

ASSESSMENT OF POTENTIAL FACTORS CONTRIBUTING TO ANIMAL HEALTH SERVICE DELIVERY PROBLEMS, IN BENISHANGUL GUMUZ REGIONAL STATE, ETHIOPIA

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ABSTRACT: A cross sectional study was conducted from October 2017 to May 2019 in Benishangul Gumuz Regional State to assess the factors contributing for animal health service delivery problems. The respondents were assessed for the existing problems in the veterinary service delivery system including the possible factors contributing for the occurrence of the problems. They were interviewed for their perception at the curing potential of drugs, their level of satisfaction with service delivered by the public animal health service centers, their preference of choice to present their sick animals for treatment, the possible diagnostic techniques that have been carried out at the public animal health service centers and animal health posts as well as the trust they have on the drugs provided by the public animal health service centers. A total of 347 animal owners specifically 138,76,69,33 and 31 in Assosa, Dibate, Wombera, Kurmuk and Kamash woreda respectively, were randomly selected. The case of dissatisfaction of animal owners with the service of public animal health sectors was identified in all five sample woredas including the highest in wombera (68.2%) whereas the lowest in dibate(26.3%). Generally, the proportion of respondents with dissatisfaction was evaluated as 38.3%. The drugs for treatment of animals infected with endemic diseases had not been distributed throughout all woredas proportionally in accordance with its need in the area of application. The animal health service delivery system had not been well equipped with adequate diagnostic materials as well as the professionals had not been well equipped by the necessary professional quality. Privatization had not been given an attention by concerned government sectors and the animal owners considered the public animal health service sector as the only sector to get service with this regard. As a result, most of the animal owners were identified to have better trust and prioritize the public sector of animal health service. The infrastructures like road, electric system, means of communication and transportation was identified as poor. The refreshment or short- and long-term training had not been provided regularly for animal health professionals to upgrade their knowledge. The animals had not been diagnosed properly to identify the right cause of the disease which may lead miss-diagnosis and miss-treatment. Hence the animal health service sectors should be well equipped by diagnostic equipment and personals.

[ASMAMMAW AKI, HAIMANOT DISASSA, NIGATU DISSASA, BAYISA KENAW AND HAILE WORKU. **ASSESSMENT OF POTENTIAL FACTORS CONTRIBUTING TO ANIMAL HEALTH SERVICE DELIVERY PROBLEMS, IN BENISHANGUL GUMUZ REGIONAL STATE, ETHIOPIA.** *Life Sci J* 2026;23(9):14-27]. ISSN 1097-8135 (print); ISSN 2372-613X (online). <http://www.lifesciencesite.com>. 02. doi:[10.7537/marslsj230926.02](https://doi.org/10.7537/marslsj230926.02)

Key words: Veterinary health service; Delivery system; Problems; Animal health professionals.

1. INTRODUCTION

Livestock are essential assets for livelihoods which help to move out of poverty, as a way into lucrative markets, as a source of foreign exchange, as important socio-economic resources, and as means of saving (Scoones and Wollmer, 2006). In Ethiopia, the contribution of livestock sector to the national economy is minimal compared to its potential. One of the main causes of this mismatch between population size and production output from livestock in Ethiopia is the widespread occurrence of many infectious and parasitic diseases which drastically reduce the production of livestock through morbidity, mortality and market restriction (Belachew and Jemberu, 2003; MoA and ILRI. 2013).

Ethiopia is endemic to a number of livestock diseases which continue to deter livestock productivity and agricultural development. The impact of animal diseases stems from direct losses due to mortality and its indirect effects through slow growth, low fertility and decreased work output that result from morbidity. Most livestock diseases have more devastating effects on young animals. Animals that recover experience severe growth problems which hinder longer term productivity, all of which translates to poor returns for the livestock keeper (Abebe, 2003; Mayen, 2003; MoA and ILRI. 2013).

The annual loss due to mortality ranges from 8–10% for cattle, 12–14% for sheep, 11–13% for goats and 56.9% for poultry. These figures are much higher for calves, lambs and kids. The direct and indirect losses from livestock disease have significant economic, food security and livelihood impacts on livestock keepers and the national economy. The presence and prevalence of a number of trade-limiting transboundary livestock diseases has denied the country access to international market and makes it vulnerable to trade bans. As many regions rid themselves of infectious animal diseases, and as international trade and travel intensify, these health threats are of increasing concern to Ethiopia's trading partners (MoA and ILRI. 2013).

Animal diseases also have an important impact on human health, with 60% of human diseases being of animal origin. Ethiopia is endemic to a wide range of such zoonotic diseases. In the past two decades, emerging and re-emerging zoonotic diseases have acquired global significance for Veterinary Public Health (VPH). These developments call for increased levels of epidemiological surveillance and preparedness, and for novel approaches to control and prevention. The OneHealth approach, which has been developed by the international community in the recent years in the context of influenza pandemics, has been adopted as the global framework for streamlining this collaboration (MoA and ILRI. 2013).

The development and growth of many poor countries depends on the performance of their agricultural policies and economies. This relates directly to the quality of their Veterinary Services. Veterinary services can be classified as curative services, preventive services, production of pharmaceuticals, human health protection, and advisory and extension services. To meet these opportunities and challenges, veterinary services need to operate on scientifically based principles and be technically competent, independent and immune from political pressures (OIE, 2010).

In most African countries the animal health services have declined due to a number of reasons. In recognition of the shortcomings of conventional veterinary service delivery system, many development agents including nongovernmental organizations started using primary animal healthcare approaches. However, there are challenges to be addressed during the implementation of primary animal healthcare services related to poor organization of regulatory bodies, lack of clear demarcation between public and private goods services, poor management of the transfer of services from the government to the private sector, delivery of animal health services in low input areas and provision of adequate services of an acceptable standard (MOARD, 2010).

1.1 Statement of the problem

The current delivery of animal health services is inadequate both in terms of coverage and quality. There are very few private veterinary service providers other than veterinary drug importers and distributors, few private veterinary pharmacies and very few community animal health workers (CAHWs) often supported by NGOs. The government, instead of providing incentives to the private sector, has been expanding the number of public clinics, which does not necessarily increase the provision of clinical service delivery in these areas. The woreda's, zonal and regional bureaus currently face problems in retaining their veterinary field personnel, especially in the more remote pastoral and agro-pastoral areas. Growth of private animal health service delivery is constrained by absence of an enabling policy environment and subsidized delivery of public animal health services. A system of sanitary mandates does not exist. Only 45% of the country is served by animal health delivery systems. Field services are constrained by lack of input supply, high operational cost and lack of transport. Budgets do not allow drug purchasers to cover more than a part of the annual needs. The ratio of salary expenditures to recurrent costs is high and is increasing (Manayeet *et al.*, 2009; Ahmed *et al.*, 2003; Getinetet *et al.*, 2003; Tolera and Said, 1992).

The National Veterinary Institute (NVI) is producing a wide range of vaccines. However, some essential vaccines are not produced or are not produced in sufficient quantity and quality. The quality, safety and efficacy of veterinary drugs

and biologicals locally produced, imported, distributed and used in the country are not properly regulated and controlled. Animal health services is affected by the government decentralization policy (devolvement of authority and responsibility to empower the regions), since the responsibilities of the federal and regional states were not well defined. There are poor communication lines between the different levels of veterinary services for the control of transboundary animal diseases (TADs) (MoA and ILRI. 2013).

Disease surveillance and reporting is poor and irregular, with only about 30–35% of woreda's submitting disease outbreak reports each month. That figure is below 5% for pastoral and agropastoral areas. Moreover, the sensitivity, specificity and timeliness of the reports are very low. There is no autonomous statutory body to regulate the profession, uphold ethics and educational standards (MoA and ILRI. 2013). All these animal health service challenges described above are not surveyed in Benishangul-Gumuz Regional state regardless of various complains coming in different directions from farmer, livestock owners and professionals on the poor animal health services. Therefore, the objectives of this survey will be:

General Objective

To evaluate quality of animal health services and identify potential challenging factors contributing to animal health services delivery problems in Benishangul-Gumuz Regional State.

Specific objectives

- To identify the existing challenges on animal health service delivery in the region.
- To assess problems in-line with treatment, quality of service provision and management practices.
- To evaluate the level of satisfaction of stockholders on animal health services in the region.
- To recommend possible alternatives for sustainable improvement of animal health service delivery for policy and decision makers of the region.
- To recommend further study on efficacy of the drugs supplied for veterinary clinics.

2. MATERIALS AND METHODS

2.1 Study area

The study area is located in the Benishangul-Gumuz Regional State where mixed farming system is dominant, in which about 92.5% of the population is engaged in agriculture as a major means of subsistence. Benishangul-Gumuz Regional State is found 687 km away from the capital city of the country, Addis Ababa, in the West. It is located at 9° 30'– 11° 30' latitude North and 34° 20'– 36° 30' longitudes East. The region is bordered with the Sudan in the West, Amhara Regional State in the East and North, Oromia Regional State in the East and South east and Gambella Regional State in the South (MoARD, 2007).

Three administrative zones, one special woreda, 19 woreda and 425 kebeles exist in the region. It covers a total area of about 5,038,100 hectares. Plain undulating slopes and mountains characterize the topography of the region. The altitude of the region ranges mainly between 580–731 meter above sea level (m.a.s.l.). The agro-climatic zonation of the region can be categorized as 75% lowland, 24% mid-highland, and 1% highland. The rainfall distribution pattern is mono-modal commencing towards end of April and ending in October.

Metekel zone has 55% % of the livestock population of the region, constituting 126, 592 cattle, 113, 061 goats, 15,806 sheep, 21,767 donkeys, 622,849 poultry, 45 horses and 92226 beehives (Negassa *et al.* 2011). Asosa zone has 35.6% of the livestock population of the region constituting 81,939 cattle, 73,181 goats, 10,231 sheep, 14,089 donkeys, 40, 3153 poultry, 29 horses and 59,695 beehives (CSA, 2007) and Kamashi zone has 9.4% of the livestock population of the region constituting 21,635 cattle, 19,323 goats, 2,702 sheep, 3,720 donkeys, 106,451 poultry, 8 horses and 15,762 beehives (CSA, 2007).



Figure 1: Map of the study area showing relative location of Assosa in BenshangulGumuz Regional State. (Source:<http://www.ocha-eth.org/Maps/downloadables/BENESHANGUL.pdf>)

2.2 Design

2.2.1 Questionnaire survey

Total of 5 woredas were selected from the three administrative zones of the region (total number of woredas in the region is 20). The number of selected woredas in each zone was determined based on size of animal population, agro ecology and farming style of the residents with the intention to make the data more representative. The selected woredas were two in Metekel zone (Wombera and Dibate), two in Assosa zone (Assosa and Kurmuk), one in Kamash zone (Kamash). In each woreda 20% of the administrative kebeles were included in the study. A total of 33 administrative kebeles were selected including 6 kebeles in Wombera, 6 kebeles in Dibate, 15 kebeles in Assosa, 3 kebeles in Kurmuk and 3 kebeles in Kamash.

The administrative units (locally called kebele) were randomly selected from total list of administrative units in each district using a simple random sampling method. A list of the farmers living in each administrative unit was taken from local development workers and simple random sampling was used to select individual farmers. The list of farmers included in the study was dispatched to respective local agents before beginning the survey so that they arranged time schedule for the respondents.

Using Thrusfield's (2008) derivation for sample size, the following assumptions was made and the number of individuals to be included was estimated. As the objective of the survey is more of a qualitative study, 10% error was inferred and, because no published work was encountered, 50% was used for expected prevalence of problems. The following formula will be used:

$$n = \frac{1.96^2 P_{exp}(1 - P_{exp})}{d^2}$$

Where: n = required sample size;
exp = expected prevalence;
d = desired absolute precision

A total of 347 respondents from the farmers, 26 public/government animal health service delivery centers and about 7 private animal health service delivery centers were obtained for questionnaire. The number of respondents with respective of woreda; 138 in assosa, 33 in kurmuk, 31 in kamash, 69 in womera, and 76 in dibate. A structured and pre-tested questionnaire format was used to collect information from each district and all veterinary practitioners were involved in both the public ($n = 26$) and private sector ($n = 7$) available during the study period.

The questionnaire was designed to assess the occurrence of common diseases in the area, the treatment regimens adopted when disease develops and the level of satisfaction with the existing animal health service delivery, including reasons for any dissatisfaction. During the questionnaire survey, it was attempted to correlate farmers' local perception of disease signs and symptoms with scientific contexts. For individuals in veterinary services (private and public), the methods used for **routine diagnosis** and commonly used therapeutic agents was also assessed. This data was collected by enumerators which have degree level professionals in animal health.

2.2.2 Observation of infrastructural setup

A checklist (based on standards set by the fishery and livestock development agency) was prepared and both private ($n = 8$) and government ($n = 26$) animal health service delivery centers operating during the survey period were included, inspected and observations recorded for all available premises and facilities.

2.2.3 Discussions with agricultural sectors

After the individuals in the public and private animal health service delivery sectors and farmers had been interviewed, the problems raised were summarized and forwarded to Agriculture sectors at kebeles, district, zonal and regional levels whose views will be obtained with respect to the existing constraints raised from the survey and future prospects for the service including options to improve it.

2.3 Data management and analysis

Surveyed data was recorded in Microsoft Excel sheets. The data was summarized and existing problems with their respective potential factor was estimated using descriptive statistics. The associations among categorical variables such as problems and potential factors will be analyzed using chi-squared test. The effects of various potential factors on binary outcomes will be assessed using logistic regression with available statistical soft wares. In all the cases the P value of less than 0.05 was considered significant.

2.4 Expected Outcomes

1. The existing animal health service delivery problems was identified.
2. Potential factors associated the existing problems were assessed.
3. The finding is expected to help the policy makers and decision makers to design the alternative improvements in veterinary delivery services in the region.

2.5 Beneficiaries of the study

Farmers, professional, researchers, policy and decision makers, governmental and non-governmental institutions any society utilize animals and their products will be benefited.

3. RESULTS AND DISCUSSION

3.1. Questionnaire Survey of Animal Owners

The respondents were assessed for the existing problems in the veterinary service delivery system including the possible/potential contributing factors. These are: their perception for the curing potential of drugs, level of satisfaction with service delivered by the animal health service centers, preference of choice to present their sick animals for treatment, the possible diagnostic techniques that have been carried out at the animal health service centers and animal health posts as well as the trust they have on the drugs provided by the public animal health service centers.

3.1.1 Level of satisfaction of the animal owners

Level of satisfaction of farmers was evaluated in different woredas and the result is summarized in table 1. As indicated in the table, dissatisfaction was detected in all study woredas with different values. A total 347 farmer respondents were evaluated for level of dissatisfaction where 138(39%) from assosa, 33(9.5%) from kurmuk, 31(8.9%) from kamash, 69(19.9%) from wombera, and 76(21.9%) from dibate woreda; in which wombera woreda is identified with highest level of dissatisfaction. The level of dissatisfaction in different woreda are evaluated as 40(29%), 13(39%), 13(41.9%), 47(68.2%), 20(26.3%) in assosa, kurmuk, kamash, wombera and dibate woreda respectively. All of the respondents share in common, as the attention had not been given to the animal health service sector. Among the total of the respondents (347), the rate of dissatisfaction is identified as 38.8% (133 respondents).

Table 1: Level of satisfaction

Woreda	Frequency	Satisfied	Dissatisfied	Total
Assosa	138(39%)	98(71%)	40(29%)	138(100%)
Kurmuk	33(9.5%)	20(60.6%)	13(39.4%)	33(100%)
Kamash	31(8.9%)	16(51.6%)	13(41.9%)	31(100%)
Wombera	69(19.9%)	11(15.9%)	47(68.2%)	69(100%)
Dibate	76(21.9%)	44(57.9%)	20(26.3%)	76(100%)
Total	347(100%)	189(54.5%)	133(38.3%)	322(92.8%)

3.1.2 The diagnostic techniques at public animal health service delivery center

The most common diagnostic technique carried out at all public animal health service delivery center is physical diagnosis only [309(89%)]. Only 3 respondents or 0.9% response rate was encountered, responding as laboratory diagnosis is being implemented to examine their animals in two woredas (Assosa 2(1.4%) & Dibate 1(1.3%)). Among all respondents only 34(9.8%) respondents encountered for the diagnostic techniques like Physical diagnosis, taking of history & using of thermometer for examining of the animals before treatment as indicated (Table 2).

Table 2: Possible diagnostic techniques

Woreda	Diagnostic techniques exercised at public animal health service delivery center					Total
	Not mentioned	Physical dx.	Physical /History /Thermometer	dx. Physical dx./Laboratory dx		
Assosa	0(0%)	136(98.6%)	0(0%)	2(1.4%)		138(100%)
Kurmuk	0(0%)	33(100%)	0(0%)	0(0%)		33(100%)
Kamash	0(0%)	31(100%)	0(0%)	0(0%)		31(100%)
Wombera	0(0%)	52(75.4%)	17(24.6%)	0(0%)		69(100%)
Dibate	1(1.3%)	57(75%)	17(22.4%)	1(1.3%)		76(100%)
Total	1(1.3%)	309(89%)	34(9.8%)	3(0.9%)		346(99.7%)

3.1.3 The preference of animal owners

The public animal health service delivery center is recognized as the choice of most of animal owners (Table 3). Accordingly, 324(93.4%) of the respondents expressed their interest by preferring for the service delivered by public animal health service centers and 20(5.8%) of them prefer the combination public, private and tradition respectively according to their priority.

Table 3: Preference of farmers

Woreda	The preference of farmers to animal health service delivery systems			
	Private	Public	Public/private/tradition	Total
Assosa	0(0%)	136 (98.6%)	2(1.4%)	138(100%)
Kurmuk	0(0%)	33(100%)	0(0%)	33(100%)
Kamash	0(0%)	31(100%)	0(0%)	31(100%)
Wombera	0(0%)	61(88.4%)	8(11.6%)	69(100%)
Dibate	1(1.3%)	64(84.2%)	10(13.2%)	75(100%)
Total	1(0.3%)	324(93.4%)	20(5.8%)	345(99.4%)

3.1.4 The curing efficiency of treatment

The respondents were asked for the efficiency of treatment that had been delivered at the public animal health service centers. The highest response rate [22(71%) among 31 respondents] for the occurrence of treatment failure was encountered in kamash woreda followed by kulmuk woreda with the response rate of 21(63.6%) among 33 respondents whereas the least value for the occurrence of the case of treatment failure was found in assosa woreda (49(35%) among 138 respondents). Generally, 197(56.8%) respondents among 347 gave negative response for the case but about 149(42.9%) respondents were encountered with positive response for the occurrence of the case of treatment failure (Table 4).

Table 4: Occurrence of treatment failure

	no	yes	Total
	89(64.5%)	49(35%)	138(100%)
	12(36.4%)	21(63.6%)	33(100%)
	9(29%)	22(71%)	31(100%)
	46(66.7%)	23(33.3%)	69(100%)
	41(53.9%)	34(44.7%)	75(100%)
	197(56.8%)	149(42.9%)	346(99.7%)

3.1.5 The trust of farmers

The trust of farmers on the public animal health service centers was also evaluated and the value of response of respondents is summarized in the table below. Accordingly, the highest value for the trust of farmers on the public animal health service centers is encountered in assosa woreda with response rate of 129(93.5%) among 138 respondents whereas the least value in wombera woreda with response rate of 51(73.9%) among 69 respondents. In general, among all respondents (347) about 303(87.3%) were recognized to have a trust on the drug delivered by government or public animal health service sector (Table 5).

Table 5: Trust of farmers

Woreda	The trust of farmers on the drug delivered by public veterinary service delivery sector		
	no	Yes	Total
Assosa	9(6.5%)	129(93.5%)	138(100%)
Kurmuk	4(12.1%)	29(87.9%)	33(100%)
Kamash	4(12.9%)	27(87.1%)	31(100%)
Wombera	16(23.2%)	51(73.9%)	67(100%)
Dibate	9(11.8%)	67(88.2%)	76(100%)
Total	42(12.1%)	303(87.3%)	345(100%)

3.2 Veterinary Professionals at Public Center

3.2.1 Assessment of Common Animal Diseases

Based on the response of veterinary professionals working at public veterinary clinic, most common diseases of domestic animals were assessed in the study area and the data is summarized in the table below.

Table 6: Common diseases of the area

Diseases of cattle	Diseases of sheep and goat	Diseases of poultry
Foot and mouth diseases, trypanosomiasis, pasteurellosis, ecto and endoparasites, mastitis, black leg, fly infestation, lumpy skin disease and salmonellosis.	PPR, pasteurellosis, pneumonia, unidentified goat disease.	Newcastle disease

3.2.2 The most common drugs available at the clinic

Different drugs such as antibiotics, anti-parasites (ecto& endo parasites), anti-protozoa and other chemicals to control tsetse fly infestation are identified as product of different countries (China, India, Ethiopia, Sudan, Kenya and France) among which the China product was the most dominant.

3.2.3 The existing constraints

The animal health professionals at veterinary clinic/animal health posts were assessed for the challenges that they have been facing while they were providing the service for their customers. The most common challenges encountered from the animal health professionals are shortage and poor quality of drugs, limitation of the attention given by the woreda level animal health professionals for the service, lack or shortage of diagnostic materials, limited number of professionals, limitation with timely provision of vaccines and treatment chemicals, lack of good governance, shortage or lack of infrastructures, lack of initiation, and professionals have not been getting various refreshment or skill gap filling trainings. The veterinary service practitioners and animal owners were complaining in common for unfair distribution/supply of drugs without considering the existing situation of the area regarding the quantity and items demanded by the community.

3.3.4. The existing diagnostic equipment and the diagnostic trends

The existing diagnostic materials at the public animal health service delivery centers was also assessed through onsite observation and the information from the professionals. Accordingly, at the center the diagnostic materials available for the examining of sick animals are microscope, stethoscope, and thermometer and heart girth. Among which stethoscope and thermometer are commonly available almost in all service centers. There are some cases in which professionals are not interested to use the diagnostic materials found in their veterinary clinic or animal health posts.

3.4 Private Veterinary Service Sectors

Animal health professionals at private animal health service delivery sectors were interviewed for about certain informations regarding the service they have been providing for their customer. The same question was provided for those practitioners as that of the public sector including, the issues; like the available diagnostic materials and the possible diagnostic techniques that have been conducted, the available treatment chemicals, the quality of drugs supplied to their sector, common challenges to deliver appropriate service and the most common diseases of the area. For this purpose, about 7 private animal health service centers were assessed in 4 woredas where 2 private sectors were assessed in each of the three woredas including kamash, dibate and wombera whereas 1 private animal health service sector in assosa town but kurmuk was recognized as with no private animal health service center.

Almost all of private animal health service sectors were not veterinary clinic/posts rather they were vendors or drug shops, however some of them were recognized as they were trying to deliver animal health clinic services which means they are trying to diagnose and treat the sick animals. Regarding the available diagnostic materials and the possible diagnosis carried out to identify the disease and its causative agents: thermometer, stethoscope, vaginal speculum are the diagnostic materials whereas case history and physical examination was identified as the common/major diagnostic technique. The type and source of treatment chemicals were more or less the same to that of public sectors. The other basic challenge was that the farmers were identified as not interested to complete the required/recommended dose due to unaffordable costs or the interest they have.

3.5 Discussion with concerned bodies at kebel and woreda level

During the discussion the perception of the stockholders for the animal health service delivery system was assessed. They complained for, that potency of drugs; that are in use to treat sick animals, has not been tested by the laboratory. There were also other issues forwarded by those stockholders like skill gap from professionals, trends of farmers to buy different medicines from vendors without knowhow about their dosage and side effects, farmers visit the veterinary clinic after many self-trials and when they consider that it becomes beyond their capacity. They complained for the occasions that some professionals were prescribing under dose medication for sick animals; at the same time the farmers were complained as not to be strict for prescription given by the professional.

Because of scattered residential areas of farmers in the kebele, some parts of the residents in the kebele were found far away from the service delivery centers; at the same time the roads to the clinic were not appropriately constructed for using motorcycle transportation system. It was also encountered as there was lack of proportionality between the number of the farmers and the professionals. They also complained; that, there was lack of timely provision of vaccines for the animals which means the vaccines have not been provided before the occurrence of the outbreak of the animal disease.

Among the stockholders there were certain groups complaining for quality and quantity of the drugs as well as some others complained for lack of consistent and systemic way of monitoring, evaluation and controlling of the animal health service delivery system. With this all problems they considered as that their animals were not diagnosed appropriately because of shortage/lack of instrument/infrastructure and skill gap of professionals.

3.6 Observation of the Existing Situation of the Service Delivery Centers

During the study, information was gathered through field observation about the existing situation of the veterinary service delivery systems regarding the infrastructure, the professional quality, the availability and quality of treatment chemicals and diagnostic equipment and motivation/ initiation of the professionals to deliver the service appropriately. In addition, the system by which the required drugs and the equipment have been supplied to the animal health service delivery centers was also assessed.

Accordingly, serious problem was identified with regard to the infrastructures like road, appropriate buildings, cold chain and diagnostic materials; especially in some public veterinary clinics where the researchers recognized lack of ownership; in addition to this the available diagnostic materials had not been used appropriately, for example solar microscope was available almost at every public veterinary clinic but almost all of them were not being used. Professionals with knowledge/skill gap were identified at some veterinary clinics and the professionals at all clinics were not motivated or initiated to carry out their duties and responsibilities.

The veterinary practitioners at the veterinary clinics recognized as reluctant for the ethical issue of the profession. The mechanism by which treatment chemicals or drugs have been handled was detected as not according to the manufacturer's prescription. In some veterinary clinics the drugs were on floor of the room, even there were the cases where the drugs in use were found mixed with expired as well as empty bottles. At most of the veterinary clinics the syringes were being used without being cleaned or sterilized.

The mechanism of supporting, monitoring and evaluation of the service delivery system by the respective higher professionals or responsible authority was identified as weak. Privatization was not being supported by the responsible government bodies; even the significance/value of privatization was identified as not known. The clinic workers as well as the animal owners were not interested/happy with the mechanism through which the diagnostic materials and treatment chemicals had been supplied to the clinic, because they consider that the bureau of agriculture at regional level were providing the drugs without considering the existing situation of the area.

4. DISCUSSION

Veterinary services are generally poorly developed in many underdeveloped countries of Africa and Asia. The situation is particularly serious in more remote, dry land areas inhabited by pastoral and agropastoral communities. These areas are characterized by their large size, harsh climate, poor infrastructure, and relatively small but mobile human populations. These factors are constraints to conventional fixed-point service delivery through facilities such as government or private, urban-based veterinary clinics (Catley *et al.*, 1998).

In Ethiopia, conventional veterinary services have been playing a paramount role in the control and prophylaxis of livestock diseases in the last three decades. However, they cannot yet deliver complete coverage in preventive and curative health care practices because of inadequate labor, logistical problems, an erratic supply of drugs, and the high cost of drugs and equipment. Consequently, the majority of those raising stock in rural areas especially are far from the site of veterinary stations, and those who have access to veterinary services may not be able to afford to pay for

them. Additionally, reduced funding for animal disease control is an issue in Ethiopia and is likely to influence the incidence of some serious livestock diseases (Sori *et al.*, 2004).

4.2 Questionnaire Survey

Animal Owners

The highest level of dissatisfaction was identified in wombera woreda [47(68.2% of 69 respondents)] whereas it has the least value in dibate woreda [20(26.3% of 76 respondents)]. Wombera woreda is well known with high livestock population; hence the high rate of dissatisfaction in this woreda might be due to unfair distribution of treatment chemicals/drugs in type and amount required for the area, which means; not proportional to the livestock population as well as the existing cases of animal disease problems. Even though more respondents [189(54.5%)] were recognized as satisfied with the service that had been delivered by the public sector of animal health service delivery system, the dissatisfaction rate of the respondents was considered as significant [133(38.3%)].

The most common diagnostic technique carried out at all public animal health service delivery center is physical diagnosis [309(89%)] only. Disease investigation is not so easy that can be achieved by simple physical diagnosis rather it needs appropriate diagnostic techniques including lab tests, in addition to physical diagnosis and measurement of vital signs. Because of this, professionals might encounter difficulties in identifying the cause of the disease that will lead to mistreatment. As a result, the efficiency of treatment might be compromised which might be complained as treatment failure.

Almost all respondents [324(93.4%)] reacted as they preferred to of the veterinary service delivered by public sector. More of the respondents [303(87.3%)] were also identified as they had trust on the service delivered by public sector. They did have consideration as they could enforce the responsible government bodies and would get improvement through complains based on the existing constraints; which might be the reason for their preference and the trust they had. Among the five woredas, more respondents [16(23.2%)] in wombera were recognized as they had no trust on the veterinary service provided at their veterinary service delivery centers. The reason for this might be due to their high extent of demand for the service, which might have association with their high rate of dissatisfaction with the service which had been indicated in the previous paragraph. One of the implications of the response of respondents regarding the preference and the trust they had is; that responsible government bodies did not promote the perception of the animal owners as well as the private sectors had not been properly supported or encouraged to became capable to serve the community and would get trust from them.

The farmers also complained for shortage of veterinary professionals which made it difficult to cover all their resident area because of their scattered settlement and also interruption of the service on weekend days (the veterinary professionals were not available at the clinic on weekend days). As a result, it is clear that the drug intended to be administered on those days would be interrupted.

The above situation could be considered as the implication of unfair distribution of drugs, which was done without considering the existing situation of the veterinary clinics/animal health posts. It might also be the implication of poor service delivered by the professionals; hence the animal owners could be enforced for other options to treat their sick animals that would lead to drug abuse. As a result, the disease might be misdiagnosed and mistreated whereas it might lead to under dose application of the drugs and would result in drug resistant.

Professionals at Public Veterinary Clinics/Animal Posts

According to the response of professionals at veterinary clinics/animal posts, the presence of different livestock diseases was identified as cattle disease (Foot and mouth diseases, trypanosomiasis, pasteurellosis, ecto and endoparasites, mastitis, black leg, fly infestation, lumpy skin disease and salmonella.), sheep and goat disease (PPR, pasteurellosis, pneumonia, unidentified goat disease.) and poultry diseases (Newcastle disease). According to the response of veterinary professionals working at the site of veterinary clinic/animal health post; antibiotic, anti-parasite, insecticides and antiprotozoal drugs of different types were available in all veterinary clinics in various amounts. In some of the veterinary clinics/ animal health posts, shortage of drug was detected whereas excesses amount was identified in other veterinary clinics/ animal health posts. This situation might be the implication of unfair distribution of the drugs for the districts, which would not be in accordance with the existing animal health problems or not proportional with the existing livestock population of the area.

According to the response of veterinary service practitioners, the existing constraints were identified as lack/shortage of infrastructures; including; road, appropriate rooms for laboratory diagnosis and storage of drugs and staff office, electricity for cold chain and other activities that require the application electric power. As a result, there were the situations in which drugs were handled and kept on the floor of the room; even, there were veterinary clinics/animal health post where the drugs were kept in individual's resident home which is not recommendable. This might cause

the situations in which the drugs would lose their curing potential. In addition to this, the shortage/lack of diagnostic materials was also identified as one of the basic problems at veterinary clinics/animal health posts. With this all problems, the potency of treatment chemicals as well as the most important factors affecting the curing potential of those drugs has not ever been investigated with the intention to alleviate the existing problem of the community.

Most veterinary professionals have complained for; lack of the chance for training based on the skill gap they have, the way of getting incentives was identified as not fair. Still the system by which the higher professionals at respective authority; support, monitor and evaluate the practices at the veterinary clinics/animal health posts was evaluated as unclear and with no accountability. The veterinary service practitioners and animal owners; both, were complaining in common for unfair distribution of drugs; which means, it has been done without considering the existing situation of the area regarding the item, quantity and quality of drugs; that might be the reason for complaints.

4.3 Professionals at Private Veterinary Service Centers

About 7 private animal health service centers were assessed in 4 woredas where 2 private sectors were assessed in each of the three woredas including; kamash, dibate and wombera, whereas 1 private animal health service sector in assosa town but kurnuk was recognized as with no private animal health service center. Those private sectors were identified as they exist only in the main town of the woreda except for dibate where the two private veterinary drug shops were identified to exist in the kebele towns. This indicates that the attention has not been given for the private sectors of the veterinary service system by concerned government authorities.

Almost all of private animal health service sectors were not veterinary clinic/posts rather they were vendors or drug shops, however some of them were recognized; that, they were trying to deliver animal health clinic services which means they were trying to diagnose and treat the sick animals. Regarding the available diagnostic materials and the possible diagnosis carried out to identify the disease and its causative agents; they did have the trends which were identified to be similar to those of the public veterinary service sectors. The type and source of treatment chemicals were more or less the same to that of public sectors. The other basic challenge was that the farmers were identified as not to be interested to complete the required dose due to unaffordable costs or the interest they had not to invest much for their animals. This might be because of unaffordable cost set by the sector or because of the value; the farmers have given to the animals. This is in turn, the implication, as the attention has not been given for the private sector of veterinary service delivery system, and hence it has been considered as any business sector.

4.4 Discussion with concerned bodies at 'kebel' and woreda level

During discussion with concerned bodies at kebele and woreda level, complaints for the drugs and professional quality have been recognized. Most of farmers did have a trend to buy different medicines from vendors without knowhow about their dosage and side effects, farmers visit the veterinary clinic after trying treating their animals in different ways by themselves and when it becomes beyond their capacity. According to the stock-holders' evaluation, there were the occasions that the veterinary professionals were giving under dose medication for sick animals at the same time the farmers were considered not to be strict for prescription given by the professional. Accordingly, it indicates that the service has been delivered under full of shortcomings where it would be difficult to be effective. These mentioned all trends and practices would give the chance for the drug to develop resistance.

Because of scattered residential areas of farmers in the kebele, farmers from some parts of the residential areas in the kebele were found far away from the service delivery centers at the same time the roads to the clinic were not appropriately constructed for using motorcycle transportation system. It was also encountered as there was lack of proportionality between the number of the farmers and the professionals. They also complained; that, there was lack of timely provision of vaccines for the animals which means the vaccines have not been provided before the occurrence of the outbreak of the animal disease. This indicates that the animal owners were not getting full technical service according to their demand. We can see this in different way; the existing situation of the farmers was identified as not convenient for the professionals to exert their maximum effort, the number of professionals in position were not proportional to the number of farmers and the road was not well constructed as well the professionals were not supported by means of transportation.

The presence of complaints for lack of consistent and systemic way of monitoring, evaluation and controlling of the animal health service delivery system were recognized. As a result, they considered that their animals were not diagnosed appropriately because of shortage/lack of instrument/infrastructure and skill gap of professionals. This would be the indicator for less attention given for the sector.

4.5 Observation of the Existing Situation of the Service Delivery Centers

During observation, serious problems were identified with regard to the infrastructures like road, appropriate buildings, cold chain and diagnostic materials. In some public veterinary clinics lack of ownership was recognized, even in some veterinary clinics/animal health posts; available diagnostic materials had not been used appropriately, for example

solar microscope was available almost at every public veterinary clinic but almost all of them were not being used. Professionals with knowledge/skill gap were identified at some veterinary clinics and the professionals at all clinics were not motivated or initiated to carry out their duties and responsibilities. This might be due to biased or unfair way of giving incentives for professionals according to their efficiency. And also it could be the implication of less attention given to the veterinary service sector.

The veterinary practitioners at the veterinary clinics recognized as reluctant for the ethical issue of the profession. The mechanism by which treatment chemicals or drugs have been handled was detected as not according to the manufacturer's prescription. In some veterinary clinics the drugs were on floor of the room, even there were the cases where the drugs in use were found mixed with expired as well as empty bottles. At most of the veterinary clinics, the syringes were being used without being cleaned or sterilized. This would be lack of knowledge or awareness of the professionals for the ethical issue of the veterinary service system. This might be the implication of, the way they were being monitored was weak and not strong enough to make them capable to do so due to various reasons.

Privatization was not being supported by the responsible government bodies; even the significance/value of privatization was identified as not known. The clinic workers as well as the animal owners were not interested/happy with the mechanism through which the diagnostic materials and treatment chemicals had been supplied to the clinic, because they consider that the bureau of agriculture at regional level were providing the drugs without considering the existing situation of the area. This would be the implication of less attention given to privatization and the role of accurate diagnosis for effective treatment has also been ignored.

5. CONCLUSION AND RECOMMENDATIONS

According to this study, the perception of farmers was identified as they were looking at the government for all the services required for them from the veterinary sector. This means the private part of the sector has not been given an attention or the private sectors were not encouraged/supported by responsible government bodies. The veterinary service delivery system has been identified as being carried out under full of challenges including shortage of infrastructures (like means transportation, road, electric system, appropriate constructions), diagnostic equipment, treatment chemicals and vaccines and professional quality (skill gap) and quantity.

Poor management system of the sector was also recognized, which was implied by practices of poor monitoring, evaluation and controlling mechanisms. The way by which the process of veterinary service delivery system, timely provision of inputs, quick identification of the problems and reporting it to the concerned bodies was evaluated as to be not in line to alleviate existing problem of the community. There were the situations in which disease outbreaks were occurring but the cases were not identified. The way through which the inputs have been supplied to the service delivering centers (clinics/animal health posts) was not determined based on the existing disease problems of the community. The items, quantity and quality of drugs supplied to public veterinary service system were evaluated as to be under question. The drugs provided by the regional bureau of agriculture to the public veterinary service delivery sector was not satisfactory with regard to the aspects mentioned above. The absence of trends to test the potency of drugs by using either laboratory or field trials was also evaluated. Various level of dissatisfaction, rate of treatment failure, farmers trust on the service delivered by public sector and their preference was detected during the survey.

The system by which veterinary professionals were being managed in the veterinary service delivery system was evaluated as to be not well-designed, sustainable, fair and rational way. The way to provide chance for trainings, refreshment courses or upgrading of the status was evaluated as not with the full intention to fill skill gap or to encourage professionals rather than their political involvement, which is discouraging for technically efficient professionals.

Based on the above conclusion the following recommendations are forwarded:

The private sector of the veterinary service delivery system should be supported, encouraged and expanded and at the same time the awareness of the community should be enhanced; make them consider it, as one of responsible sectors to alleviate the existing animal health problems of the community.

The necessary infrastructures including road, means of transportation and buildings of the clinics should be improved by the concerned government bodies to at least a minimum level to make the veterinary service delivery system more functional.

The most important diagnostic materials that are essential for disease identification should be supplied and made functional at all veterinary service delivery sectors according to their existing situation.

There should be a system for timely provision of treatment chemicals and vaccines based on the demand of the farmers or the existing animal health problems of different parts of the region.

The veterinary service delivery system should be monitored, evaluated and controlled systemically and regularly with the intention to identify the problems of the community and report them quickly to concerned authorities for action. There should be regular quality assessment for process of veterinary service delivery system, professionals and the diagnostic and treatment chemicals by the responsible authorities.

The skill, attitude and knowledge of professionals should be enhanced through different mechanisms like experience sharing, short- and long-term trainings, providing different incentives based on their performance.

The quality of drugs being supplied to the veterinary service delivery sectors should be tested in scientific way either through laboratory tests or field trials.

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