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Characteristics and Determinants of Livestock Production in Jimma Zone/Southwestern Ethiopia

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Abstract: The study was carried out in three selected districts (Seka chokorsa, Mana and Dedo) of the Jimma administrative zone, south western Ethiopia, with the objectives of characterizing livestock production systems, identify and prioritize the major constraints and opportunities of livestock intensification in the area. A total of 540 household heads were selected for the detail study using a systematic random sampling method, 180 households from each district. Data were collected through a structured questionnaire and focus group discussion. About 87.8% of respondents in the districts housed their livestock at their home at night and part of the day while the rest (12.2%) kept at night enclosures and open yards. Animals were acquired through purchase (28%), gifts (10.50%) and reproduction (61.48%) while they were disposed through sale (46.4), gifts (4.98) and slaughter (48.59%) ($p<0.05$). Most of the livestock breeds (98.8% cattle, 100% of small ruminants and equines) were local type and mating was uncontrolled and livestock is characterized by low productivity. Age at first parturition for local cow, ewe, doe, mare and jennies were 4.66, 2.29, 2.10, 4.94 and 6.20 years, respectively. On the other hand, parturition intervals identified for cow, ewe, doe, mare and jennies were 25.02, 15.80, 15.48, 35.6 months and 2.56 years, respectively. The main sources of feed in the districts were natural pasture (30.39%), aftermath and road side grazing/browsing (19.34%), fodder trees and shrubs (17.12%) and crop residues (17.67%) ($p<0.05$). The major constraints identified were feed shortage, poor access to improved extension services, lack of improved cattle breeds and distance to marketing points and poor administrative mechanisms to restore range ecosystem ($p<0.05$). Pasteurolosis, anthrax, fasciolosis, trypanosomiasis and black leg were the major reported cattle diseases in the study districts. The general indication is that livestock productivity is not improved. There is, therefore, an urgent need for research in livestock prodction to design improvement strategies in the area of genetics, management systems and make available suitable technologies to produce feeds to help in the development of sustainable livelihood of resource poor farmers while preserving the natural environment.

Key words: Constraints % Ethiopia % Live stock % Mixed farming % Production systems

INTRODUCTION

Ethiopia has great potential for increased livestock production, both for local use and for export [1, 2, 3]. However, expansion was constrained by inadequate nutrition, disease, a lack of support services such as extension services, insufficient data with which to plan improved services and inadequate information on how to improve animal breeding, marketing and processing [4-7]. Livestock husbandry plays an important role in agricultural development in Ethiopia, which is the backbone of the economy [2, 8] Livestock are source of income, milk, meat, hides, skins, manure and also a means of employment [9, 1, 9, 10]. In addition, oxen are used for traction power in traditional faming systems, indicating close interdependence of crop and livestock production systems [10]. Crop-livestock interaction farming systems have been viewed as the poverty saving net for resource-poor rural farmers in the developing countries where the farmers are generally poor and unable to afford conventional fertilizers for soil fertility maintenance [11].

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Apart from additional income derivable from the inclusion of livestock in the farming enterprise, other benefit is the increase in crop yields made possible through the availability of animal manure for soil fertility maintenance [12]. The demand for live animals and their products is increasing due to the growing urban population, while farm areas are shrinking considerably as a result of an increase in the rural population [13-17]. Furthermore, meager information is available on the general husbandry and management practices, productivity, constraints and opportunities of livestock production in southwest Ethiopia in general and Jimma zone in particular where livestock are of considerable importance to the livelihood for growing population. This study was, therefore, initiated to characterize the smallholder livestock production systems, identify and prioritize the constraints which impact the development of livestock sector in the area and to suggest possible opportunities for improvement.

MATERIALS AND METHODS

The Study Area: The survey was carried out in three selected *woredas* (districts) of Jimma zone, southwest Ethiopia, located around Jimma city. Jimma city is found 350 km away from Addis Ababa and lies between 36°50´E longitude and 7°40´N latitude at an average elevation 1750 masl [18]. The study districts are believed to represent the mixed crop-livestock farming systems of southwest Ethiopia. The climate of the area [19] is characterized by humid tropical with bimodal heavy rainfall which is uniform in amount and distribution, ranging from 1200 to 2800 mm per year, with short and main seasons occurring from mid February to May and June to September, respectively. In normal years, the rainy season extends from mid February to early October. The ten years mean annual minimum and maximum temperature of the area was 11.3°C and 26.2°C, respectively. The size of the land holdings varies generally from 0.25 to 2.5 ha. Barley, tef (*Eragrotis tef*), wheat, pulses (beans, peas), maize, sorghum, coffee, fruits, potato and enset (*Ensete ventricosum*) are among the major crops grown in the area. Cattle production is characterized mainly by traditional smallholders that are kept in freely-grazing communal rangelands throughout the year. Nitosols are the most abundant covering about 90% of the study area, which is dark reddish brown in color, slightly acidic. The area has slightly undulated to plain terrain feature.

Sampling Procedure and Data Collection: Reconnaissance field survey was conducted to have the notion of understanding about the study area and to select the representative study sites. The districts were purposely selected based on accessibility and representation of the mixed crop-livestock farming systems in humid agro-ecological conditions of south west Ethiopia. Peasant associations (PAs) and farmers in the PAs were selected using systematic random sampling technique. Households (HHs) that have at least one species of each livestock at the time interview or HHs who have a minimum of ten year experience in livestock production were included in the study. Accordingly, 60 households from each PA, a total of 180 and 540 HHs from each district and three districts, respectively were participated in the study. The selected farmers were interviewed using a structured questionnaire that was pre-tested with a few farmers. Questions were re-framed, after pre-tested, in such a way that farmer would provide information that was most recent and easy to recall. Group discussions were held with 8 key informants once in each study area in order to gain an in-depth insight about the topics covered during the structured interview and to check whether patterns found in the households were validated by focus groups.

Data Analysis: Quantitative variables like mean size of HH socio-economic characteristics, land and livestock holding per HH, livestock holding trends, lactation and reproductive performance parameters were subjected to one-way analysis of variances whereas qualitative variables (frequencies and percentages) were analyzed and compared crossways the study districts following crosstabs in SPSS [20]. For all types of data significance differences were declared at $p<0.05$. Tukey test was used to separate means of quantitative variables.

RESULTS AND DISCUSSION

Household Characteristics: Household (HH) characteristics per district are summarized in Table 1. The statistical analysis revealed that in Seka, Dedo and Mana districts; most of the respondents were middle aged (43.6, 41.0 and 45.9 years, respectively ($p<0.05$). All age groups of the present study were included under productive age group of between 15 and 65 [21]. The average numbers of children per household in the districts were 6.43, 6.60 and 6.40, respectively. There were a relatively larger number of children per household in all

Table 1: Summary of household characteristics per district

		District mean (±SE)			
Characteristic		Seka	Mana	Dedo	p
Age of respondent		43.62±1.32^{ab}	45.88±1.04^{a}	41.00±1.25^{b}	*
Number of children		6.43±2.98	6.58±3.64	6.39±3.40	ns
Household size		8.79±3.01^{b}	9.45±3.17^{a}	9.63±3.11^{a}	***
		District % (frequency)			
Marital status of the HH head	Single	0%	3.33%	3.33%	ns
	Married	100%	96.67%	96.67%	
Educational status of the HH head	literate	9.84%	26.67%	30%	*
	Illiterate	90.16%	73.33%	70%	

Means in the same row for each parameter with different superscripts are significantly different (p <0.05); *p<0.05;***p<0.001; ns: non-significant difference (p>0.05); SE: standard error of means

the three districts; however, statistically significant difference was not observed between the districts (p>0.05). Having many children is thought as an asset for supply of labor for farming activities and being large in number in a household has social prestige showing the strength of that family or clan. The average HH size of each district was 8.80, 9.50 and 9.63, respectively (p<0.001). The highest values in household sizes could be due to practices of polygamous marriages as well as meager family planning activity in the districts. The results of this study agree with the findings of [22, 23]. The present figure is greater than the Ethiopian national average for household size (7.4) and sub-Saharan average (5.6) [24]. About 90.16%, 73.33% and 70% of the respondents in Seka, Mana and Dedo districts, respectively were illiterate. Educational status of the HH head and level of training had a significant difference among districts (p<0.05). This would seem to infer that training opportunities should be accessible to HH members who are not heads and HH heads too.

Land Holdings: Respondents explained about the land use patterns mainly for three purposes: crop production, livestock (grazing) and wood production (Table 2). Mean landholdings between the districts showed significant variation (p<0.05). Mean landholding values in the studied districts are categorized between small and medium land size as compare to Ethiopian national average, 1.3 ha [24], which call for intensification of livestock production in the area. According to the 91.70 % of respondents, the total land holding per HH over the last 30 years had decreased; yet 10.63% of respondents agreed that size of land holdings for crop, grazing and wood production had increased overtime (p<0.05). Therefore, it is clearly shown that there is shrinkage of landholding by HH over the past 30 years. This can be attributed to the population increase over the three decades. Studies done by [22, 26, 27] found comparable results where they blamed population pressure for declining trend of landholding per HH in mixed crop livestock production systems. Traditionally, there is sharing of household lands among children whenever they initiate new families resulting in smaller and smaller land size.

Income Sources of the Households: In the study districts, both crop and livestock production combined the major sources of HH (p<0.05) (Table 3). Livestock alone is the second important sources of income followed by crop prodctionand in all the districts and the variation is statistically significant (p<0.05). According to the results of the study, livestock production is considered for a source of income and survival. The proportion of income generated from livestock is smaller than reports of central highland regions of Ethiopia (CHRE). Livestock income contribution to HH is relatively higher for CHRE, averaging between 30 and 50% [28], in value terms, in both areas.

Livestock Composition and Ownership: Relatively large average holding of cattle and sheep was recorded in Mana (Table 4). In all the districts, cattle were ranked first in population followed by sheep, goats and donkeys. Cattle were the main livestock species in the smallholder agricultural sector because of their multiple uses. Cattle are the major source of draught power, beef and milk for geometrically growing human population. The relative population of equines is found to be low as compared to other provinces of Ethiopia. This might be attributed to climatic influences and cultural preferences. The animals dislike humid climate and are susceptible to pneumonia and bronchitis when chilled [29]. The former provinces of

Table 2: Mean landholding (ha) (±SE), use patterns by household per district and percentage of respondent farmers perceived a decrease in landholding status (n=180 for each district)

	District mean (±SE)			
Characteristic	Seka	Mana	Dedo	P
Grazing (pastureland)	0.28±0.06^{ab}	0.46±0.08^{a}	0.21±0.03^{b}	*
Crop land (arable)	2.02±0.77^{a}	1.85±1.12^{b}	1.75±0.10^{b}	*
Bush/wood land	0.19±0.04^{a}	0.08±0.03^{ab}	0.02±0.0.02^{b}	*
Total land	2.49±0.18^{a}	2.38±0.15^{ab}	1.98±0.11^{b}	*
Decreasing trend in landholding,%	81.56^{c}	92.53^{b}	97.56^{a}	**

Different superscripts in a row indicate statistically significant difference between the districts ($p<0.05$); *P<0.05; **P<0.01; SE, standard error of means

Table 3: Sources of income for living in the studied households

Income sources for the households	Seka	Mana	Dedo	P
Livestock and its products,%	19.7^{a}	20^{a}	13.3^{b}	*
Crop production, %	29.5	30	25	ns
Crop and livestock production,%	41.0^{b}	41.7^{b}	55^{a}	*
@Non- farm activity,%	8.20	8.33	8.33	ns

Different superscripts in a row indicate statistically significant difference between the districts ($p<0.05$); ns, non-significant difference ($p>0.05$); @Non-farm activity includes petty trade, weaving of clothes, private, wage labor, stock broker, etc; *$p<0.05$; SE, standard error of means;

Table 4: Mean (±SE) livestock composition and ownership by HH across the district

	District mean (± SE)			
Species	Seka	Mana	Dedo	P
Cattle	4.38±0.10^{b}	5.25±0.17^{a}	4.46±0.13^{b}	*
Donkeys	0.45±0.09	0.37±0.05	0.43±0.15	ns
Horse	0.18±0.08	0.15±0.05	0.30±0.13	ns
Mule	0.20±0.10	0.12±0.06	0.48±0.03	ns
Sheep	2.90±0.18^{b}	4.83±0.58^{a}	2.77±0.13^{b}	*
Goats	2.52±0.16^{b}	2.42±0.20^{b}	3.22±0.08^{a}	**

SE, standard error of means; means with different superscripts in a row indicate statistically significant difference between the districts ($p<0.05$); *$p<0.0$; **$p<0.01$; ns, non-significant difference ($p>0.05$)

Gamo Goffa, Keffa(including Jimma zone) and Wollega shared the lowest levels of all provinces in Ethiopia suggesting environmental conditions maybe a significant factor [30].

Housing System, Means of Acquiring and Disposing Animals: Majority of the respondents, 88.33%, housing different species of their livestock at their own home at night, which is not separated from their own living house and part of the day (Table 5). While the rest (11.67%) kept at night enclosures and open yards, which are separated their own home ($p<0.001$). The results of present study agrees with reports of [31] who reported similar finding in Tigray national region of Northern Ethiopia where livestock housing is very primitive even compared to sub-Saharan African standard. Animals were acquired through purchase (3.33%), gifts (3.89%), home breeding (92.78%)($p<0.05$) while they were disposed through sale(46.44%), gifts(4.98%) and slaughter(48.59%) ($p>0.05$). The fact that majority of the animals are acquired from home breeding means, there is chance for inbreeding and hence impaired performance of the livestock. Similar reports were obtained from Darolabu of Hararghe region [27] and some parts of Jimma zone [32]. Animal houses are too primitive and animals are not kept in a good welfare. Animal are exposed to many transmissible diseases. Houses are neither built to reduce ammonia and methane emissions to the environment nor to reduce losses of manure and nutrients which in turn results in considerable amount green house accumulation. High ammonia concentration is suspected to contribute to increased incidence of bronchial diseases among people engaged in indoor animal production. Now, gases produced by livestock farming, such as ammonia, nitrous oxide and methane, are being increasingly considered as well [33, 34].

Table 5: Housing system, means of acquiring and disposing animals

	Districts, mean				
Housing system	Seka	Mana	Dedo	Overall	P
HHNP,%	95[a]	96.67[a]	73.33[b]	88.33	*
Enclosures/open yard, separate room,%	4.92[a]	3.33[b]	28.33[c]	11.67	***
Acquisition of animals					
Home breeding	88.33	90	100	92.78	ns
Purchase	3.33	6.67	0	3.33	ns
Gifts	8.33[a]	3.33[b]	0[c]	3.89	*
Animals disposing through					
Sale	40.98[c]	48.33[b]	50[a]	46.44	*
Slaughter	54.10[a]	46.77[b]	45[b]	48.59	*
Gifts	3.28[c]	5.00[b]	6.67[a]	4.98	**

SE, standard error of means; means with different superscripts in a row indicate statistically significant difference among the districts ($p<0.05$); *$p<0.0$;**$p<0.01$; ns, non-significant difference ($p>0.05$)

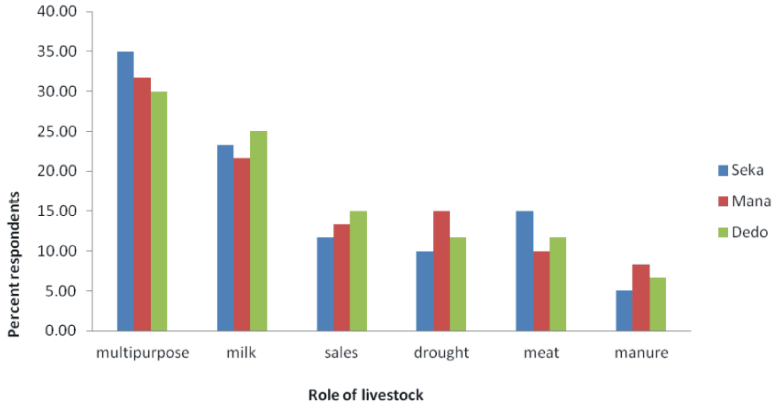

Fig. 1: The relative importance of livestock in each district

Role of Livestock for the Livelihood of Resource Poor Farmers: In the study area, livestock husbandry is being practiced for food (milk, milk products and meat), fiber (hides and skin), draught power (traction, pack transport, sport/riding, cart pulling) and cash income (Figure 1) since time immemorial. Livestock keeping, however, is primarily a subsistence activity to meet household food needs and supplement farm income. Accordingly, the overall survey result of 53.33% and 41.67% of the respondents assured that livestock are source of food and cash, respectively (Figure 1). Livestock, mainly oxen complement crop production by supplying draught power in all the districts. There is little practice of using horses and donkeys as solution for draft oxen shortage. Moreover, livestock are given as a marriage gift for young married couples (personal experience). Farmers also sell livestock to mitigate household problems like medication, school fees, payment for fertilizer credits and purchases and others. Livestock also plays an important role in maintaining the livelihoods of the farmers by providing social and cultural identity, medium of exchange and means of savings and investments. Food security through livestock keeping, however, in Jimma zone, would be influenced in three ways: a) Direct use of products like meat, milk and milk products, 2) Using the income from milk, manure or animal sale to buy food and 3) Using manure as fertilizer to improve household food production like vegetable and other food crop production. Like in many developing countries, domestic animals play a crucial role in Ethiopia, they constitute as source for traction power, income, in provision of milk and meat [35, 36].

Livestock Holding Trends: About 66.9% of the respondents across the districts disclosed a decreasing trend in the number of livestock per HH through time ($p<0.05$) (Table 6). According to the respondents, there were different reasons for decline in livestock holding per household. Among the reasons, feed shortage was the major. Feed is critical element in livestock production in the study areas where there is sequential shortages of both grazing and farmlands. Decline in livestock

Table 6: Livestock holding over the last 30 years and perception of respondents about the reasons for decreasing trends of livestock

	%					%				
Trend	Seka	Mana	Dedo	p	Core reasons	Seka	Mana	Dedo	M	P
Increasing	31.67[a]	13.33[c]	26.77[b]	**	Feed shortage	44.26[b]	53.33[ab]	58.33[a]	52.22	*
Decreasing	60[b]	73.33[a]	68.33[b]	*	Diseases	37.70[a]	16.67[c]	23.33[b]	26.11	*
No change	8.20[b]	13.11[a]	6.56[c]	**	Land shortage	18.03[a]	13.33[b]	18.33[a]	16.67	ns
					Poor productivity of local breeds	0[b]	16.67[a]	0[b]	5.56	**

Different superscripts in a row indicate statistically significant difference between the district (p<0.05); M, overall mean;*p<0.05; **p<0.01; SE, standard error of means; ns, non-significant difference (p>0.05)

Table 7: Major feed resources and proportional utilization of feed resources in Seka, Mana and Dedo districts of Jimma zone

		District proportion			
Feed resources		Seka	Mana	Dedo	p
Main feed types,% of respondents	Natural pasture and road side grazing/ browsing	29.50[b]	26.67[b]	35[a]	*
	Aftermath grazing	18.03[b]	25[a]	15[b]	*
	Green feed (cut grasses, legumes, crop thinning/weed, fodder trees and shrubs)	18.03[b]	20[a]	13.33[c]	*
	Crop residue(straw and stovers)	19.67	16.67	16.67	ns
	Non conventional feeds	14.75[b]	11.67[c]	20[a]	*
Subtotal,%		100	100	100	
Supplementary feeds, %	Mineral supplement (Common salt)	73.77	75	73.34	ns
	Cereal grains	9.84	5.0	0	***
	Agro-industrial by products	0	0	0	ns
	Food mill byproduct, grain shorts	8.20	10.0	13.33	*
	Non-conventional feed stuffs	8.20	10.0	13.33	*
	Subtotal	100	100	100	
Source of water, %	River	94.70	92.20	96.30	ns
	Bore hole	5.30[b]	7.80[a]	3.70[c]	*
	Subtotal	100	100	100	
Watering frequency,%	*Adlibitum*	85.50	79.70	87.64	ns
	Two times a day	5.20	7.99	7.33	ns
	Once a day	9.30[b]	12.31[a]	5.03[c]	**
	Subtotal	100	100	100	
Practice of feed conservation in the form of hay		0	0	0	ns
Feeding system,%	Free-ranging	68.85	86.67	83.61	ns
	Cut and carry/zero grazing	13.11[a]	5.00[b]	4.92[b]	**
	Tethering	18.03[a]	8.33[c]	11.48[b]	*
	Subtotal,%	100	100	100	

Different superscripts in a row indicate statistically significant difference between the districts (p<0.05); *p<0.05; **p<0.01; ***p<0.001; ns, non-significant difference (p>0.05)

population per HH might be due to the associated expansion of crop cultivation as it was the cause in south East Asia [37]. This was presumably the root cause for all problems perceived by the respondents that resulted in shortage of land, depletion and degradation of rangeland and other natural resources. The second most important reason for the decline in livestock number is disease epidemics. The humid climate in the study areas favor outbreak of different diseases that in turn have adverse effect on livestock population.

Feed Resources and Feeding System: Livestock were fed on diverse feed stuffs (Table 8). The major feed resource bases of the districts identified were natural pasture (mainly communal), after math grazing, crop residues, green fodder and non-conventional feeds like *attela,* house left over, grain mill byproducts, chat (*Catha edulis*) left over, coffee pulp and husk (p<0.05). Grazing on natural pasture is the most dominant feeding practice for the livestock species (p<0.05). Livestock are reared on natural pasture under continuous grazing systems.

Natural pasture in the high altitudes was rich in pasture species, particularly indigenous legumes [38]. According to the same author, the proportion of legumes tends to increase with increasing altitude particularly above 2,000m. There is a wide range of annual and perennial *Trifolium* spp and of annual *Medicago* spp. At lower altitudes native legumes were less abundant and commonly have a climbing or sprawling growth habit which renders them more susceptible to loss through grazing. The most common grasses observed were species of *Pennesetum clandestinum, Cynodon dactylon, Digiteria spp, Eragrostis spp, Sporobolus spp, Brachiaria spp, Phalaris spp, Hyparrhenia spp, Eleusine spp* and *Andropogon* spp. In the wetter areas, sedges of the genera *Carex, Eleocharis* and *Mariscus* occur. *Junicacea* species are also the prevailing plant species of wetter areas.

As indicated in the previous table (Table 6) about 51.67% of respondents witnessed that the major constraint for livestock sector in the area is animal feed. Feed shortage is prevalent though out the year; the shortage of feed occurs both in dry and wet seasons [39]. Leaves from multipurpose trees [40], bushes and shrubs were provided during the end of the dry season while the main feed resource base was scare.

Due to continuous stocking and over grazing of pastures and road sides, soil erosion was developing into major phenomenon. Encroachment of the less palatable and preferred plants like *Sida spp* in the major grazing areas become a major problem of livestock production [41]. Tethering and cut-and carry were mainly practiced in major cropping seasons. The practice of feed conservation in the form of hay was almost non-existent (100%) in the entire production year. However, crop residues (straws and stovers) were used by 19.67, 16.67 and 16.67% of respondents in Seka, Mana and Dedo districts, respectively ($p>0.05$). Supplementation of non-conventional feed resources such as *Attela*, local beverage by-product, was practiced only by 14.75, 11.67 and 20% of respondents in the districts, respectively, mainly as energy source ($p<0.05$). About 10.55 % of the respondents supplement grain shorts from local grain mill houses. Majority of the respondents 73.80%, 75% and 73.34% of farmers in Seka, Mana and Dedo, respectively used table salt for lactating cows as mineral supplement while 9.84, 5.0 and 0% of the respondents, respectively in the districts supplement cereal grains for draught oxen and lactating cows as energy source. Mubi [42] identified that the introduction of multi-nutrient block technology in areas where ruminants are fed fibrous crop residues or poor quality basal rations, which contain limited amounts of nutrients, would suit for improvement of productive and reproductive performance of livestock species.

Watering: About 85.50%, 79.70% and 87.64% of respondents in Seka, Mana and Sedo, respectively watered their livestock from nearby rivers and streams (Table 7). Sick and immature animals were watered from the same sources but were mechanically assisted by shepherds. Only 6.11 % of respondents offered relatively clean water from boreholes ($p<0.05$). Belay [43] reported that water intake and watering frequency varied among season and species of animals.

Major Diseases of Livestock: The percentage of respondents and the corresponding diseases of livestock are shown in Table 8. The major diseases outbreaks were anthrax, black leg, foot and mouth disease (FMD), locally known as Maansa and CBPP. Though disease like CBPP, locally known as samba and black leg occur year round, their highest prevalence periods were December-May and June to October. The higher number of respondents agreed that higher prevalence rate of anthrax (14.22%, 15.53% and 12.30%, respectively across the districts) was in the drier season of the year. This might be attributed to close grazing of tough, scratchy feed of this season which injures the buccal area of animals/cattle. However, according to 15.35% percent of respondents anthrax and black leg were irregular in their frequency of occurrence. With reference to 7.73% of respondents the occurrence of FMD was once a year. Abortion as a reproductive disorder in all classes of livestock was reported by 7.0% of respondents. Flea and/or lice infestation was aliments mentioned economically important external parasites. Ectoparasite infestation imposes economic losses as a result of reduction in leather quality, reduction in body weight gain and milk yield, occasional mortality, reduction in performance in draught animals and losses associated with treatment and prevention of diseases [44].

Production and Reproductive Performances: The productive and reproductive performances of different species of livestock are presented in Table 9. Age at first calving (AFC) in cattle has increased to 4.66+0.05 years. This finding was higher than values reported by [45-48]. The mean lactation yield of cattle is comparable with reports of Adugna and Said [49] but lower than what had been reported by [50] for Oromia region, [6] for the national average and [45] for Sheko cattle in south

Table 8: Livestock diseases across districts

	Districts				
Diseases (Vernacular name)	Seka	Mana	Dedo	OrM	P
Anthrax (Abba Sanga)	14.22	15.53	12.30	14.02	ns
Black leg (Abba Gorba/sinchi)	17.17[a]	18.44[a]	14.20[a]	16.60	*
Mastitis (Mucha Dhiitesa)	7.20[b]	6.34[c]	10.23[a]	7.92	**
Pasteurollosis (Gororsiisa)	18.51[a]	13.53[c]	15.51[b]	15.85	*
FMD (Okkolcha/Maansa)	6.24	8.73	8.22	7.72	ns
Brucellosis (Abortion)	8.13	6.84	6.03	7.00	ns
CBPP (Samba)	15.0	13.14	17.10	15.08	ns
Fashiola	7.23	9.12	7.21	7.85	ns
Trypanosomosis (Gandi)	6.30	8.33	9.20	7.94	ns
Subtotal total	100%	100%	100%		
Ectoparasite, flea/lice and tick	73.60	71.27	75.30		ns

Different superscripts in a row indicate statistically significant difference between the districts ($p<0.05$); ns, non-significant difference ($p>0.05$); *$p<0.05$; **$p<0.01$

Table 9: Production and reproductive performances of breedable livestock

		Districts, (mean±s.e.m)			
Species	Variable	Seka	Mana	Dedo	P
Cattle	Age at first calving (*years*)	4.59±0.09	4.81±0.07	4.60±0.11	ns
	Calving interval (*months*)	24.86±0.62	24.75±0.75	25.47±0.54	ns
	Lactation length (*months*)	6.59±0.35	5.88±0.22	6.33±0.32	ns
	Lactation milk yield (*liters*)	244.7±1.0	249.5±0.1	243.57±0.11	ns
	Reproductive lifespan of cows (*years*)	7.72±0.25	7.49±0.26	7.85±0.24	ns
	Draught age of oxen (*years*)	4.30±0.12[b]	4.71±0.08[a]	4.41±0.12[ab]	*
	Draught life span of oxen (years)	5.13±0.13	5.07±0.14	5.09±0.14	ns
Sheep	Age at first lambing (*years*)	2.33±0.22	2.15±0.09	2.37±0.22	ns
	Lambing interval (*months*)	15.90±0.41	15.85±0.40	15.63±0.40	ns
Goats	Age at first kidding (*years*)	2.09±0.05	2.07±0.05	2.16±0.06	ns
	Kidding interval (m*onths*)	15.56±0.36	15.20±0.34	17.00±0.35	ns
Horse	Age at first calving (*years*)	5.01±0.11	4.86±0.17	4.98±0.15	ns
	Calving interval (*months*)	29.59±1.13[b]	37.48±1.95[a]	39.65±2.2[a]	*
	Age for work (transport/draught) (*years*)	5.93±0.22	6.33±0.32	6.59±0.35	ns
Mule	Age for work (transport/draught) (*years*)	6.32±0.20[b]	6.75±0.12[a]	6.72±0.09[ab]	*
Donkey	Age at first calving (*years*)	6.57±0.26	5.69±0.37	6.39±0.32	ns
	Calving interval (*years*)	2.88±0.19[a]	2.48±0.17[ab]	2.33±0.16[b]	*
	Age for work (transport/draught) (*years*)	6.95±0.84[a]	6.20±0.10[ab]	5.98±0.18[b]	*

Different superscripts in a row indicate statistically significant difference between the districts ($p<0.05$); ns, non-significant difference ($p>0.05$); *$p<0.05$

western Ethiopia. The mean lactation length found in this study [6] is also lower than what had been reported by [47] for indigenous cattle in southern Ethiopia. Similarly, the average lactation length reported by [51] for Horro cattle was 7.5 months. The reproductive life span of indigenous cows of Jimma (7.69+0.14 years) is shorter than what had been described for Horro cattle (10.1+0.01 years) by [45, 51] and 14.70+3.24 years for Sheko cattle in south western Ethiopia. Local indigenous oxen in Jimma start ploughing at an average age of 4.47+0.07. On average they can perform this function for 5.07+0.08 year (n=180). A similar report described average age of starting drought work in Ethiopia by [52], even though, as low as 2 year of age was reported for starting of drought work in case of Jimma cattle. However, age at first plowing is greater than the reports of [45] on Sheko cattle of south west Ethiopia, [48] on indigenous cattle of west Wellega and [53] on Horro cattle of east Wellega. Lambing and kidding intervals for sheep and goats were 15.80+0.23 and 15.48+0.2 months, respectively (n=180). This result was greater than reports of [46] local sheep breed in Welayita province of Southern nations and nationalities region. In general, livestock productivity is low for all species of livestock. The relatively late age at maturity, the extended parturition intervals, shorter lifespan reflect an environment in which animals are subjected to long periods of nutritional stress and disease epidemics.

Table 10: Farmers perceptions of major constraints and overall impact in the studied districts

		District, % average			
Major constraints	Overall impact of the problem	Seka	Mana	Dedo	p
Feed supply	Deterioration in performance of animals,%	30.0	29.3	43.5	*
	Increased mortality of livestock,%	32.8	39.0	23.5	*
	Limiting livestock and forage plant diversity,%	37.2	31.7	33.0	*
Population pressure	Degradation of rangelands,%	15.0	21.0	19.6	*
	Overgrazing and overstocking,%	10.0	20.0	7.0	**
	Encroachment of woody plants,%	16.0	10.0	16.0	*
	Reduction of palatable herb species	13.5	22.0	13.4	*
	Shrinkage of browsing vegetation	12.6	10.0	13.2	ns
	Loss of biodiversity	19.7	6.0	18.5	*
	Deforestation for income generation	13.2	11.0	12.3	ns
Animal diseases and parasites	Cause of more mortalities	23.5	22.0	30.0	*
	Total failure in performance of animals	32.3	18.5	22.2	*
	Total failure in producing marketable animals	21.0	36.0	24.5	*
	Total loss of income earnings	23.2	23.5	23.3	ns
Inadequate livestock extension services	Low awareness on productive livestock rearing	20.0	16.5	19.3	ns
	Poor productivity of livestock	12.3	17.8	22.5	*
	little infrastructure and public services such as AI centers, vaccination or drugs	16.9	20.2	19.8	ns
	Little livestock development intervention	11.3	10.0	12.6	*
	Little feed development	21.2	23.2	10.4	*
	Little administrative mechanism to restore range ecosystem	19.0	12.3	15.4	*
Market for livestock	Difficult to access markets	37.8	39.3	37.5	ns
	Unplanned livestock sales at loss	33.2	30.7	33.0	ns
	Loss of producer benefits	29.0	30.0	29.5	ns

Different superscripts in a row indicate statistically significant difference between the districts ($p<0.05$), ns, non-significant difference (>0.05); *$p<0.05$; **$p<0.01$

Major Constraints to Livestock Production: The respondents classified their perceptions on the major constraints of herbivorous livestock production in the mixed production system in to five groups (Table 10). They also described these constraints in terms of 23 different types of negative impacts on the overall livelihood of the smallholder farmers. Of these, the farmers relate 7 impacts (14.29%) to human population growth, 3 impacts (33.33%) to feed shortage both quality and quantity, 4 impacts (23.33%) to animal disease and 6 impacts on poor access to livestock extension services (15.57%) problem. In order to understand the intensity and magnitude of the implications of these constraints, they were ranked in order of importance as perceived by the farmers. Markets for livestock and livestock products were also mentioned in all areas as a problem. In situations where markets were available, the producer prices were so low that returns would be very small. Other constraints were draught power shortage (overall, about 50% had none); land sizes for grazing and crop production; livestock rustling and predators. Based on this ranking the feed supply shortage problem was ranked first followed by animal diseases (2^{nd}), population pressure (3^{rd}), improved access to livestock extension activities (4^{th}) and problem of livestock marketing (5^{th}).

Opportunity of Small Ruminant Production: Crop-livestock mixed agriculture is the prevailing agricultural system where livestock production is an integral component of crop production. The integration of livestock production is important as they can be intermediate food, draught power, wealth status and cash sources sustainably throughout the year. Moreover, their high turnover rate, easy to be managed by children and women are advantages that worth mention for their integration with crop production.

Seka, Dedo and Mana districts of Jimma, representative region of southwest Ethiopia, are highly endowed with local feed resources which are not utilized as potential feed resources and various annual and perennial plants that can be potential feed resources for the livestock. Moreover, the area receives enough amount of rainfall that can be used to develop various types of improved grasses, legumes and browses through different production strategies. Landless youth and farmers, retired people and other members of society can be engaged in dairy and fattening activities that could benefit as result of high market demand and higher prices for meat and live animal sell. There is also increased possibility to enhance pack transport and plowing using equines. There is high demand of the livestock for food, cash source and

draught power by local and national people. Milk and meat and of ruminants are highly, demanded in the local market as a result of population increase, urbanization and increase in income (even within a district) can be considered as an opportunity for the small ruminant producers. Nowadays, many abattoirs are flourish in the country; so agents and assemblers ruminant livestock even at farm gate. Ethiopia nowadays exports live meat animal, thus modernizing organic livestock can perfectly enhance fattening and dairy sector in the study area.

CONCLUSION AND RECOMMENDATION

In the study districts high population growth and density are causing the shortage of grazing land on which organic livestock production by small holders depends.

Animal health and improved management is also one of the major constraints of livestock development in which cause poor performance across the production system. Many of the problems result from the interaction among the technical and non-technical constraints themselves e.g. poorly fed animals develop low disease resistance, fertility problem, partly because the animal health care system relies heavily on veterinary measures, poor grazing management systems continue to cause high mortality and morbidity (e.g internal parasites), many of the disease constraints which affect supply are also a consequence of the non-technical constraints e.g. insufficient money to purchase drugs or vaccines.

Improvement of animal husbandry in rural setting requires adequate understanding of the production system and its operations. Furthermore, development direction strategies should be geared to addressing farmers' real problems and constraints to help them expand their production. This in sequence requires careful and detailed analysis and understanding of farmers' circumstances and practices before carrying out development activity.

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