

Report of community conversations on animal health management

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Introduction

Ethiopia has a huge livestock resource, of which the livestock production system is generally subsistence-oriented and productivity is very low (Hurrissa and Eshetu 2003). Livestock development is hampered by various constraints, the main constraints being diseases, nutrition, traditional husbandry and marketing problems (Abebe 2003). The prevalence of animal diseases is high and access to animal health services is very low as in other developing countries.

Management of herd health is an important and integral part of small-ruminant farming to increase the efficiency and productivity of the animals. Good feeding and breeding will not result in maximum production if sheep and goats are not maintained in good health.

Community-based animal health management is very important in which community members plan and collaboratively apply disease prevention and control measures. For the effectiveness of community-based animal health management, community conversations (CCs) facilitated by trained animal health agents are very important.

CCs are facilitated dialogues among community members and local service providers to explore and analyse knowledge, attitudes and practices (KAP) of community members about causes, transmission, prevention and control of animal diseases. CCs facilitate collaborative learning and sharing ideas among community groups leading to community actions on prevention and control of major animal health and zoonotic problems.

The CCs about animal diseases were conducted in Menz Mama Midir, Doyogena and Adiyo districts on 22 January, 27 January and 10 February 2021 respectively. The purpose of the CC sessions was to explore knowledge, attitudes, and practices of community members about the causes, transmission pathways and prevention and control measures of common animal diseases and zoonotic risks.

This CC module on animal health management is part of a series of participatory training modules developed under the CGIAR research program on Livestock which addresses smallholder livestock production challenges in Ethiopia.

The study areas

The CCs were conducted in three livestock CGIAR Research Program (CRP) sites: Menz Mama Midir, Doyogena and Adiyo districts.

Menz Mama Midir is one of the districts in Amhara regional state of Ethiopia. The capital of the district, Molale town, is located about 254 km northeast of Addis Ababa, the capital city of Ethiopia. Its altitudinal location ranges between 1,575 and 3,425 metres above sea level (masl). The annual rainfall is 1,000–1,500 mm and the temperature ranges from 15–20°C. Mixed farming, which includes crop and livestock production, is practised in the area. The main livestock types reared are cattle, sheep and goats, of which sheep are the dominant livestock type. The main religion in the area is Ethiopian Orthodox Christianity (Abebe 2017). The CC was conducted in Zeram illage of the district.

The Doyogena District is in Kembata Tambaro Zone, southern Ethiopia, 258 km south of Addis Ababa. The average sized landholding per household in the district is 0.75 ha, with an average family size of five members. The major crops produced in the district include enset, faba beans, potatoes and wheat. Farmers also rear different types of animals, including cattle, sheep, goats, horses and poultry. The altitude of Doyogena is 1,900–2,300 masl and the agroecology of the district is classified as midland (30%) and highland (70%). Annual rainfall is 1,200–1,600 mm and the mean temperature varies from 10–16°C. The main religion in the area is Protestant Christianity followed by Ethiopian Orthodox Christianity and a few Catholics and Muslims (Ashenafi et al. 2013). The CC was conducted in Lemi Suticho village of the district.

The Adiyo District is located in the southwestern part of the country in Kafa Zone of Southern Nations, Nationalities and Peoples' Regional State (SNNPRS). The altitude of the district ranges from 500–3,500 masl and the temperature ranges from 3–36°C. The area is characterized by large evergreen natural forests receiving rainfall almost all year round. The annual rainfall ranges from 1,700–2,000 mm with the peak rainy season being mid-June to early October. The district has 35% highland, 55% midland and 10% lowland agroecology. The prominent farming system is mixed crop-livestock production. The main religion in the district is Ethiopian Orthodox Christianity, followed by Protestant Christians and Muslims (Tera Dolebo et al. 2020). The CC was conducted in Shena village of the district.

Process and methodology

Facilitation team alignment on the methodology and facilitation process

Before the CCs, a baseline KAP survey on animal and zoonotic diseases was conducted on selected participants of the CCs. The survey helped the team to capture the main KAP gaps in the areas and to plan main discussion points for the CCs. After the KAP survey, the team reflected on their observations and insight gained, which helped them become familiarized with the thinking and practices of community members and localise discussion points for the conversations.

The facilitation team from partner organizations was oriented on the facilitation process and the CC module on animal health management. The team also discussed note-taking strategies and a template was prepared for this purpose (see Annex 2). Also discussed was how to open and close the CC session. The team members became aligned with the methodology and shared tasks. The district livestock development experts and heads promised to follow up on the application of actions of CCs and other intervention activities.

Opening and introductions

In all the districts, the sessions were opened and closed by blessings and prayers by elders and religious leaders. After that, the CC participants were asked to recap on previous sessions on animal feeds and forages. The participants were asked if they acted on the main feeding and feed management problems. Promising changes were identified by CC participants on the application of the community action plans on the main problems of animal feeding and feed management.

To start the discussion on animal health, the CC participants were asked to describe the importance of animals for human wellbeing and they listed the economic, cultural, psychological and emotional importance of animals to humans. This question helped start the discussion smoothly and motivated participants to participate actively in the discussion. They were then asked how humans must care for animals and the moral obligations and economic reasons for caring for their animals. The farmers described the care they should give to their animals as good feeding and good health management. The discussion revealed that the farmers care for their animals as well as they can because the animals are their main income source for their livelihoods.

The facilitation team then opened the main discussion of the CC and divided participants into men and women groups to capture gendered differences in KAP on animal diseases and health management. The split groups were very important to encourage women's participation and explore gendered perceptions on animal health management and zoonosis. In the first round of the CC sessions on animal feeds, before the split of the groups, it was noted that

despite good representation, some women participants were shy to talk freely in mixed groups. Once the groups were split, women actively discussed and even generated meaningful information on animal diseases compared to the men's group. After the separate group discussions, the groups were combined and group outputs were reported and discussed in a plenary. Men participants were surprised at how knowledgeable women were after listening to the output of the women's group.

As shown in Table 1, a total of 119 (63% male and 37% female) community members were engaged in the three sites of Menz Mama Midir, Doyogena and Adiyu districts.

Table 1. Number of participants

Participant	Number of participants		
	Male	Female	Total
Research partners	5	2	7
Development partners	5	1	6
Organizers	3	-	3
Community members	61	58	119
Total	74	61	135

Issues and main points from the community conversations

Menz Mama Midir District

Animal and zoonotic diseases and their clinical signs

In Zeram village of Menz Mama Midir District, the facilitation team asked the participants to list the common animal diseases in their area, with the focus on small ruminant diseases. There was competition between women and men groups as to which group identified the greater number of diseases. Both groups actively participated in conversations and were happy to relate their experiences. Some of the farmers were very interested to learn and asked the team to go directly to the topic of animal health management. The team told the farmers that the KAP gaps would be addressed after discussion and identification of gaps. The farmers communicated that previously there had been no specific training and/or meetings on animal health management in their village and they found the discussions very interesting.

Table 2: Small ruminant diseases and the clinical signs listed by group - Menz Mama Midir District men's group

S.No	Disease local name	Disease category	Probable scientific or common name	Clinical signs
1	<i>Azurit</i>	Neurological	Coenurosis	Falls to the ground, remains separate from flock, circling, front legs do not move properly
2	<i>Engibosh/Nitash</i>	Respiratory	Ovine Pasteurellosis	Rapid breathing, raising of hair, mucoid nasal discharge
3	<i>Abasenga</i>	Systemic	Blackleg	Lameness, painful swelling of limb, makes crackling sound when pressed, wounds ooze dark red blood, sudden death
4	<i>Kulkulit/Mawule</i>	Parasites	Fasciolosis	Swelling around lower jaw that holds watery fluid
5	<i>Kentir</i>	Neurological		Falls to the ground, legs raised stiffly into the air
6	<i>Yesal Beshita</i>	Respiratory		Coughing, emaciation
7	<i>Kerkire</i>	Systemic	FMD	Loss of appetite, swelling of legs and hoof area
8	<i>Yechinkilatna fit masabet</i>	Systemic		Swelling of head and stomach
9	<i>Shint mezzgat</i>	Systemic	Urethral obstruction	Swelling of the urinary tract, the animal moves around aimlessly
10	<i>Yewuc tigezna</i>	Ectoparasites	Ectoparasites	Emaciation, itching, scratching of their body by wood, house and earth

Table 3: Small ruminant diseases and the clinical signs listed by group - Menz Mama Midir District women's group

S.No	Disease local name	Disease category	Probable scientific or common name	Clinical signs
1	<i>Kulkulit/pholephole/yegubet til</i>	Parasites	Liver fluke	Collection of fluid around the neck, ascites, depression, emaciation, sudden death
2	<i>Nitoshe/Engiboshe</i>	Respiratory	Pasteurellosis	Gasping, grunting, diarrhoea, coughing
3	<i>Nizey/Afemaze</i>	Skin	Contagious Ecthyma, ORF	Lesions on mouth, nose and tongue, unable to drink and feed
4	<i>Azurite</i>	Neurological	Coenurosis	Circling, staggering, separation from the flock
5	<i>Yesanba tile</i>	Respiratory	Lungworm	Mucoid nasal discharge, thin white worm, coughing, shallow breathing, hydrothorax

After the two groups rejoined, the report of the discussion was shared by the note-takers and facilitators. Local names were given to each disease, derived from the obvious clinical signs as shown in Table 2 and Table 3. The men farmers acknowledged the knowledge of women on animal diseases. Some men participants were surprised by the knowledge of the women's group and their clear and precise listing of animal diseases, the clinical signs and transmission pathways. The facilitation team found that animal disease is the main constraint in the areas.

The KAP on listing zoonotic diseases

A significant gap was identified in knowledge of zoonotic diseases and their prevention and control. The farmers believed that animal diseases were not transmissible to human beings except rabies, which they knew could be transmitted from infected dogs or other animals to humans but they could not list any other zoonotic diseases. However, upon further probing into the risks of consumption of raw meat and milk, they were able to understand disease transmission from sick animals.

Causes, transmission pathways and seasonality of common animal diseases

In separate men and women groups, community members were asked to name common small ruminant diseases. Local names were given to diseases, based on contributing stress factors, clinical signs and effects on the animal. The main knowledge gap identified during the CC was on the causes and transmission pathway of animal diseases. The participant farmers linked the causes of disease to environmental stress. However, they could not specifically name any virus or bacteria but did mention ectoparasites. They stated the causes of diseases as stress, dust or some grasses for liver fluke. There was a difference between men and women in describing the transmission pathways of diseases. The women group explained transmission pathways much better than the men did. The men group answered 'unknown' about causes and transmission pathways of most of the listed animal diseases. They did not understand the transmission pathway of the important small ruminant diseases such as coenurosis, ovine Pasteurellosis and fasciolosis. Both men and women groups were good at identifying the seasons when diseases occur. Accordingly, they explained that some diseases were seasonal while others could occur at any time of the year, such as coenurosis.

On further probing, although community members blamed diseases for environmental stress, they were not actively involved in trying to reduce disease. For example, they drove their animals long distances to reach water, did not clean animal barns daily, especially the sheep housing. They mentioned experiencing suffocation when they released the sheep in the morning. This indicates that they do not recognize that adequate space and ventilation are important in preventing infections. They cleaned the cattle barns daily because they use the dung for fuel but sheep barns were cleaned only every second day.

Another knowledge gap is related to the spread of infections from the introduction of new animals. They mixed new animals purchased from the market or their own animals not sold with the herd. Some said they would isolate new animals if they observed any sign of sickness but otherwise if the animal seemed active, they mixed it with the herd. However, they did keep sick animals separate and cared for them.

Community members demonstrated a lack of knowledge about environmental infections which cause new infections in their herds. They did not bury the bodies of dead animals or sheep heads. They were unable to understand how the remains of dead animals could cause new infections.

Overall, both men and women groups displayed a lack of knowledge about the causes and transmission pathways of the diseases they identified. This knowledge gap is critical as it influences their ability to implement effective preventive measures.

Prevention and control measures of animal and zoonotic diseases

Since community members' knowledge of the causes and transmission pathways of some of the diseases was very low, their knowledge of preventative measures was also very low. They listed some available vaccines for their small ruminants against sheep and goat pox and ovine Pasteurellosis. They further mentioned that they control gastrointestinal (GI) parasites by administering anthelmintics to their animals. The farmers did use some traditional remedies to treat diseases but this was not the main method of treatment. The farmers evaluated if they could manage the diseases traditionally but reliance on traditional treatments was minimal. The farmers said that they monitor the health of their animals strictly and since they know the main clinical signs of major known diseases, they act immediately. They take their animals to veterinary clinics or consult animal health experts or veterinarians (vets). The crucial identified gap lies in practising prevention of disease rather than control of disease.

Regarding zoonotic diseases, what came to people's minds were rabies and tapeworm. They could not understand that poor livestock husbandry practices could expose them to zoonotic risks. The prevention and control measures taken by community members for zoonosis were very low. Generally, the cultural tradition of consumption of raw meat and milk was minimal. Only a few people ate raw meat and drank 'ergo' (fermented milk) and said they felt some discomfort after consumption but they did not know that diseases could be passed from sick animals to humans. The roles of men and women were different, hence the level of exposure to zoonotic diseases was also different. The participants reported that they washed their hands after any animal husbandry activities, including milking. However, this appears to be for general sanitation with no thought given to the prevention of zoonotic diseases.

On further probing, we noted that community members do not use protective materials when they give care to sick animals, dispose of dead animals, clean barns and attend births. They were not able to conceive that such husbandry practices could expose them to zoonotic diseases.

The control of antimicrobial resistance (AMR) was discussed and it was found that the participants did not buy and administer injectable drugs at their homes. They sometimes bought anthelmintics for their animals and the main sources were the district veterinary clinics and government animal experts in the area. They were well aware that buying and using medicine from the informal market was not safe. They acknowledged that traders may not store medicines under safe conditions and that the medicines could expire. However, they did not believe that AMR could occur due to improper use of drugs. It was interesting for them to learn about the risk of drug resistance in both animals and humans.

Overall, knowledge on the separation and quarantine of new animals was limited. Some farmers quarantined their new animals for only 3–8 days if they thought the animal was not active. They usually mixed their animals with neighbouring animals. On the quarantining of new animals, women appeared to be more concerned than the men were.

Introducing new knowledge to fill knowledge gaps

After merging the women and men groups and listening to the report of each group, a discussion followed on the gender differences in KAP about animal and zoonotic diseases. The men participants analysed and pondered the knowledge that women had on animal diseases. The exploration of community members' perception, knowledge and practices about the transmission, prevention and control of animal diseases helped identify key knowledge gaps. Based on this, the veterinarian from Menz Mama Midir District and CGIAR team members trained community members on causes, transmission pathways, prevention and control mechanisms of major animal and zoonotic diseases. Since this related to the knowledge gaps of community members, they found the training relevant and meaningful.

The farmers were very happy after understanding the transmission pathways and prevention of critically important diseases in the area such as coenurosis, ovine Pasteurellosis, liver fluke and some zoonotic diseases such as anthrax. In the discussions, the farmers realized that animal diseases could pass to humans by contact and consumption of raw meat and milk. They were also able to understand what actions they should take to reduce the risk of zoonotic diseases.

The farmers learned about the impact of animal diseases and the general prevention and control of diseases and parasites. The key message communicated was that prevention is better than cure or treatment. Good animal husbandry practices such as good feeding, clean, comfortable and well-ventilated animal housing, regular vaccination and deworming, separation and quarantine of new and sick animals from the herd are key to the prevention of animal diseases. They acknowledged that prevention saves money on the treatment of sick animals. They further realized that effective animal health management required community action and undertook to share the information and knowledge from the CC with other community members and so that they could take collective action.

Key messages and community actions

The farmers understood the transmission pathways and prevention or control mechanisms of very important diseases in their area. They also understood the importance of collective action in the control and prevention of animal and zoonotic diseases. Awareness was created of the importance of quarantine in the prevention and control of animal diseases.

Based on these discussions, the community plans to implement the following actions.

- bury the heads of sheep to control coenurosis
- vaccination of their animals according to the annual vaccination calendar
- deworm dogs and small ruminants for coenurosis and GI parasites
- institute good husbandry practices
- not to graze their animals in marshy areas to prevent fasciolosis or fence marshy areas to prevent sheep grazing
- to share information and knowledge from the CC in their household and with their neighbors to collectively act on animal health problems
- not to consume raw meat and milk
- use boots, gloves and face masks while cleaning barbs and wash their hands after cleaning, milking and touching animals

Reflections and follow-up strategies

At the close of the CC session, a few participants were asked to reflect on their key learnings and experiences. Community members thanked the team for such a meaningful and relevant learning experience. They found the CC session engaging and mentioned that they had never before had such a learning experience. They are motivated to act on their learning individually and collectively.

A male participant appreciated the involvement of both the district and Kebele service providers in the session. He said that they would request service providers to provide technical support on the implementation of the action plan.

The service providers appreciated the active participation of community members and noted that they learned much from the farmers' knowledge and experiences. They confirmed that they would continue to support farmers in implementing their action plans. The district expert stated that he would support the Kebele development agent (DA) in continuing to support farmers in the implementation of their action plans and share the information with other community groups in the regular extension activities.

The sheep-breeding groups also promised that they would share information and knowledge gained from the CC with other members of the cooperative who had not participated in the CC session.

All the partners agreed to follow up on the implementation of community actions. The Kebele animal health expert agreed to follow up on the prevention and control of the diseases as part of his daily plan. The Woreda expert also agreed to follow up the activities with further interventions. The farmers would request vaccination and deworming campaigns as their awareness was raised on the prevention and control of diseases. The Woreda development partners and agricultural research centres should continue to give input on the prevention and control campaigns and act according to the annual treatment calendar. Success stories of farmers should be captured to encourage the practice. Observatory monitoring should take place to see if farmers were cleaning animal houses and were applying good animal husbandry practices and grazing management.

Doyogena District

Animal and zoonotic diseases and their clinical signs

In Lemi Suticho village, Doyogena District, the CC participants were divided into two groups (men and women) after a recap of the previous CC session on animal feeds. The facilitation and note-taking team were also divided between the two groups. The facilitators led the women and men groups in listing the common animal diseases in their area, focusing on small ruminant diseases. Both groups actively participated in the conversations and were open to listing the diseases and what they knew about them. There was much debate in both the men and women groups on the names of diseases, the clinical signs and causative factors.

It was noted that women were more interactive and actively participated in small women-only groups rather than in mixed groups. It seemed that women's interaction in group events was influenced by social comparison. In mixed groups, women compared themselves with men while in women-only groups, they compared themselves with each other. The gender of the facilitation team may also influence how women interact in women-only or mixed groups, reducing or increasing social distance (Lemma et al. 2020a).

Table 4: Small ruminant diseases and the clinical signs listed by group - Doyogena District men's group

S.No	Disease local name	Disease category	Probable scientific or common name	Clinical signs
1	<i>Ganshu or Gunfan</i>	Respiratory	Ovine Pasteurellosis	Rapid breathing, eyes watering, swollen head
2	<i>Elimosu</i>	Others	Pinkeye disease	Shrunken, inflamed eyes
3	<i>Kedeferalsamiba</i>	Respiratory	Pneumonia	Continuous dry cough
4	<i>Lokahucha</i>	Others	Footrot	Lameness, holding leg up in air, folding or wrinkling of skin of a leg
5	<i>Zeasu</i>	Parasite	GI parasites (diarrhoea)	Diarrhoea
6	<i>Kukursa (goat)</i>	Respiratory	<i>peste des petits ruminants</i> (PPR)	Ulcers around mouth, diarrhoea, mucous discharge from nose

Table 5: Small ruminant diseases and the clinical signs listed by group - Doyogena District women's group

S.No	Disease local name	Disease category	Probable scientific or common name	Clinical signs
1.	<i>Ganshu/Qadafari</i>	Respiratory	Ovine Pasteurellosis/ Pneumonia	Rapid breathing, coughing and nasal discharge, swelling of the head, weakness
2.	<i>Lomei</i>	Parasites	Fasciolosis	Swelling around the neck, weakness, emaciation, swollen head
3.	<i>Lokata</i>	Others	Footrot	Lameness, white spot between hooves
4.	<i>Ile xidata/Elimosu</i>	Others	Pinkeye disease	Redness of eyes, blindness, lacrimation of eyes (watery eyes)
5.	<i>Lokanitesa (diarrhoea)</i>	Parasite	GI parasitosis (diarrhoea)	Diarrhoea, emaciation, white specks in faeces, mucous present in faeces, weakness, increased drinking
6.	<i>Kukursa</i>	Respiratory	PPR	Depression, nasal discharge, coughing, difficulty breathing

After in-depth discussions on animal health issues, the men and women groups were merged and the reports of the discussions were shared with the larger group. The men farmers appreciated and were amazed at the knowledge of women about animal diseases. As shown in Table 4 and Table 5, the report of the women's group indicated that there was not much difference in the knowledge of animal diseases between men and women. This indicates that there is a mismatch of targeting for extension services because often extension services target the household head, which is the man, for extension services. Animal health extension services can benefit from adopting approaches such as couples' participation both in home visits and training activities. Such household approaches can facilitate collaborative learning and joint actions among household members.

It was understood that animal disease is the main constraint in the production and productivity of small ruminants in the area. The farmers have indigenous knowledge of the diseases and their clinical signs.

The KAP on listing zoonotic diseases

There is a deep-rooted culture of consuming raw meat in Doyogena area. In the groups, the participants stated that the diseases of animals cannot pass to humans but a few farmers challenged others by listing diseases that could be transmitted from animals to humans. However, on further probing and posing several provocative questions, the

participants realized that diseases from sick animals could be transmitted to humans and in the end, knowing about zoonotic risks, they were surprised by how they had survived while consuming raw meat and milk. Participants did not mention rabies since the disease had been eradicated and they had stopped owning dogs after rabies outbreaks in earlier years.

Causes, transmission pathways and seasonality of animal diseases

In Lemi Suticho village, the participants were asked to identify the causes and transmission pathways of the small ruminant diseases they had listed. The identified causes such as the gaps in knowledge regarding animal husbandry practices of feeding and housing. They stated that respiratory diseases could originate from dust and the environment. Generally, the knowledge on the microbiological causes of animal diseases was very poor although some farmers mentioned the transmission pathways of animal health problems such as gastrointestinal parasitosis. Compared to Menz Mama Midir District CC participants, the participants in Doyogena District had a better understanding of the transmission pathways of animal diseases such as respiratory diseases and gastrointestinal parasites. Their knowledge of the seasonality of diseases was good but they did not know how the seasons were related to the occurrence or transmissibility of disease.

The main knowledge gap that was identified in the CC session was the management of newly introduced animals. The CC participants said that they checked the appearance of newly-purchased animals from the market while travelling home. If the animals looked healthy, they were immediately mixed with their home flock. They believed that mixing was good to make the newly-bought animal sociable with the home flock. They only separated animals if they saw any clinical signs of disease. Total separation was a challenge because all animals and humans lived in the same house and most farmers did not have enough space for full separation.

The culture of throwing sheep heads into the environment or for dogs was negligible. There is a very small or no dog population since the owning of dogs was banned after the outbreak of rabies in their area.

When an animal dies, they bury it immediately. This has become the culture in the area. Some farmers mentioned that they bury the dead animal because it could transmit the disease to other healthy animals. However, most community members said that they buried dead animals to avoid the bad smell from decaying bodies. As the village is densely populated, any remains of animals can cause air pollution from the bad smell and thus possibly also cause human disease. The burying of sheep heads and dead animals is a practice not because this can cause reinfection to other animals but because it was a community practice to keep their community clean. This community does not even defecate out in the open.

Prevention and control measures of animal and zoonotic diseases

Compared to Menz Mama Midir District participants, the Doyogena District participants seemed to have a better understanding of the transmission of disease from sick animals to healthy animals, which facilitated a better understanding of the prevention of diseases by separating sick animals from healthy ones. However, the farmers were still unable to list the prevention of some diseases, like PPR, which is a viral respiratory disease of small ruminants.

Another gap investigated in the CC was the understanding of different vaccines for small ruminants. If an animal receives one vaccine in a year, the farmers think that it can prevent all other diseases. They could not list the different vaccines. The same as the Menz Mama Midir District, farmers in Doyogena, mainly the women group, could not clearly distinguish between prevention and control measures and did not know what vaccines were given for what disease and when the vaccine should be given.

The farmers in Doyogena area use some traditional treatments for respiratory diseases but sometimes also use modern drugs and ethnoveterinary treatments. For example, they use a mixture of tobacco, garlic and ginger to treat respiratory infections and they treat footrot by burning the infected area with hot metal and putting salt on the area. However, traditional treatments are not the main method used in the area.

The discussions revealed that disease control or treatment after the animals were already sick was the main practice, rather than preventing the diseases before they occurred. This indicates a major gap in knowledge and practice as farmers do not take appropriate preventative measures to reduce both animal and zoonotic diseases.

There is a deep-rooted culture of consuming raw meat and milk in the area. There was very strong resistance to the notion of and debate on the transmission of animal diseases to human beings. Most participants did not believe that the diseases of animals could be passed to humans. Only a few farmers listed some zoonotic diseases such as anthrax, bovine tuberculosis and bovine cysticercosis and their transmission to human beings. Generally, understanding the transmission pathways of zoonotic diseases was very low in Lemi Suticho village. The family members lived with animals in the same house and did not understand the risk of living with animals. Only a few farmers had separate housing for animals.

The other main knowledge gap identified from the discussions was that the farmers in Doyogena area usually buy and give anthelmintics to their animals, even if their animals are not sick. Some farmers stated that they buy the anthelmintics from legal private veterinary drug shops and give them to their animals at 15-day to one-month intervals. They did not know if this trend could create AMR. A follow-up discussion with local partners during the reflections at the end of the session revealed that regulation of the sale of veterinary drugs is weak and the risk of AMR is a real concern, which needs action through consultative processes involving the different actors. It is important to create awareness about responsible drug use and AMR risks, both at the service delivery and user/community level using participatory processes (Lemma et al. 2020b).

Another knowledge gap exists regarding quarantining of new animals. Farmers only quarantine the animals if they notice any clinical signs while traveling from market to home. If they do not see any signs, the new animals are mixed with the home flock immediately.

Introducing new knowledge to fill knowledge gaps

After merging the women and men groups, the participants listened to the reports of each group. The knowledge of women and men groups on animal and zoonotic diseases was discussed. The men participants were surprised at the knowledge women had on animal diseases. After identifying their knowledge gaps, the CGIAR research team and the veterinarians from Areka Research Center and the Doyogena District livestock and fish office introduced new knowledge to the participants. Community members were trained on causes, transmission pathways, prevention and control mechanisms of major animal and zoonotic diseases in the area.

Special emphasis was placed on zoonosis and AMR since there is a culture of eating raw meat and drinking raw milk. The other issues discussed included the different vaccines for small ruminants. Special focus was on the names of vaccines and it was agreed that it was important for farmers to know the names of vaccines administered to their animals. District and research centre veterinarians have committed to educating farmers on what diseases their animals have been vaccinated.

Key messages and community actions

After the introduction of new knowledge to close knowledge gaps or supplement existing knowledge, the facilitators communicated key learning points and messages to integrate learning. The participants understood the transmission

pathways and prevention or control mechanisms of very important animal and zoonotic diseases in their area. Thereafter, community members were asked what they could do to apply the new learning.

Based on these discussions the community planned to implement the following actions.

- Good husbandry practices for their animals, mainly cleaning the animal barn;
- Vaccinate their animals based on the annual calendar;
- Not to consume raw meat and milk, to eat animal source foods after cooking;
- Build separate housing for their animals;
- Quarantine new animals and separate sick animals;
- Not to buy veterinary drugs from illegal sources such as open markets and shops and prevent AMR by rational use of drugs;
- Paired (husband and wife) extension learning and use of information sources; and
- Use protective materials (gloves, masks and boots) while working on animal-related activities.

Reflections and follow-up strategies

In closing, the CC participants thanked the team for the interactive conversation and for introducing new knowledge.

After completing the session, a discussion ensued with the research and development partners about their reflections on the process and what were their key learning points from the conversations. The partners appreciated the interactive approach, felt that they had learned a lot and promised to follow up on the implementation of community action plans. The animal health expert for Lemi Suticho Kebele and enumerator from Areka Agricultural Research Center (ARC) promised to support the farmers in the implementation of their action plans.

The veterinarian from Doyogena District was very impressed with the CC approach and promised to use it to identify different animal health problems in the district. Both the partners found the CC approach converse to their community engagement approach and said that they had only talked to farmers without learning from their experiences or engaging them in experiential discussions.

The partners also raised the importance of follow-up on the community action plans. Strict follow-up of the CC participant farmers will be done by the Kebele animal health expert, data enumerators, the researcher from Areka ARC, the district veterinarian and the CGIAR team. The follow-up success stories on the implementation of community actions will be developed to teach others.

Adiyo District

Animal and zoonotic diseases and their clinical signs

As in the other sites, we started the CC session in Shena village with prayers and blessings. We then did a recap of the previous session, focusing on information recall, information sharing and knowledge application. From the feedback received from the community members, it seems the community action plans were well received.

As a motivation for this session and to have a seamless transition, we asked community members to mention the benefits of animals to human beings and what care they should give to animals to obtain these benefits. We continued until they mentioned animal health, then introduced the session and clarified expectations.

The community members were split into male and female discussion groups. In the smaller groups community members were asked to name common animal diseases, focusing on small ruminant diseases. For each disease identified, the team facilitated discussions on the causes, seasonality, transmission pathways, prevention and control measures and if the diseases were zoonotic.

The discussions lasted for about an hour, after which the groups were combined in a plenary to listen to and discuss the group findings. Based on the results of the group discussions, i.e. identification of key KAP gaps, the vets introduced new knowledge to address these knowledge gaps and supplement existing knowledge. Extension and gender experts discussed gender dynamics in the household and the importance of increasing women's access to information and advisory services.

The pre-CC KAP survey helped the research team to gain insight into how community members thought about animal health management and gender differences in and familiarized the team with the perspectives and reasoning of community members.

During the KAP survey, community members were asked "Who is more knowledgeable about animal diseases?" and "Who contacts the local veterinary officer for advice when an animal gets sick?" The impression gained from the survey during the CC session was confirmed. Some men and women who participated in the survey indicated that only women know the clinical signs, which they report to their husbands and it is the husband who knows the diseases and contacts the local veterinary officer. We asked the women survey participants what would happen if their husbands were not around when they observed that an animal was sick. They stated that they would seek assistance from neighbours and take the animal to the veterinary clinic.

The male and female groups were asked separately whether gender played a role in the knowledge of animal diseases. It was found that the knowledge of both men and women participants on common animal diseases and clinical signs was comparable. Both groups named almost the same type and number of small ruminant diseases and demonstrated similar knowledge gaps in causative agents, transmission pathways and preventive measures (see Table 6 and Table 7).

Table 6: Small ruminant diseases and the clinical signs listed by group - Adiyio District men's group

S.No	Disease local name	Disease category	Probable scientific or common name	Clinical signs
1	<i>Goochoo</i>	Parasites	GIT Parasitosis	Diarrhoea
2	<i>Hacho Machochene</i>	Unknown		Swollen head, watery nose, sudden death
3	<i>Kilona (Azurit)</i>	Parasitic	Coenurosis	Circling
4	<i>Bate Nutero</i>	Others	Footrot	Limping, animal weak
5	<i>Oshio</i>	Respiratory	Ovine Pasteurellosis	Mucous nasal discharge, depressed,
6	<i>Micho</i>	Parasitic	GIT	Hair raised, emaciated
7	<i>Morol</i>	Others	Pink eye disease	Eyes clouded, blindness
8	<i>Chomo</i>	Unknown	Unknown	Urinating a lot, urine smells bad
9	<i>Shecho (goat)</i>	Unknown	Unknown	The animal screams
10	<i>Michichino</i>	Unknown	Unknown	Bloody diarrhoea

Table 7: Small ruminant diseases and the clinical signs listed by group - Adiyu District women's group

S.No	Disease local name	Disease category	Probable scientific or common name	Clinical signs
1	Gunfan (<i>Coughing</i>)	Respiratory	Ovine pasteurellosis	Nasal discharge, sneezing, coughing
2	Michi	Others	Skin disease	Drying of skin
3	Azurit (<i>Circling</i>)	Neurological	Coenurosis	Circling to one side, walking aimlessly
4	Megagna (<i>Evil</i>)	Unknown	Unknown disease	Shivering, salivation and death
5	Katoo	Others	Bloat	Abdominal distension
6	Goochoo	Parasitic	GIT Parasitism	Diarrhoea
7	Nuturo	Others	Footrot	Lameness, swelling of feet
8	Kuchoo	Skin disease	Orf	Swelling and ulceration of the mouth

The male and female groups were combined in a plenary and group results were shared and discussed. It was very enlightening for both groups to listen to the results of one another's groups. The men group was amazed at how knowledgeable the women group was. This group result confirmed the impression gained during the survey on the two questions asked.

The evidence was convincing and encouraged both groups to probe further and question their assumptions about gendered knowledge of animal diseases. Finally, community members acknowledged that women possessed equal knowledge to men on animal diseases and it was only due to cultural influence that women reported that they knew the clinical signs but men knew the diseases. Culturally, the man is the household head and is supposed to be the decision-maker, that is why women report diseases to the man and he contacts the local vet officer.

Every disease has a local name derived from clinical signs, such as diarrhoea and coughing.

An intergenerational knowledge gap was apparent in listing the diseases of animals. The older participants listed the diseases and described clinical signs and transmission pathways better than the younger participants did. This could be because older people had more experience in practising traditional treatments on their sick animals.

There was much debate in the men's group to list some diseases, such as eye disease with its causes and naming of some diseases. In general, the knowledge of the participants on zoonotic diseases was very poor. In the beginning, both groups stated that animal diseases are never passed to humans but on further probing, they mentioned some zoonotic diseases, such as rabies and bovine tuberculosis. Apart from the consumption of animal-source foods, community members did not know the transmission pathways of zoonotic diseases. They could not conceive that zoonotic diseases could be transmitted through animal husbandry activities, such as contact with sick animals, cleaning of barns, disposal of dead animals or attending births. They did not wear protective materials while doing many of these activities.

Causes, transmission pathways and seasonality of animal diseases

The knowledge of participants of the causes and transmission pathways of listed diseases was very poor. For the causes of diseases, the farmers listed only feed and water shortages, dust, severe heat and cold weather. All the farmers in the men's group reported that the cause of neurological diseases, such as coenurosis, is the devil and consumption of a local plant called 'mogn abeba'.

They listed the transmission pathways for some diseases as contact with sick animals, while diarrhoea or gastro-intestinal parasites were transmissible by direct contact or respiration. For most of the listed small ruminant diseases, they did not know the transmission pathways, while for others they merely said the diseases were not transmissible.

The farmers correctly described the seasonality of disease, stating that respiratory diseases occurred mostly in the dry season while GI parasitosis occurred mostly in the wet season. According to the farmers, some of the listed diseases, such as coenurosis and footrot, occurred in all seasons. However, they did not know how the seasons were related to the occurrence or transmissibility of the disease.

In general, community knowledge of the causes and transmission pathways of animal and zoonotic diseases was limited. This is evidenced by the fact that community members did not see sharing shelter with their animals as a risky practice. They even saw advantages in it because it provided warmth for both animals and humans. In addition, they discard the bodies of dead animals into the environment and gave sheep heads to dogs. They did not realize the reinfection risks from the disposal of dead animals into the environment. They also did not quarantine new animals from the herd. This suggests that community members had limited knowledge of the complex interaction of animals, humans and the environment. This again limited their ability to take proper preventive measures. Integrated animal health extension is really important using the “One Health” approach to capacitate farmers to take appropriate preventive measures.

Prevention and control measures of animal and zoonotic diseases

All the participants had knowledge limitations regarding the prevention and control of animal diseases. The first thing they thought of when prevention was raised was treating or separating sick animals but after further probing and discussion they listed some preventive methods such as good animal husbandry. However, vaccination was not mentioned as a preventive method.

Their knowledge of quarantining of new animals was very poor. They immediately mixed the new animals into their home flocks or kept them separate for only one or two days. Their practice of the separation of sick animals was good but their knowledge of why it was important to separate sick animals to control disease was poor. They mostly separated the sick animals because the animals could not walk to the grazing lands and eat or drink equally with the other healthy animals.

As we mentioned in the site description, farmers in Shena community had good knowledge of traditional treatments. Factors such as rich biodiversity, distance from the district centre and limited or no access to animal health services forced them to rely on traditional medication. According to the participants, mostly traditional treatments are used in the village. Community members take a phased approach to treating sick animals. The farmers said that they first try traditional treatments before they consult animal health personnel or administer a bolus to their animals. They use traditional remedies as both preventive and control methods for some diseases. For example, they use a mixture of tobacco, garlic, salt, ginger and ‘feto’ for the prevention and control of respiratory infections. The farmers said that some of the medicinal plants are disappearing from their area. The veterinary service delivery system is weak in the area and the clinics are very far from the village.

In general, the knowledge, attitude and practice of participants on the prevention and control of animal diseases in the area were very low. They disposed of dead animals into the environment and did not know that this practice could lead to the transmission of diseases to healthy animals. Additionally, they threw the sheep heads to their dogs or into the environment and cleaned sheep and goat barns only once or twice a week. They transported their animals over long distances to reach grazing and water but their knowledge of the effect of transportation on the occurrence of respiratory diseases was very poor.

The CGIAR research team understood that the service the farmers received from animal health experts was mainly treating sick animals and it did not include education and extension services on preventive measures.

There is a culture of eating raw meat in the area and the knowledge of participants on diseases that can be transmitted from animals to humans by this practice was very poor. The farmers stated that they trusted the meat inspectors fully, so they ate raw meat from shops without any worries. However, they did not seem to be concerned about what could happen if they ate uninspected meat. Most of the farmers lived in the same house with their animals and they did not know that it could lead to zoonotic diseases.

Introducing new knowledge to fill knowledge gaps

After fully understanding the participants' knowledge, attitude and practice gaps on animal and zoonotic diseases (causes, transmission pathways, preventive and control measures), new knowledge was introduced to fill the knowledge gaps and/or supplement existing knowledge and practices. Farmers were trained on the causes, transmission pathways, prevention and control of animal and zoonotic diseases. From the degree of their attentiveness, the time and patience they invested in the training and the oral feedback received by the team, it was apparent that participants found the training relevant, engaging and meaningful. Since the training came as a surprise, they were nodding and smiling in agreement, probably realizing what mistakes they had made previously.

Reflections and follow-up strategies

Finally, the key learning points and messages were summarized and communicated. Thereafter, community members were asked to identify actions to apply the new knowledge.

Accordingly, the following community actions plans were identified, which participants committed to implement:

- To bury dead animals and the heads of sheep
- The separation of sick animals from healthy animals until full recovery
- Quarantining of new animals
- Daily cleaning of animal barns and providing enough barn space for their animals
- Regular vaccination and deworming of their animals based on an annual calendar
- Sharing of their new knowledge with their families and communities
- Not to consume raw meat and milk
- Using protective materials (gloves, masks and boots) while busy with animal-related activities.
- Deworm their dogs for the control of coenurosis

Community members were encouraged to implement these action plans by having the benefits explained to them. Local partners were requested to commit to supporting community members in the implementation of their action plans, which could become part of the regular extension activities.

Analysis and lessons learned

At all sites, knowledge and practice gaps in animal and zoonotic diseases were found, with disease being identified as the main constraint and limitation to livestock production. There was not much difference in the knowledge, attitude and practices of the participants at all the sites. Initially, men community members believed that they were more knowledgeable of animal diseases than women were. However, the separate male and female discussion groups proved that this was not the case and it was only a perception due to socio-cultural influence. In plenary discussions, men and women farmers acknowledged that women knew equally, sometimes even more, about animal diseases. Even though women were engaged in many livestock-related activities such as feeding, cleaning animal barns and taking care of sick animals, they did not have access to information sources such as training and meetings. The consequences of women's limited access to information and decision-making were discussed and actions were agreed that support joint action and learning at the household level.

Across all sites, when community members thought of animal health, what came to their minds was treatment of sick animals and some mention of vaccination. Overall, community members could not distinguish prevention from treatment. They also lacked knowledge of which vaccination is given for which disease and when. This indicates that outreach on vaccination campaigns is limited and farmers simply brought their animals when they were instructed to do so by the animal health agents. There is a need for more community education and outreach on preventive measures. For example, vaccination and deworming calendars for common diseases could be posted at the farmer training centres (FTCs) or at community meeting centres or even schools so that farmers had easy access to this information. Also, this information could be communicated to farmers through local radio programmes. It was also a good practice to advise farmers to keep records of their animal treatment or vaccination activities. This is very important in reducing the risk of AMR.

There is an important characterization of the sites which influence the KAP of community members regarding animal health management and reducing AMR risks. The study villages of Doyogena and Menz Mama Midir districts are nearer to the district towns than the village in Adiyo District. Due to this, the farmers in Shena village of Adiyo District mainly used traditional treatments since it was not easy for them to access veterinary services in their village. But more so, the village in Adiyo District has richer biodiversity and more local medicinal knowledge than Menz Mama Midir District, which has poor vegetation cover. The farmers in Menz Mama Midir District mainly get the animal drugs from government veterinary clinics while the farmers in Doyogena buy from private veterinary drug shops. In terms of private veterinary services, Doyogena is better off than the other sites. There are no approved veterinary service providers in Menz Mama Midir.

Even though privatization of the veterinary sector is good, it needs strict regulation and legalization since some private veterinary drug shops could sell the drugs to farmers without any control, which could lead to AMR. Partners in Doyogena have already expressed serious concern about AMR risks. In comparison to Doyogena and Menz Mama Midir districts, the introduction and distribution of modern animal drugs in Adiyo District is slow but is increasing over time. The problems regarding veterinary service provision, including extension services, could be solved by creating multi-stakeholder platforms with all value chain actors in the area.

The risk of zoonosis from eating raw meat is higher in Doyogena and Adiyu districts since there is a deep-rooted culture of raw meat consumption. Because farmers see 'educated' people such as human and animal health experts who eat raw meat, they believe that it is safe. It requires further education and conversation to break this culture.

Lessons learned

In the CC process, many relevant lessons were learned, which could inform future intervention:

- The CGIAR team and the local partners learned many things from the session. The CC session helped them to explore and analyse animal health problems at the sites and realize that CCs can also be applied as a research tool.
- The development partners also learned important aspects of the gaps in their extension. It was realized that CCs could inform annual plans and be used as a participatory planning process. The CC process is recommended for the identification of researchable ideas.
- The involvement of research and development partners in the CC process has many advantages. Since farmers see the service providers participating in the CC process, they are encouraged to actively participate, realizing that the CC intervention had buy-in from the local partners. The local partners also supported the CGIAR team to localize the discussion issues, even reinforcing the discussion by giving local examples and clarifying relevant points.
- Local partners appreciated CCs as an engaging and participatory process. They evaluated their past practices and gained insight and encouragement to apply experiential learning processes and active learning methods.
- District livestock offices agreed to add the CC action plans to their monitoring and supervision checklists for Kebele DAs. Some, for example, Menz Mama Midir District, would even consider including the CC intervention as performance management criteria for DAs.
- The local partners appreciated the importance of follow-up and mentoring support for the implementation of community action plans and dissemination of information from the CC sessions.
- Despite good representation, it was noted that women did not find it easy to actively participate in mixed groups. The use of separate groups yielded better input from women participants.
- It was learned that the CC process promotes collaborative learning, reflection and joint action among community members and local service providers.
- The CC process is not a stand-alone intervention. It is meant to address KAP gaps in the SmaRT pack interventions. Other intervention areas should continue engaging farmers and reinforcing their knowledge from the CC sessions. The CC sessions are meant to engage community members in the analysis of key issues relevant to the SmaRT pack interventions and take ownership of the interventions. Monitoring and supportive supervision of partners are important to appreciate the process and envision the benefits of the approach beyond the project.
- The CC approach as a participatory, experiential farmer training approach can be best managed in two consecutive half-day events. The first half-day session will be devoted to exploring KAP of community members, preferably in separate male and female groups. In the second half-day session, new knowledge can be introduced to address knowledge gaps or supplement existing knowledge and practices based on the results of the first day, i.e. exploration and analysis of KAP of community members. Also, community action points and follow-up strategies can be agreed and documented. This sequential approach will allow facilitators time to analyse the KAP exploration results and identify critical knowledge gaps so that they can better develop and structure essential content for participatory training on the second half-day.

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Annexes

Annex I. Discussion checklist

Conversation on animal health facilitation checklist

Activity 1: Animal and zoonotic diseases

- Recap of the previous session, discussion on animal feeds (recall, sharing, application, change)
- Session motivation: The importance of animals for human wellbeing and care for animals
- Identification of common animal diseases and description of their clinical signs – who is more knowledgeable, men or women?
- Who does what regarding animal health management, in household? Who contacts the local veterinary officer when an animal gets sick?
- Zoonotic diseases from the listed animal diseases – who is more knowledgeable, men or women? Who is more at risk? Why?
- Transmission pathways and control measures for animal and zoonotic diseases

Activity 2. Causes, clinical signs and transmission pathways of animal diseases

- Identification of the causes, clinical signs, and transmission pathways of the diseases
- Seasonality of prevalence, and which animal types are more susceptible
- Causative agents of animal diseases (virus, bacteria, fungus)
- Improper livestock husbandry and introduction of new animals
- Self-treating of sick animals and antimicrobial misuse

Activity 3. Prevention and control measures of animal and zoonotic diseases

- Consequences of animal and zoonotic diseases – how the diseases affect households
- Prevention and control of animal and zoonotic diseases – prevention is better than cure
- Sanitation, vaccination and nutrition

Activity 4. Learning integration, key messages and action planning

- Key learning points and messages
- Action points on prevention and control of animal and zoonotic diseases
- Indicators of change

Annex 2. Note-taking table

Table for notetakers

Group:

Livestock species	Animal disease	Clinical signs	Causative agents	Seasonality	Transmission from animal to animal and animal to human (if zoonotic)	Prevention & control	Zoonotic or not zoonotic
Sheep/goat							

Annex 3. Community conversation process in pictures



Figure 1: Women CC at Lemi Suticho Village.
(Photo credits: Mamusha Lemma).

Figure 2: Women CC at Shena Village.

Figure 3: Team reflection after CC.

Annex 4. List of participants

Partners

Name	Sex	Site	Affiliation
Minda Hilemichael	M	Menz Mama Midir	Menz Mama Midir District livestock expert
Addissie Dibabie	M	Menz Mama Midir	Menz Mama Midir District site data collector
Wubetu Alelign	M	Menz Mama Midir	Animal health expert
Hasabu Abebe	M	Adiyo	Adiyo site data collector
Meseret Qochito	M	Adiyo	Animal health expert
Abezach Alemayehu	F	Adiyo	Bonga site health data collector
Afewerk Geremew	M	Adiyo	Animal health expert
Asrat Arkea	M	Bonga	Bonga Research Center animal health researcher
Negash Desta	M	Doyogena	Office head
Kibnesh Yohanis	F	Doyogena	Animal health expert
Takele Obola	M	Doyogena	Doyogena site animal health data collector
Desalech Markos	F	Doyogena	Site data collector
Tesfalem Nane	M	Doyogena	Areka research centre animal health researcher

List of community members

C.N.	Name	District	Sex
1	Kes Birhane H/maryam	Menz Mama Midir	M
2	Teferi Nigusse	Menz Mama Midir	M
3	Aregahegn T/Yohanes	Menz Mama Midir	M
4	Hailu G/Kidan	Menz Mama Midir	M
5	Kes Zewdie G/Kiros	Menz Mama Midir	M
6	Zebene W/Maryam	Menz Mama Midir	M
7	Tefera Zenebe	Menz Mama Midir	M
8	Bizuayehu Sahilu	Menz Mama Midir	F
9	Kes G/Tsadiq Dibaba	Menz Mama Midir	M
10	Kes Fikre Behailu	Menz Mama Midir	M
11	Alemzewude Wolde	Menz Mama Midir	F
12	Tirunesh Admike	Menz Mama Midir	F
13	Kes Engidashet Hailemaryam	Menz Mama Midir	M
14	Tamire Yirga	Menz Mama Midir	F
15	Dejene Negash	Menz Mama Midir	M
16	Niguse Getamesay	Menz Mama Midir	M

C.N.	Name	District	Sex
17	Abebaye Metaferia	Menz Mama Midir	F
18	Almaz Mamo	Menz Mama Midir	F
19	Engida W/Maryam	Menz Mama Midir	M
20	Kebede Woldie	Menz Mama Midir	M
21	Tesfaye Atilaw	Menz Mama Midir	M
22	Bogale Demise	Menz Mama Midir	M
23	Zenebe Mengesha	Menz Mama Midir	M
24	Elfe Getahun	Menz Mama Midir	F
25	Yeshi Zebene	Menz Mama Midir	F
26	Almaz Wondafer	Menz Mama Midir	F
27	Sinke Deneke	Menz Mama Midir	F
28	Kidan Seife	Menz Mama Midir	F
29	Getenesh G/Kiros	Menz Mama Midir	F
30	Masresha Mandefro	Menz Mama Midir	F
31	Dimimua Tadese	Menz Mama Midir	F
32	Yeshe G/Meskel	Menz Mama Midir	F
33	Zenebe Sahilu	Menz Mama Midir	M
34	Wondafrash Tekilay	Menz Mama Midir	M
35	Zebene Kete	Menz Mama Midir	M
36	Yeshiwork Hailegnaw	Menz Mama Midir	F
37	Woldeyes W/Rufael	Menz Mama Midir	M
38	Getachew Tedila	Menz Mama Midir	M
39	Estarike Bekele	Doyogena	F
40	Ayele Abuye	Doyogena	F
41	Alemitu Tamire	Doyogena	F
42	Abonesh Temesgen	Doyogena	F
43	Mulu Desta	Doyogena	F
44	Tekalign Tesfaye	Doyogena	M
45	Kebebush Abera	Doyogena	F
46	Abote Forecha	Doyogena	M
47	Sugame Abute	Doyogena	M
48	Dobe Bafa	Doyogena	M
49	Adise Chafamo	Doyogena	M
50	Lema Orebo	Doyogena	M
51	Bekele Wongelo	Doyogena	M
52	Ayele Awno	Doyogena	M
53	Melesech Andemo	Doyogena	F
54	Ayelech Tesema	Doyogena	F
55	Belaynesh Maru	Doyogena	F
56	Genet Tadiwos	Doyogena	F
57	Lapiso Gurmiso	Doyogena	M
58	Lema Achiso	Doyogena	M
59	Desta Menta	Doyogena	M
60	Bekele Shambo	Doyogena	M

C.N.	Name	District	Sex
61	Tagese Landore	Doyogena	M
62	Daniel Yirgete	Doyogena	M
63	Asefa Adise	Doyogena	M
64	Desalech Bekele	Doyogena	F
65	Meselech Haile	Doyogena	F
66	Tesema Yenore	Doyogena	M
67	Degefea Tekile	Doyogena	M
68	Fikre Legese	Doyogena	M
69	Abebech Chafamo	Doyogena	F
70	Ayelech Siyum	Doyogena	F
71	Desalech G/Hana	Doyogena	F
72	Mulunesh Embore	Doyogena	F
73	Abebech Shamebo	Doyogena	F
74	Tseganesh Tesema	Doyogena	F
75	Lemam Wondimu	Doyogena	M
76	Workinesh Gugisa	Doyogena	F
77	Asefa Gadiso	Doyogena	M
78	Tesema Yenore	Doyogena	M
79	Tadelech Tekile	Adiyo	F
80	Aster Emito	Adiyo	F
81	Wondimu Gaycho	Adiyo	M
82	Legese Kebede	Adiyo	M
83	Atinafu Asefa	Adiyo	M
84	Bizuayehu Markos	Adiyo	F
85	Tariku Tekile	Adiyo	M
86	Marino Woldie	Adiyo	M
87	Mitiku Abuye	Adiyo	M
88	Temesgen Terefe	Adiyo	M
89	Etenesh H/Giorgis	Adiyo	F
90	Kifle Asefa	Adiyo	M
91	Birhanu Tamene	Adiyo	M
92	Abebech Ayano	Adiyo	F
93	Tariku Tamiru	Adiyo	M
94	Yeshareg Teka	Adiyo	F
95	Akalu Feleke	Adiyo	M
96	Girma H/Giorgis	Adiyo	M
97	Habtam Ayano	Adiyo	M
98	Mindaye Memgesha	Adiyo	M
99	Atirse Asefa	Adiyo	M
100	Wodajo Wondimu	Adiyo	M
101	Ayele Kero	Adiyo	M
102	Atirse Alemu	Adiyo	M
103	Erago Emito	Adiyo	M
104	Alemayehu Kero	Adiyo	M

C.N.	Name	District	Sex
105	Amisalech Abera	Adiyo	F
106	Ashibe Abitew	Adiyo	M
107	Habtamu H/Mikael	Adiyo	M
108	Abinet Buleto	Adiyo	M
109	Bayush Belay	Adiyo	F
110	Talech Teka	Adiyo	F
111	Belay Mekuria	Adiyo	M
112	Tarekegn Tekile	Adiyo	M
113	Geremew Gachiso	Adiyo	M
114	Kifle Tekile	Adiyo	M
115	Mengesha Melese	Adiyo	M
116	Habtamu Tekile	Adiyo	M
117	Teka Alemu	Adiyo	M
118	Agegnehu Shamo	Adiyo	M
119	Adisu woldie	Adiyo	M