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# SURVEY ON MORTALITY, MORBIDITY AND ASSOCIATED RISK FACTORS IN THE SELECTED KEBELES OF THREE DISTRICT, BENISHANGUL GUMUZ REGIONAL STATE

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**ABSTRACT**: Questionnaire survey was conducted on retrospective mortality and morbidity at 11 kebeles of Bambasi, Homosha and kurmuk districts, with the objective to identify the main constraints related to livestock production and cause of morbidity, mortality and their associated risk factors. In this survey, the demographic features of respondents were assessed and 10.8%, 16.84%, 3.04%, 2.94% and 66.43% of relative mortality rates were recorded in Cattle, Goat, Sheep, Donkey and poultry respectively in three districts (11 kebeles) of study sites. The highest and lowest (3.54%) and (0.69%) crude mortality rates were recorded in poultry and cattle respectively. According to Livestock owners response, the highest causes of morbidity were Trypanosomosis (14.16%) , CBPP (12.4%), PPR (10.67%) and NCD (22.55%) and of avian salmonellosis (12.70%), CCPP (9.52%) and of Bovine pastuerellosis (6.86%), while the lowest morbidity rates were of shoat pox (5.97%), and ovine pasteurelloss (2.73%). Among the respondents, 100%, 93.2%, 94.52%, 89.04%, and 76.71% ranked Trypanosomosis, CBPP, PPR, Pasteurellosis and NCD as the highest priority animal diseases while, (4.11%) and (9.58%) of respondents indicated, Toxic plant and shoat pox as the lowest priority animal diseases respectively. In 11 kebeles of the surveyed sites, average frequency of treatment per animal/per year was 18, 11.66 and 7.33 for cattle, shoat and equines respectively. Majority (97.3%) of the study participants indicated that, animal diseases were transmitted by flies, while 47.94%, 17.80%, and 21.91% of respondents stated that the diseases were transmitted by ticks, treatment materials, and other (stress) respectively. In study areas, inappropriate treatment, irregular vaccination schedule, less monitoring and evaluation system and weak disease surveillance were the main gap identified. Therefore, strategic prevention and control measures should be implemented properly in study area so to mitigate the fore mentioned problems.

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## 1. INTRODUCTION

Livestock in Ethiopia has been recognized as one of the most important sectors in subsistence agriculture in the quest to attain human food security and good welfare (Fikre Z, 2016). Livestock is an integral part of agriculture in Ethiopia, and its contribution to the economy accounts for about 19% of GDP and 20% of export earnings (Behnke and Metaferia, 2011). The contribution of the livestock sector to the livelihoods of producers in particular and to the national economy in general can be explained in terms of food production, supply of inputs and services for crop production, raw material for agro-industry, cash income and export earning, savings and investment, and its role as a generator of employment (Behnke and Metaferia, 2011).

Most people in rural areas of these countries depend on agriculture sector for their livelihood, which plays a great role in the socio-economic development. Despite the large number of livestock, productivity in general is low in the country, mainly due to the low genetic quality of local breeds, poor nutrition, and animal health problems. Similar to low-income African countries, per capita consumption of food from a livestock origin is low, mainly due to uncontrolled animal diseases, poor husbandry, and poor infrastructure (Ayele *et al*., 2003; Negassa *et al*., 2011).

The livestock industry success depends on the good health and managements of the animals that helps to increase the productivity; whereas any compromise on the health ground would shelter the hope of livestock sector (BangarY, 2013). The infectious diseases of

domestic animals livestock remain a major threat to attaining food security and are a source of economic and livelihood losses for people dependent on this sector for their livelihood. Knowledge of the major infectious diseases that causes majority of deaths in general in our country the most crucial in determining disease control strategies and in the allocation of limited resources available for disease control program. Ethiopia has the largest livestock population in Africa, with 65 million cattle, 40 million sheep, 51 million goats, 8 million camels and 49 million chickens in 2020 (Central Statistics Agency, CSA, 2020a).

Benishangul-Gumuz Regional state, have also estimated animal population to be (Cattle (1,089,269), Sheep (276,635), Goat (588,637) and Equine (95,133), Poultry (1,622,096), (BANR, 2018). Benishangul-Gumuz Regional State, which found in the North western part of the country, has favorable agro-climatic condition in its all part and suitable for animal raring. In other way common animal diseases such as Trypanosomosis, internal parasites and external parasites and several infectious diseases (CBPP, PPR, FMD, etc.) occurs in outbreak forms hiders overall effort made to develop livestock sector and improve the life of farmers in region. Recent studies conducted by (CSA, 2016) on mortality rate in the region indicates the rate between 12.7% to 48.06 %. The study conducted on morbidity and mortality in cattle covering 7(seven) districts of Benishangul Gumuz Regionand reported that the overall morbidity and mortality rate in cattle, sheep, goat and equine was 21.46%, 22.1%, 22.52% and 6.75% respectively (Asmamaw *et al*, 2017).

Recent studies conducted by Asossa Animal Health Diagnostic and Research Laboratory indicated, overall morbidity and mortality rate 40.9% & 4.9%, 43.8%, 22.4%, 37.5% % 14.9% and 11.7% & 7.0% mortality rate for cattle, sheep, goat and equine respectively in three districts of Asossa zone and Mao Komo special district. The study on morbidity and mortality rates provides important information to determine the health status and guidelines for management practices ultimately helps in increasing animal production and productivity and improves the economic status of livestock owners.

In this case, the common animal production constraints such as improper handling /back ward husbandry system/, infectious and non- infectious diseases occurrence in outbreak and endemic forms that hiders overall effort made to develop livestock sector and improve the livelihood of farmers in three District. Therefore, the present survey was conducted to assess the problems related with livestock production and/or health including morbidity, mortality and management aspects in domestic animals. This survey was conducted on the existing problems in the livestock that hider livestock production and productivity in the region in general and in the district in particular.

**Objectives**

- To assess the major cause of morbidity and mortality of livestock
- To assess, its associated risk factors in the selected woreda of Asossa zone.

## 2. AL AND METHODS

### 2.1 Study area

The present survey was conducted from May to September in Homosha, Bambasi, Kurmuk districts, which is found in Assosa zone of the Benishangl Gumuz regional state. Asossa zone shares boundary in East with Khamashi zone and Oromia, in South with Mao & Komo special district, in the North with metekel zone and in the west with south Sudan and republic of Sudan. The zone covers the total area of 18,340 sq.km out of the region's total of 50, 076sq. km. Altitude of the Asossa zone ranges between 580-1544 m.a.s.l, (FITCA, 2003). Based on, the recent report of BGRS, Agricultural Bureau, the animal population of the region was; Cattle (70,844), Sheep (16,233), Goat (179,573), Equine (23,674), and Poultry (274,123) (BANR, 2018). The study aimed to cover 50% of the Asossa zone was conducted in three purposely selected districts from Asossa Administrative zones, based on their animal population stratified to low, medium and high animal population namely in Bambasi, Homsha, and Kurmuk districts. Regarding PAs selection, 16% of each selected study district PAs was used for this study.


**Figure 1: Map of Benishangul Gumuz Regional state indicating Asossa zone (Homosha, Bambasi, and Kurmuk)**

**2.2 Study population**

Regarding study population, six to seven voluntary livestock owners'from eleven peasant associations of three districts and animal health workers from each peasant associations were interviewed individually.

2.3 **Study Design**

Retrospective and semi-structured questionnaire survey was used.

**2.4 Sample size and sampling method**

The present study was conducted in Bambasi, Homosha and Kurmuk. From three districts, (11) kebeles were selected in simple random sampling technique. Cattle, sheep, goats, donkey and poultry rearing animal owners selected for random interview and fill questioner (16% of the districts). So, 73 livestock owners were interviewed individually by representing the population in the kebeles. Every district animal health process owner, all animal health experts of respective clinics at district level and all animal health post technicians will participate during questioner filling and casebooks at district clinics and health post will be viewed for confirmation.

The sample sizes was determined by using (Yemane, 1973) formula.

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

Where:

n = the required sample sizes for the study

N = total population of the kebeles

e =the level of accuracy 0.05

$n = 90/1+ (90*0.05^2)$

$= \underline{73}$

The total key respondents involved in the questionnaire survey was 73.

**2.5 Study Methods**

The present retrospective study, was conducted in 2022 in three districts of Asossa administrative zone. The study is designed to cover 16% of the selected districts, and districts with high, medium and low animal population were incorporated. Totally 11 kebeles of 3 woredas and 84 participants were interviewed in this study. That was, seven kebeles of Bambasi districts, from high animal population, two kebeles of Homosha district from medium population and two kebeles of Kurmuk district with low animal population were selected for this study.

**2.5.1 Interview with kebele community livestock owners**

The questionnaire survey was used to assess the livestock owners on livestock constraints (mortality and morbidity rate) investigation in Bambasi, homosha, and kurmuk districts of selected 11 kebeles such as M48, Bambasi01, M47, keshamando, m43, 53, womba, Dunga, Darselam, Abadi and Bildiglu. During the assessment, the most important livestock constraints and difficulties that prevent achieving the best results from stock farming, most important problems that hinders animals production, list of common animal diseases occur in area,the frequency of treatment for individual animal in a year, cost of treatment per animal once treated, rating of livestock based on the

importance, number of animals diseased and died in the kebeles.

**2.5.2 Interview with kebele Animal Health workers**

Interview up on community animal health workers in the 11 kebeles were (animal population of the village, the main constraints, participation of the community in controlling animal health problems in this village (e.g. management), problems regards to materials needed to give veterinary services, number of animals diseased and died in 2021/2022 years.

## 3. DATA MANAGEMENT AND ANALYSIS

All questionnaire data collected from eleven (11) kebeles and 73 animal owners and 11 animal health experts were recorded and handled carefully and put in to a Microsoft excel sheet and analyzed by Stata Version-13, descriptive statistics was used to estimate respondents and Chi- Square to determine the mortality rate in all administrative kebelles including; Livestock species, diseases, sex and age category used as a factor for analysis.

$$\text{Crude death rate} = \frac{\text{Total death from diseases in period}}{\text{Average population at risk in the period}} \times 100$$

## 4. RESULT

### 4.1 Questionnaire survey with livestock owner

**Table 1: Demographic features of respondents**

| Respondents | Categories | Frequency | Response rate (n=73, %) |
|---|---|---|---|
| Sex | Male | 59 | 80.82 |
| | Female | 14 | 19.2 |
| Education level | Illiterate | 21 | 28.76 |
| | 1-4 | 26 | 35.62 |
| | 5-8 | 16 | 21.92 |
| | 8-12 | 10 | 13.69 |
| Age | <35yrs | 10 | 13.69 |
| | 35-50 yrs | 37 | 50.68 |
| | >50 yrs | 26 | 35.62 |

As *Table 1* indicated, from 73 respondent livestock owners in three woredas (11 kebeles), 80.82 % were male respondent whereas 19.2% were female respondents. Of 73 respondent participants', 28.76%, 35.62%, 21.92% and 13.69 % of the education level categories were illiterate, 1-4, 5-8 and 8-12 grade respectively during the assessment of the study. Of these 73 study respondents' age categories, majority (50.68%) of participants were 30-50 years old while the lowest (13.69%) were less than 35 years old.

**Table 2: Rank /score/ of animal kept in selected woreda by their importance**

| Animal kept | Woredas | | | Response rate | |
|---|---|---|---|---|---|
| | Bambasi | Kurumk | Homosha | N=73 | % |
| Cattle | 45 | 11 | 15 | 71 | 97.26 |
| Sheep | 6 | 3 | 7 | 16 | 21.92 |
| Goat | 18 | 21 | 20 | 59 | 80.82 |
| Equine/ donkey/ | 23 | 16 | 13 | 52 | 71.23 |
| Poultry | 24 | 20 | 23 | 67 | 91.78 |

As *Table 2* indicated, in three woredas, 71 (97.26%) respondents selected cattle as primary importance of domestic animals, 67(91.78%) respondents selected poultry as secondary importance, 59(80.82%) respondent selected goat as 3rd importance, and 52(71.23%) participants' selected donkey as 4th importance, according to community livestock owners preference. Whereas sheep was selected as 16(21.92%) 5th importance in domestic house, in 11 kebeles as survey indicated.

**Table 3: Scored causes of animal diseases in the selected districts by respondents**

| Causes of animal diseases | Woredas | | | Response rate | |
|---|---|---|---|---|---|
| | Bambasi | Kurumk | Homosha | (n=73) | % |
| Disease outbreak | 26 | 25 | 22 | 73 | 100 |
| Lack of treatment | 11 | 19 | 16 | 46 | 63.01 |
| Failure of treatment response | 10 | 16 | 11 | 37 | 50.68 |
| Lack of veterinary service | 0 | 0 | 27 | 27 | 36.98 |

As *Table3* indicated; with regard to causes of animal diseases, the highest (100%) of the respondents were indicated as disease outbreak was prevailing in the areas while the rest 63.01%, 50.68% and 36.98% of participants said that, lack of treatments , failure of treatment response, and lack of veterinary service respectively.

**Table 4: Grazing managements of animals**

| **Grazing managements** | **Woredas** | | | Response rate | |
|---|---|---|---|---|---|
| | Bambasi | Kurumk | Homosha | (n=73) | % |
| Communal and free grazing | 26 | 25 | 22 | 73 | 100% |
| Live at the outside of the farmers' house in bere system | 10 | 15 | 11 | 36 | 49.32 |
| Private and free grazing | 16 | 13 | 11 | 40 | 54.79 |
| Live at the out side of farmers house | 6 | 0 | 7 | 13 | 17.80 |

Study participants indicated that, 100% of livestock owners' grazing managements of animals were communal and free grazing, while the remaining 49.32%, 54.79%, and 17.80% of respondents indicated , live at the outside of the farmers' house in bere system, private and free grazing and live at the outside of farmers house respectively.

**Table 5: Animal died in 2021 in the three woreda study conducted**

| Woreda | Species | Animal died in the 2021 | | | | | | (n=986, %) |
|---|---|---|---|---|---|---|---|---|
| | | **<1year** | | **1-3 year** | | **>3 year** | | |
| | | **N=402** | **%** | **N=296** | **%** | **N=280** | **%** | |
| Bambasi (7 pa), kurmuk(2 pa) , and Homosha ( 2 pa) | Cattle | 9 | 2.24 | 26 | 8.78 | 71 | 25.36 | 106 (10.75% |
| | Goat | 47 | 11.69 | 79 | 26.68 | 40 | 14.28 | 166(16.84%) |
| | Sheep | 9 | 2.24 | 16 | 5.40 | 5 | 1.78 | 30(3.04%) |
| | Donkey | 3 | 0.74 | 8 | 2.70 | 18 | 6.43 | 29(2.94%) |
| | Poultry | 342 | 85.07 | 167 | 56.42 | 146 | 52.14 | 655(66.43%) |
| Total | | 402 | | 296 | | 280 | | 986 |

As Table 5 indicated, 10.8%, 16.84%, 3.04%, 2.94% and 66.43% of relative mortality rate were recorded in Cattle, Goat, Sheep, donkey and poultry respectively in three woredas (11 kebeles) of study sites.

**Table 6: Animal crude mortality rate in 11 villages in (2021) by livestock owners**

| No | Animal type | No of animal population | No of animal died | Crude mortality rate % |
|---|---|---|---|---|
| 1. | Cattle | 15,219 | 106 | 0.69 |
| 2. | Sheep | 1,242 | 30 | 2.46 |
| 3. | Goat | 6,073 | 166 | 2.73 |
| 4. | Equines | 1,747 | 29 | 1.65 |
| 5. | Poultry | 18,500 | 655 | 3.54 |
| | | 42,756 | 986 | 2.30 |

As the Table 6 above indicated, the crude mortality rate in animal type were, 0.69 % of cattle, 2.46 % of sheep, 2.73% of goat, 1.65% of equines and 3.54% of poultry in 11 villages of the study area. Without poultry, death rate=331/24,256x100%=1.36.

**Table 7: Animal diseased(sick) in the three woreda in 2021**

| Woreda | Species | Sick | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|
| | | <1year | | 1-3year | | >3 yr | | | |
| Bambasi (7 pa); kurmuk(2 pa) and Homosha ( 2 pa) | Cattle | 19 | 7.94% | 111 | 28.90% | 396 | 57.98% | 526 | 40.27% |
| | Goat | 53 | 22.17% | 85 | 22.14% | 106 | 15.52% | 244 | 18.68% |
| | Sheep | 11 | 4.60% | 19 | 4.94% | 13 | 1.90% | 43 | 3.29% |
| | Donkey | 7 | 2.92% | 6 | 1.56% | 25 | 3.66% | 38 | 2.90% |
| | Poultry | 149 | 62.34% | 163 | 42.44% | 143 | 20.93% | 455 | 34.84% |
| Total | | 239 | | 384 | | 683 | | 1,306 | |

As Table 7 indicated, 40.3%, 18.68%, 3.29%, 2.90%, and 34.84% of relative morbidity rate of Cattle, Goat, sheep, Donkey and poultry respectively were recorded in the 11 kebeles of study sites.

**Table 8: Specific Diagnosis of diseases and syndromes responsible for animal morbidity in three woredas (2021) respond by livestock owners**

| Diseases and syndrome | Species | No. of sick | Proportional morbidity rate(n=1574 diseased) |
|---|---|---|---|
| Trypanosomosis | Cattle | 223 | 14.16 |
| CBPP | | 195 | 12.38 |
| Bovine pasteurellosis | | 108 | 6. 86 |
| PPR | Shoat | 168 | 10.67 |
| Shoat pox | Goat | 94 | 5.97 |
| CCPP | | 150 | 9.52 |
| Ovine pasteurellsis | Sheep | 43 | 2.73 |
| Pneumonic case | Equine | 38 | 2.41 |
| NCD | Chicken | 355 | 22.55 |
| Avian salmonella | | 200 | 12.70 |
| | | =1,574 | |

**Table 9: No. of animals born in 2021**

| Animals | Animal born by Sex | | Total (N=927) | % |
|---|---|---|---|---|
| | Male no. | Female no. | | |
| Cattle | 68 | 75 | 143 | 15.43% |
| Sheep | 13 | 8 | 21 | 2.26% |
| Goat | 74 | 124 | 198 | 21.35% |
| Donkey | 6 | 5 | 11 | 1.18% |
| Poultry | 276 | 278 | 554 | 59.76% |

59.8% of poultry were born while 15.43%, 2.26%, 21.4%, and 1.18% of cattle, sheep, goat, and donkey (equine) were born in 2021 in the study sites as Table 9 indicated.

**Table 10. Common animals diseases in your locality in their order of importance**

| Animal disease in the area | Woreda | | | Response rate | |
|---|---|---|---|---|---|
| | Bambasi | Homosha | Kurmuk | N=73 | % |
| Trypanosomosis | 26 | 24 | 23 | 73 | 100 |
| CBPP | 28 | 21 | 18 | 68 | 93.15 |
| PPR | 22 | 23 | 24 | 69 | 94.52 |
| Black leg | 6 | 8 | 5 | 19 | 26.02 |
| Pasturellosis | 23 | 22 | 20 | 65 | 89.04 |
| Endo parasite ( Fasiola, fluke) | 9 | 11 | 15 | 35 | 47.94 |
| Ecto parasite | 8 | 9 | 5 | 22 | 30.13 |
| NCD | 22 | 16 | 18 | 56 | 76.71 |
| Rabies | 5 | 4 | 3 | 12 | 16.43 |
| LSD | 2 | 3 | 9 | 14 | 19.17 |
| FMD | 18 | 5 | 3 | 26 | 35.62 |
| Shoat pox | 2 | 2 | 3 | 7 | 9.58 |
| Toxic plant | 0 | 1 | 2 | 3 | 4.11 |
| CCPP | 3 | 4 | 3 | 10 | 13.69 |
| Brucellosis | 2 | 2 | 3 | 8 | 10.95 |

As *Table 10* showed that, 100 , 93.2, 94.52, 26.02, 89.04, 47.94, 30.13, 76.71, 16.43, 19.17, 35.62, 9.58, 4.11, 13.69, and 10.95 respondents of 11 kebeles of community livestock owners indicated ; Trypanosomosis, CBPP, PPR, Black leg, Pasturellosis, endoparasite, ectoparasite, NCD, rabies, LSD, FMD and Shoat pox, Toxic plant, and Brucellosis respectively were scored as common animal disease in the villages.

**Table11: Level of the disease symptoms in the woredas by respondents**

| Animal disease problems | Level of disease symptoms / importance by respondents | Ranking |
|---|---|---|
| Sudden death | 202 | 3 |
| Itching or wool loss or skin problem, | 173 | 5 |
| Diarrhea, | 216 | 2 |
| Losing body condition, | 280 | 1 |
| Bloating or swollen belly, | 117 | 7 |
| Nervous symptoms, | 100 | 9 |
| Not eating, | 186 | 4 |
| Lambing problems, | 136 | 6 |
| Blindness | 104 | 8 |

As Table 11 indicated that, animal disease problems or symptoms such as losing of body conditions, diarrhea, sudden death, not eating, itching or wool loss or skin problems, lambing problems, bloating or swollen belly, blindness, and nervous symptoms were scored as 1- 9 based on veterinary importance as respondents in five kebeles reported.

**Table 12. Frequency of treatment in the selected three woredas in year**

| Livestock kept | Woredas | | | Mean frequency in a year |
|---|---|---|---|---|
| | **Bambasi** | **Homosha** | **Kurumk** | |
| Cattle | 24 | 18 | 12 | 54/3=18 |
| Shoats | 11 | 12 | 12 | 35/3=11.66 |
| Equine/ Donkey/ | 5 | 9 | 8 | 22/3=7.33 |

As *Table 12* indicated; respondents in the three woredas reported domestic animals such as cattle, shoats, and equine (donkey) were taken averagely, 18, 11.66 and 7.33 defined frequency of treatment in the year.

**Table 13. Cost of treatment in the woredas**

| Livestock kept | Average cost of treatment in woredas | | | Average cost |
|---|---|---|---|---|
| | **Bambasi** | **Homosha** | **Kurumk** | |
| Cattle | 45 | 43 | 42 | 43.33 |
| Shoats | 22 | 25 | 20 | 22.33 |
| Equine/ Donkey/ | 29 | 28 | 30 | 29 |

As *Table 13* indicated, 43.33, 22.33, and 29 birr of average cost of treatment were given to cattle, shoats and donkey in selected three woredas respectively.

**Table14. Do you think the treatment is effective?**

| **Variables** | Freq. | Response rate (n=73, %) |
|---|---|---|
| a. Yes | 56 | 76.71 |
| b. No | 13 | 17.80 |
| c. I don't know | 9 | 12.32 |

As Table 14, 76.71% of the respondents indicated that as treatment was effective while the rest 17.80%, and 12.32% of study participants noted as there was no effective treatment and as they did not know whether the drug was effective or not in the surveyed areas.

**Table15. Is the animal drugs used in the area are effective treatment?**

| **Variables** | **Freq.** | **Response rate (n=73, %)** |
|---|---|---|
| a. Yes | 43 | 58.90 |
| b. No | 30 | 41.09 |

As Table 15 indicated that, 58.90% of the respondents noted that, the animal drugs used in the area were effective while 41.09% of the respondents noted as it was not effective.

**Table16. How do you control or treat diseases, when it occurs in your herd?**

| Variables | Freq. | Response rate (n=73, %) |
|---|---|---|
| 1. By using traditional medicine locally available | 4 | 5.47 |
| 2. Buying and administration of veterinary drugs by their own | 0 | 0 |
| 3. Travelling to nearby veterinary clinic | 66 | 90.41 |
| 4. All alternatives | 0 | 0 |

90.41% of the study participants indicated that, diseases in the areas was controlled by travelling to nearby veterinary clinic while 5.47% of the respondents noted as they control diseases by using traditional medicine locally available as Table 16.

**Table17. What is the effect of diseases?**

| **Variables** | **frequency** | **Response rate (n=73, %)** |
|---|---|---|
| a. Cause death of livestock | 73 | 100 |
| b. Cause production loss(milk, meat, and hides/skin | 42 | 58 |
| c. Cause loss of work efficiency ( draught power) of oxen and other | 11 | 15 |

100% study participants noted that, the effect of diseases would cause death of livestock while the rest 58% and 15% of respondents stated the effect of diseases would cause production loss (milk, meat and hides/skin) and cause loss of work efficiently (draught power) of oxen and other respectively as table 18 indicated.

**Table18: Season/month of livestock, most often get the disease in selected woredas**

| No | Disease name | Seasonal Occurrence | Disease control & prevention measures |
|---|---|---|---|
| 1 | Trypanosomosis | Rainy season( entrance) | Treatment and Tsetse fly control |
| 2 | Internal parasite | Entry and exit of rainy season | Treatment, deworming & education |
| 3 | Ectoparasites (Tick) | High in rainy season | Treatment/ spray/ and education |
| 4 | FMD | September–November, Feburary | Treatment, animal movement restriction |
| 5 | PPR | July; December; March-April; October & January | Vaccination, Treatment, animal movement restriction |
| 6 | Shoat Pox | April- may, June | Vaccination & Treatment service |
| 7 | Rabies | November, April- june | Abormal dog eradication; vaccination |
| 8 | NCD | April-may, july; November - January | Vaccination and Treatment service, buried died; isolation of sick from normal |
| 9 | Pasteurellosis | March- April,June, entrance of rainy season | Seasonal offerance of Vaccination and Treatment service |
| 10 | Anthrax | November, Januray, Febuarary | Seasonal offerance of Vaccination and Treatment service |
| 11 | LSD | September- November, may, August | Seasonal offerance of Vaccination and Treatment service |
| 12 | Strangyle | April | Proper Treatment service |
| 13 | Black leg | March- april, Following rainy season disease occur | Vaccination and Treatment service; isolation of sick from healthy |
| 14 | CBPP | September, October | Timely, Vaccination & Treatment service |
| 15 | CCPP | October, Dry season | Pre vaccination & isolation |
| 16 | Pneumonia | Dry and wet season, stress season | Vaccination, early treatment |

**Table 19. How is the disease transmitted?**

| Variables | frequency | Response rate (n=73, %) |
|---|---|---|
| a. By flies | 71 | 97.26 |
| b. By ticks | 35 | 47.94 |
| c. By treatment materials | 13 | 17.80 |
| d. Others (stress ) | 16 | 21.91 |

Majority (97.3%) of the study participants indicated, as the disease transmitted by flies, while 47.94%, 17.80%, and 21.91% of respondents stated as the disease transmitted by ticks, treatment materials, and other (stress) respectively, as table 20 showed.

**Table 20 : Is there any operation for animal disease in your area?**

| Variables | Freq. | Response rate (n=73, %) |
|---|---|---|
| a. Yes | 70 | 95.89 |
| If yes, what kind of control methods employed in your area? | | |
| 1. Fly control using insecticides | 68 | 93.15 |
| 2. Resting animals from work | 59 | 80.82 |
| 3. Treatment of affected animals | 69 | 94.52 |
| 4. Vaccination | 66 | 90.41 |
| 5. Animal movement control | 31 | 42.46 |
| b. No | 0 | 0 |

95.89% of the respondents noted that, as there was animal diseases control methods in the areas while 93.2%, 80.82%, 94.52%, 90.41%, and 42.4% of participants said that as there was fly control using insecticides, resting animals from work, treatment of affected animals, vaccination and animal movement controls respectively which were set as operation for animal diseases in your areas as the Table 20 showed.

**Table 21. Where do you get drugs for the treatment of patient animals?**

| Variables | Freq | Response rate |
|---|---|---|
| a. Vet. Pharmacy | 65 | 89.04 |
| b. Shops | 8 | 11 |
| c. if exist others | 0 | 0 |

89.04% of study respondents indicated as the drugs for treatments of patient animals get from veterinary pharmacy while the 11% of the respondents stated as they get from shops as table 21 indicated.

**Table 22.** Do you think that drugs found in your area is effective for the treatment of animals disease encountered there?

| Variables | | Freq | Response rate |
|---|---|---|---|
| a. yes | | 53 | 72.60 |
| b. no | | 20 | 27.39 |

The highest (72.60%) of the participants noted as the drugs in the areas were effective for treatment of animals diseases while 27.4% of the respondents said as the drugs provided were not effective for animals disease as Table 23 noted.

**Table 24:** Animal mortality, and economic impact in selected villages by livestock owners (in 2021)

| No | animal type | No of animal died | Average per animal price in birr(cost) | Total price | Economic impact ( mortality in birr) |
|---|---|---|---|---|---|
| **1** | Cattle | 106 | 30000 | 3,180,000 | 3,180,000 |
| 2 | Sheep | 30 | 3000 | 90,000 | 90,000 |
| 3 | Goat | 166 | 2800 | 464,800 | 464,800 |
| 4 | Equine | 29 | 12000 | 340,000 | 340,000 |
| 5 | Poultry | 655 | 500 | 327,500 | 327,500 |
| | Total | 986 | | | 4,402,300 birr |

Based on animal mortality studied result, economic losses on to farmers due to death of animal population were estimated as 4,402,300 birr. Similarly, when farmers animal sick production and productivity decline, draft animal power reduced, a agriculture service reduced, directly or indirectly animal and crop development made impact (Table 24).

### 4.2 INTERVIEW WITH KEBELES ANIMAL HEALTH WORKERS

Eleven animal health workers (respondents) were involved in the studied kebeles. In the kebele veterinary health posts, retrospective information were assessed from the case book documents from 2021, which were related to list of common priority animal diseases, preconditions under taken before patient treatment and recommended drugs for suspected diseases were surveyed in the veterinary health posts during the questionnaire survey.

**Table 25. What are the animal diseases exists in your area in order of their economic importance?**

| **Animal disease in the area** | Woreda | | | Response rate | |
|---|---|---|---|---|---|
| | Bambasi | Homosha | Kurmuk | **N=11** | **%** |
| Trypanosomosis | 7 | 2 | 1 | 10 | 90.90 |
| CBPP | 7 | 1 | 0 | 8 | 72.7 |
| PPR | 7 | 2 | 2 | 11 | 100 |
| Black leg | 2 | 1 | 1 | 4 | 36.36 |
| Pasteurellosis | 6 | 2 | 2 | 10 | 90.90 |
| Endo parasite ( Fasiola, fluke) | 4 | 1 | 1 | 6 | 54.54 |
| Ecto parasite | 2 | 1 | 1 | 4 | 36.36 |
| NCD | 6 | 2 | 2 | 10 | 90.90 |
| FMD | 5 | 0 | 0 | 5 | 45.45 |
| Shoat pox | 1 | 1 | 1 | 3 | 27.27 |
| Pneumonia | 6 | 2 | 2 | 10 | 90.90 |

90.90%, 72.7%, 100%, 36.4%, 90.90%, 54.54%, 36.4%, 90.90%, 45.45%, 27.3%, 90.90% of the respondents indicated,Trypanosomosis, CBPP, PPR, Black leg, Pasteurellosis, endoparasites, ectoparasites, NCD, FMD, Shoat pox, and pneumonia respectively as Table 25.

Table 26: Do you think that there area available (enough) drugs and vaccines in your clinic to treat and control animal diseases occurs in your area?

| **Variables** | **frequency** | **Response rate (n=11, %)** |
|---|---|---|
| a. Yes | 4 | 36.36 |
| b. No | 7 | 63.63 |

36.4% of the animal health workers in the kebele indicated that, as available drugs and vaccines in the veterinary clinics treat and control animal diseases while 63.63% of the respondents noted that as they were not effective to treat and control the diseases as Table 26.

Table 27: Do you know that the drugs are effective treatment for the diseases occurs in your areas?

| Variables | Frequency | Response rate (n=11, %) |
|---|---|---|
| a. Yes | 10 | 90.91 |
| b. No | 1 | 9.1 |

The highest (90.91%) of kebele animal health workers noted that as the recommended drugs were effective for specific diseases whereas 9.1% of them were noted as the drug were not effective for diseases in the areas as Table 27 shown.

**Table 28: Is there any illegal drugs sellers and injector in your kebeles or areas?**

| Variables | Frequency | Response rate (n=11, %) |
|---|---|---|
| a. Yes | 4 | 36.36 |
| b. No | 7 | 63.63 |

As Table 28 indicated, majority (63.63%) of the study participants said as there was no any illegal drug seller and injectors in the kebeles whereas 36.4% of the participants(kebeles animal health workers) noted as there was illegal drug seller and injector in the areas.

## 5. Discussion

The present survey was conducted in Bambasi (7 kebeles), Kurmuk (2 kebeles) and Homosha (2 kebeles) of three districts for retrospective animal mortality and morbidity and problems identification in the areas. Overall 73 respondents of livestock owners and 11 kebeles animal health workers were interviewed. Animal crude mortality and proportional morbidity rate, treatment cost per animal in a year, domestic animal level of importance, disease and syndrome prioritization, and animal population in 2021, were assessed during the survey.

Of 73 respondents of kebeles rural residents, 80.82% were male, and 19.2% were female. Regarding the educations categories, (28.76%), (35.62%), (21.92%) and (13.69%) of respondents were illiterate, 1-4, 5-8, and 8-12 grades respectively in the 11 sites. And < 35 years, 35-50 years and >50 years of age categories were 13.69%, 50.68%, and 35.62% of respondents respectively in the 11 villages of study sites. The present findings were concord with the previous findings of Umer seidGeletu *et al*. (2021) in Doba District of WestHarerghe Zone, Ethiopia; who indicated demographic features the respondents.That is 86.7% of males and 13.3% of females of sex groups. 66.7% of illiterate, 24.4% of literate, 8.9% of primary school of education status. And 37.8% of respondents were less than 15 years, 62.2% of respondents of family size were age ranging greater than 15 years. Similarly, Abdihakim M, *et al*.(2022) in Somali Shabelle Zone, Somali Regional State, Ethiopia, showed that, Gender, age, educational level and family size were assessed, that was, 75% of respondent males and 24.5% females of sex groups. 63.5% of respondents illiterate, 26% of primary grade, and 10.5% religious school of educational levels. Furthermore, Gebremedhin A.(2007) who studied that, major animal health problems of market oriented livestock development in Atsbi Womberta woreda, Tigray regional state, that is 82% respondents of males, and 18% of females. Respondents of 82 % of illiterate, 10%of Religious, and 6% of elementary school and 2% of junior and above. 39.8% of respondents were less than 15 years old, and 61.2% of respondents of greater than 15 years of demographic features in the areas.

Majority (97.3%) of the study participants indicated, as the disease transmitted by flies, while 47.94%, 17.80%, and 21.91% of respondents stated as the disease transmitted by ticks, treatment materials, and other (stress) respectively. Study participants indicated that, 100% of livestock owners' grazing managements of animals were communal and free grazing, while the remaining 49.32%, 54.79%, and 17.80% of respondents indicated, Live at the outside of the farmers' house in beret system, private and free grazing and live at the outside of farmers house respectively. 100% of study participants noted that, the effect of diseases would cause death of livestock while the rest 58% and 15% of respondents stated the effect of diseases would cause production loss (milk, meat and hides/skin) and cause loss of work efficiently (draught power) of oxen and other respectively.

Up on investigation of animal health problems, majority of respondents said that disease occurrence, communal grazing land and water are the most common livestock production limiting factors in the areas. Comparably, Umer seid Geletu *et al*. (2021) in Doba District of West Harerghe Zone, Ethiopia; indicated that, 100% of occurrence of health problems, and 37.8% of animal loss due to diseases were animal health constraints that limit the productivity in the area. Besides this, Birhanu A *et al.(*2015) who studied on Investigation of major cattle production constraints in

Kembata Tambaro zone of Southern Ethiopia, showed shortages of feed and free grazing land and diseases as the major constraints affecting production and productivity of cattle and small holders' livelihood. In addition, Markos T, (1999) in a M2-2 sub-agroecologicalzone with special reference to goat production, who investigated, livestock production constraints as feed shortages, livestock diseases, low genetic potential of indigenous livestock, lack of marketing infrastructure and water shortages.

Comparably, this finding was in line with the previous finding of Nigatu D. *et al. (2017)* who studied assessment of potential factors contributing to animal health service delivery problems, in Benishangul Gumuz Regional State, Ethiopia and indicated that, shortage and poor quality of drugs, misdiagnosis, lack of consistent and systemic way of monitoring, evaluation, and controlling of service delivery, lack or shortage of diagnostic materials, limitation with timely provision of vaccines and treatment chemicals, biased managers, shortage or lack of infrastructures, lack of initiation, and lack of professional refreshment trainings as existing constraints in selected woreda kebeles of Assosa zone.

As community livestock owners respond, animal crude mortality rate with animal type were 0.69% of cattle, 2.46% of sheep, 2.73% of goat, 1.65% of equine, and 3.54 % of poultry. Similarly, 10.8%, 16.84%, 3.04%, 2.94% and 66.43% of relative mortality rate were recorded in Cattle, Goat, Sheep, donkey and poultry respectively in three woredas (11 kebeles) of study sites.

In addition, the current study was concord with the previous findings of Gebremedhin A. (2007) who indicated in Atsbi Wombertaworeda, Tigray regional state, as 16.98%, 6.6% of anthrax in cattle, sheep, 15.7%, 14.7% of black leg in cattle, sheep, 10.6% of mastitis of cattle, 8.9% ,17.0% of Pasteurellosis in cattle, sheep, 5.3% of LSD in cattle, 7.9% ,53.7% of shoat pox of sheep , goat and 53.7% of NCD of livestock mortality rate respectively, and also, Gebremedhin A. (2007) reported that, during 2005/2006 years, a total of 223 animals died from different causes, but according to farmers, most of sheep died of diseases that is categorized as unknown disease. From the total number of animals died, 12.3% were cattle, 40.8 % were sheep, 20.1% Goat, 18.7% were poultry and 4.1% were equine.

Comparably, the present crude mortality was in line with the previous findings of Asmamaw A *et al.* (2017) which was reported as crude animal mortality rate were, 21.46 % cattle, 22.1% sheep, 22.52 % goat, 6.75 % equines and 75.1 % poultry. Besides this, 2.32% LSD, 2.91% CBPP, 0.87% anthrax, 21.97% PPR, 7.2% Shoat pox, 10.92 % CCPP, 52.32 NCD% and 1.46% Rabies, were reported as proportional mortality rate. These varieties might be due to, the major causes of mortality were poor management problems followed by viral and bacterial diseases. Similarly, it was also slightly inconsistent with mortality rate of 12.17% cattle, sheep 38.06%, goat 68.58% and equines 30.28% and crude mortality rate excluding poultry were 48.63% in Assosa zone woredas' (CSA, 2013).

However, the present finding is lower when compared with the previous findings of, Tesfaye D *et al*. (2011) who indicated, 4.4 % overall mortality rate of cattle due to trypanosomosis and 12.1% of overall prevalence of the disease, during his research activity on economic burden of bovine trypanosomosis in three villages of Metekel zone, Northwest Ethiopia. In addition, it disagrees with the previous findings of Hossain MM *et al.* (2014) who reported, 5.6% average overall mortality rate, and higher mortality of cattle in rainy season (37.98%) followed by winter (33.03%) and summer (28.99%) and also pneumonia (39.91%), Tuberculosis (20.58%) and enteritis (15.58%) cause of deaths. In addition, this result was in line with the earlier reports by Solomon w. *et al*. (2014) during their studies on major causes of lamb mortality at Ebinatworeda, Amhara National state, north western, Ethiopia, that, 40% of overall lamb mortality, most of mortalities were due to diarrhea (51.0%), pneumonia (38%)and others 10.0%.

Livestock owners respondents said that, morbidity rate in animal type were 14.16% trypanosomosis, 12.4% CBPP, 10.67% of PPR, 6.86% of Bovine pasteurellosis, 9.52% of CCPP, 22.55% NCD, and 12.70 % of avian salmonella, 5.97% of shoat pox, 2.73% of ovine pasteurellosis, in 11 villages of surveyed sites. Besides this, 40.3%, 18.68%, 3.29%, 2.90%, and 34.84% of relative morbidity rate of Cattle, Goat, sheep, Donkey and poultry respectively were recorded in the 11 kebeles of study sites. Comparably, Asmamaw A *et al.*(2017) reported that, 28.72% Trypanosomosis (cattle, shoats), 26.39% internal parasites (cattle, shoat, equines), 13.46% ectoparasites (cattle, shoat, equines) and 31.43% other disease complications were studied as proportional morbidity rate during the study period.However, the present findings were inconsistent with the findings of Chaudhary JK, *et al*. (2013) who reported an overall bovine morbidity of 31.22%. Besides this, it was in accordance with the study conducted by Kelay B *et al*. (2008) who reported incidence of crude morbidity 61.5%, due to (diarrhea, pneumonia, navel ill, septicemia and congenital disease), during the study of calf morbidity in dairy farms in Debre zeit, its environs, Ethiopia and also the most frequent disease of calf diarrhea with incidence of 42.9%. This variation were due to substantial economic losses and/ or animal death, due to disease occurrence, shortage of

variety drugs, in appropriate vaccination program, and different health constraints in the areas.

As the present survey indicated that, Trypanosomosis, CBPP, PPR, Black leg, pasteurellosis, endoparasite, ectoparasite, NCD, Rabies, LSD, FMD, and Shoat pox, Toxic plant, CCPP, and Brucellosis were common animal diseases prioritized by respondents as, 100% , 93.2%, 94.52%, 26.02%, 89.04%, 47.94%, 30.13%, 76.71%, 16.43%, 19.17%, 35.62%, 9.58%, 4.11%, 13.69%, and 10.95 % of response rate respectively assessed in the 11 villages of the sites. The current finding was similar with the findings of Nigatu D.*et al*. (2017) who indicated, the response of the animal health workers at the public animal health service centers and the common priority animal diseases of the area as, Trypanosomiasis, Pasteurellosis & CBPP, PPR, Pneumonia, ectoparasites and endoparasites, NCD, Salmonella, FMD, Blackleg, Lumpy skin disease, and Sheep and Goat pox, in the study area of Assosa zone of Benishangul Gumuz Regional State.

According to community livestock owners respondents' indication, economic losses due to animal death were recorded as 4,402,300 birr Comparably, Asmamaw A *et al*. (2017) showed that, farmers' household treatment cost because of diseased animals were 1,631,044 birr and economic loss due to death of animal population were estimated as 78,830,840 birr in the region as retrospective data in the casebooks of the studied area indicated.

The present study indicated that, frequency of treatment per animals per year were averagely, 18, 11.66, 7.33 of cattle, shoat and equines respectively, were brought to nearby veterinary health posts in a year as community livestock owners reported. Besides this, 43.33 for cattle, 22.33 for shoat, 29 for equine of average treatment cost was reported by livestock owners during the survey period in selected three woredas. This survey was comparable with the findings of Gebremedhin A. (2007), in Atsbi Wombertaworeda, Tigray regional state, who indicated that 42.5% of modern treatment cost, and 35.2% of traditional treatment cost as frequency of treatment. Similarly, 44.0% expensive, 44.0% moderate and 12.0% cheap of degree of treatment cost as respondents in the study areas. This finding was relatively comparable with that of Asmamaw A *et a*l. (2017) who showed, the farmers in the area were spending a significantly higher amount of money for the treatment of priority common animal diseases. Many of the farmers prioritized losses of draft power as the most important impact of the disease. The disease burden was significantly higher in the rainy season than at other times of the year.

## 6. CONCLUSION AND RECOMMENDATIONS

The retrospective survey on animal health problems investigation in Bambasi, Homosha and kurmuk (11 kebeles) were assessed. The highest and lowest (3.54%) and (0.69%) crude mortality rate were recorded in poultry and cattle respectively. Similarly, the highest and lowest (66.43% of poultry, 16.84% of Goat, 10.8% of cattle) and (3.04% of sheep, and 2.94% of donkey) of relative mortality rate were investigated in the study areas respectively. Study Livestock owners indicated that, 14.16% of Trypanosomosis, 12.4% of CBPP, 10.67% of PPR and 22.55% of NCD, 12.70% of avian salmonella, 9.52% CCPP, and 6.86% of Bovine pasteurellosis, were recorded as highest morbidity rate; while the lowest 5.97% of shoat pox, and 2.73% ovine pastuerelloss, of morbidity rate were recorded. 100%, 93.2%, 94.52%, 89.04%, and 76.71% of respondents were noted as (Trypanosomosis, CBPP, PPR, Pasteurellosis and NCD) highest priority animal diseases while, (4.11%) and (9.58%) of respondents indicated, Toxic plant and shoat pox as lowest priority diseases respectively. In 11 kebeles of the surveyed sites, frequency of treatment per animal in the villages, averagely were 18, 11.66, 7.33 of cattle, shoat and equines respectively, were come to nearby veterinary health posts in a year. Majority (97.3%) of the study participants indicated, as the disease transmitted by flies, while 47.94%, 17.80%, and 21.91% of respondents stated as the disease transmitted by ticks, treatment materials, and other (stress) respectively. In studied area, un strategic treatment and vaccination service, mis diagnosis, lack of veterinary diagnostic equipments, less monitoring and evaluation system, less surveillance and assessment were main gap identified. Therefore, strategic prevention and control policy would be implemented properly in study area so as to prevent problems encountered.

**Based on the above findings, the following recommendation was forwarded**:

- Illegal drug seller /shoppers, venders and injectors in the specific areas should be managed and owner ship would be created,
- Identification and isolation of major animal disease, and seasonal surveillance could be implemented,
- Community sensitization/ mobilization could be done in order to increase their perspectives up on animal husbandry, handling, sanitary measures, disease symptoms reporting, management options of communal feeding and watering strategy,
- Capacity building should be given for community front line animal health workers so as to increase their attitude, knowledge and skill regarding advanced veterinary service such as diagnostic,

surveillance and monitoring on the animal health problems and constraints encountered during the survey.

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