the first six months via voucher system. The contribution of HEARD will decline progressively while the farmers' share will increase by 50% in subsequent seasons (i.e. HEARD farmer contributions will be 25%:75% in 2nd deworming/spraying season). The lab costs for testing the effects of the interventions will also be covered by the HEARD project.

Partners and roles/responsibilities

Table 12. Partners/stakeholders and roles for strategic GIT and external parasite control in Oromia and Somali regions of Ethiopia

Partners	Roles and responsibilities
HEARD	Sharing cost of acaricide and dewormer through voucher system
	Awareness creation on the role of ectoparasite control in animal production and health (farmer training)
	Strengthen capacity of private service providers
PPP Task forces	Work in setting supportive regulation required for the PPP
	Over sees entire PPP work within the region
Regional livestock office (Bureau)	Recognition of the private sector involved in the program with renewable certificate
	Enforce implementation of regulation
Deghaboure and Dire Inchini woreda animal health department	Provide deworming and spraying calendars to private service providers in consultation with the regional offices and farmers/pastoralists
	Support community mobilization and Monitor the deworming/spraying campaign
Kebele administration and health sector staff	Mobilization of the campaign
	Discuss with the community to decide on the campaign date
	Work with ILRI/EVA on awareness creation activity
	Support monitoring and evaluation process by collaboration with ILRI/EVA

Pastoralist and farmers	Actively participate in the training program
	Actively participate in the campaign to insure proper unitization of vouchers
Private sector	Procure supplies
	Provide deworming and acaricide spraying service on the day of campaign to the pastoralist
	Provide report and other necessary information and of the campaign to the woredas animal health department
	Provide voucher to ILRI/EVA any other necessary information before payment

Model VIII: Leasing *kebele* public health posts to jobless veterinary graduates

Description of the model

The model involves leasing the public kebele health posts to jobless young veterinary, preferably residing in the kebele, graduates to provide animal health services. The services may include clinical services, and vaccination and health extension services in collaboration with the woreda public clinics. The model is proposed by Amhara PPP taskforce.

This modality entails major changes and needs approval by the regional government council. The region's PPP taskforce is tasked with the following tasks:

- Inventory of jobless graduates in collaboration with the EVA
- Alternative approaches for the transfer of health posts to private practitioners
- Advocating and lobbying the PPP model concept to government stakeholders

IV. Business case

Private service providers

The PPP models are designed based on the principles of profit-making businesses. However, the models involve a strong partnership between the private and the public sector which includes certification of the private partners' service, support with facilities the private sector lacks, and monitoring and evaluation of the private partners services by the public sector in collaboration with the PPP taskforces. Most of the private service providers are licensed as drug shops and cannot provide clinical services legally, including mobile clinical services. The regional livestock offices offered a waiver for such service providers.

The private service providers were selected by the regional livestock offices HEARD project component based on their capacities to provide the services contracted by the public sector. In some cases, like in Akana Kebele of Amhara region, the only available private service provider was included. Descriptions of the private partners are shown in Table 13.

Table 13. description of private service providers

Region	Woreda	Kebele	Business name	PPP model	PPP Services
Somali	Deghabour	Bulaleh	Al Nasri Vet Pharmacy	Model II	Vaccination
			CAHW	Model VII	Strategic deworming/spraying
				Model V	Clinical service
	Hargelle	Oman	Kulmiye Vet-Agri service coop.	Model III	Vaccination
			Iftin Vet Pharmacy	Model V	Clinical service
			CAHW		
Oromia	Dire Inchini	Waldo Hindu	Teferi Vet Drug shop	Model I	Vaccination
				Model IV	Mobile clinical service
				Model VII	Strategic deworming/spraying
		TBD	Sabena Vet Clinic *	Model I	Vaccination
				Model IV	Mobile clinical service
				Model VII	Strategic deworming/spraying
	Negelle Arsi	Gambelto	Negesso vet Clinic *	Model I	Vaccination
				Model IV	Mobile clinical service
	Amhara	Banja	Akana	Desalew Vet Clinic	Model I
Model V					Kebele-based Clinical service
Two Women vaccinators				Model VI	Vaccination
Bati		Cacatu	Gerbaba Vet drug shop	Model I	Vaccination
Bahir Dar zuria		Town & 5 Kebeles	Netsanet Vet Clinic **	Model I	Rabies vaccination

* Clinics yet to be established (Sabena clinic belongs to the PPP Award winner)

** This pioneer private vaccinator whose practice was identified as one of the PPP models was recommended by the taskforce meeting group to be included

Marketing

The procurement of inputs for the services is described under section IV ('PPP Models'). The HEARD project will contribute to the strengthening of the private service providers with the necessary equipment/instruments to provide effective services (this is essential as most of the service providers are drug shops and lack the equipment for clinical services).

The costs of services incurred by the livestock keepers were calculated by the taskforces in the presence of the service providers, experts and directors from the woreda and regional livestock offices. The costs are calculated based on the costs of inputs plus service charge by the service provider (Table 14). Pastoralists/farmers are encouraged to contribute to 20-30% of the costs in the first vaccination season, which will increase in subsequent seasons.

Business viability

The market volume for the private service providers is estimated as the number of livestock in the pilot kebeles (Table 15). It is expected that the service providers will have sufficient markets to survive as a viable enterprise. The percent of the livestock population assumed to be covered in vaccination, clinical services, and strategic deworming/spraying were 90%, 20%, and 50%. The market volume could increase in the next season and service providers are encouraged to expand their businesses to neighboring kebeles in consultation with the livestock offices.

The profitability of the businesses is confirmed by the cost-benefit analysis for the service providers (Table 15) which shows medium to high net revenue, except for Model IV. The businesses are profitable even when they bear the cost of vaccine transport from NVI is included (Table 15) although during the project period vaccines are procured by the livestock offices. In the case of Models involving more than one service provider, the partners need to establish business relations and agreements which includes profit sharing of their joint business. The taskforce suggested 70:30% profit shares between woreda clinics and CAHWs in the case of Model II.

Table 14. Input costs to service providers and service costs to livestock keepers and shares¹ of HEARD project and livestock keepers

Inputs and costs			Sale price/animal (input cost + service charge, or gross sale price)							Cost share (%)	
Inputs	Species	Cost/head	Dire Inchini	Negelle	Bati	Banja	Deghab	Hargelle	Bahirdar	HEARD	Farmer/pastoralist
Pasteurellosis vaccine	Sheep/goat	0.5	1.5		1.55		3.5	4.5		70 ³	30
Pasteurellosis vaccine	cattle	1.5	3.00		3.00					70 ³	30
Sheep/goat pox	Sheep/goat	1.5								70 ³	30
Camel pox	Camel	0.5					5.5	7.5		70 ³	30
CCPP	Sheep/goat	0.5								70 ³	30
Blackleg vaccine	cattle	1.6		3.10		3.1				70 ³	30
Anthrax vaccine	cattle	0.6	2.10	2.10		2.1				70 ³	30
Rabies vaccine	dogs	20.00	25.00			50			100	60 ⁴	40
NCD vaccine	chicken	0.50				1.00				0	100
Oxy (long acting)	cattle/camel	18.75	45.00			15-20% ²	33.00	15-20% ²		0	100
	small ruminant	3.00	25.00			15-20%	19.5	15-20%		0	100
Penistrip	cattle/camel	39.38	66.45			15-20%	57.00	15-20%		0	100
	small ruminant	6.30	27.15			15-20%	25.50	15-20%		0	100
dewormer	cattle/camel	5.33	8.10				25.00			50	50

	small ruminant	2.50	5.00				15.00			50	50
acaricide	cattle/camel	2.00	4.00				6.05			50	50
	small ruminant	1.25	3.00				6.05			50	50

¹ Livestock keepers share of costs will increase from 2nd vaccination season onwards until 100% cost recovery by end of project

² Service cost = cost of input plus 15-20% of costs as service charge

³ Share of farmers increases to 60-70% in the 2nd vaccination season, and continue to increase

⁴ Villages: 40% HEARD, 60% and 100% cost recovery in Towns. Farmers' share increases in 2nd vaccination season

Table 15. Cost-benefit analysis for private service providers

Model	Woreda	Service	Market volume	Costs					Revenue	
				Input	Labor	Vet time	Transport to NVI	Transport to kebele	Gross revenue	Net revenue
I	Dire Inchini	O. Pasteurellosis	5400	2700	540	900	452	540	8100.00	2967.62
		B. Pasteurellosis	3000	4500	300	500	452	300	9000.00	2947.62
	Negelle	Anthrax (Bovine)	9870	5922	987	1645	679	987	20727.00	10507.43
		Blackleg (Bovine)	9870	15792	987	1645	679	987	30597.00	10507.43
	Bati	O. Pasteurellosis	25344	12672	2534	4224	679	2534	38016.00	15372.63
		B. Pasteurellosis	3421	5132	342	570	679	342	10263.00	3198.56
	Banja	Rabies	725	14500	73	121	1407	0	36250.00	20149.52
		Anthrax (Bovine)	3296	1978	330	549	1407	330	6921.60	2328.32

		Blackleg (Bovine)	3296	5274	330	549	1,407	330	10217.60	2328.32
II	(Deghabour)	Camel pox	14152	7076	1415	2,359	3,782	1,415	77836.00	61788.79
		O. Pasteurellosis	35300	17650	3530	5,883	3,782	3,530	123550.00	89174.52
III	(Hargelle)	Camel pox	22621	11311	2262	3,770	3,107	2,262	169657.50	146945.49
		Sheep/goat pox	28000	42000	2800	4,667	3,107	2,800	126000.00	70626.19
		CCPP	17000	8500	1700	2,833	3,107	1,700	76500.00	58659.52
		Bovine Pasteurellosis	2641	3962	264	440	3,107	264	19807.50	11770.49
IV	Dire Inchini	Oxy (Bovine)	1080	20250	0	7,500	63	108	48600.00	20679.50
		Oxy (ovine)	600	1800	0	7,500	63	60	15000.00	5577.50
		Penistrip (Bovine)	1080	42525	0	7,500	63	108	71766.00	21570.50
		Penistrip (ovine)	600	3780	0	7,500	63	60	16287.00	4884.50
V	Deghabour	Oxy (camel)	2830	53070	0	7,500	113	283	93403.20	32437.66
		Oxy (ovine)	7000	21000	0	7,500	113	700	136500.00	107187.50
		Penistrip (camel)	2830	111447	0	7,500	113	283	161332.80	41990.26
		Penistrip (ovine)	7000	44100	0	7,500	113	700	178500.00	126087.50
VI	Dire Inchini	Deworming (Bovine)	4050	21587	2430	2,250	113	810	32805.00	5616.00
		Deworming (Ovine)	2250	5625	1350	2,250	113	450	11250.00	1462.50
		Acaricide (Bovine)	4050	8100	2430	2,250	113	810	16200.00	2497.50
		Acaricide (Ovine)	2250	2813	1350	2,250	113	450	6750.00	-225.00
	Deghabour	Deworming (Bovine)	7076	37715	4246	2,250	113	1,415	176900.00	131161.62
		Deworming (Ovine)	17500	43750	10500	2,250	113	3,500	262500.00	202387.50

		Acaricide (Bovine)	7076	14152	4246	2,250	113	1,415	42809.80	20634.50
		Acaricide (Ovine)	17500	21875	10500	2,250	113	3,500	105875.00	67637.50
VII	Banja	NCD vaccination	5619	2810	0	750	250	0	5619.20	1809.60

V. Sustainability and success factors

Sustainability

The models were developed and endorsed with full and active participation of representatives from the public and private sectors in the regional PPP taskforce. The taskforces included members from the regional and *woreda* livestock offices and the private sector. The discussions included details including fees for different services and quality of services. The following were listed as barriers to introduce the PPP models:

- Supportive Policy/regulatory environment
 - National PPP proclamation encourages privatization of and partnership with the private sector for provision of services
 - Some efforts by the government to engage private enterprises in the delivery of some vaccines (E.g. Rabies vaccines being delivered by private clinic holder in and around Bahir Dar)
 - No supportive legal framework for the private sector to participate in vaccination services
 - Absence of regulation for vaccination services by private service providers with drug shop license
- Barriers in Policy/regulatory environment
 - Free vaccine services for some diseases known as “List A diseases” in Ethiopia (e.g. NCD vaccine and others)
 - Absence of service charges for vaccines for some vaccines including Rabies, etc. (15% service charges)
 - National regulation (VDFACA) that vet drug shops (pharmacies) cannot delivery vaccination services, while there is a need under some areas where there is little access to the services.
 - Unwillingness of local government authorities to cooperate with projects and sometimes interfering with (and/or suppressing) the duties of the private actors (mostly private vet service providers),
- Institutional and organizational capability to engage with the PPP
 - Public sector inefficient bureaucracy may delay vaccine procurement and vaccine delivery if vaccine is to be procured by the public sector
 - Weak capacity of the private sector to participate in the delivery of vaccination service for live vaccines
 - Communities may not be paying for the proposed cost of vaccination as vaccines are provided by the public sector free of charge or at highly subsidized rate
 - Smooth communication b/n the private sector and *woreda* animal health office
- Availability of resources for mobile clinical service and vaccination service

- Available: Diagnostic equipment, (stethoscopes, thermometer), treatment syringe, drugs, gloves, scissors,
- Not available: microscope, sterilizer, heart girth, ice box, surgical kits, transportation
- The private sector does not have a cold chain and private transportation means
- Consequences of the PPP on other actors and on the environment
 - May benefit the private clinics involved in the PPP program and the other private service providers may complain about not being involved in the PPP

Solutions for the barriers

- ✓ Setting regulation supporting private vaccination services
- ✓ Licensing the drug shop owner to allow participation in vaccination service.
- ✓ Letting the private sector to procure vaccines
- ✓ For the first phase of the PPP model, the private sector may be limited to participate in ovine and bovine *Pasteurella* vaccination (dead vaccines)
- ✓ Cold chain facility will be provided by the public sector
- ✓ certifying the private service provider involved in the PPP and setting regulations.
- ✓ The private service providers could use public transport dead vaccines
- ✓ Based on demands and specific conditions (where government couldn't reach), there is a need to engage private sectors in specific vaccines delivery on reasonable prices and expanding this based on lessons.
- ✓ Creating awareness for the community and reaching consensus on cost recovery.
- ✓ Private clinic owners engage in the services, forming partnership between pharmacies and clinics on license for this services

Needs, benefits and impacts

There is high need for strengthening vaccination services in all the pilot sites. There is no public clinic or drug store at the pilot *kebeles* in Dire Inchini and Bati *woredas* (information from field visits and consultation with livestock offices). Satisfaction of livestock keepers with the *woredas'* public services is medium to low and disease prevalence is high (Survey reports in all pilot sites). Consultations with the PPP taskforces also indicated high need for efficient and effective service delivery. The benefits and impacts of the models developed by the workshop participants are documented in the various workshop reports.

Governance

- A Memorandum of understanding (MoU) or contracts will be signed between stakeholders
- The agreements may include defining the type of partnership, service types and geographic locations, procurement of services and inputs, quality standards, affordability of services, commitment and meeting expectations of partners to the agreement, duration of the PPP agreement.

- MoUs to be signed and contents of MoUs
 - Between private sector and *woreda* livestock office (Agreement on provision of vaccination calendar and mobilization, Time frame of vaccination campaign)
 - Between private sector and EVA for strategic deworming
 - Between EVA and community (informal discussion)???
 - EVA and private sector (Payment agreement for each delivered dose, Payment ground rules (payment round, voucher they collected or initial animal numbers agreed on?))
 - EVA and regional labs (Assela, Bahir dar and Kombolcha labs) - Inputs (provision of diagnostic kits, vacutainer tube, vacutainer needle, needle holder, cryovial, cotton role, glove, alcohol, micro-pipette tips), DSA and accommodation for sample collection and processing, Deadline to submit the laboratory test result
- ILRI/EVA and NAHDIC

VI. Planning

Households and Livestock populations in pilot sites

Table 16. Pilot sites and livestock populations in pilot sites

Region	<i>Woreda</i>	Rural <i>Kebeles</i>	HHs	Cattle	Shoat	poultry	dog	Equines	Camel
Oromia	Dire	Waldo hindho	600	5400	3000				
		Bola kalaci							
	Arsi negelle	Gambelto	799	9,870	5328	5438		2146	
Amhara	Bati	Cacatu	678	3421	25,344				
	Banja	Akena	650	3296	2516	1886	325	1308	
		Banja town+environs	862	8028	2308	5,138	400	188	
Somali	Deghabour	Bulaleh	1200	14152	35000				14152
	Hargelle	Oman	1400	2,641	28,000				22,621

Resource and budget requirements

Item	quantity	unit	cost	beneficiary	budget source
Vaccines	88427	dose	639,900.00	livestock keepers	Private sector
Veterinary equipment/instruments		pieces	482,250.00	Private clinics	ILRI/EVA
Vouchers for vaccines and treatment			2,784,037.50	Livestock keepers	EVA

Lab. kits, supplies. Sample collection/analysis			2,301,937.50	Regional labs.	ILRI
Regional labs. capacity building	8	trainees	408,675.00	NADHIC	ILRI
Total			6,616,800.00		

Work plan

Table 16. work plan for **Somali region**

Activity	Time frame	Responsibility
MoU/contract between private sector and <i>woreda</i> livestock office	Feb. and March 2021	EVA
MoU/contract between private sector and ILRI/EVA for strategic deworming/spraying and vaccination service	Feb and March 2021	EVA
CRA/contract between ILRI and regional laboratory	Jan 2021	ILRI
Certification of the private sector involved in vaccination program with renewable certificate for specified disease within specified area	Feb 2021	Regional and <i>woreda</i> livestock resource development office
Procurement and provision of equipment support for the private sector	Feb and March 2021	ILRI/EVA
Starting clinical service by the private sector	April 2021	Private service provider
Vaccination calendar preparation and Provide vaccination calendar for the private sector	Jan-Feb 2021	<i>woreda</i> livestock health department
Procurement vaccines the campaign	Feb 2021	Woreda livestock offices and private service provider
Awareness creation and discussion with the community to decide on-vaccination date	2 weeks before campaign date	<i>woreda</i> livestock health department and kebele administration and DA
Mobilization and implementation of strategic community-based deworming campaign		<i>woreda</i> livestock health department and kebele administration and DA
Mobilization and implementation of strategic community-based spraying campaign		<i>woreda</i> livestock health department and kebele administration and DA

Provision of vouchers for farmers and pastoralists	2 weeks before campaign date	ILRI/EVA in cooperation with kebele administration and DA
Supply of diagnostic kits	Mid Jan 2021	ILRI
Training one serological department experts at NAHDIC	4 th Jan 2021	ILRI
Collection of serum sample and baseline data from Oman kebele from shoats for CCPP pre intervention study.	Feb 2021	Jigjiga Regional Laboratory
Collection of parasitological sample and baseline data from Bulaleh kebele from camel and shoats for pre intervention study.	April 2021	Jigjiga Regional Laboratory
Collection of serum sample and data from Oman kebele from shoats for CCPP post intervention study.	April 2021	Jigjiga Regional Laboratory
Collection of serum sample and baseline data from Bulaleh kebele from camel and shoats for pre intervention study.	May 2021	Jigjiga Regional Laboratory
Collection of serum sample and baseline data from Oman kebele from camel, cattle and shoats for pre intervention study.	May 2021	Jigjiga Regional Laboratory
Collection of parasitological sample and data from Bulaleh kebele from camel and shoats for post intervention study.	June 2021	Jigjiga Regional Laboratory
First reporting	June 30 th , 2021	Jigjiga Regional Laboratory
Collection of serum sample and data from Bulaleh kebele from camel and shoats for post intervention study	July 2021	Jigjiga Regional Laboratory
Collection of serum sample and data from Oman kebele from camel, cattle and shoats for post intervention study.	July 2021	Jigjiga Regional Laboratory
Final reporting	August 30 th , 2021	Jigjiga Regional Laboratory
Monitoring and evaluation (adopt/develop tool)	June to Dec 2021	EVA/ILRI, regional HEARD team, regional lab.

Table 17. Work plan for Amhara region

Activity	Time frame	Responsibility
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MoU/contract between private sector and woreda livestock office	Feb. and March 2021	EVA
MoU/contract between private sector and ILRI/EVA for strategic deworming/spraying and vaccination service	Feb and March 2021	EVA
CRA/contract between ILRI and regional laboratory	Jan 2021	ILRI
Certification of the private sector involved in vaccination program with renewable certificate for specified disease within specified area	Feb 2021	Regional and woreda livestock resource development office
Procurement and provision of equipment support for the private sector	Feb and March 2021	ILRI/EVA
Starting clinical service by the private sector	April 2021	Private service provider
Vaccination calendar preparation and Provide vaccination calendar for the private sector	Jan-Feb 2021	woreda livestock health department
Procurement vaccines the campaign	Feb 2021	Woreda livestock offices and private service provider
Awareness creation and discussion with the community to decide on-vaccination date	2 weeks before campaign date	woreda livestock health department and kebele administration and DA
Mobilization and implementation of strategic community-based deworming campaign		woreda livestock health department and kebele administration and DA
Mobilization and implementation of strategic community-based spraying campaign		woreda livestock health department and kebele administration and DA
Provision of vouchers for farmers and pastoralists	2 weeks before campaign date	ILRI/EVA in cooperation with kebele administration and DA
Supply of diagnostic kits	Mid Jan 2021	ILRI
Training two serological department experts at NAHDIC	4th January 2021	ILRI
Collection of fecal sample and baseline data from Akena and Zufari kebele from cattle and shoats for pre intervention study.	14 May 2021	Bahir-Dar regional laboratory

Collection of fecal sample and other data from Akena and Zufari kebele from cattle and shoats for post intervention study.	1st June 2021	Bahir-Dar regional laboratory
1st round reporting	July 2021	Bahir-Dar regional laboratory
Collection of serum sample and baseline data from Akena and Zufari kebele from cattle for pre intervention study.	September 2022	Bahir-Dar regional laboratory
Collection of serum sample and other data from Akena and Zufari kebele from cattle for post intervention study.	November 2022	Bahir-Dar regional laboratory
Collection of serum sample and baseline data from Akena and Zufari kebele from poultry for pre intervention study.	February 2021	Bahir-Dar regional laboratory
Collection of serum sample and other data from Akena and Zufari kebele from poultry for post intervention study.	March 2021	Bahir-Dar regional laboratory
Collection of serum sample and baseline data from Cacatu kebele from cattle and shoats for pre intervention study.	5 April 2021	Kombolcha Regional Laboratory
Collection of serum sample and other data from Cacatu kebele from cattle and shoats for post intervention study.	27 May 2021	Kombolcha Regional Laboratory
Reporting	30 th June 2021	Kombolcha Regional Laboratory
2nd round reporting	15th July 2021	Bahir-Dar regional laboratory
Monitoring and evaluation (adopt/develop tool)	June to December 2021	EVA/ILRI, regional HEARD team, regional lab.
Final reporting	August 30 th , 2021	Kombolcha and B.Dar Lab. Regional Laboratory
Monitoring and evaluation (adopt/develop tool)	June to Dec 2021	EVA/ILRI, regional HEARD team, regional lab.

Table 18. Work plan for Oromia region

Activity	Time frame	Responsibility
MoU/contract between private sector and woreda livestock office	Feb. and March 2021	EVA

MoU/contract between private sector and ILRI/EVA for strategic deworming/spraying and vaccination service	Feb and March 2021	EVA
CRA/contract between ILRI and regional laboratory	Jan 2021	ILRI
Certification of the private sector involved in vaccination program with renewable certificate for specified disease within specified area	Feb 2021	Regional and woreda livestock resource development office
Procurement and provision of equipment support for the private sector	Feb and March 2021	ILRI/EVA
Starting clinical service by the private sector	April 2021	Private service provider
Vaccination calendar preparation and Provide vaccination calendar for the private sector	Jan-Feb 2021	woreda livestock health department
Procurement vaccines	Feb 2021	Woreda livestock offices and private service provider
Awareness creation and discussion with the community to decide on-vaccination date	2 weeks before campaign date	woreda livestock health department and kebele administration and DA
Mobilization and implementation of strategic community-based deworming campaign		woreda livestock health department and kebele administration and DA
Mobilization and implementation of strategic community-based spraying campaign		woreda livestock health department and kebele administration and DA
Provision of vouchers for farmers and pastoralists	2 weeks before campaign date	ILRI/EVA in cooperation with kebele administration and DA
Supply of diagnostic kits	Mid Jan 2021	ILRI
Training two serological department experts at NAHDIC	4th January 2021	ILRI
Collection of fecal sample and baseline data from Gambelto kebele from cattle and shoats for pre intervention study.	24 February 2021	Assela Regional Laboratory
Collection of fecal sample and data from Gambelto kebele from cattle and shoats for post intervention study.	14 March 2021	

Collection of serum sample and baseline data from Waldo hindho kebele from cattle and shoats for pre intervention study.	28 March 2021	Assela Regional Laboratory
Collection of serum sample and other data from Waldo hindho kebele from cattle and shoats for post intervention study.	23 May 2021	Assela Regional Laboratory
Collection of fecal sample and baseline data from Waldo hindho kebele from cattle and shoats for pre intervention study.	14 May 2021	Assela Regional Laboratory
Collection of fecal sample and other data from Waldo hindho kebele from cattle and shoats for post intervention study.	1 st June 2021	Assela Regional Laboratory
Collection of fecal sample and baseline data from Gambelto kebele from cattle and shoats for pre intervention study.	24 February 2021	Assela Regional Laboratory
Final reporting	August 30 th , 2021	Assela Regional Laboratory
Monitoring and evaluation (adopt/develop tool)	June to Dec 2021	EVA/ILRI, regional HEARD team, regional lab.

Monitoring and evaluation

The OIE PPP model development tool will be followed to collect relevant data. FGDs will also be held with women and men farmer/pastoralist groups in for mid-term and final evaluation.

Data on sero-prevalence and sero-conversion of vaccination interventions, pre-intervention EPG assessment and mortality/morbidity, diseases observed, and performance levels will be collected to be compared with post-intervention disease status and performance levels. Similar data will be collected periodically and at the end of the intervention. Additionally, participatory evaluation with farmers/pastoralists in FGDs. The FGDs evaluate on accessibility, affordability, and quality of services on 1 to 10 scale. The checklists for the FGD are attached.

- Data types and methods:
 - Evaluation of vaccination services - laboratory tests (serology for respiratory diseases) pre- and post-vaccination (sero-conversion), pre and post intervention EPG assessment. The
 - Mortality data
 - Morbidity data - disease scoring based on clinical signs. The data to be collected are number of animals showing each clinical sign in each herd by sex and age group (guide/list of clinical signs to be prepared), severity of signs (severe, mild, minor)
 - Similar data will be collected quarterly after interventions are introduced

- The regional HEARD team and PPP taskforce will be involved in supporting and monitoring of the activities
- The ILRI and EVA HEARD team will make a Quarterly visit
- Mid-term and final assessment to be conducted to evaluate the success/failure
 - data on costs and benefits for cost-benefit analysis will be collected to evaluate profitability of the interventions for the private sector.
 - Cost-benefit analysis to be conducted to determine the profitability of the private veterinary businesses which determines the sustainability of the interventions.
 - A monitoring and evaluation framework with indicators and targets will be developed

Annex I: Priority diseases and health services

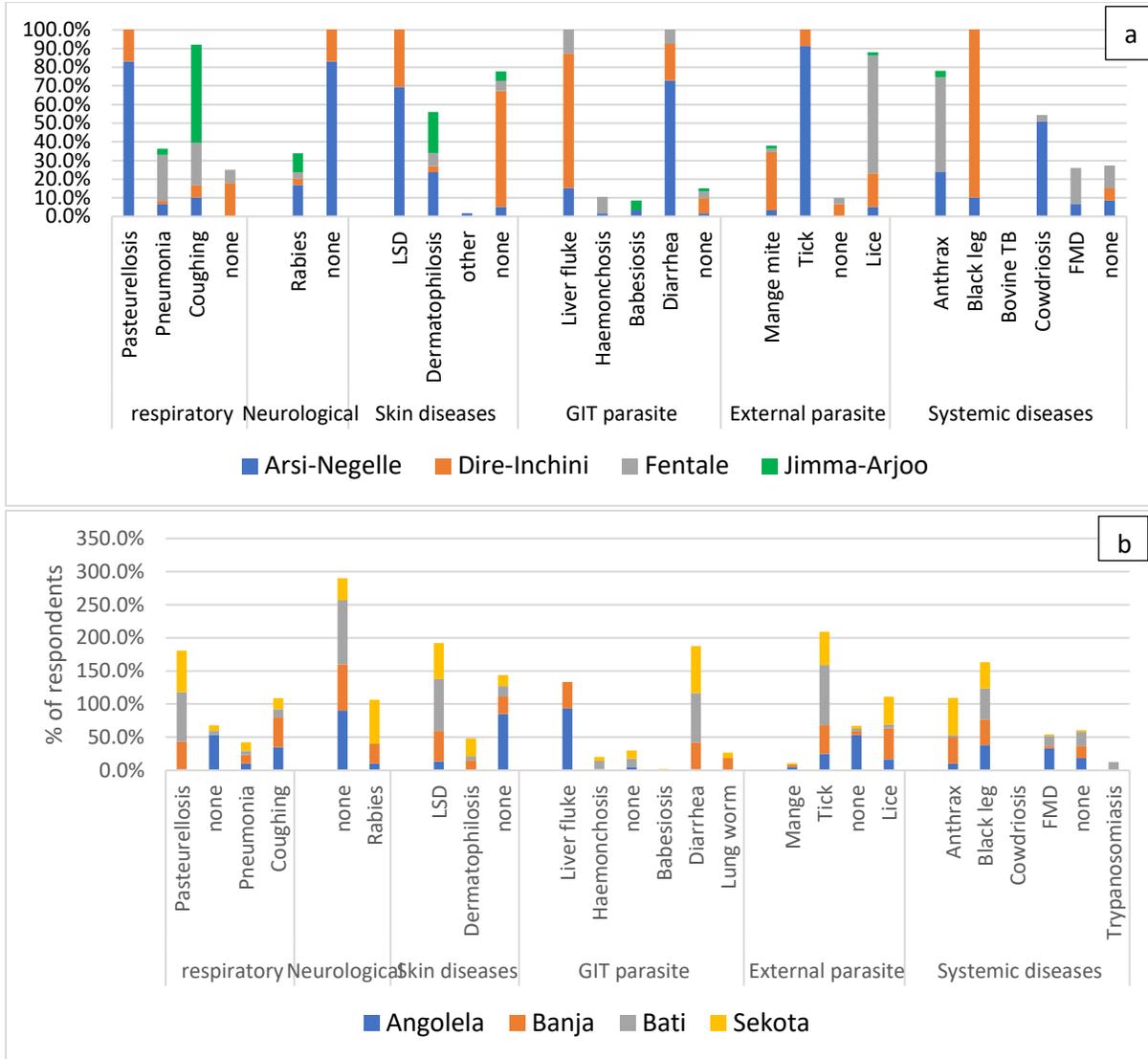
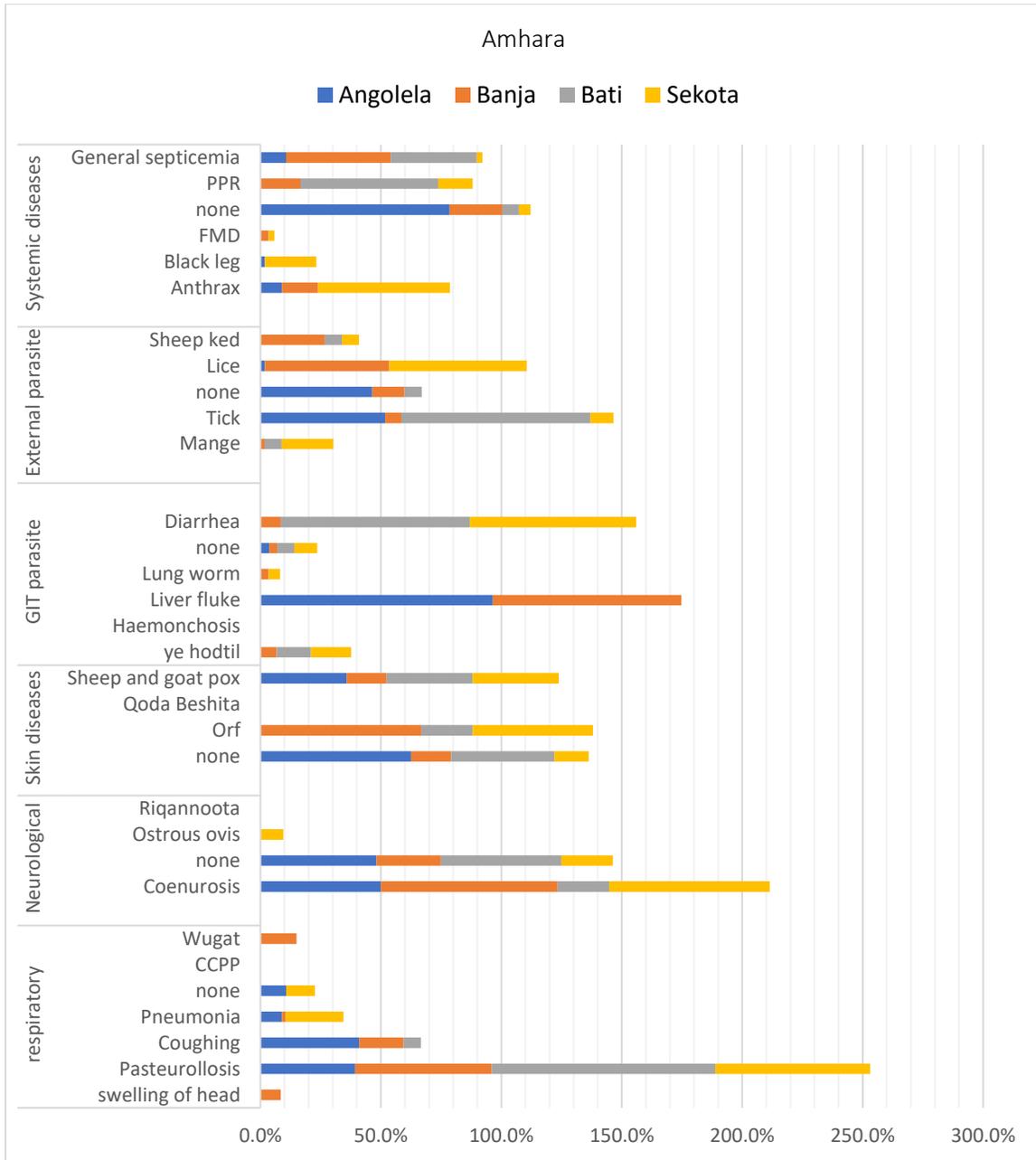


Figure 1. Per cent of respondents reporting their first priority cattle disease within each disease category in four *woredas* in each of Oromia (a) and Amhara (b) regions of Ethiopia [LSD lumpy skin disease, GIT gastro-intestinal tract]



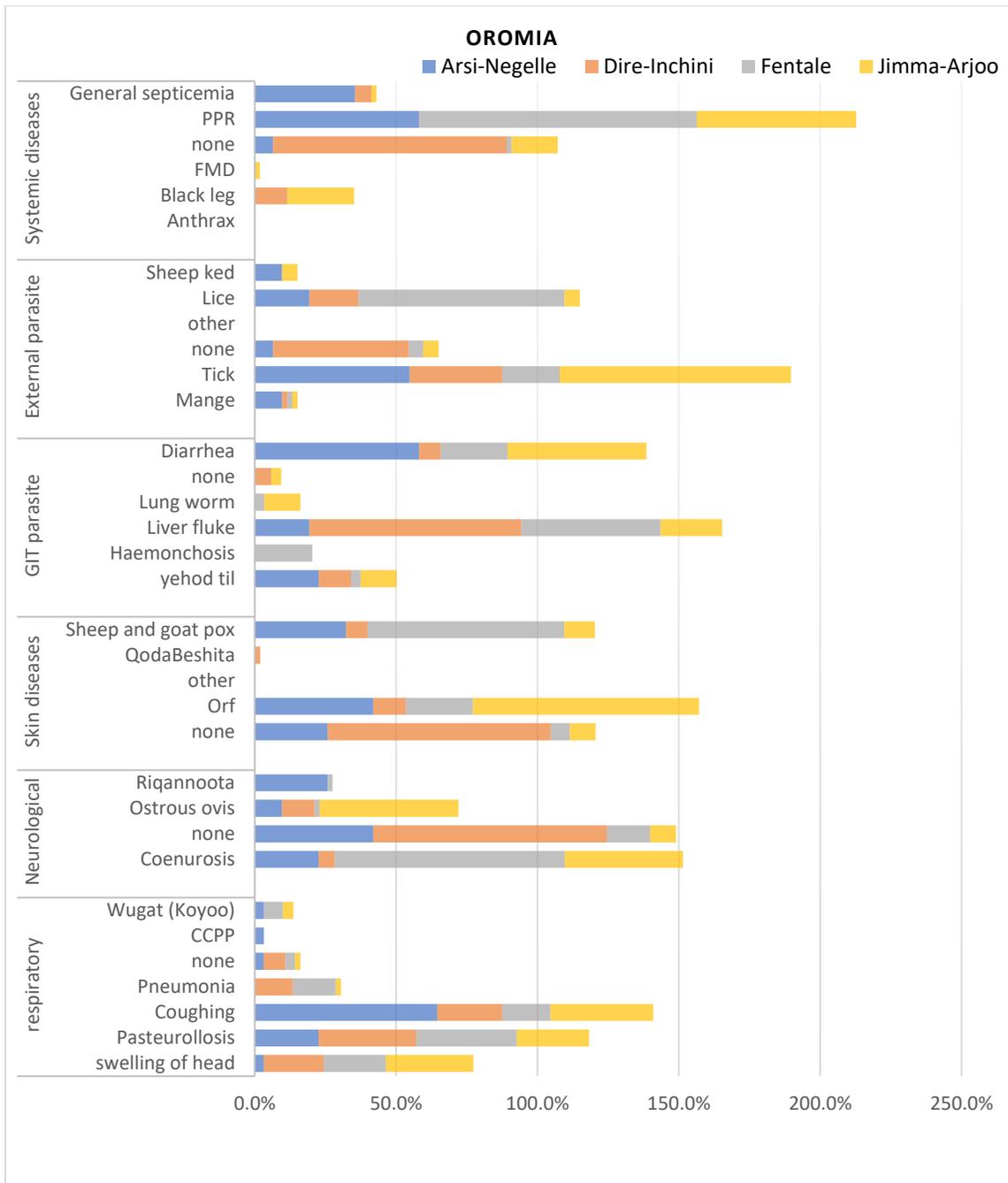
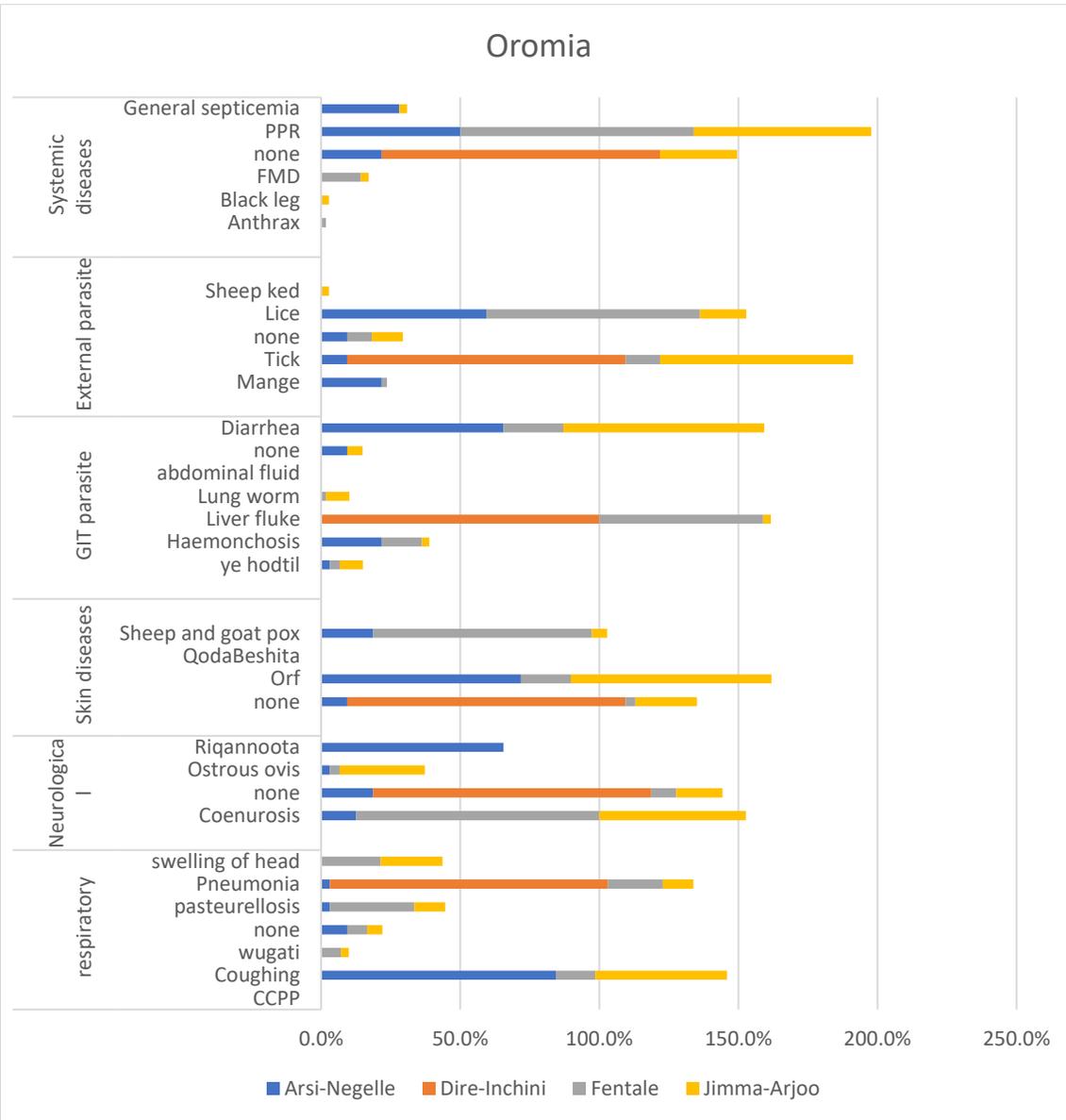


Figure 2. Per cent of respondents reporting their first priority sheep diseases in each of the six disease categories in six *woredas* of Oromia and Amhara regions of Ethiopia

Oromia



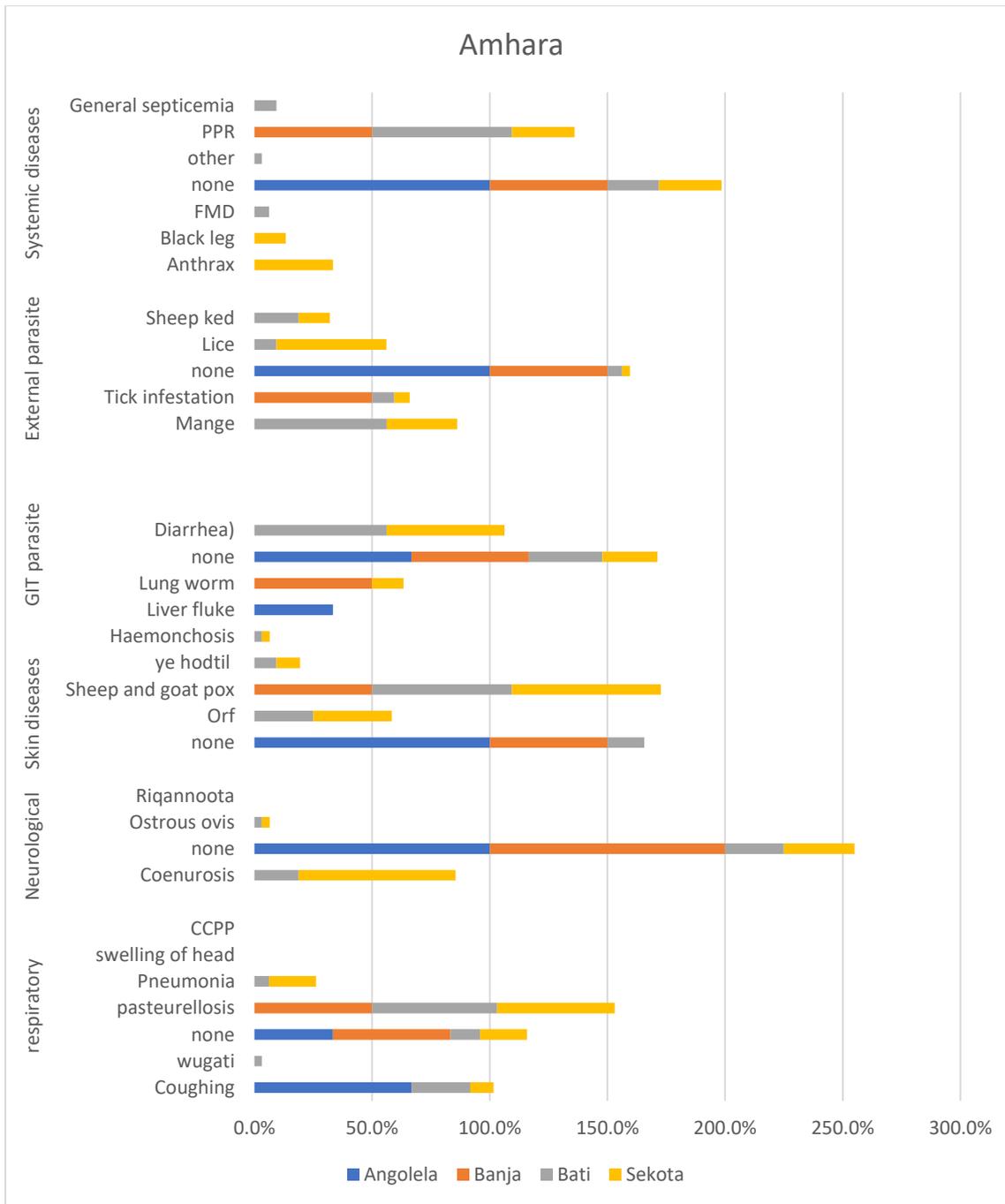


Figure 3. Per cent of respondents reporting their first priority goat diseases in each of the six disease categories in six *woredas* of Oromia and Amhara regions of Ethiopia [results from Angolela-Tera, Banja and Dire inchini *woredas* should be disregarded as the number of respondents were too few]

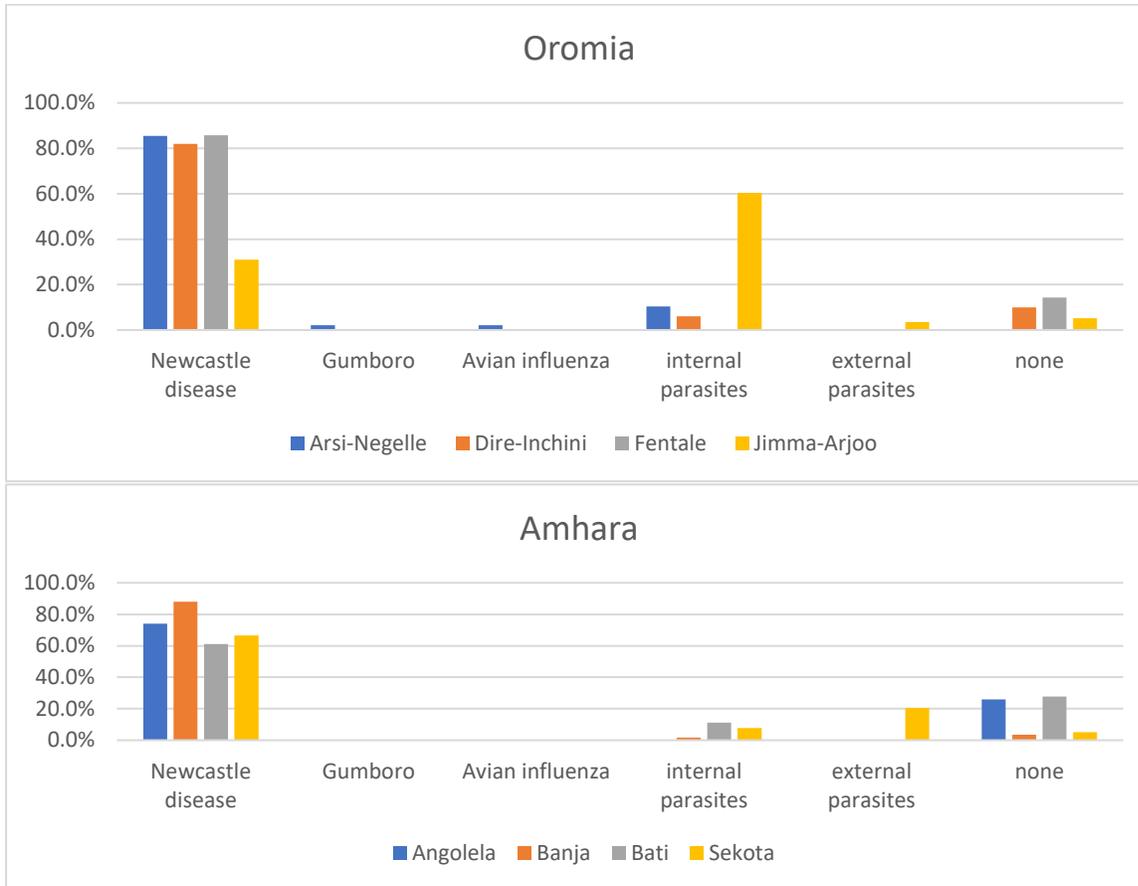


Figure 4. Proportions (%) of chicken keepers reporting their priority diseases in eight *woredas* in Oromia and Amhara regions of Ethiopia

Table 1. Proportion (%) of respondents reporting access to animal health service providers in four *woredas* of Oromia and Amhara regions in Ethiopia

	Amhara				Oromia			
	Angolel a-Tera	Banj a	Bati	Sekot a	Dire- inchi	Fental e	Jimm a -	Arsi- Negell
Community animal health						10.0		
Animal health assistant	28.3	100.	50.0	96.7	37.7	98.3	100.0	100.0
Livestock extension agent	63.3	100.	100.	88.3	91.8	51.7	98.3	100.0
Local/ traditional healer	21.7	60.0	13.9	16.7	3.3	58.3	15.0	100.0
Veterinary drug store	78.3	48.3	100.		78.7	100.0	48.3	100.0
Private veterinarian	6.7	50.0	19.4		52.5		68.3	48.3
Official (Public)	71.7	50.0	100.	68.3	91.8	91.7	85.0	100.0

Table 2. Satisfaction (score out of 10) of livestock keepers with services provided by different sources during the survey year in in four *woredas* in Amhara and Oromia regions of Ethiopia

	CAHWs	AHA	LEA	healer	Drug store	Pvt vet	Pub. vet
Angolela-Tera- tera		7.68	7.53	7.37	5.81	6.82	7.53
Arsi Negelle		6.25	7.44	5.73	6.05	6.50	7.01
Banja		8.31	8.34	7.40	7.93	6.07	8.35
bati		5.86	5.90	6.15	6.36	6.44	5.97
dire inciinii		3.32	3.94	3.95	3.30	5.42	3.86
Fentale	6.5	7.20	8.13	5.23		6.39	7.48
jimma arjoo		6.65	5.45	5.71	5.57	4.32	6.08
Sekota Zuria zuria		7.78	7.61			4.93	7.81
<i>Overall</i>	6.5	6.93	6.72	5.81	5.70	5.85	6.86

Accessibility included affordability.

Table 3. Proportions of camel herds affected and died of (case fatality) camel diseases identified by female and male focus group discussions in Hargelle *woreda* of Somali region, Ethiopia

		Male FGD	Female FGD		

Local name	Veterinary name	% affected	Case fatality (%)	% affected	Case fatality (%)	average	Rank
Respiratory diseases							
Kench	Hemorrhagic septicemia/Pasteurellosis	40	15	45	56	42.5	7
GerAduhf	respiratory syndrome	100	10	90	22.22	95	1
Neurological diseases						0	16
Gudan	Neurological disorder	24	7			12	15
Skin diseases						0	16
Achiro	Camel pox	66	19	65	38.56	65.5	4
Ambar	Dermatophilosis	30	0	10	0	20	14
GIT parasites						0	16
Elle/gorjalle	camel GIT	100	40	60	??	80	3
Suki	diarrheal disease	55	15			27.5	10
Dugetu	Coughing, fever, lung worm?	80	0			40	8
External parasites						0	16
Addo	camel mange mite	77	9	100	0	88.5	2
shilin	tick			100	0	50	6
Systemic diseases						0	16
dhukhan	Trypanosomiasis	89	10	25	20	57	5
Kutke	Anthrax	42	24			21	13
Other diseases						0	16
Deleco	camel contagious necrosis	43	6			21.5	12

	camel brucellosis	73	3			36.5	9
Andobarar	camel mastitis	30	0	25	0	27.5	10

Table 4. Proportions of camel herds affected and died of (case fatality) camel diseases identified by female and male focus group discussions (FGD) in Degehabour *woreda* of Somali region, Ethiopia

		Male FGD		Female FGD		Overall	Rank
		Morbidity (%)	case fatality (%)	Morbidity (%)	case fatality (%)		
Respiratory diseases							
Middle East respiratory syndrome (MERS)	geraduuf	100	10	100	15	100	1
Pasteurellosis	kancha	40	37.5	65	23	52.5	6
lung worm (Coughing)	dugatto	80	0			40	7
Neurological complex						0	11
Skin diseases						0	11
camel -pox	achirro/Furqageele	70	14.3-57.2	70	42.85	70	4
Dermatophilosis	ambahar	30	0	20	0	25	9
GIT parasite						0	11
general septicemia	gorian/A'al	100	4	20	15	60	5
External parasite						0	11
Mange mite	A'ddoo	100	0	100	0	100	1
Tick infestation	shilin	100	0	100	0	100	1
Systemic diseases						0	11
Trypanosomiasis	dhukhan	34	0	40	25	37	8
other diseases						0	11
mastitis	Andobara	30	0	20	0	25	9

Table 5. Proportions of sheep and goat flocks affected and died of (case fatality) sheep and goat diseases identified by female and male focus group discussions (FGD) in Hargelle woreda of Somali region, Ethiopia

Local name	Veterinary name	% affected	Case fatality (%)	% affected	Case fatality (%)	Over all	Rank
Har	PPR	50	25	90	61	70	5
Gereduf	Male FGD: Respiratory complex, Female FGD: Nasal discharge	100	50	100	70	100	1
Sambab/Kuffa	CCPP	30	15	100	36	65	6
Farka Adiga	sheep and goat Pox	100	50-80	100	40	100	1
Hulumbie	Nairobi sheep disease	100	50			50	8
Boode	Pasteurellosis	80	40	89	40	84.5	4
Raf dilea	foot rot	10	0			5	12
Gestheri	male: Coenerosis/o. ovis, Female: Myiasis (o. ovis)	30	20	20	10	25	9
Shilin	tick	100	80	100	0	100	1
gorian/A'al	GIT	20	10	100	0	60	7
Ambahaar/Gubatto	Dermatophilosis			10	0	5	12
	FMD			38	21	19	10
rimaayat	abortion			38	0	19	10

Table 6. Proportions of sheep and goat flocks affected and died of (case fatality) sheep and goat diseases identified by female and male focus group discussions (FGD) in Degahabour woreda of Somali region, Ethiopia

Veterinary name	Local name	Morbidity (%)	case fatality (%)	Morbidity (%)	case fatality (%)	Overall	Rank
respiratory diseases							
Nasal discharge	geraduuf	100	50	74	56.75	87	3
Pasteurellosis	boode	80	50			40	5
CCPP	sambab	30	50	40	62.5	35	6
Neurological						0	10
						0	10
Skin diseases						0	10
Sheep and goat pox	Fur gadiga	100	65	85	22	92.5	2
orf	Af-garfow			30	13.33	15	8
GIT parasite						0	8
general	gorian/A'al	20	50	30	66.6	25	6
External parasite						0	7
Tick infestation	shilin	100	80	100	15	100	1
myiasis (Oestrus ovis)	geeste heeri	30	66.66	50	20	40	3
Systemic diseases						0	5
PPR	haar	50	50	80	75	65	2
Nairobi sheep disease	hulumbe	100	50	60	50	80	1
FMD	Abeb			70	21.4	35	1
other diseases						0	2
foot rot	raaf dila'aa	10	0	25	0	17.5	1

Table 7. Pastoralists willingness to pay for animal health services in Hargelle woreda of Somali region, Ethiopia

Species	Service	Service provider	FGD group	No. of participants	WTP (vote, %)	Birr/a nimal
Camel	vaccination	private	Male	10	80	30.00
		public	Male	10	NA	NA
	Treatment (antibiotics)	private	Male	10	60	40.00
	External parasite (ivermectin)	private	Male	10		3.50
	External parasite (spray)	private	Male	10	80	50.00
Sheep/goat	vaccination	private	Male	10	90	7.50
		public	Male	10	NA	NA
	Treatment (antibiotics)	private	Male	10	70	10.00
		public	Male			
	External parasite (spray)		Male	10	90	3.00
Cattle	vaccination		Male	10	50	20.00
	Treatment (antibiotics)		Male	10	50	25.00
	External parasite (spray)		Male	10	80	30.00
Camel	vaccination	private	Female	10		3.00
		public	Female	10		1.50
	Treatment (antibiotics)	private	Female	10	100	20.00
		public	Female	10	100	10.00

	External parasite (Ivermectin)	public	Female	10	100	3.00
		private	Female	10	10	5.00
	External parasite (acaricide spray)	public	Female	10	100	1.00
		private	Female	10	100	3.00
Sheep/g oat	vaccination	private	Female	10	100	3.00
		public	Female	10	100	1.50
	Treatment (antibiotics)	private	Female	10	100	5.00
		public	Female	10	100	3.00
	External parasite (spray)	public	Female	10	100	1.00
		private	Female	10	100	2.00
	External parasite (ivermectin)	public	Female	10	100	0.50
		private	Female	10	100	2.50

Table 8. Willingness of pastoralists to pay for animal health services in Degehabour woreda of Somali region, Ethiopia

Species	Service	Service provider	FGD group	No. FGD participants	WTP (vote, %)	Birr/animal
camel	Treatment with Antibiotic	public	Male	10	100%	10.00
		private	Male	10	100%	20.00
	vaccination	public	Male	10	100%	1.50
		private	Male	10	100%	2.50

sheep/g oat	Ivermectine injection	public	Male	10	100%	3.50
		private	Male	10	100%	5.00
	Spraying acaricide	public	Male	10	100%	1.00
		private	Male	10	100%	3
shoat	Treatment with Antibiotic	public	Male	10	100%	3.00
		private	Male	10	100%	4.50
	vaccination	public	Male	10	100%	0.00
		private	Male	10	100%	4.00
	Ivermectine injection	public	Male	10	100%	0.50
		private	Male	10	100%	2.00
	Spraying acaricide	public	Male	10	100%	1.00
		private	Male	10	100%	2

Table 9. Satisfaction scoring (out of 10) of pastoralists and agropastoralists with health service providers in Somali region, Ethiopia

	Accessibility	Affordability	Quality	Timeliness
CAHWs				
Pastoralist	6.36	6.55	6.79	6.13
Agropastoralist	6.32	6.72	6.88	6.72
Livestock agent				
Pastoralist	6.94	6.81	7.00	6.97
Agropastoralist	6.33	7.67	6.67	5.33
Traditional healer				
Pastoralist	5.00	5.00	8.00	7.00
Agropastoralist	7.00	7.00	6.00	7.00

Drug store				
Pastoralist	5.76	5.68	6.00	5.71
Agropastoralist	5.47	5.00	6.33	5.80
Private vets				
Pastoralist	6.73	7.64	8.55	7.64
Agropastoralist	6.13	6.43	7.38	8.25
Public vets				
Pastoralist	6.50	5.00	5.00	5.00
Agropastoralist	6.33	7.00	7.00	7.00

[Source: Gebremedhin et al. (2017) RPLRP project report]

Annex II: Willingness to pay for services

Table 10. Pastoralist's willingness to pay for animal health services in Hargelle woreda of Somali region, Ethiopia

Species	Service	Service provider	FGD group	No. of participants	WTP (vote, %)	Birr/animal
camel	vaccination	private	Male	10	80	30.00
		public	Male	10	NA	NA
	Treatment (antibiotics)	private	Male	10	60	40.00
	External parasite (ivermectin)	private	Male	10		3.50
	External parasite (spray)	private	Male	10	80	50.00
sheep/goat	vaccination	private	Male	10	90	7.50
		public	Male	10	NA	NA
		Treatment (antibiotics)	private	Male	10	70
		public	Male			

	External parasite (spray)		Male	10	90	3.00
cattle	vaccination		Male	10	50	20.00
	Treatment (antibiotics)		Male	10	50	25.00
	External parasite (spray)		Male	10	80	30.00
camel	vaccination	private	Female	10		3.00
		public	Female	10		1.50
	Treatment (antibiotics)	private	Female	10	100	20.00
		public	Female	10	100	10.00
	External parasite (Ivermectin)	public	Female	10	100	3.00
		private	Female	10	10	5.00
	External parasite (acaricide spray)	public	Female	10	100	1.00
		private	Female	10	100	3.00
sheep/g oat	vaccination	private	Female	10	100	3.00
		public	Female	10	100	1.50
	Treatment (antibiotics)	private	Female	10	100	5.00
		public	Female	10	100	3.00
	External parasite (spray)	public	Female	10	100	1.00
		private	Female	10	100	2.00
	External parasite (ivermectin)	public	Female	10	100	0.50
		private	Female	10	100	2.50

Table 11. Willingness of pastoralists to pay for animal health services in Degehabour woreda of Somali region, Ethiopia

Species	Service	Service provider	FGD group	No. FGD participants	WTP (vote, %)	Birr/animal
camel	Treatment with Antibiotic	public	Male	10	100%	10.00
		private	Male	10	100%	20.00
	vaccination	public	Male	10	100%	1.50
		private	Male	10	100%	2.50
sheep/g oat	Ivermectine injection	public	Male	10	100%	3.50
		private	Male	10	100%	5.00
	Spraying acaricide	public	Male	10	100%	1.00
		private	Male	10	100%	3
shoat	Treatment with Antibiotic	public	Male	10	100%	3.00
		private	Male	10	100%	4.50
	vaccination	public	Male	10	100%	0.00
		private	Male	10	100%	4.00
	Ivermectine injection	public	Male	10	100%	0.50
		private	Male	10	100%	2.00
	Spraying acaricide	public	Male	10	100%	1.00
		private	Male	10	100%	2

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Among others, one of the objectives of the project, ‘improving the technical competencies of veterinary service providers to enable them to deliver better and provide rationalized services’ is jointly implemented by the International Livestock Research Institute (ILRI) and the Ethiopian Veterinarians Association (EVA). The lead implementer of the HEARD project is the Federal Democratic Republic of Ethiopia’s Ministry of Agriculture.

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Funded by the European Union

Lead implementer



Component 2 of the HEARD project is implemented by

