Sci. Technol. Arts Res. J., Oct. - Dec. 2021, 10(4), 1-15
DOI: https://doi.org/10.20372/star.v10i4.01
ISSN: 2226-7522 (Print) and 2305-3372 (Online)
Science, Technology and Arts Research Journal
Sci. Technol. Arts Res. J., Oct. –Dec. 2021, 10(4), 1-15
Journal Homepage: https://journals.wgu.edu.et

Original Research

Characterization of Livestock Production Systems at Sasiga and Guto Gidda Districts of East Wollega zone, Oromia, Ethiopia

Mathewos Mulatu[1], Diriba Diba[2], Hasan Yusuf[2] & Gemeda Duguma[3]*

[1]Nejo District Office of Agriculture, West Wollega zone, Oromia, Ethiopia
[2]Faculty of Agriculture, Wollega University, PO Box 398, Nekemte, Ethiopia
[2]School of Veterinary Medicine, Wollega University, PO Box 398, Nekemte, Ethiopia

Abstract

The study was conducted in the Guto Gidda and Sasiga districts of East Wollega Zone, Oromia, Ethiopia, to characterize livestock production systems. The districts were chosen due to their suitable climate, large livestock population, and available feed resources. A total of 150 respondents were involved, with 30 from each PA. The study identified major problems such as improved livestock husbandry knowledge gaps, feed shortages, disease prevalence, shortages of improved breeds, lack of organized markets, and the road for marketing animals. Opportunities for improvement include large land holding per household, rich experience in cattle fattening practices, feed conservation practices, and a good feeding system like zero grazing. The Sasiga district also has a large irrigation canal, which could help cultivate irrigated forages. Proper conservation, treatment, and utilization of crop residues in the Sasiga district present significant opportunities for livestock production expansion, productivity enhancement, and sustainable overcoming of seasonal feed shortages.

Article Information

Article History:
Received : 08-10-2021
Revised : 21-11-2021
Accepted : 12-12-2021

Keywords:
Cattle production, Feed resource; Oda Gudina; Mada Jalala; Qarsa Mojo; Uke area

*Corresponding Author:

Gemeda Duguma

E-mail:

gdjaallataa@yahoo.com

INTRODUCTION

According to the CSA (2015), Ethiopia boasts the biggest population of livestock among African nations. Depending on the type of livestock, agricultural GDP can range from 35 to 49 percent, while household incomes can range from 37 to 87 percent (Ayele et al., 2003). Whether we consider monetary values or non-marketed services (such as traction and manure), the livestock sector accounts for over 47% of Ethiopia's agricultural GDP (Behnke, 2010). Smallholder farmers and pastoralists rely heavily on cattle as a means of subsistence and economic support for their families. According to Melaku (2011), the majority of Ethiopian farmers rely on animal traction when ploughing their crop fields. Additionally, livestock is significant in urban and peri-urban regions for both the

impoverished who rely on it for subsistence and for individuals engaged in trade (Ayele et al., 2003). Shapiro et al. (2015) found that livestock is still an important part of ensuring food security, human nutrition, and economic growth in the county.

An opportunity to profit from the sector may arise in emerging nations like Ethiopia, where the demand for human consumables of animal origin is periodically increasing owing to human population expansion, rising incomes, and urbanisation (Thornton, 2010). Regardless of all these factors, the livestock resource in Ethiopia does not contribute nearly enough to human nutrition or export earnings. This is because the animals are not as productive as they could be, mainly because of the poor quality and lack of feed (Berhanu et al., 2007; FAO, 2010; Getahun et al., 2010). In the lowlands, livestock production systems are primarily agro-pastoral, while in the highlands, they are mixed crop-livestock. Historically, in both systems, the primary focus of animal fattening has been on males, since they are either sterile or have completed their reproductive cycle. Crop wastes are the primary source of animal feed in the highland agro-pastoral system, in contrast to the lowland system where grazing is the most prevalent feed source. Eleias et al. (2007) found that during the wet season, male animals are brought to lowland areas to graze since agricultural residues are scarce in the highlands. According to Alemayehu (2005) and Adugna (2007), the primary feed resources in Ethiopia typically consist of natural pasture, crop leftovers, aftermath grazing, and agro-industrial by-products. According to the most recent data from CSA (2015), 56.2% of the nation's animal feed comes from grazing on natural pasture, 30.0% from crop wastes, and 1.2% from agro-industrial byproducts. The ongoing conversion of grazing land to cropland is exacerbating the animal feed scarcity in the country, as the contribution of natural pasture is diminishing periodically as a result of ineffective management and the relentless development of crop farming. Inadequate management also makes the existing grazing areas susceptible to degradation, which leads to their eventual transformation into gullies and barrenness. This provides more evidence that low-quality crop wastes are the only feed options for cattle (Zewdie & Yosef, 2014), which helps to explain why we need to find other sources of feed.

Ruminant cattle rely on crop wastes for around half of their feed during the year, with that percentage rising to as much as 80% in the dry season in the Ethiopian highlands (Adugna, 2007). The animals have insufficient nutrition supply, low productivity, and even weight loss due to the high fiber content, moderate digestibility, and low nitrogen levels of these feed supplies (Tsigeyohannes, 2000; Hindrichsen et al., 2004). Based on factors such as geography and agroecology, crop leftovers' nutrient content and productivity can differ.

In order to better plan for future development, it is useful to characterize livestock production systems so that we may identify the most common practices in a particular area, as well as the opportunities and restrictions that exist within them.

So, these are the goals that motivated the current study:

With the aim of defining the Sasiga and Guto Gidda areas' structures for raising livestock

In order to determine the advantages and disadvantages of raising cattle in the regions under consideration

MATERIALS AND METHODS

Location of the Study

East Wollega Zone, Oromia Regional State, Ethiopia's Guto Gidda (Uke region) and Sasiga districts were the sites of the research. As seen in Figure 1, the study site is depicted on the map. The number of animals in each district was a deliberate selection criterion. This research drew participation from three PAs in the Sasiga district and two in the Guto Gidda district.

In the Oromia Regional State, Sasiga district is one of seventeen districts in the East Wollega Zone. It is situated approximately 343 kilometers west of Addis Abe and 18 kilometers west of Nekemte, the capital of the East Wollega Zone. Benshengul Gumuz Regional State forms the district's western and northern borders, while Digga and Guto Gida districts form its southern and eastern borders, respectively. The average yearly rainfall in the district varies between 800 and 1500 mm, and its height ranges from 1200 to 1500 m.a.s.l. In Sasiga district, you can expect temperatures between 26.5 and 270 degrees Celsius. With five special towns and twenty-seven rural peasant associations (PAs), the Sasiga district is home to thirty-two PAs and twenty-eight FSCs. The district's total land area is around 980.70 km2. According to SDOAgric (2019), the district's land cover varies from 11.9% for cultivable land, 1.6% for forest land, 2.8% for grassland, and 83.7% for other land. Qarsa Mojo, Oda Gudina, and Mada Jalala were the three PAs who participated in this study.

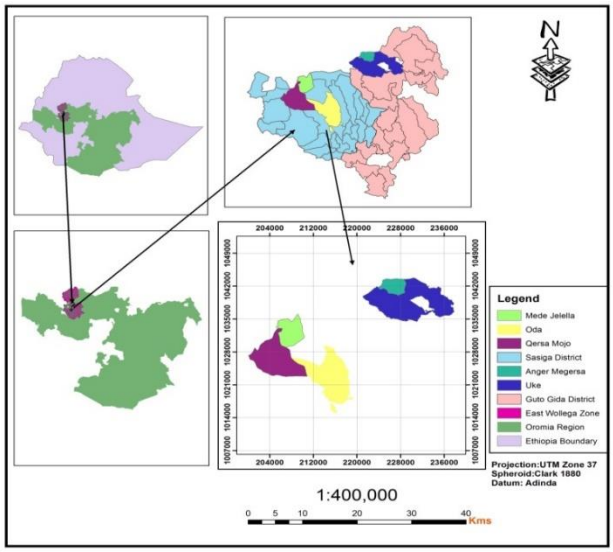

Figure 1 *Description map of study areas*

The Guto Gida district is one of seventeen in the East Wollega Zone. There are seven rural towns and twenty-one peasant groups in this area. In all, the district extends about 901.80

km^2. The northerly districts of Gidda Ayyana, Abe Dongoro, and Gudaya Bila adjoin Guto Gidda district; the eastern districts of Sibu Sire and Wayyu Tuka border the district to the east; the southern district of Leka Dullacha borders Digga and Sasiga; and the western district of Benshengul Gumuz Regional State borders Guto Gidda district. An elevation of 1,350 to 2,450 meters above sea level characterizes the territory. The agricultural landscape of the Guto Gidda district can be divided into three distinct zones: the lowland, the midland, and the highland. Temperatures slightly over 150 °C and rainfall between 1,600 mm and 2,000 mm are typical annual experiences in the district (GGOAgric, 2019).

Sampling procedures and cross-sectional survey

It was with an eye on the livestock population that the two districts were chosen. Accessibility and cattle population were used to identify five PAs, three of which were located in the Sasiga area and two in the Guto Gidda district. After Yamane (1967) compiled a list of all farmers with cattle production experience, a random sampling of households from these PAs was conducted.

$$n = \frac{N}{1+N\,(e^2)}$$

Where:

n is the sample size, N is the total households in the study area, and e is the level of precision

Data Collection Methods

To gather important information about the availability and utilization of feed resources at the study sites, data was collected using a semi-structured questionnaire survey. The source data was supplemented with secondary data obtained from the relevant district agricultural offices.

Statistical analysis

All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS, 2012. version 21).

RESULTS AND DISCUSSION

Farming activity

In the study regions, most farmers use a mixed crop-livestock production strategy. Since nearly all respondents (100%) depend on agricultural and animal production for their livelihood, it is obvious that these activities offer the primary economic foundation of livelihood in the study districts.

Household characteristics

About 83.3% of the households in this survey were headed by men, while 16.7% were headed by women. The percentage of participants who were able to read and write and who had completed elementary, secondary, or junior high school, respectively, are around 25.3%, 32.7%, 16.02%, and 0.66% of the total. The majority of the participants in this study (58%), despite the fact that education is crucial for the transfer and adoption of technology, went to elementary school or did not attend any kind of formal education. According to CSA (2015), the average household size in Ethiopia is 5.8 people, and the average family size in the research area was 5.63±2.1. There are both beneficial and bad impacts of family size on

economic growth. Bad living conditions are the result of an increase in the number of dependent groups caused by large family sizes and a lack of economic activity and income sources. Yadessa (2017) claims that greater family sizes were a result of labor-intensive agricultural activities. Respondents indicated that as family sizes grow, land holdings per person decrease. The rationale for this is that when children marry and move live with their parents, the parents are compelled to give them a portion of their land.

In terms of age, 53% of respondents were between the ages of 55 and 64, while 45% were between the ages of 45 and 54. Approximately 18% of respondents were in the 25-34 age bracket, while 34% were in the 35-44 age bracket. In terms of cattle productivity, nearly all age groups included in this study are considered active.

Landholding and land use patterns of the households

The amount of production is heavily influenced by the availability and quality of land, which is the most important limiting factor in production. Table 1 displays the average landholding per household in each PA. The integration of crop and livestock systems has been challenged by the periodic decrease in landholding per household, according to Admassu (2008). Throughout the research areas, households possessed an average of 2.75±1.89 hectares of land, with a range of 0 to 7.125 hectares. Nearly 16.7 percent of the households surveyed did not own any land at all. Through time-based contractual arrangements, these households acquire farmlands from other farmers. People without access to land raise animals by utilizing shared pastures and agricultural waste. Each district and PA has its own unique distribution of household landholdings. In the Uke, Hangar Magarsa, Oda Gudina, Mada Jalala, and Karsa Mojo PAs, the average landholding per household was 2.8±1.90 ha, 4.7±2.94 ha, 2.9±2.05 ha, 2.5±2.09 ha, and 3.8±2.44 ha, respectively. When compared to the national average landholding (1.15 ha/household) and the Oromia region's reported 0.96 ha/household (CSA, 2011), the current study's average total landholding (2.75±1.89 ha/household) significantly greater.

On average, 1.8±1.31 hectares of land was set aside for crop production in the research regions, with a range of 0 to 5 hectares, and an overall average of 0.4±0.51 hectares for grazing. Each household is allotted 1.78 hectares (53.74% of the total land area) for crop production and 0.40 hectares (12.2%) for private grazing, according to the respondents.

Mada Jalala, Oda Gudina, and Qarsa Mojo were all state farms during the 17 years of the Dargue government (until 1991). Many of the mentioned PAs were populated by Oromo people from the eastern section of Oromia, Hararghe zone, after the Dergue regime fell. The residents of the Oda Gudina and Mada Jalala PAs were also given plots of irrigated land that had been developed by non-governmental organizations. Approximately 0.125 hectares belonged to each household. Most of the irrigated lands were covered with Chat tree, a stimulant crop that was highly preferred at the time of the current study. When it's dry, the owners sow sweet potatoes

in the spaces between their Chat trees. There are two uses for sweet potatoes. During the dry season, the sweet potato's leaves are utilized as green fodder for animals, while the root is consumed. The larger a household's landholding, the more livestock they can keep. Many animals are kept by households with big plots of land, while less cattle are kept by respondents with smaller plots of land.

Table 1

Least squares mean (LSM±SE) of average land holding (ha) of households in the study areas

Land allocated for different purposes	Guto Gida district		Sasiga district			Overall mean landholding per household
	Uke	Hangar Magarsa	Oda Gudina	Mada Jalala	Qarsa Mojo	
Cropland	1.8±1.31	3.6±2.46	1.8±1.35	1.6±1.47	2.3±1.58	2.2±1.80
Grazing land	0.4±0.51	0.5±0.57	0.4±0.56	0.3±0.31	0.4±0.43	0.4±0.48
Fallow land	0.5±0.49	0.4±0.47	0.5±0.45	0.4±0.50	0.8±1.03	0.5±0.64
Forest land	0.13±2.80	0.18±0.20	0.17±0.20	0.13±0.17	0.19±0.18	0.16±.18
Irrigated land	-	-	0.09±0.06	0.08±0.06	-	0.03±0.06
TLH/HH	2.8±1.90	4.7±2.94	2.9±2.05	2.46±2.09	3.8±2.44	3.3±2.42
Mean family size	5±1.60	5.2±1.79	5±1.70	7.3±2.40	5.7±2.10	5.6±2.10

TLH= Total landholding; HH= household; ha=hectare

Purpose of livestock production and livestock holding per household

One of the most common types of livestock in Ethiopia is cattle. Cattle are kept by households for many different purposes. The causes differ among socioeconomic categories, agroecological settings, production methods, and ethnic groups (Chimonyo et al., 1999). Ranchers in the research regions typically raise cattle for reasons, milk output, and revenue (57%). Some 43% of those who took the survey raise cattle for meat and other animal products, mostly for personal use. Oxen are employed for pulling purposes and as a source of money in the regions under investigation. Following its two or three years of traction use, oxen is conditioned, fattened, and sold. The primary sources of income are cattle, which are utilized for draft power, milk, meat, skin, and hides (Zewdu et al., 2014). In contrast, tiny ruminants are mostly kept for domestic use (56.1% of the population), as a source of revenue, and as a sacred animal for religious festivals. Domestic consumption and revenue generation are the primary uses for chicken in the studied locations. The sole purpose of all horses is to carry people and agricultural goods to and from the market.

Table 2 details the average number of cattle held per household in the study locations. The area's most common livestock species are cattle, next goats, and finally sheep. In agreement with the present conclusion, CSA (2021) also noted that, on a national basis, 70 million heads of cattle, 52.5 million heads of goats, and 42.9 million heads of sheep are the most numerous livestock species. The current survey found that on average, each household had 10.2±5.60 cattle, 2.5±2.46, 3.3±2.93, 0.7±0.75, 6.3±3.66, donkeys, beehives, and chicks, respectively. There is a wide range in the kinds and numbers of livestock kept by different households. Over 60% of people who took the survey said they wouldn't want to increase their herd size due to the periodic decline in available grazing pasture. The present research confirms that the size of a household's landholding correlates with the number of animals they keep.

Table 2

The least squares mean (LSM±SE) of livestock holding per household in the study areas

	Guto Gidda district			Sasiga district		Overall Average
Livestock Holding	Uke	Hangar Magarsa	Oda Gudina	Mada Jalala	Qarsa Mojo	
Cattle	11.6±6.70	12.1±5.66	10.7±5.22	6.5±3.20	10.1±5.12	10.2±5.60
Sheep	3.2±3.21	2.4±2.09	2.9±2.83	6.5±3.20	10.1±5.12	2.5±2.48
Goat	3.7±3.80	3.4±2.68	3.4±2.29	2.6±1.92	3.4± 3.53	3.3±2.93
Donkey	0.73±0.74	0.7±0.64	0.9±0.93	0.47±.63	0.8±0.75	0.7±0.75
Chicken	6.3±4.07	6.6±3.13	5.3± 2.59	6.1±3.80	7.1±4.45	6.3±3.66
Beehive	1.7±1.85	1.9±2.52	1.8±2.18	1.8±2.44	1.7±2.10	1.8±2.20

LIH=livestock holding;

Fattening practices of the study area

Within the research areas, approximately 58% of the respondents engage in cattle fattening. Most of the fattening in the region is done according to the Hararege method. The research regions rely on pasture-based fattening. Nearly three quarters of the people surveyed in the research regions, particularly in Sasiga district, identify as Oromo, a people hailing from the Hararghe zones. As a result, this method of fattening is widely used. Natural pasture, crop leftovers (e.g., corn stover, sorghum stover, groundnut straw), over-matured sweet potato leaves, cucumber (fruit), and chat leaves are the main feed sources for fattening. Cattle fatteners augment the diets of fattening animals with around two to three cobs of early-mature maize each animal. A common practice during the dry season involves planting sweet potatoes between rows of chat trees. The purpose is to harvest the leaf for feed and eat the root. Green fodder for male cattle is the maize leaves that are sown on the moist bottom land, which is locally known as "Bone" in Afan

Oromo. From the base of the plant, producers pluck the over-matured leaves (those that have turned a yellowish hue) and feed them to their animals that are kept in the backyard or under sheds.

Attala, which are by-products of local breweries, are common supplemental food for fattening livestock. Brewery by-products provide a significant supplemental feed for around 18.33% of cattle farmers in the Guto Gidda district, particularly in the Uke area. The reported by-products of breweries like 'Areke' and 'Tella' are available for supplementary purposes because of the significant demand for local brewers in Uke town. Residents of Uke Town who work with dairy cows also make use of the by-products. Having said that, the Sasiga district does not typically make use of the aforementioned by-products. Concentrate supplementary feeds, such as agro-industrial items like wheat bran, are unavailable in the research regions, despite the fact that livestock farmers are interested in implementing fattening systems that are market-oriented.

Housing system

In order to house their cattle, over half of the people surveyed said they utilize an open shed with an earthen floor. In order to keep mature cattle safe from predators and to stop them from wandering around and harming crops or other properties, most responders (50.7%) utilize open enclosures or kraals during the night. The kraal is moved to neighboring locations on a periodic basis by cattle owners when it becomes muddy. Moving a kraal to a clean, neighboring spot when it gets dirty helps with two things at once: first, spreading manure across the farmland as the kraal travels to different parts of the farm, and second, keeping the kraal clean itself. The smallholder farming system has been able to persevere and thrive thanks in large part to this and other highly practical indigenous traditional techniques. Every day, the family cleans up the feces and urine from the small ruminants, young calves, and chickens that live in a corner of the kitchen and home.

According to the people who took part in this survey, an open shed is the best way to keep dairy cows and fattening bulls dry and protected from the elements. When fattening male cattle at night, it is common practice to tether them to pegs in the backyard so they don't get away and ruin the crops. It is common practice for producers to move the pegs around so that the animals may graze adequately and so that the manure can be spread on fields to increase its fertility. The problem is that without constant supervision, cattle kept in this way are easy prey for predators and robbers.

Feeding and watering practices

A whopping 66.7% of people who took the survey said they used either family or paid hands to herd their animals. However, nearly one-third of those who took the survey were engaging in both zero-gazing and herding behaviors. The majority of respondents (94.8%) stated that animals in the study regions use group watering systems to acquire water from the Running River. All of the research regions had quite comparable irrigation systems. It is common practice to either water young calves, pregnant cows, ill

animals, and fattening animals at home or to make the long walk to local watering holes. All participants in the survey reported watering their animals twice daily, and the typical distance to the watering spot was 1.4 km. It appears that water is not a big concern in either district, as respondents noted the presence of numerous perennial rivers throughout the research areas.

Extension services

Animal health and artificial insemination services

In the research areas, parasites, infectious illnesses, and trypanosomes were named as the main obstacles limiting cattle productivity and production by 32%, 80%, and 100% of respondents, respectively. All PAs included in the current study have access to veterinary services, whether public or private, and the average distance between them is around 2.82 kilometers. When producers see that their breeding cows or heifers are getting hot, they do contact researchers or specialists in artificial insemination (AI) via phone. After the conversation ends, the AI technician hops on a motorcycle and rides to each district's designated call location. An increase in the number of AI centers may be necessary if the technician fails to detect the standing heat and the semen dies as a result of environmental conditions like direct sunlight.

Natural matting and AI are both utilized in the study locations. Roughly 70% of people who took the survey own breeding bulls. Conversely, approximately 11.3% of responders use AI services, while 18.7% go to their neighbors for bull service. The breeding bulls do not receive any special treatment from the producers. Due to lower market demand and feed responsiveness, castrated bulls are not castrated. Consequently, this treatment is not used to bulls.

Access to credit services

Veterinarian medications and other inputs are easily accessible in the research regions. Respondents indicated that, with the exception of fertilizer, financing services to increase crop and livestock output were not readily available. The sole entity entrusted with the responsibility of facilitating credit services for commodities like fertiliser is the district offices of agriculture. However, there are a number of significant obstacles that farmers face when trying to get credit, including stringent regulations (such as the need to save money in order to get credit) and the service's limited capacity (i.e., the small amount of money provided is equal to the amount saved).

Market information

For farmers, a lack of market knowledge is a major obstacle to increased output and efficiency. Producers lacked access to trustworthy market data, according to respondents. Duguma et al. (2012) states that farmers typically learn about the market either talking to other farmers or going to the market in person before making a purchase. Respondents primarily sell their animals at farm stalls in the Sasiga district, whereas those from the Guto Gidda district sell them to Uke Market. Livestock producers sell their animals wherever they think it's suitable, according to Duguma et al. (2012), who analyzed the value

chain of sheep in Horro Guduru Zone. Markets close by or far away can provide a better price, or they can sell them at the farm gate. The lack of a personal connection between buyers and sellers makes brokers more lucrative than producers in cattle selling, according to this study's respondents.

Major feed resources are available in the study areas.

In the regions under consideration, natural pasture, followed by crop wastes and crop aftermaths, constituted the most important feed supply. In the Guto Gida area, communal grazing land, private grazing land, and crop leftovers were the top three feed sources; in the Sasiga district, private grazing land and crop residues were the top two. Communal and private grazing fields are present in both research districts. Compared to the Guto Gidda district, smallholder households in Sasiga are more likely to fence their private grazing land. While nearly all respondents in the first district fenced up their private grazing areas, just over 43.33 percent of those in the Guto Gidda district did the same. Cattle graze the agricultural residue on bottomlands, roadsides, and riverbanks during the dry season. Both research areas are home to several perennial rivers, which provide abundant year-round green forages. Because most arable land is ploughed and covered with various crops throughout the rainy season, cattle also face feed problems, according to responses. When it's dry, farmers gather green fodder (pasture) from fields of chat plants, animal-eating tree and banana leaves, and crop leftovers. The findings of this study are in line with those of Belay and Geert (2015), who also noted a significant feed scarcity during the dry season. In order to feed their animals during the dry season, livestock farmers in the study areas store crop wastes, including maize and sorghum. Nearly everyone in the Sasiga district who took the survey said they save hay for when the weather gets dry. To make hay, most farmers collect grass from areas such as their own pastures, the sides of roads, and the edges of their agricultural fields. For the dry season, some of the responders also buy hay made from grass that grows on the grounds of churches and public buildings like schools.

In the study locations, other unconventional feeds were also utilized, such as banana and chat leaves, sweet potato vine, and cucumber (fruit). As a percentage of feed resources, non-conventional feed accounts for approximately 15% in the Guto Gidda district and 24.4% in the Sasiga district. The producers would slice cucumbers and feed them to their livestock. In both the rainy and dry seasons, animals can be supplemented with sweet potato plants.

Compared to the rainy season, the dry season saw a greater utilization of enhanced fodder. When it's dry, farmers feed their animals pigeon pea, elephant grass, and mulberry. Natural pasture is the primary feed source during the rainy season, according to Assefa et al. (2015), who also discovered that crop leftovers and stored hay are the primary feeds used during the dry season.

Grazing land management

The research regions do not typically experience communal grazing land management methods like enclosure or fertilizer application. Some of the management measures include weeding and

enclosing or fencing the plot of private grazing areas to prevent animals from entering. Hay is made or green feed is distributed using the cut-and-carry procedure from the grasses collected from the pastures. Producers collect overmatured grass from their own grazing areas, when its nutritional value has dropped and its fiber content has risen, according to the research. Both the feed's digestibility and the amount consumed can suffer as a result.

Improved forage development practices in the study areas

When feed is scarce, smallholder farmers can deal with the situation in a variety of ways by utilizing forage development strategies. Having said that, the research regions do not typically engage in better forage development. Out of all the responses, only approximately 28.9% in the Sasiga district and 26.0% in the Guto Gidda district grow improved forage. According to Ahmed et al. (2010), only approximately 35.0 percent of families in the Central Highlands of Ethiopia grow improved forages to help with feed shortages during the dry season. Farmers in the present research areas who lived closer to the farmers' training centers (FTCs) had easier access to development agents' assistance, planting materials, and improved forage seeds and planting techniques than farmers farther away from the FTCs. This is due to the fact that the FTC centers act as instructional and demonstration hubs for various technologies. Model farmers receive a lot of attention from extension workers, and the adoption of technology is correlated with distance from FTC (Delgado et al., 1999).

Major problems and opportunities

The current study found that there are some similar challenges that limit cattle productivity in both the Guto Gidda and Sasiga areas (Table 3). The current study highlights several significant challenges in the field of livestock husbandry, including gaps in knowledge, feed shortages, illness prevalence, improved breed shortages, unorganized marketplaces, and the road problem when it comes to marketing animals.

Table 3

Major issues and respective solutions suggested by respondents from the study areas

Major Challenges	Suggested solutions
Lack of knowledge of improved livestock production techniques	Intensive capacity building in line with different needs
Livestock diseases	Isolation of diseased animals, utilization of traditional and veterinary medicine, and seasonal vaccination are more important. Especially to control trypanosomosis

Seasonal feed shortage	Proper preservation and utilization of crop residue (CR) intensive production of improved forage species and managing of the communal graze land of the area
Shortage of improved breed/genotypes	Strengthening/enhancing the use of AI services
Unorganized Marketing systems	Co-operating the livestock producers of the area, to avoid over-exploitation of livestock producers by bargainers.
Table.3 continues…	
Lack of by-products and formulated ratio in the study areas	Organizing, supporting, and encouraging people of the area as they brought and distributed this byproduct and formulated ration to the farmers. While doing so, they get a job opportunity.
Problem of road, especially summer season they suffer	Constructing/improving roads to avoid problem

One of the main obstacles, especially in the summer, was traffic congestion. The majority of the roads in the study regions are not designed for wet weather, thus they become muddy when it rains. Conversely, as a result of relatively large acreage sizes owned by households and the availability of sufficient rainfall, the two districts included in this study show tremendous promise for crop and livestock production.

Most limiting issues in both research districts were a lack of improved livestock breeds and contemporary scientific knowledge of livestock management. Other concerns included problems with roads, feed shortages, poorly organized markets, and livestock diseases. Oda Gudina, Mada Jalala, and Karsa Mojo were just a few of the Sasiga district's peasant organizations (PAS) that had severe issues gaining access to banking services. Distance was cited as the main cause for the lack of bank service, leaving farmers vulnerable to theft when they travel with cash. In addition, Karsa Mojo, PA, experienced a water scarcity. Producers in Pennsylvania must carry their animals for great distances to find water because perennial rivers do not exist in the state.

CONCLUSIONS

The potential for cattle production may exist in the present research locations due to the sparse population and relatively high land holdings per household compared to many other parts of Ethiopia (Gemeda et al., 2012). Moreover, the Oromo people of the Sasiga district have settled there from the Hararghe zones, and they have a wealth of knowledge and expertise when it comes to fattening cattle, especially intact bulls, and conserving feed through the use of hay, storing and utilizing crop residues, and a suitable feeding system like zero grazing. The second chance comes from the 200 hectares of irrigation land that the local NGO constructed and distributed to farmers. This means they can keep their animals supplied with green food all year round, even when the weather is dry.

With the right kind of administration, the communal grazing areas in the Guto Gidda district are far larger than those in the Sasiga district. The farmers in the area aren't making good use of the resources, said the respondents. Sustainable solutions to seasonal feed shortages may be possible if the plentiful pastures that are accessible during the rainy season are preserved, managed, and used appropriately. This could lead to an increase in livestock productivity.

ACKNOWLEDGMENTS

The authors are thankful to Wollega University for providing the necessary facilities to accomplish this study.

DECLARATION

No conflict of interest among the authors

DATA AVAILABILITY

The data supporting the findings are available within the article materials.

REFERENCES

Admassu, Y. M. (2008). *Assessment of livestock feed resources utilization in Alaba Woreda, Southern Ethiopia* (Doctoral dissertation), Haramaya University, Ethiopia.

Adugna, T. (2007). Feed resources for producing export quality meat and livestock in Ethiopia examples from selected Woredas in Oromia and SNNP Regional States. http://publication.eiar.gov.et:8080/xmlui/handle/123456789/3038?show=full

Ahmed, H., Abule, E., Mohammed, K., & Treydte, A. C. (2010). Livestock feed resources utilization and management as influenced by altitude in the Central Highlands of Ethiopia. *Livestock research for rural development*, *22*(12),229.

Alemayehu, M. (2005). Feed Resources Base of Ethiopia: Status, limitations and opportunities for integrated development. *ESAP Proceedings*, *377*.

Assefa, F., Ano, T., Aba, T., & Ebrahim, Z. (2015). Assessment of improved forage types and their utilization in Shashogo Woreda, Hadiya zone, Southern Ethiopia. *Global Journal of Animal Science, livestock production and animal breeding*, *3*(6), 227-230.

Ayele, S., Assegid, W., Jabbar, M.A., Ahmed, M.M. & Belachew, H. (2003). Livestock marketing in Ethiopia: a review of structure, performance, and development initiatives, *Socioeconomic and Policy Research Working Paper*, *52*, International Livestock Research Institute (ILRI), Nairobi, Kenya.

Behnke, R. & Metaferia, F. (2010). The Contribution of Livestock to the Ethiopian Economy-Part II, *IGAD Livestock Policy Initiative (LPI) Working Paper*, 2, 11.www.igad-lpi.org/ publication/ docs/ IGADLPI-WP-02-11-Part II.

Belay, D., & Geert, P. J. (2016). Assessment of feed resources, feeding practices, and coping strategies to feed scarcity by smallholder urban dairy producers in

Jimma town, Ethiopia. *SpringerPlus*, *5*, 1-10.

Berhanu. A., Melaku, S., & Prasad, N. K. (2007). Effects of varying seed proportions and harvesting stages on biological compatibility and forage yield of oats (Avena sativa L.) and vetch (Vicia villosa R.) mixtures. *Livestock Research for Rural Development*, *19*(1), 12.

Chimonyo, M., Kusina, N.T., Hamudi kuwanda, H., & Nyoni, O. (1999). A survey on land use and usage of cattle for draught in a smallholder farming area of Zimbabwe. *Journal of Applied Sciences for Southern Africa, 5*(2), 111-121.

CSA (Central Statistical Agency), (2015). *Agricultural Sample Survey*, Livestock and Livestock Characteristics (private peasant holdings), Ethiopia

CSA (Central Statistical Agency), (2021). Federal Democratic Republic of Ethiopia, Central Statistics Agency, *Agricultural Sample Survey*, Addis Ababa, Ethiopia.

CSA, (2011). *Federal Democratic Republic of Ethiopia Central Statistical Agency*, Addis Ababa, Ethiopia.

Delgado, C., Rosegrant, M., Steinfeld, H., Ehui, S., & Courbois, C. (1999). Livestock to 2020. Food, Agriculture and the Environment, *Discussion Paper, 28*. Washington DC, USA.

Duguma, G., Jembere, T., Degefa, K., Temesgen, W., Kumsa, A., Wamatu, J., & Duncan, A.J. (2012). Chacterization of the farming and livestock production systems and the potential to enhance livestock productivity through improved feeding in Horro district, Ethiopia. *International Agricultural Research in Dry Areas* (ICARDA). http://hdl.handle.net/10568/35373.

Elias, M., Berhanu, G., Hoekstra, D. & Jabbar, M. (2007). Analysis of the Ethio-Sudan cross-border cattle trade: The case of Amhara Regional State. IPMS (Improving Productivity and Market Success) of Ethiopian Farmers Project Working Paper 4. ILRI (International Livestock Research Institute), Nairobi, Kenya.

FAO. (2010). *Production year book ,55*. FAO, Rome, Italy.

Getahun, L., Marianna, S., Girma, A., & Anne, V. (2010). Economic performance of small ruminants in mixed-farming systems of Southern Ethiopia. *Tropical animal health and production*, *42*, 1531-1539.

GGO Agric, (2019). Guto Gidda District Office of Agriculture, Annual Report.

Hindrichsen, I. K., Osuji, P. O., Odenyo, A. A., Madsen, J., & Hvelplund, T. (2004). Effect of supplementation of maize stover with foliage of various tropical multipurpose trees and Lablab purpureus on intake, rumen fermentation, digesta kinetics and microbial protein supply of sheep. *Animal Feed Science and Technology*, *113*(1), 83-96.

Melaku, T. (2011). Oxenization versus tractorization: Options and constraints for Ethiopian framing system. *International journal of sustainable agriculture*, *3*(1), 11-20.

SDO Agric, (2019). Sasiga District Office of Agriculture, Annual Report.

Shapiro, B.I., Gebru, G., Desta, S., Negassa, A., Nigussie, K., Aboset, G., & Mechal,

H. (2015). Ethiopia Livestock Master Plan. International Livestock Research Institute (ILRI), Project Report. Nairobi, Kenya.

SPSS (Statistical Package for Social Science) (2012) International Businesses machines of Statistical Package for Social Sciences Statistics for Windows, Version 21.0.

Thornton, P. K. (2010). Livestock production: recent trends, future prospects. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *365*(1554), 2853-2867.

Tsigeyohannes, H. (2000). Livestock feed security and associated impacts on sustainable agricultural development. In: Proceedings of the 7th Annual Conference of Ethiopian Society of Animal Production (ESAP), Addis Ababa, Ethiopia, 26-27 May 1999. pp: 51-61.

Yadessa, E., Tulu, D., Bogale, A., Mengistu, G., Aleme, M., Shiferawu, S., Esatu, W., & Amare, A. (2017). Characterization of smallholder poultry production systems in Mezhenger, Sheka and Benchi-Maji zones of south western Ethiopia. *Research Journal of Agricultural Science Research*, *5*(1), 2360-7874.

Yamane, T. (1967). *Statistics, An Introductory Analysis*, (2nd edition), New York: Harper and Row.

Zewdie, W., & Yoseph, M. (2014). Feed resources availability and livestock production in the central rift valley of Ethiopia. *International Journal of livestock production*, *5*(2), 30-35.

Zewdu, S., Kassa, B., Agza, B., Alemu, F., & Muleta, G. (2014). Smallholder cattle production systems in Metekel zone, northwest Ethiopia. *Research Journal of Agriculture and Environmental Management*, *3*(2), 151-157.