



Production Potentials and Strategic Constraints of livestock in Gedeb District, Gedeo Zone, SNNPR, Ethiopia

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Abstract

Gedeb district is known for its livestock production in the Gedeo zone of SNNPRS. Various types of livestock being raised were manifestations of livestock potential of this district although various factors of production and productivity were retaining back development of the sector. Therefore, this study was conducted in Gedeb district to identify and document the recurrent production potential and constraints in the livestock sector so as to base research and development works on the output. To achieve these objectives, checklists were prepared; sample Kebeles, focus group discussion (FGD) participants and key informants were purposively selected, interviewed and discussions were made. Secondary data were collected from the districts and selected Kebeles. The data collected were analyzed using descriptive statistics. The result indicated that availability of a large flock of livestock species such as cattle, sheep, poultry, honey bee, fish, and equine; the trend of rearing improved breeds of dairy, beef, and poultry; improved forage crops, and supplementary feeds as commonly used feed resources among others were identified as major potentials and opportunities of livestock production. Whereas, a decreasing trend of grazing land; diseases prevalence; absence of modern equipment and lack of experience in the fishery/aquaculture; lack of modern hive; lack of training; lack of improved breed of goat and equines; lack of improved steer and sheep for mating; absence of oil crop cakes and molasses and the likes were identified as constraints in livestock production in the district. Based on these results, research, demonstrations, and training on livestock disease and parasite management; training and demonstration of technologies such as modern hive and fish production; demonstration of improved breeds and training on their management; demonstration of industrial feeds of livestock such as oil cake and molasses; research on breed improvements such as sheep and equine; strengthening and modernizing of some services such as AI and bull services; researches on impacts of infrastructures such as veterinary clinics and others; training on strengthening extension system and the likes were some of the ways forward recommended to be undertaken to enhance production and productivity of livestock in the study district.

Keywords: *livestock production; opportunities; constraints; descriptive statistics*

1. Introduction

Ethiopia is first in Africa and tenth in the world in livestock population although lots of natural and human made catastrophes were holding back the development of the sector in terms of quality and quantity. The total estimated livestock species and their number include 65 million cattle, 40 million sheep, 51 million goats, 8 million camels and 49 million chickens as per the 2020 statistical abstracts of central Statistical Agency (CSA, 2020 cited in Management Entity, (2021). It had been an integral part of crop production since the advent of agriculture in Ethiopia. The livestock sector in Ethiopia is estimated to account for 18% of the GDP; provides employment to over 30% of the agricultural labor force; and produces 40% of the income the

country generates from the agricultural sector (Aleme & Lemma, 2015). Therefore, it is believed that developing this sector is crucial to boost national economy at one hand and the livelihood of smallholder farmers on the other hand (Shapiro, et al., 2017).

In this regard, Gedeb district is known for its high production of livestock in Gedeo zone of SNNPR of Ethiopia. Almost all domestic animals are being reared in the district even though various challenges have been testing the sector not to escalate to the expected level. Therefore, assessing and properly quantifying those production potentials and strategic constraints, and working on them had been crucial to enhance production and productivity of the sector. Doing that is believed to enable identify those major bottlenecks of livestock production that can be basis for research and development works, and enables to use limited resources efficiently. Hence, this study was conducted in this sense of understanding.

2. Research Methodology

Two Kebeles of Gedeb district were selected based on livestock production and productivity potential by the district's agriculture office experts, which were believed to represent the production potentials and constraints of the district well. The Kebeles were Gedeb Gubeta and Otilcho. One FGD per each Kebele consisting of 8 participants were formed, and discussions were conducted based on the FGD guiding questionnaires and checklists. The participants were from various social strata including model farmers, kebele administration representatives, Elders, women and youth. In addition, key informants were purposively selected, interviewed and discussion were conducted using checklists. Secondary data were also taken from Kebele repositories. Finally, the data were analyzed using descriptive statistics and priorities of the identified problems were ranked using pair wise ranking method.

3. Results and Discussion

3.1. Description of Gedeb district

Gedeb district is one of the 7 districts of Gedeo zone. It is located at the southern part of Gedeo zone. Agro-ecologically, the district is 75% Dega (Highland) and 25% woinadega (Midland) (GARDO, 2021). Two representative sample kebeles namely Gedeb Gubeta and Harmufo were selected from Gedeb district to understand the production potentials and constraints of livestock production and productivity of the District. The mean land holding of the District was 0.5ha with minim of 0.125 and maximum of 1.25ha. Astronomically, the district is located at 7° 19' North latitude and 39° 17' 0" East longitude. The altitude ranges from 2250-2367masl. The figure 1 bellow shows map of Gedeb district.

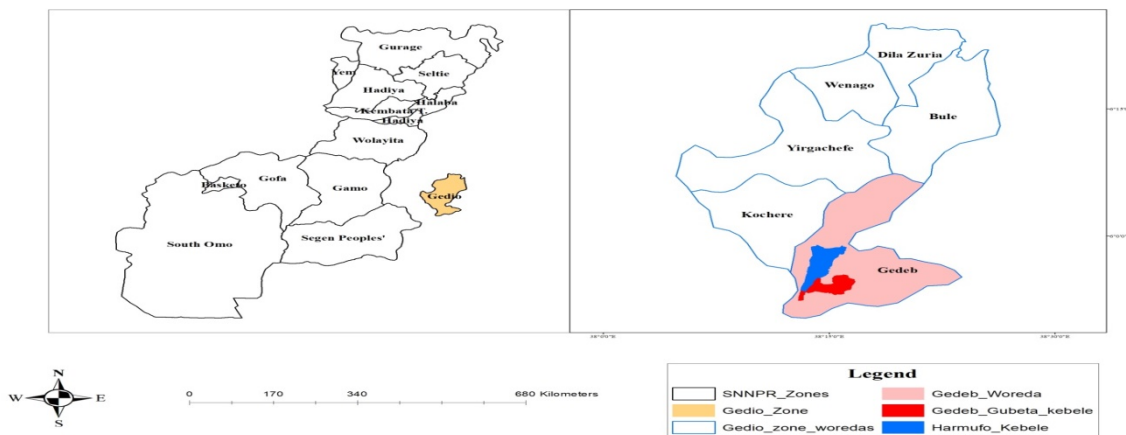


Figure 1. Map of Gedeb District

3.2. Livestock types and purpose of rearing

The main livestock species reared in the district include cattle, sheep, poultry, honeybee, and equine (especially horse). According to FGD participants, only two persons practice aquaculture to produce fish by using earthen ponds and goats are seen rarely in the district. The main purposes of rearing these livestock species were for home consumption, drought power, transport, and market. There were also farmers who were producing livestock for Prestige.

3.3. Livestock species and performance

As discussed in table 1 below, there were improved breeds of Dairy, Beef, and Poultry being produced in addition to the local breeds available. As indicated in the table, there were no improved sheep and equine in the district and Goat is never being reared in the district. The main sources of these improved breeds were district agriculture office, market, cooperatives such as Ethio chicken & Dehub chicken. Sources of the local breeds were home grown, Heritage and market. As per the responses of FGD participants, the local dairy cow yield 1-3 litter milk per day whereas the improved dairy cow yield 6-8 litter per day, which implies low productivity in both cases. Improved poultry breeds yield 300 eggs/year whereas local breeds yield 160 eggs per annum on average terms. Age at puberty was 3-4 years for improved dairy cow and 4-5 years for local ones. It is around 3 years for equine, and 8 months for sheep. The calving interval for improved dairy cow in the district is 2 years and for that of local breeds is 1 year and 6 months. It is around 6 months for sheep and 3-5 months for improved poultry breeds. Lactation length for improved dairy cow is 7 months and that of local ones is 5 months. The FGD discussants argued that more than 6 years were accounted since improved breeds of dairy caws and beef were introduced in the district. They also reported that 4 years passed since new poultry breeds came to the district which is very low in this regime where lots of improved breeds come in a yearly basis.

Gedeb District is a home for sheep. It is known by its high production. The secondary data taken from the two sample Kebeles indicated that the amount of sheep being kept in these two kebeles were 8744, which is considerable amount. But all of them were local (annexes 1 and 2). Therefore, there has to be an improvement program such as community sheep breeding program, which is believed to enhance the sheep production by through its molecular characterization process that are being seen in other parts of the countru such as Bong and Doyogena.

Table 1. Livestock types, source and Productive and reproductive performance

Livestock species	Improved (Yes, No)	Source	Local (Yes, No)	Source	Yield (milk/day, egg/year, honey/year)/head		Productive and reproductive performance						Duration of improved breed entry (year)
					Local	Improved	Age at puberty (yr)		Calving/clutching Interval		Lactation length		
							Improved	Local	Improved	Local	Improved	Local	
Dairy	Yes	Extension	Yes	Heritage, mkt, born at home	1-3 L/D	6-8 L/D	3-4	4-5	1-5 yrs	1yr & 6 months			6 years
Beef	Yes	Extension	Yes	mkt									6 years
Sheep	No		Yes	mkt, born at home				8 month		6 months			
Goat													
Poultry	Yes	Extension, mkt, cooperative (Ethio & Debub chicken)	Yes	mkt, born at home	160/yr	300/yr	3 months	3 month	1 week	4-5 months	-----	-----	4 years
Equine	no		Yes	mkt, born at home				1 yr					

As per the responses of FGD participants, high amount of yield (milk, egg.), long lactation period, long egg lying period, fast growth and high price were the main advantages of rearing improved breeds over the local ones and were also the reasons why some of the farmers in their locality were engaged in rearing of improved breeds. They also argued that improved breeds are not only advantageous. As per them, some of the disadvantages of rearing improved breeds include that improved breeds consume high amount of feed and water, they need additional labor hour for management such as feeding, watering and cleaning. The local ones have advantage of consuming low amount of feed and water, and they need low supplementary feed over the improved ones. Their disadvantage is that they have low market price, give low yield and are not disease resistant compared to the improved ones.

3.4. Inputs used for livestock production

As discussed in table 14 below, the mating of both dairy and sheep were being undertaken by using local breeds. There is no improved steer and sheep for mating. Since there are improved Poultry breeds, the mating was being undertaken by both local and improved ones. There is also AI service in the district for dairy cow and sheep. Both free grazing and Stall feeding were practiced in the district as a feeding system for all livestock type. Farms in the district prepare separate housing for livestock. But some farmers owning poultry use the same house. The medication being given for sick livestock in the district is Pharmaceutical. Water is available but at a distant place. It is a little-bit difficult to get. The average distance farmers' travel to fetch water is around 2 km or 1 hour travel.



Table 2. Inputs used in Gedeb district

Livestock class	Mating		AI	Feeding		Housing (√)		Health (√)		Water		Remark
	Bull			Free grazing	Stall feeding	Same house	Separate	Traditional	Pharmaceutical	available (yes/no)	Average Distance/wh	
	Improved	Local										
Dairy		√	√	√	√		√		√	Yes	1	Water is a little-bit difficult to get
Goat												
Sheep		√	√	√	√	√	√		√	Yes	1	
Poultry	√	√	√	√	√	√	√		√	yes	1	

Note= WH=walking hour

3.5. Commonly used feed resources

According to participants in FGD, Natural pasture, improved forage crops, Supplementary feed, House waste and Crop residues were commonly used feed resources in Gedeb district . The dominantly used feed type in the district is natural pasture (NP). Farmers in the district use cut & carry natural pasture and also they send their livestock for grazing. Both improved grass and legume forages were available in the study district . Supplementary feeds used in the study district were concentrate and wheat bran. Farmers were not familiar with oil crop cakes and molasses. House waste is out of the main livestock feed that have being given to all livestock types. Out of crop residues, mainly used feeds were cereal crops residues and there was no trend of giving root/tuber crops and pulse crops for livestock (Table 15).

Table 3. Commonly feed resources used in Gedeb District

Livestock class	Natural pasture		Improved forage crops		Supplementary feed				House waste	Crop residues			Dominantly used sources (NP, IF, SF), HW, CR)
	Grazing	Cut & carry	Grass	Legumes	Concentrate	Wheat bran	Oil crop cakes	Molasses		Root/tuber	Pulse	Cereal	
Dairy	√	√	√	√	√	√			√			√	NP
Beef		√	√		√	√			√			√	NP
Goat													
Sheep	√	√	√	√	√	√			√			√	NP
Poultry	√	√			√	√			√			√	NP
Fishery													



Trend of improved forage utilization for the last five years was increasing due to that the extension system is expanding the practice. The main source of improved forage crops is extension system as per the responses of FGD participants. The common grass species produced in order of area coverage were Desho and Elephant grasses. The common legume species produced in the study district in order of area coverage were susbania, cow pea, and pigeon pea. The commonly practiced methods of crop residues preparation/treating were treating with salt and water, chopping, and giving to livestock as it is. Hay making, silage, and hipping were being practices as feed conservation practices in the study district . According to the participant farmers in FGD, the trend of grazing land holding per household is decreasing from time to time. They argue that this is due to expansion of urbanization, and increase in population. Currently, there is no grazing land in the study area.

3.6. Common diseases and parasites of livestock species

Lots of livestock diseases were prevalent in the study area (Table 16). These diseases include tripanosomiasis, black leg, antrax, Ovine pastoralis, Coughing, neucasel disease, FMD, AHS, Alserative lymphangitise, and Ephithotic lymphangitise. As indicated in table 16 above, all livestock types were susceptible to diseases mentioned above. The first two diseases are diseases of dairy cattle and the last three diseases were diseases of only equines. Most of the diseases were severe in rainy season from May to September; some others were severe irrespective of season (any season). Out of these diseases, Antrax, Newcastle disease and black leg were ranked by farmers from the first to third most severe and important diseases. The locally available measures in the district were taking the sick livestock to veterinary clinic available in each kebele and simply giving recommended medications by veterinary Experts. The FGD participants also reported that there is no treatment for some diseases such as Alserative lymphangitise, Ephithotic lymphangitise and liver disease. They suggested further investigation/research intervention/ on these non-curable diseases (Table 16)

Table 4. Common diseases and parasites of livestock species in Gedeb district

Diseases Name	Livestock classed affected					Severity season (month)	Rank AC to importance	Locally available measures	Proposed interventions
	Dairy	Goat	Sheep	Poultry	Equine				
Gendi (trichinosis)	√					Rainy season	9	Taking to vet. clinic	Increase vet. clinic
Aba gorba (black leg)	√					Rainy season from May-September (in relation to grazing)	3	Vaccine	
Liver disease (Yegubet beshita)	√					Rainy season/summer (May-September)	5	No	Research intervention
Aba senga (anthrax)	√		√		√	Rainy season	1	Taking to vet. clinic	
Ovine pastoralis (Gororsa)	√		√			Rainy season	6	Taking to vet. clinic	
Coughing (Gunfan)			√	√	√	Any season	8	Vaccine	
Fengil (neucasel disease)				√		Any season	2	Vaccine	
Foot mouse disease (FMD)				√		Any season	10	Giving recommended medications by vet. Experts	
African Hours Sickness (AHS)					√	Rarely	11	Giving recommended medications by vet. Experts	
Alserative lymphangitise (Borchoka)					√	Any season	4	No treatment	Research
Ephithotic lymphangitise					√	Any season	7	No treatment	Research

3.7. Fish and Apiculture Production

3.7.1. Fish production

The FGD participants identified availability of water body; sound agro-ecology; land and labor availability for pond preparation, and farmers' interest as the main potentials for fishery production. The respondents reported that there is aquaculture practice in the study district but there were only two individuals who practice it within the district. Due to that, they do not know common fish species being produced and Feed sources being used, and also they argue that there were no Fish trapping equipment's available in the study district.

According to the participant farmers, absence of fish production equipment, and lack of experience in the fishery/aquaculture were the main constraints of fishing production in the study district.

3.7.2. Apiculture

As per the responses of FGD participants, apiculture is one the main agricultural practices in the district. However, the hive types used in the study district are traditional ones. They yield 10-15 kg/year. The feeds used were most of natural feeds and improved feeds/bee floras were not well known in the study district. The honey harvesting equipment were traditional and there were no honey and wax processing equipment. The commonly known enemies of honey were ants and crop chemicals. FGD participants argued that the management methods practiced in the district to tackle these enemies were spraying filiti, pouring boiled water for ants; and putting hives far from farmlands where crop chemicals are sprayed. According to them, the main constraints of honey bee production in the district include lack of modern hive; lack of training, and lack of modern equipment (wax printing, honey harvesting closes and the likes).

3.7.3. Livestock marketing

The FGD participants argue that district, and zonal markets were the main marketing routs and outlets for live animals and products. Producers, collectors wholesalers, retailers, processors, and brokers were the main market actors in the study area. Women participate in selling live animals (such as poultry and sheep), and processing livestock products (milk, butter, egg,) and selling. The main constraints reported by FGD participants on livestock and its products marketing were price fluctuation, brokers, lack of demand, and absence of cooperatives.

3.7.4. Gender role in livestock production and processing

Regarding gender role, women participate in watering; feeding; and cleaning the house/barn. They also perform milking, adding value (churning to produce butter and cheese); egg collection; storing until consumption and sale.

3.7.5. Livestock production, management and marketing constraints

The pairwise ranking was conducted by FGD participants to identify the main constraints which are given high priority in the district. The major livestock production and productivity constraints identified to be ranked were Lack of Improved breed, Inefficient AI, Feed shortage, Disease and parasite, Pest and predators, Limited product processing, Lack of credit, Marketing,

Low price, Poor infrastructure and Weak extension service (Table 8). The three most important constraints in order of importance include poor infrastructure, lack of credit and limited products processing.

Out of these 11 constraints, poor infrastructure was ranked as the first constraint for livestock production and productivity. Participants of FGD reported that infrastructures such as animal health centers, all weather road, livestock marketing centers, feed processing plants, clean water supply infrastructures and the likes were almost absent in the district and they argued that these were the main challenges for livestock production and productivity. Cattle, sheep, poultry, all other livestock and even the farmer himself were highly affected by absence of these infrastructures. They stated that this is the mandate of government to build these infrastructures for the society.

According to the FGD participants, Lack of credit is the second ranked most important constraint of livestock production and productivity. As per the participants, there is no credit facility provided to them to support and expand their livestock production and they strongly argue that they would have shown great progress on cattle, sheep and poultry production in terms of quantity and quality if they had been provided with it. As an intervention, they proposed that gov't and other concerned organs should plant institutions and the system.

Limited products processing was one the main constraints ranked third by the FGD participants (Table 8). They believed that supplying livestock products processing equipment such as milk churning machine, wax printing machine, honey harvesting and purifying equipment, and the like will further enhance livestock production and productivity.

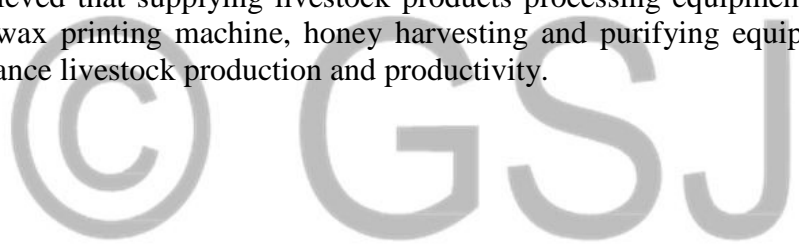


Table 5. Livestock production, management and marketing constraints

Major constraints	IB	AI	FS	DP	PP	Pr	Cr	mkt	LP	Is	ES	Score	Rank	species affected			Proposed interventions
														1st	2nd	3rd	
Lack of Improved breed (IB)	--	IB	FS	IB	IB	IB	Cr	mkt	LP	IS	IB	5	6	Cattle	sheep	Equine	Extension should bring
Inefficient AI		---	FS	AI	AI	Pr	Cr	mkt	LP	IS	AI	3	8	Cattle			Research on why it fails
Feed shortage (FS)			---	DP	FS	Pr	Cr	mkt	LP	IS	FS	4	7	Cattle	sheep	Poultry	Extension should introduce improved forage
Disease and parasite (DP)				---	DP	Pr	Cr	mkt	LP	IS	DP	3	9	Poultry	Equine	Cattle	Increase vet. Clinic; research
Pest and predators (PP)					---	Pr	Cr	mkt	LP	IS	PP	1	10	Poultry	Cattle	bee	Extension and research should introduce mgt practices
Limited product processing (Pr)						---	Pr	Pr	Pr	IS	Pr	8	3	Cattle (skin)?	Sheep (hide)?		Extension, NGOs and research should introduce
Lack of credit (Cr)							---	Cr	Cr	IS	Cr	8	2	Cattle	sheep	Poultry	Gov't should plant institutions and the system
Marketing (Mkt)								---	Lp	IS	Lp	5	5	Sheep	Poultry		
Low price (LP)									---	IS	Lp	7	4	Sheep	Poultry		Middle actors (brokers) should be reduced
Poor infrastructure (Is)										---	IS	10	1	Cattle	sheep	Poultry	Gov't should deliver
Weak extension service (ES)											----	0	11				

Out of the most important constraint in the study district were diseases and parasites as per the participants of FGD. There were lots of disease and parasites affecting livestock in the district (Table 16). Although most of them have pharmaceutical solutions, some of them have no solutions except local treatments. Almost all of the livestock were affected by the disease and parasites available in the district. The participants proposed increasing veterinary Clinics for those diseases and parasites that have medical solutions and research for immedicable ones.

Lack of Improved breeds, inefficient AI and Feed shortage were also out of major constraints identified in the study district. Most of the breeds available in the district were local and in most cases AI was inefficient and due to that, farmers are reluctant to get the service. They also reported that feed shortage is as important as others in that grazing land is reducing from time to time, supply shortage of industry feeds (concentrates, oil cakes & molasses) and limited introduction of improved feeds.

Marketing and low price were also out of main constraints in livestock production. Farmers were not getting margins they should get from the sale of livestock and its products. As per the FGD participants, lack of marketing cooperatives and brokers that signal asymmetric market information were the main reasons for low price and reduced margin of farmers in the study area, which will result in inefficient marketing system.

4. Conclusion

Based on the above results, research and trainings related to disease and parasite management, especially non-curable livestock diseases; trainings and demonstration of technologies such as modern hive and fish production; researches on introduction and evaluation of improved livestock technologies; demonstration of improved breeds and training on their management; demonstration of industrial feeds livestock such as oil cake and molasses; value chain studies of feeds; research on breed improvement such as sheep and equine; community sheep breeding; strengthening and modernizing of some services such as AI and bull services; and impacts of some infrastructures such as veterinary clinics, among others that can address livestock constraints listed in this document were recommended to be implemented to improve livestock production and productivity in the study district.

5. References

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