

Assessment of Indigenous Knowledge and Its Relevance for Livestock Production: the case of North Gondar zone: Amhara Region, Ethiopia

Tigist Petros¹, Demissie Chanie², Wondim Awoke¹ and Aregalign Sewagen³

¹University of Gondar, College of Agriculture and Rural Transformation, P.O. Box 196, Gondar, Ethiopia

²University of Gondar, College of Veterinary Medicine and Animal science, P.O. Box 196, Gondar, Ethiopia

³North Gondar zone, Office of Agriculture, Early warning case team, P.O. Box 180, Gondar, Ethiopia

Abstract

The study was conducted in North Gondar Zone, Amhara region Ethiopia, to explore the various indigenous knowledge systems practiced in livestock production by small holder farmers. Both qualitative and quantitative data were collected from primary and secondary data sources. Qualitative data that helped to assess indigenous knowledge practices in the study area were collected through personal observation, and focus group discussions. In addition to this semi-structured questionnaires were distributed to 120 Households spread across the three districts of different PA administrative to collect relevant data. The data collected through questioner was organized and analyzed by using SPSS (version 20). The study revealed that a combination of crop residue and natural pasture is common sources of feed for most (45.8 %) of respondents. The indigenous knowledge regarding livestock production is considered as old as domestication of various livestock species. With regard to feed treatment practices, most (51.7%) of the farmers in the area treat the animal feed by using common salt in order to increase food palatability by the animals. Ethno-veterinary medicines is one of the common practice by households in North Gondar Zone. Even though most (65%) of households prefer modern disease treatment, about 78.3 % of farmers are using cultural medicine for treating different livestock diseases. The main reason for using cultural medicine by farmers in the area is it's easily availability, cheapest cost and its practical applicability. The major constraint of indigenous knowledge utilization in north Gondar zone is the resistance Development agents (28.3%) followed by other administrative bodies (22.5%) in the region. There is a high risk of extinction of indigenous knowledge if it is not documented. To avoid this loss, emphasis should be given on developing indigenous knowledge systems and documenting this unique knowledge into the mainstream knowledge. In addition to this, research should be done on the various methods of ethno-veterinary medicine and document the effective ones for use by the future generations. Moreover, research from a gender perspective is needed to document specialized ethno-veterinary knowledge not only of cattle but also of small stock such as sheep and chickens. It is important that livestock farmers share ideas on traditional knowledge with modern veterinarians in order to optimize productive capacity of herds and enhance sustainable rural livelihoods.

Key words: *Ethno-veterinary medicines, Indigenous Knowledge, livestock*

Introduction

The basic component of any country's knowledge systems is its indigenous knowledge. It encompasses the skills, experiences and insights of people, applied to maintain or improve their livelihood (World bank, 1997). Significant contributions to global knowledge have originated from indigenous people for instance in medicine and veterinary medicine with their intimate understanding of their environments. Indigenous knowledge is developed and adapted continuously to gradually changing environments and passed down from generation to generation and closely interwoven with people cultural values. Indigenous knowledge is also the social capital for the poor, their main asset to invest in the struggle for survival to produce food, provide food, shelter or achieve control of their own lives. According to Mararike (1999), for people to survive, one of the strategies required is the application of appropriate indigenous knowledge. Such

knowledge should give people confidence to tackle life threatening problems and enable them to meet internal and external challenges.

Indigenous knowledge provides communities with a basis for problem-solving strategies in various activities such as agriculture, health, education, veterinary medicine and natural resource management. Indigenous practices have good role to assist and maintain sustainable agricultural crop land management, livestock production, climate change adaptation and mitigation and agricultural innovation. Farmers have experimentation and ways of knowing, which allow them to be innovated in the local practices and systems. Recognizing, empowering and incorporating indigenous practices in participatory rural development projects has been considered a means of ensuring socially, environmentally and economically sustainable natural resources management (Dixon,2002).

On the other hand, indigenous knowledge has not been well incorporated in development interventions. This is due to several development interventions are not adequately incorporate indigenous knowledge system, among others, on sustainable development, that is why most of initiatives have been relying on formal scientific knowledge (Bisong, *et al.*, 2010). This results IK has failed to address the agricultural and environmental concerns of the community.

In Ethiopia particularly in North Gondar Zone, the role, practices and prospects of indigenous knowledge for sustainable development are not well studied on crop land management, climate change and livestock production. Therefore, this research was intended to investigate the practices of indigenous knowledge utilization for livestock production and its contribution for the sector as a baseline information for future research works.

Materials and methods

Study area

The study was conducted in North Gondar Administrative Zone, which is located in the North–western part of the country between 11⁰ 56' and 13⁰ 45' North latitude and 35⁰ 11'and 35⁰ 50' East longitudes, 738 km. from Addis Ababa. The boundaries of the Zone adjoin Tigray region in the North, Ageawe Zone and West Gojam Zone in the South, Waghimra Zone and South Gondar Zone in the East and the Sudan in the West. The zone comprises 25 woredas of which five are urban. In addition it has also 533 rural and 51 urban PAs total of 584 PAs. The total area of the Administrative Zone is 50,970 square kms. Most of it is located in the North Central massif area of the highlands. This study was conducted based on agro ecology classification *Dega, Woina Dega* and *Kola* in Gonder zuria, Dabat and West belesa, respectively.

Data Types, Data Sources and Data Collection Methods

Both qualitative and quantitative data were collected from primary and secondary data sources. Qualitative data that helped to assess indigenous knowledge practices in the study area were collected through personal observation, and focus group discussions. Three groups were organized in three districts that consists from 12-20 members at each group from all relevant stakeholders including farmers.

Self-administered questionnaire were distributed to 120 Households spread across the three districts of different PAs administrative as the instruments used for data collection. The questioner was well organized and pre-tested before the commencement of the actual survey. Apart from indigenous knowledge utilization by households, Information was also collected on the socio-economic characteristics of the respondents such as age, sex, marital status, level of education, and tenure on farm.

Table 1. Sample respondents at 3 woreds of North Gondar zone

S.No	Name of the sample woreda	Number of HH	Sample HH	Number of PAs
1	Gondar Zuria	2009	35	2
2	Dabat	2751	49	2

3	West Belesa	2026	36	2
Total		6786	120	

Sampling Procedures and Techniques

A multi-stage sampling method was employed. In the first stage 3 out of 25 districts of North Gondar zone were selected purposively based on the assumption to represent each agro-ecological zone from the sample districts. Secondly, North Gondar zone was stratified on the bases of agro-ecology to create homogeneous stratum for the selection of districts. Thus, the woredas will be grouped in to dega, woynadega and kola. Then after, from the woinadega Gonder zuria districts, from dega Dabat district and from the kola/low West belesa woreda were selected purposively to have representative districts in North Gondar. In the third stage of sampling, listing households at all levels and taking 120 sample respondents from 2 representative PAs from each districts randomly.

Methods of data analysis

Both qualitative and quantitative data were analyzed and appropriate tools and techniques of analysis were employed. Qualitative data that was obtained by observation, focus group discussion and group interview were organized and described on the process in the field or the site.

Quantitative data analysis was carried out using descriptive statistics including frequency counts, and percentages. After collecting the data it was entered into a computer and analyzed using *SPSS version 20 windows* statistical software.

Result and Discussion

Demographic characteristics of respondents

As explicitly presented in the methodology of this paper; survey design with the support of well-structured interview schedule has been employed to achieve the major quantitative part of the study. Thus, in this section the major demographic; socio-economic and other characteristics' of the respondents of the study are displayed in Table1 below. As shown in the table 1 below, the majorities of the respondent households are male headed which accounts 90 % of the total sample survey whereas the remaining are female respondents. With regard to educational level; the great majorities that accounts 56.7% from the total survey are illiterate who couldn't write and read. The remaining 32.5 % of the respondents' in the survey were those either who read and write or completed some level of formal education or only 10.8% from the total survey are between grade 7-12. The other variable is the marital status. As shown in the same table 90.8%, 3.3%, 3.3% and 2.5 % of them are married, single, divorced and widowed respectively.

Table 2: Description of the respondents

Characteristic		Frequency	Percent
Sex :	Male	108	90.0
	Female	12	10.0
Total		120	100
Education level:	Illiterate	68	56.7
	Literate(1-6)	39	32.5
	Literate(7-12)	13	10.8
Total		120	100
Marital status:	Single	4	3.3
	Married	109	90.8
	Divorced	4	3.3

	Widowed	3	2.5
Total		120	100

Source: own survey, 2017

Age and Livestock Holding of Respondents: The average age of the respondents is 44.59 with a minimum of 20 and maximum of 80 years. Whereas the tropical livestock unit used to measure possession of livestock shows that on average the respondents possessed 4.042TLU with a minimum and maximum of 0.365 and 12.34 TLU respectively.

Land Holding: With regard to the land holding status of the respondents 92.5 % have land whereas 7.5% of the respondents have no land. The amount of land holding of the respondents is with an average of 1.96ha with a maximum of 6.25 hectares.

Existing Indigenous Practices in Livestock Production

Feeding Practices

Feeding is a major element of exchange and interaction between the two main components of the farms agro-ecosystem i.e the land and the animals. Different feed and feed resources are available in the study area. A basic principle of indigenous knowledge is that livestock are kept as part of the farming system and their nutrition should be based on home grown feeds which is intended to guarantee optimum food quality. The feeding practices of farmers in the study areas indicating that the farmers were following traditional practices by mixing crop residue with natural pasture. As indicating in table 5 37.5% of the respondents feed crop residues, 16.7% feed natural pasture and the majority 45.8% feed by mixing crop residue with natural pasture. with regard to feed treatment practices by the farmers in the area as indicating in the table most of the respondents 51.7% of them treat the animal feed by using common salt in order to increase food palatability by the animals while 48.3% of the respondents does not use any treatment.

Table 5. Common sources of feed and use of feed treatment

Characteristics		Frequency	Percent
Feed sources	natural pasture	20	16.7
	crop residues	45	37.5
	all types	55	45.8
Use of feed Treatment	Yes	62	51.7
	No	58	48.3
Total		120	100.0

Source: own survey, 2017

Housing (Shelter): As shown in table 6 below most of the respondents about 65.8% give shelter for their animals in their main house, only 18.3% of the respondents prepare a separate constructed house while the remaining 15.8% of the respondents shelter the animals with a house attached with the main house.

Table 6. Housing (shelter) of animals

Shelter of animals		Frequency	Percent
	In the main house	79	65.8
	A house attached to the main house	19	15.8
	A separately constructed animal house	22	18.3
	Total	120	100.0

Source: own survey, 2017

Role of Indigenous Knowledge for Livestock Health Management

The use of indigenous knowledge (cultural medicine) and preference of farmers towards cultural medicine is indicated in fig 1. Most (78.3%) of households in the study area are currently using their indigenous knowledge for treating various livestock diseases. This finding is in line with the report of Shilema (2013), who indicate that about 84.6 % of the responds are traditional medicine practitioners in Amaro district of

southern Ethiopia. It is also reported by different scholars that A large number of farmers rely on a range of ethno veterinary knowledge to keep their livestock healthy and have been used for preventing and treating livestock ailments for several generations (Yigezu et al., 2014). On the other hand, the preference of farmers to use cultural medicine in North Gondar zone is low (35%) which might be associated with the less support of governmental and non-governmental institutions.

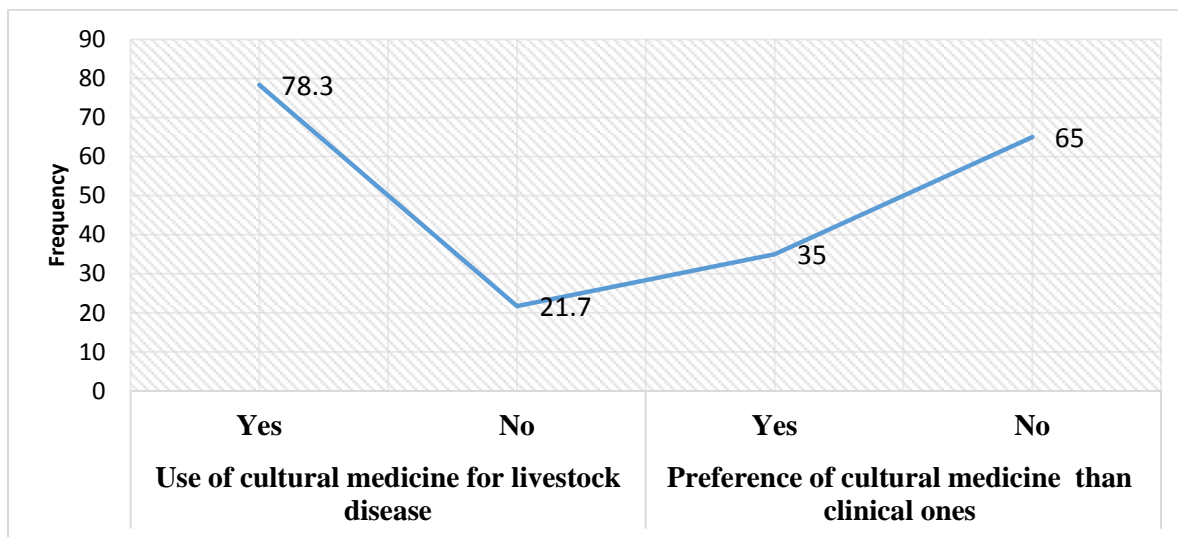


Figure 1. Cultural Medicine practitioners and preference of farmers in North Gondar zone

The reason for preference of cultural medicine than using government veterinary clinics in North Gondar zone is presented in fig 2. From the total 35 % respondents, the majority (16.7 %) of farmers indicated that cultural medicine is preferred due to a combination of it's easily availability, cheapest cost and its practical applicability. Cultured based (8.3%) and availability of treatment materials were found to be the second and the third reasons for cultural medicine preference, respectively. Treatment by contemporary veterinary medicine has, in these days, been out of the reach of the ordinary farmers often due to high cost of drugs and none coverage(GidayandAmeni,2003;Teshaleetal.,2004).

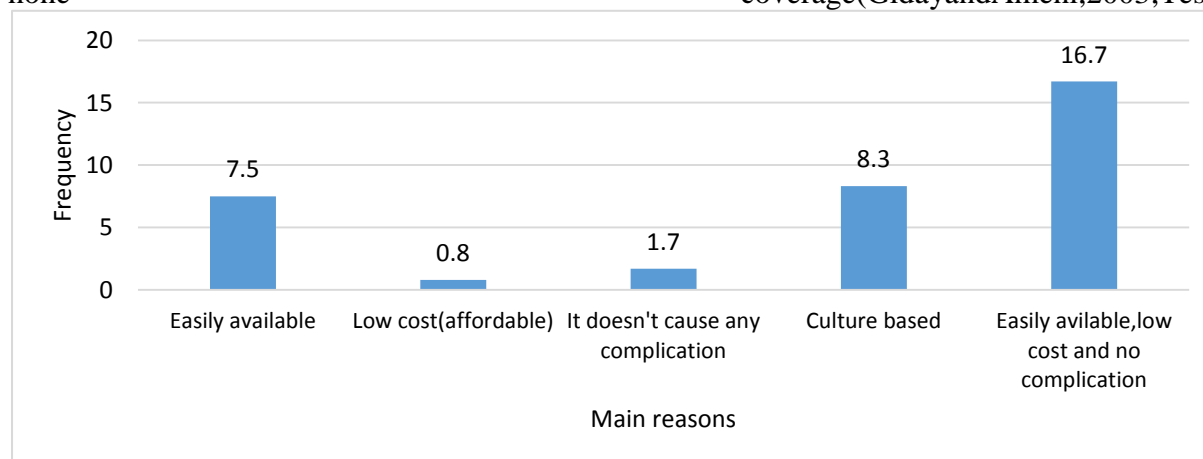


Fig.2 Reasons for preference of cultural medicine in North Gondar zone

Common disease of Farm animals and Cultural treatment practices in North Gondar zone

The major diseases which are affecting livestock productivity in north Gondar zone are mentioned in Table 1. The common diseases mentioned by most of the respondents were Gendi (Trypanosomiasis), Aba Senga (Anthrax), Fentata (Sheep Pox), respectively. In agreement with this finding, farmers in Ethiopia have long been suffered and aware of serious diseases such as *desta*(rinderpest),*aftegir*(footandmouthdisease),*abasenga*(anthrax),*abagorba*(blackleg),*gendi*(trypanosomiasis) and diseases caused by internal and external parasites, and of the zoonotic nature of diseases such as anthrax and rabies (Mesfin and Obsa, 1994). There are various plants or other ingredients which are used by

households to control/treat various disease in the study area (Table1). Among plants, abalo, kutintina, lenkuata ,kebricho tobiyaw were mentioned by most of the households in the study area. In line with this finding, Ethiopian plants have shown very effective medicinal value for some ailments of humans and domestic animals. The major reasons why medicinal plants are demanded in Ethiopia are due to culturally linked traditions, the trust the communities have in medicinal values of traditional medicine and relatively low cost in using them (Endashaw, 2007).

Moreover, nitirkibe, shiro, salt, telba, feto, bikil, enjerafitfit, were mentioned as important ingredients for treating different disease in the study area. In line with this finding, Livestock producers in Amaro districts of southern Ethiopia have been using various indigenous knowledge and practices to control and treat testes and trypanosomes (Shilema, 2013). According to the information obtained from focus group discussion (FGD), Kutintina is used commonly as treatment mechanism for isolated animals, depressed animals and for diseased equines. In addition to this, using the plant keberecho smoking through the nose of equine is mentioned as treatment mechanisms for treating equine disease. Framers also indicated that nitirkibe is used for unidentified disease called kortem. In line with this Farmers employ material other than plants, e.g. powder soap and potash, as well as special methods, such as branding, massaging with hot water and making cuts on the skin to treat cattle (Tabuti etal, 2003).For treating wound, there are practitioner farmers who are capable of tightening and surgeon. Moreover, farmers indicated that plant tobiyaw is used for treating any digestive disturbances.

Table 1. Common disease of farm animals in North Gondar

Scientific Name of the Disease	Common Name of the Disease	Plants/other ingredients used for treatment	Method of control/ treatment
Trypanosomiasis	Gendi (ገንዲ)		
Anthrax	Aba Senga (አባስንጋ)		Restriction of water intake
Sheep pox	Fentata (ፈንጣጣ)		Taking animal to the market
Blackleg	Aba Gorba (አባጎርባ)		Incision of swollen area
Newcastle disease	Fengil(ፈንግል)	enjerafitfit with feto	Feeding
Bloating	Yehodemenefat (የሆድመነፋት)	Salt, Shiro, oil, Bikil, Butter (Nitirkibe)	Drenching
Retained placenta	(የእንግዶልጅመቅረት፣ በወሊድ ወቅት)	, Lenkuata, Flax (Telba)	Drenching

In North Gondar zone, most (75.8 %) of households used different indigenous knowledge to control insects (Fig 3). In agreement with this, about 93 % of respondents in Nigeria practiced hygienic keeping control method, which involves keeping the environment clean, setting fire to warm the environment at cold nights and about 87 of respondents used herbs which involves cutting herbs and boiling them for their animals to drink as a mechanism for preventing pests and disease of livestock (Adekunle, 2002).

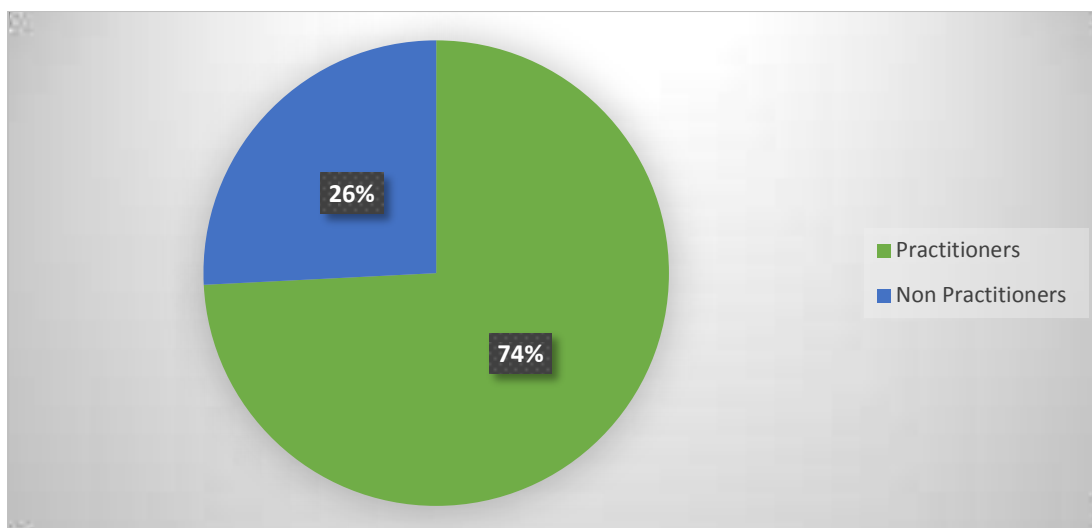


Fig.3 Use of Ik for insect & pest treatment

Constraints of Indigenous knowledge utilization

As shown in the table below, 28.3% of the respondents indicate they get resistance from kebele development agents and animal health workers, 22.5% of them from kebele administrative and the rest from community and little of them about 2.5% from NGO's.

Table 11. From which ones u get Resistance when using IK?

Variables	Frequency	Percent
No resistance	51	42.5
das or animal health workers	34	28.3
administrative bodies	27	22.5
community	5	4.2
NGO	3	2.5
Total	120	100.0

Source: own survey, 2017

Participants of FGD in the area indicated that development agents are playing key role for reducing the utilization of indigenous knowledge by farmers in the area. Based on the information obtained from FGD, development agents always provide orientation for farmers to ask support from the agent during the occurrence of any disease. Moreover, as per their information, there is no government support for traditional knowledge practitioners in the district. Despite its great role, veterinarians do not recognize the importance of traditional veterinary practices. However, the experience in other countries has shown that traditional medicine could be useful if applied as an integral part of modern veterinary medicine (Mesfin and Obsa, 1994).

Conclusion and Recommendations

In this study employing 120 sample respondents; three major research objectives have been critically analyzed. In terms of approach, mixtures of quantitative and qualitative approaches were utilized to come up with the following conclusions and recommendations.

The indigenous knowledge regarding livestock production is considered as old as domestication of various livestock species. Though indigenous knowledge systems form a strong base of knowledge for the society, they are still shunned and negated due to lack of institutional support. As a result, they are not properly utilized though evidence has proven that they are very effective. The feeding practices of farmers in the study areas indicating that the farmers were following traditional practices by mixing crop residue with natural pasture. With regard to feed treatment practices by the farmers in the area treat the animal feed by using common salt in order to increase food palatability by the animals. Ethno-veterinary medicines have several advantages over modern veterinary care. They are cheap and locally available compared to modern

pharmaceutical drugs which are expensive and sometimes out of stock. The emphasis should be on developing indigenous knowledge systems and documenting this unique knowledge into the mainstream knowledge. There is a high risk of extinction of indigenous knowledge if it is not documented. To avoid this loss, research should be done on the various methods of ethno-veterinary medicine and document the effective ones for use by the future generations. Culturally, traditional herbalists are not at liberty to tell the herbs that they use for animals but they just give a prepared mixture. This control over knowledge is business to the traditional herbalists who earn some money for their profession. There is need for change of attitude towards sharing of knowledge to allow research and documentation of ethno-veterinary knowledge.

The efficacy of ethno-veterinary knowledge for preventing and treating livestock diseases and range management strategies identified in this study need to be fully investigated and integrated in veterinary extension services. More research from a gender perspective is needed to document specialized ethno-veterinary knowledge not only of cattle but also of small stock such as sheep and chickens. It is important that livestock farmers share ideas on traditional knowledge with modern veterinarians in order to optimize productive capacity of herds and enhance sustainable rural livelihoods. More research is needed to explore untapped reservoir of farmers' indigenous knowledge so that it can be integrated into extension service provision.

5. References

- [1] Abubakar M. S. and Abdurahman E. M. 1998. Useful Plants in Traditional Control of Insect Pests, *Journal of Herbs, Spices & Medicinal Plants*, 6:2, 49-54, DOI: 10.1300/ J044v06n02_06
- [2] FAO .2008. Climate related Trans boundary Pests and Diseases Including Relevant Aquatic Species. Expert meeting,
- [3] Giday MAmeni G.2003. An ethnobotanical survey on plants of veterinary importance in two districts of Southern Tigray, Northern Ethiopia. *Ethiop J Sci*, 26(3):123–136. 5.
- [4] Gill, M. and Smith, P. 2008. Mitigating Climate Change: The Role of Livestock in Agriculture. Livestock and Global Change Conference proceeding, May 2008, Tunisia.
- [5] Mararike, C. G. 1999. *Survival Strategies in Rural Zimbabwe*, Harare Mond Books.
- [6] MesfinT, and Obsa T. 1994. Ethiopian traditional veterinary practices and their possible contribution to animal production and management. *Rev. sci. tech. Off. int. Epiz*, ,13 (2), 417-424
- [7] Miles, M. and Hagerman, M. 1994. *Qualitative data analysis: An Expanded Sourcebook*.
- [8] London: Sage
- [9] Rowlinson, P. 2008. Adapting Livestock Production Systems to Climate Change – Temperate Zones. Livestock and Global Change Conference proceeding, May 2008, Tunisia.
- [10] Shilema1 A, Zerom K, Mussa A. 2013. Ethnoveterinary practices against animal trypanosomosis in Amaro district, Southern Ethiopia. *International Journal of Medicinal Plants Research*, 2 (7), pp. 238-241, www.internationalscholarsjournals.org
- [11] Tabuti R.S, Shivcharn S, Dhillion, Kaare A. 2003. Ethnoveterinary medicines for cattle (*Bosindicus*) in Bulamogi County, Uganda: plant species and mode of use. *Journal of Ethnopharmacology* 88 (2003) 279–286
- [12] TeshaleS, Merga B, Girma A, Ensermu K. 2004. Medicinal plants in the ethno veterinary practice of Borena Pastoralists, Southern Ethiopia. *Int J Appl Res Vet Med*, 2(3):220–225
- [13] WorldBank.1997 *Indigenous Knowledge for Development* www.worldbank.org/afr/ik/basic.html
- [14] Yigezu Y, Berihun D, andYenet W. 2014. Ethnoveterinary medicines in four districts of Jimma zone, Ethiopia: cross sectional survey for plant species and mode of use. *BMC Veterinary Research* 2014, 10:76 <http://www.biomedcentral.com/1746-6148/10/76>