

Identification of Livestock Production Constraints and Husbandry Practices Reared in Pastoral and Agro-Pastoral Areas of Selamago Woreda of South Omo Zone, Ethiopia

Research Article

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Abstract

Livestock's raised at pastoral and agro-pastoral areas play important roles. However, due to the aloofness of this area insufficient scientific information has taken place and most of the livestock's in the areas are seldom studied. This assessment conducted to identify and describe livestock production constraints and husbandry practices in Selamago woreda. The major resource of feed was natural pasture and source of water was from river. A semi-structured questionnaire was employed for interviewing 120 randomly selected respondents. Discussions were also held informal way with pastoral and agro-pastoral groups in each surveyed kebeles with the respective development agents and extension facilitator working in the areas. The pastoral and agro-pastoral which are established in arid and semi-arid agro-ecology livestock are reared by all of them. They way of life is associated with the purely livestock based transhumance and nomadic production systems largely based on rangeland and natural vegetation. The major problems reported and cited by the community in their order of importance; animal health problems; lack of improved breeds, forage; recurrent drought, water shortage, conflict and security problem; poor infrastructure and accesses to market alternative. Hence, more emphasis should be given on access to improved breeds and forage technologies with equipped package, affordable animal health service delivery, awareness creation and training on conflict management aspects are need to be introduced in the area.

Keywords

Livestock Production; Constraints; Selamago Woreda; Pastoral; Agro-Pastoral

Introduction

Ethiopia has the largest livestock population in Africa, with estimated 70 million head of cattle, 42.9 million sheep, 52.5 million goats, 2.15 million horses, 10.80 million donkeys, 0.38 million mules, and about 8.1 million camels [1]. Livestock contribute to the sustainable livelihoods and security of more than 800 million poor smallholders as Natural Capital (meat, milk, wool, hide, rangeland, and pasture), Financial Capital (cash, savings, credit, insurance, gifts, and remittance), Social Capital (traditions, wealth, prestige, identity, respect, friendship, marriage

dowry and festivity), and Human Capital [2]. Three main livestock production systems exist across Ethiopia. These are the low-input extensive pastoral system, the semi-intensive mixed crop-livestock system and the intensive livestock production system. Mixed crop-livestock farming in Ethiopia is predominantly practiced in places located above 1,500 m.a.s.l. and crop production extends to altitudes up to 3,300 m.a.s.l [3]. Livelihood strategies of the farmer in Ethiopia depended on the combination of both on-farm and off-farm activities. Out of on-farm activities in Ethiopia, income gained from livestock production and

crop production were the major income sources for the farmer [4]. It is raised in all of the farming systems by pastoralists, agro-pastoralists, and crop-livestock farmers. It is estimated that about 30% of the livestock population are found in the pastoral areas. Nevertheless, because of the erratic nature of rainfall that results in shortage of feed availability, productivity is low and highly seasonal [5].

According to [6] the crop and livestock production integrated farming systems can further be divided in to two broad sub-divisions namely: crop-livestock and livestock-crop systems. In the crop/livestock system, cropping is primary and the more important farming activity while livestock is secondary while in the livestock/crop system, the livestock is the primary activity and cropping takes secondary position in terms of farming importance. In the mixed crop-livestock system, livestock is the second most important source of income after crop activities. Crops are the second most important contributor to total income in the pastoral and commercial systems [7]. In pastoral and agro-pastoral production systems, which are found in arid and semi-arid agro-ecological zones, livestock are kept by nearly all pastoralists. This production system is associated with the purely livestock based nomadic and transhumance pastoral production systems based largely on range, primarily using natural vegetation and characterized by low or no-crop production culture [3]. However, in mixed farming system, cattle provide draught power and manure for cropland fertilization beside to milk production whereas the purpose of keeping cattle in pastoral production system is for breeding and selling, in agro pastoral production system for meat and draught power and in highland mixed crop-livestock production is for draught power and sale of culls [8]. The traditional pastoral schemes of rearing a mixture of live stocks nevertheless represent an effort to maximize productivity of the animals. Different livestock species have diverse environmental tolerance, different production and work capacities. Although their performance has been poor the productivity potential of pastoral livestock is promising [9]. Pastoral and agro-pastoral areas are characterized by high spatial and temporal variability in rainfall distribution and patterns. Although there are general rainy and dry seasons the rainfall might start at different times in different years which increasing irregularity and altering the normal pattern [10]. In such a way significant crop production cannot be expected in rain-fed agriculture and extensive livestock production seems to be a better means of exploiting the grazing and browse resources in the lowlands. Livestock is comprised of large flocks and herds of sheep, goats and cattle. Extensive livestock keeping is the backbone of the economies of the lowlands. The semi-arid rangelands of southern Ethiopia support the livestock that are highly valuable to the nation as direct sources of consumption for the pastoral and agro-pastoral population, as sources of cash income and foreign currency

for the nation and for provision. However, prolonged dry period and drought very often result in critical decline in quantity and quality of feed, shortage of water which leading to decreased productivity and increased mortality of animals. During severe drought season the entire herds may be demolished and pastoralists who lost their herds due to severe droughts they also alternative to this way of life when they fail to rebuild their herd. This trend is currently observed in the southern rangelands of Ethiopia [10]. Over the years, many researchers and extension workers have been contributed much effort to generating improved agricultural technologies and convey to the producers. Despite that this numerous technologies have been developed in the past it have not been fruitful to provide appropriate and required technologies to the end users. Due to this result too few agricultural technologies established beforehand are adapted by the end users and significant numbers of technologies are shelved without imperative contribution to the objective they are intended for. The assessment study is take off for the succeeding research extension activities to identify pastoral and agro-pastoral livestock production constraints and technological needs of the farming community. Therefore, the present study initiated to identify and describe livestock production constraints and husbandry practices for providing scientific information.

Materials and Methods

Description of study areas

South Omo is the most diverse administrative zone in Ethiopia. It is home to 16 ethnic groups of which the most populated and agrarian Aari and Maale make up about half of the population. Most of the remaining 14 are agro-pastoral groups in the vast lowlands extending to Kenya and South Sudan. These agro-pastoral groups are located in six woreda, namely Benna-Tsemay, Dassanech, Hamer, Nyangatom, and Salamago [11]. The survey was conducted in Selamago Woreda south omo zone of southwest Ethiopia. Selamago Woreda is located at 870 km to the Southwest of Addis Ababa. The Salamago is inhabited by the Mursi (who practice a combination of the three livelihood mechanisms), Kwegu (who mainly rely on fishing, farming and small stock) and the Dime (who live in midaltitude areas and practice rain-fed agriculture). Selamago is bordered on the south by Nyangatom on the west and north by the omo river which separates it from the Bench maji, keffa and Konta, the northeast by the gamo gofa on the east by the basket and bako gazer and on the southeast by the usno river. The administrative center of Selamago is Hana. The study area lies between 6°19' and 7°10' N latitude and 15° 12' and 22° 25' E longitude, with total land size of 451.12 km². The area receives bimodal rainfall in which the long rainfall occurs in the months of March to June while the short rainfall season

is in the months of August to October. The annual average temperature of area was recoded to be 29°C (range of 20 to 37.5°C). The vegetation type of the area is dominated by scattered woodland, savanna and large plain grassland. Acacia, Combretum and Grewia are common woody plant species, whereas Cynodon, Brachiaria, Heteropogon, Cymbopogon, Aristida, and Chloris are common grass species found in the area and is dominated by sandy clay and clay loam soil [12]. The five largest ethnic groups found in selamago Woreda are Dime, Bodi, Mursi, Amhara and others (Figure 1). Livestock populations in Selamago woreda were 308,355 cattle, 16,821 sheep, 56,286 goats, 113,396 poultry and 600 donkeys [11].

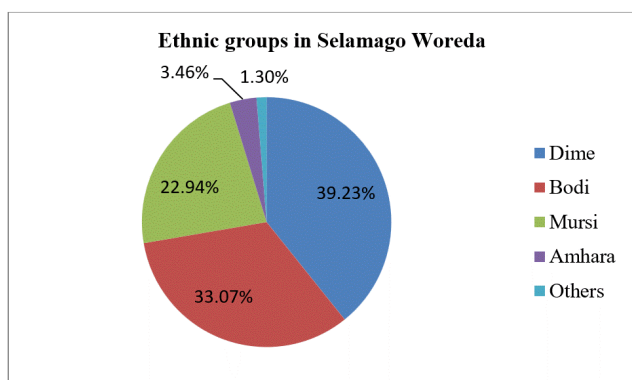


Figure 1: The five largest ethnic groups populated in selamago woreda (Own computation based on figures provided by the woreda's Finance and Economic Department)

Ethnic groups

The five largest ethnic groups were reported in the woreda. They are dime (39.23%), bodi (33.07%), mursi (22.94%), Amhara (3.46%) and all other ethnic groups made up 1.3% of the population.

Data collection and procedures followed

A semi-structured questionnaire was used to obtain the information. According to, the size of the sample depends on many factors such as budget, administrative concern and time. A total of 62 informants (72.6% males and 27.4% females) were selected purposively with the assistance of extension officer and community elders and local authorities, based on their willingness to participate and have experience farming and own livestock. Prior to data collection the questionnaire was pre-tested. Each participant was separately interviewed in their vernacular language and later translated to English by the research team from Dohne Agricultural Development Institute. The questionnaire basically covered the household characteristics of sheep farmers, constraints that limited sheep production.

The assessment was conducted with multidisciplinary team of researchers' with expert from Woreda and kebele development agents. Three potential representative kebeles (Daguba, Dime/Erika and Bebelew) were selected purposely from the Woreda because they had high number of cattle, relative security and experienced livestock keepers based on the guidance from the district. From the selected kebeles, only livestock herders with livestock breeding experience in the surveyed area more than five years were randomly selected. The locations of the study kebeles was constrained by security problem and distance traveled between kebeles. Before we engaged too, the study team held short discussions with the Woreda executive administrative, pastoral office, agricultural and rural development offices. After quick discussions, a total of 90 male and 30 female (40 respondents from each kebele) pastoral informants with the mix of different ages and sexes and who share the same livelihood system and common needs were selected in collaboration with the PA's administration and development agents working in the localities. A semi-structured questionnaire was used for collecting data. The data collectors were mobilized with district administrators and community guides for security. Following the selection, primary data were collected through focus group discussions (Pastoralists, agro-pastoralists, local leaders, and livestock production experts and livestock extension workers) after that key informants were also interviewed and recorded carefully through the guidance of the checklist (Figure 2). Basic secondary data's were collected from PRG, Agricultural and Rural



Figure 2: Interviewed participants in the selected kebeles

development office. Finally, after group discussion and key informant interviews held information particularly animal production and productivity related constraints was identified and summarized and ranked the problems thought consensus in order of their importance. The following were the main focus points in the assessment. Livestock production system and livestock composition; purpose of keeping livestock and breeding management; livestock husbandry practices such as availability of feed resources for livestock production, housing, watering sources and practices; major livestock disease and parasite; livestock marketing systems and potential opportunities.

Daguba kebele

Livestock production system and composition

Daguba kebele is one the PAs found in selamago Woreda. This kebele is dominated by Konso ethnics group they came from konso zone of southwest Ethiopia in the way of camp. Most of the households rear livestock but do not move them from their private land (i.e. livestock are kept in enclosures) with crop growing and with other different income generation activities. Most of the mursi or bodi groups they have trends of moving from place to place with their livestock's. Indeed, in relative the settlements of pastoralists increasing from time to time and new settler of konso people were also recently reported in woreda. The konso groups of livestock keepers are well known for their cultural preference for the animals. In addition, direct exchanges of animals between konso groups and pastoralist herders have been reported. In general, considering that the stresses of pastoralists (bodi-belelew kebele) and agro-pastoralists (daguba kebele) face on conflicts especially for communal grazing. In FGDs, some small conflicts between neighboring kebeles and between livestock herders and crop farmers were mentioned in this kebele. Additionally, conflicts over people cutting trees also were mentioned. In selamago woreda conflicts reported included between Selamago and settled Konso. In the kebele the household kept only local type species of cattle, sheep, chicken and donkey in their important order. Irrespective of the kebeles the crossbreed or exotic animals are not observed. Cattle are the predominant and most highly valued livestock species in all the localities of surveyed areas. The pastoralists in the area have a long experience and a very strong attachment to cattle rearing. The households interviewed owned very few equines (donkeys), indicated the low importance of these species in this areas. Horse and mule are not still domesticated by the community. Similar trends reported in Dasenech Woreda [9]. In the Daguba kebele the attention given to rearing of goat is very low (no goat populations exist in the areas). One of the reasons reported to be for the lowest goat holding was due to traditional believes (backyard thinking) of the community (in Mursi and Bodi), a pastoral who have

such animal is call as "poor". However, the community has good perception and awareness regarding to the improved technologies but access to get this technology are too limited. In the survey areas most of the cattle and sheep were herded together on the outdoor/fields. Herding together has several advantages as it requires less labour and provides security to the animals. However, this too leads to overgrazing and also at times there may be fights among the bulls especially in the breeding season. The survey results clearly show that in areas less frequently affected by drought, in livestock type's diseases and parasites are the most important mortality reason. Natural reasons of death, such as old age or predators were largely uncommon.

Purpose of keeping livestock and Breeding management

Livestock are the main assets of the households upon which the livelihood of the communities depend on. The dependence are usually both tangible and intangible and the major reason for which the livestock are reared are source of food, social functions (prestige, dowry and other socio-cultural values), saving, indication of wealth, income source and risk minimization. Livestock and its product play multifarious roles for the society. In daguba kebele Milk is only processed into butter for marketing purpose other product such as buttermilk, whey yoghurt give for animals. These products are not practiced for home consumption. Donkeys are used to carry materials to transport from place to place. Reproductive technologies that help to improve the local breeds of the community such as improved bull service, artificial insemination, selection and introduction of exotic animals are not introduced yet, so the community faces challenge with the low production and productivity of the local breeds. Mating was practiced naturally through locally available bull without any control. The average daily milk yield of indigenous cow gives 1-2L/d.

Livestock feed resources

The main source of feed used for livestock feeding in the area are natural pastures (herbaceous vegetation composed mainly of grasses and herbs and browses (shrubs, tree leaves and pods) followed by very small crop residues. [13] revealed that about 78% shares open communal grazing land and 22% shared indigenous browse and shrubs. Different grass species are found in the assessment areas and valued as the most important and palatable species which is highly precious terms of palatability and enhancing better milk and butter production of cows when they are consumed. This grass species are growing in both dry and rainy seasons of the year and play very important role as sources of feed primarily for the grazing species such as cattle and sheep. In this case there is no shortage of livestock feed due to abundance availability natural pasture in the areas.

Contradicted result was reported by [13] who find that feed shortage in to study area is more serious issue and it required further intervention. In both season (dry and rainy) the livestock are grazing in private grazing as well as communal grazing land (within their specified kebele). Although there are adequate natural pastures there are also some seasonal variations in availability and quality of feed resources due to seasonal variation in rainfall pattern. The availability of feed resources is more adequate during the rainy season than dry season. Crop residue particularly; maize and sorghum Stover used as animal feed in a limited extent after the crop is harvested where these crops are produced. Previous study by [13] reported that crop residues used as the second most important cattle feed resource comes from Teff, sorghum and pulses crops next to the open grazing land in the Woreda. These crops residue helps to support feed requirements of animals but most of the time the community used this crop a residue for soil fertilizer and leaved on the crop land after harvesting. In addition hay making and crop residue treatment is also practiced. Improved forage grass varieties are not introduced yet, except elephant grass which introduced by NGOs in some households. In Daguba kebele cut and carry system, tethering and hay grass preparation is practiced and reported feeding system. The most livestock feeding system particularly fattening, working ox and lactating animals is by tethering with feed trough. Rotational grazing is not practiced in the areas because there is no feed shortage; there is productive and well grazing pasture in terms of quality and quantity. There is supplementation practice for sick, lactating cow, calves, lambs, working oxen and for fattening animals through sludge (by-product of *Cheka*; *konso favorable drink*) with feed trough and selected grass type without feed trough. Commercial feed and industrial by-product were generally unknown by community. The main challenge face to the community is conflict and robbing of livestock when the livestock feeding on communal grazing areas.

Watering sources and practices

Finding water of consumable quality for livestock is one of the major occupations of pastoralists and agro-pastoralists and one of the key determinants of pastoral movement and migration. Furthermore, the distribution and type of water facilities can influence the frequency with which animals are watered. In general, the further producers live from the water source, the more likely they will be forced to practice alternative day watering of their animals. The availability of water is very variable from place to place. Different watering point types are used as source of drinking water for livestock in the different places. Availability of water is better in the surveyed areas and the most common sources of water for livestock in Daguba kebele are Local River (*named as Gio River*). Based on the survey, the responses of the sampled households

regarding watering frequencies for milking and dry cows, heifers/calves, bulls/oxen and sheep showed that once per day.

Housing Practices

Housing of livestock is one of the primordial features pertaining to good husbandry practices. In the daguba kebele the most common type of residential is thatched; these thatched roofs seem to be preferred in most agro-pastoral areas. On the other hand, a considerable proportion of households used open barn used this shelter separately for their animals. So, provision of suitable shelter during the adverse environmental conditions will buffer the extremes of climatic conditions and reduce the peak stress on the animals that possibly helps the production and productivity.

Major livestock Disease and Parasite

The names and descriptions of diseases and parasites obtained from respondents were later validated with the local veterinary officer and literature sources. The main cattle diseases that reported to be occurring frequently in the area in order of importance were contagious bovine pleuropneumonia (CBPP), contagious caprine pleuropneumonia (CCPP), trypanosomiasis, skin diseases, blackleg and anthrax. The current survey result was line with report of [14]. An external parasite particularly mange mites and ticks are also of important health problem. However, internal parasites are not mentioned by respondent in the areas and it is not a serious problem in the area. Diseases and parasites that affect sheep are CCPP; mange mite and tick are mainly reported to be as health problems in the area. The main poultry's diseases and parasite observed in the area are Newcastle disease and lice. There is access of regular vaccination and medication health posts to be treated their animals in the kebele. There are some ethno-veterinary practices in this community to treat their animals. When their animals get chicken pox diseases they treat by grinding garlic and ginger by mixing with water. For anthrax disease they use white grass (*nechi sar*) and ginger by grinding and drenching thought mixing with water. For chicken diseases related to eyes they treat with a hot wood nearest to the eye using selected plant species (unspecified). [14] reported that Mursi and Bodi pastoral communities used traditional medication to prevent and treat cattle diseases.

Chicken Production

Chicken have important value to generate income after selling eggs and live chicken and as a source of egg and meat for home consumption and. The major chicken types found in this kebele are indigenous types and very small improved chickens also provided by woreda agricultural office. The main problems of poultry production in the

areas were diseases and low productivity of local chickens. The major diseases in order of importance are Newcastle and chicken pox. One local chicken lays in average 8-10 eggs in one clutch and the number of eggs lays by improved chicken determined by access of feed; if they get more feed they give more eggs continually. The main post-harvest product handling and storage constraints are poor storage, hot weather condition which lead to spoilage of the eggs which also indirectly reduce the quality.

Apiculture

Beekeeper's of these area follow traditional production system by hanging their hive in forests. In this area, both transitional and modern hive is not introduced yet. Absence of training; awareness creation and modern technology interventions are the main constraint of this sector in this area. Honey harvest two times per year and the average honey yield from one traditional hive is 16 kilogram/year (in the two harvesting season).

Erika kebele (Dime)

Livestock production system and Livestock composition

Erika kebele is among the five largest ethnic groups found in the Selamago woreda; they are also known as *Dime*. Most of the households rear livestock but do not move them from their private land (i.e. livestock are kept in enclosures) with crop growing and with other different income generation activities. Most of the time there is a seriously commenced conflict between neighboring kebeles (bodi); between livestock herders and crop farmers were mentioned in this kebele. Due to this reason they follow the semi-intensive mixed crop-livestock production system. The Dime is more active in the local civil service and in trade than the Bodi pastoralist. Dime as compared to the Bodi is judged to be more educated and more civilized. Moreover, in comparison to the Bodi the Konso are viewed as not troubling and as hard-working [11]. The type of livestock species kept in this kebele was only local breeds of cattle, goat and chicken. Due to shortage of land and conflict problem owners owned small flock numbers of sheep and goats. The community in this kebele has good perception and awareness regarding to the improved technologies such as improved breeds (cattle, goat, sheep and chicken), forage, beekeeping materials but accessibility and availability were too limited.

Purpose of keeping livestock and Breeding management

In Erika kebele, following crop production livestock are the main assets of the households upon which the livelihood of the communities depend on. The livestock's are reared for source of food, social functions (prestige,

dowry and other socio-cultural values), saving, indication of wealth, income source and risk minimization. Livestock and its product play multifarious roles for the society. The main livestock products include milk and beef which used as home consumption and marketing. Milk is processed into buttermilk, yoghurt and whey for home consumption and butter for marketing purpose. Cheese is not practiced for home consumption. During crop failure livestock are sold and the revenue used to purchase food grain and medications. However, in case of security issue no more market traders participated for livestock and their products. Due to the limited financial capacity of the local traders, their involvement in livestock trade is also limited. They have not get any training and awareness regarding to reproductive technologies that help to improve the local breeds of the community such as bull service, artificial insemination, selection and introduction of exotic animals, so the community faces challenge for improvement technology related to production and productivity of the livestock. Mating was practiced naturally through local available bull without control. The average daily milk yield of indigenous cow is less than one litter per day.

Livestock feed

The main source of livestock feed in the Dime is also natural pasture (grass). In this kebele there is no shortage of livestock feed, the natural growing grass are very productive. In both season (dry and wet) the livestock are grazing in communal grazing land (only within the kebele) and due to shortage of land they don't have private grazing land. In addition hay making and crop residue treatment is not practiced. Crop a residue like maize and sorghum used for crop soil fertilizer and leaved on the crop land after harvesting. Improved forage grass varieties are not introduced yet, except elephant grass which introduced by NGOs in some households. In Erika/Dime kebele free grazing, cut and carry system, tethering and hay grass preparation is not practiced. Rotational grazing is practiced. There is productive and well grazing pasture in terms of quality and quantity because they practiced burning the grass to get better and emerge new grass. There is no supplementation practice for their animals. Commercial feed and industrial by-product were generally unknown by community. The main challenge face to the community is conflict and robbing of livestock when the livestock feeding on communal grazing areas.

Watering sources

Finding water of consumable quality for livestock is one of the major occupations of pastoralists and agro-pastoralists and one of the key determinants of pastoral movement and migration. Furthermore, the distribution and type of water facilities can influence the frequency with which animals are watered. In general, the further producers live from the water source, the more likely

they will be forced to practice alternative day watering of their animals. The most common sources of water for livestock in Erika kebele are Local River (*named as Balle River*). Occasionally, this river may dry off when during prolonged drought (around January). Based on the survey, the watering frequency all livestock types were once per day.

Housing Practices

Housing of livestock is one of the primordial features pertaining to good husbandry practices. In the Erika kebele the most common type of residential is thatched; these thatched roofs seem to be preferred in most agro-pastoral areas. So, provision of suitable shelter during the adverse environmental conditions will buffer the extremes of climatic conditions and reduce the peak stress on the animals that possibly helps the production and productivity.

Major livestock Disease and Parasite

The main cattle diseases that occur frequently in the area in order of importance were contagious bovine pleuropneumonia (CBPP), Trypanosomiasis, liver fluke and foot-and-mouth disease (FMD). Diseases that affect Goat are neurosis and *CCPP*. Mange mite and tick mainly observed external parasites. The main poultry's diseases and parasite observed in the area are Newcastle disease and lice. There is poor access of regular vaccination and medication health posts to be treated their animals in the kebele due to insecurity and conflict with neighboring (bodi). Similarly, given the heavy disease challenges and poor veterinary health delivery systems in these areas, it is important for the cattle to be able to withstand the endemic disease challenges and generally harsh local environments. The survey results clearly show that this area less frequently affected by drought, but the livestock diseases and parasites are the most important mortality reason. Natural reasons of death, such as old age or predators were largely uncommon. There are some ethno-veterinary practices in this community to treat their animals. When their animals get any diseases they treat by grinding *gadi* plant root and leaves (local name) by mixing with water. For chicken pox disease they use lemon and chalk thought mixing with water.

Chicken production

Chicken have important value as a source of egg and meat for home consumption and to generate income after selling eggs and live chicken. The major chicken types found in this kebele are indigenous breeds and in a very small number improved chicken also provided by woreda agricultural office. The main problems of poultry production in the areas were diseases and low productivity of local chickens. The major diseases in order of importance are Newcastle and chicken pox. One local chicken lays in

average 10-15 eggs in one clutch and the number of eggs lays by improved chicken determined by access of feed; if they get more feed they give more eggs continually.

Apiculture

Beekeeper's of these area follow traditional production system by hanging their hive in forests. In this area, both transitional and modern hive is not introduced yet. Absence of training; awareness creation and modern technology interventions are the main constraint of this sector in this area. Honey harvest 2-3 times per year and the average honey yield from one traditional hive very low (9-10 kilogram/year in the two harvesting season).

Livestock production constraints

During the survey, different livestock production constraints were identified through group discussion made with selected respondents. Livestock diseases such black leg and anthrax; parasites such as ticks and mange mites have a significant effect on the health and productivity of animals. Most of these diseases and parasite have diverse influence on outputs of livestock's. Apart from diseases, absence of improved livestock breeds that fit/adapt to the environment, poor/no extension services, drought, shortage of water, distances of livestock market and poor market infrastructure are the main constraint affecting livestock production in the area. When ethnic group conflict rising in the area, the market is disturbed and the number of animals to be bought and sold to markets influenced [15]. Ethnic conflicts between communities due to demarcation of boundaries also hinder movement of the pastoralists in sharing of resources thereby hampering the indigenous coping mechanisms. Conflicts among pastoralist on natural resources sharing that may create unbalanced usage of natural resources such as grazing land, water as well as spreads to loss of human live. In Ethiopia the pastoral community is composed of several clans and ethnic groups. They compete for sharing the limited rangeland land and water resources. This conflict in the pastoralist areas are directly manifested in the livestock markets [16].

Belelew Kebele (Mender 3)

Livestock production system and Livestock composition

Belelew kebele is among the PAs found in the selamago woreda. In this kebele almost all of the households depend purely on livestock rearing with no other sources of income and during intense drought there is also movement of livestock from place to place in search of grazing land and water without a central location of residence. The community follows the extensive production system. The type of livestock species kept in this kebele was only local types of cattle, goat and chicken.

Purpose of keeping livestock and Breeding management

Livestock are considered as an important asset, sources of prestige and means of livelihood for the pastoral communities of bebelew kebele, thus larger number of livestock (cattle & goat) are kept in any given herd irrespective of the sex, age and production group. The livestock's are reared for source of food, social functions (prestige, dowry and other socio-cultural values), saving, indication of wealth, income source and risk minimization.

They emphasize and aim at milk production and higher calf crop and improved adaptation to local environmental challenges, especially the endemic diseases. This provides a good balance between productivity and adaptation. Such a balance ensures maintenance of sizeable herds, which would help guard against risks, builds living assets while allowing for reasonable income generations through off-takes and sales. Milk is highly nutritious and major daily source of food for the community, and although sufficient milk can be produced from the large numbers of cows kept by each household, individual cow's ability to produce more milk is still important as such milk is shared with calves. Generally, the pastoral communities preferred to the breed's that have better milk production ability and adaptive capability to the local environmental stresses, such as intense heat, diseases and parasites as the key attributes for which this breed is preferred. Milk is processed only into butter for home use. More of the time they use raw milk for consumption. During harsh time and prolonged drought livestock are sold cheap price and the revenue used to purchase food grain and medications. However, in case of security issue no more market traders participated for livestock and their products. Due to the limited financial capacity of the local traders, their involvement in livestock trade is also limited.

They have not got any training and awareness regarding to reproductive technologies that help to improve the local breeds of the community so the community faces challenge for improvement technology related to production and productivity of the livestock. Mating was practiced naturally through local available bull without control, but some households' indigenous knowledge in selecting and uses bulls with better milk, disease tolerance and fast growing for breeding/mating purpose. The average daily milk yield of indigenous cow is less than one litter per day.

Livestock feed and watering sources

The main common source of livestock feed in the area is natural pasture (grass). Beside to natural pasture, tree leaves and shrubs are used as cattle feed in rainy and dry periods [14]. In this kebele there is no shortage of livestock feed. In both season (dry and wet) the livestock are grazing in communal grazing land. In addition hay making and crop

residue treatment is not practiced. Crop a residue not used for animal feeding. Improved forage grass varieties are not introduced yet. In this kebele free grazing and rotational grazing is practiced. There is no supplementation practice for their animals. Commercial feed and industrial by-product were generally unknown by community.

Finding water of consumable quality for livestock is one of the major occupations of pastoralists and agro-pastoralists and one of the key determinants of pastoral movement and migration. Furthermore, the distribution and type of water facilities can influence the frequency with which animals are watered. The survey pertaining to the source of water showed that the source of water has not different across the study kebeles and also the frequency of watering. The most common sources of water for livestock in are *cannel* from Omo River. Livestock in the study kebeles were provided water with once a day during the dry season, however, in many pastoral areas in the lowlands the livestock are provided with water once every 2 days.

Housing Practices

Housing of livestock is one of the primordial features pertaining to good husbandry practices. The Pastoralist never construct permanent house for their animals because of that all livestock species are remain in the field/outdoor though out the year without any properly constructed shelter.

Major livestock Disease and Parasite

The main cattle diseases that occur frequently in the area in order of importance were *Samba (CBPP)* and Trypanosomiasis. Diseases that affect Goat are Trypanosomiasis and *CCPP*. Mange mite and tick mainly observed external parasites. There is poor/no access of regular vaccination and medication health posts to be treated their animals. The livestock diseases and parasites are the most important mortality reason. There are no ethno-veterinary practices in this community to treat their animals.

Chicken production

The major chicken types found in this kebele are local type. The main problems of poultry production in the areas were diseases and low productivity of local chickens. The major diseases are Newcastle and chicken pox.

Apiculture

Beekeeper's of these area follow traditional production system by hanging their hive in forests. In this area, both transitional and modern hive is not introduced yet. Absence of training; awareness creation and modern technology interventions are the main constraint of this

sector in this area. Honey harvest 3-5 times per year and the average honey yield from one traditional hive very low (8 kilogram/year in the two harvesting season).

Livestock production constraints

Livestock diseases and parasites (inadequate disease control and prevention programs), inaccessibility of improved livestock breeds that fit/adapt to the local environment, poor/no extension services and inadequate market structure are among the constraints hinder the livestock production in this kebele.

Gender role and decision making

Men are mainly responsible for keeping and feeding livestock, make decisions on the use and disposal of live animals. The decision of selling animals is limited by men. After selling of livestock women will only get some money for small expenses such as buying food grain, salt, clothing and others. Women are responsible to sold less valued commodities like chicken, eggs and milk products.

Marketing of livestock in Selamago Woreda

From agro-pastoral woredas in the South Omo Zone, greater rates of market engagement are well-known for Benna-Tsemay, Hammer and Dassanech. Benna-Tsemay and Hammer are more known for delivering goats for the marketing and Dassanech recognized for selling more cattle this is indicating that having more herd composition. The remaining two woredas Nyangatom and Salamago have poor infrastructure and frequent security problem and. They providing animals for sales is very small and have lower prices [11]. Marketing includes all activities of exchange conducted by producers and middlemen in commerce for the purpose of satisfying consumer demand. This involves flow of goods and services from point of production to consumers [16]. In pastoral areas, livestock are usually sold to fulfil the family needs for cash income. In the surveyed area, the main source of cash income comes from the sale of livestock. Sheep and small sized cattle are sold for immediate demands such as buying food grains, local drink and related issues. Cattle are sold when there is a need for a higher issue of cash because they fetch a better price than other animals. The main reasons of sale of cattle are when hunger happened to fulfil their grain needs, buying weapon, to alleviate the insecurityrelated problems (more in Dime) due to frequent conflict in the areas.

Most pastoralists such as Mursi are not interested for selling their livestock in proportion to their large livestock. Bodi and Mursi pastoralists believed that the numbers of cattle are the indicators of wealth. The primary market for sale of their livestock is Mursi (Hanna) street market and their weekly market day is Saturday. However, there are no regular traders buying and selling from pastoralists

reasonably hotel and restaurant owners are purchased the animals directly from pastoralists. The price is also better in places that are closer to the main towns as there is a higher demand for the animals than other pastoralist. Therefore the major actors in the market are direct purchasers of hotel and restaurant. The price of animals is inclined by a numbers of reasons such as number of animals, security issue, and distance from the main towns, seasons. [17] reported that, the frequency of sale of livestock products is inversely related to the distance from the nearest market. The survey on livestock marketing problems indicated that different factors affect livestock marketing of pastoralists in the surveyed areas. Among which unorganized marketing structure, lack of marketing information and conflict related problems are the major (Table 1)one .

Table1: Summarized livestock production constraints ranked

Major constraints	Rank
water shortage	5
Livestock diseases and parasites	1
Access of improved forage and feed shortage/ limited availability of improved forages	3
Recurrent drought due to prolonged absence of rainfall	4
Absence of improved livestock breeds (poultry, cattle)	2
poor infrastructure and accesses to market alternative	7
Lack of different livestock processing technologies	8
Conflict and security problem	6
Lack of training	9

Conclusion and Recommendation

Results of the study show that diseases, shortage of feed, lack of infrastructure, organized market access, lack of water availability, high cost of drugs/vaccines, stock theft, visibility of animal health technicians and extension officers, selection of adapted animals and ewe to ram ratio were the major constraints limiting sheep production. Based on the results of this study, the following recommendations can be made for improving small-scale sheep production in the communal areas. Forging a strategic partnership with various stakeholders to control the identified challenges through on-going training of farmers using a demonstration approach rather than an oral presentation, formation of cooperatives to minimise the cost of drugs, conservation of feed, planting of leguminous and rain water harvesting in preparation for dry season can be a sustainable way of overcoming the constraints experienced by small-scale sheep producers.

Livestock's in the country in general and pastoral and agro-pastoral areas in particular are used for multifarious multi-purposes such as milk, meat, skin and hide, blood, draft power, drought resistance, social function and income generation. However, the functions played by the livestock tend to diverge in their importance across

locations. However, conflict with neighboring ethnic and clan groups for sharing of natural resources and resulting in theft and raiding of livestock is urgent problems in the woreda. Disease and parasite, lack of improved forage access, recurrent drought, seasonal feed shortage, absence of formal marketing in their locality, poor awareness were among the reported livestock production constraints. Therefore, based on the surveyed finding addressing pastoral and agro-pastoral the concerned body either governmental or non-governmental organizations that have working in the area should provide knowledge and skill-based training for pastoral livestock producers and create awareness for them that may improve their production systems in collaboration with all the agricultural sectors in general and the livelihood of the pastoral community in particular. Affordable animal health service delivery which is incorporating pastoral and rural populations should be implemented. Frequent training on conflict management aspects, access to improved breeds and forage technologies with equipped package are required.

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