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Ethno-Veterinary Practices among Agro-Pastoralists in Central Tanzania

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Abstract: This study was conducted in Mpwapwa district, located in semi-arid region of Tanzania. It aimed at assessing extent of ethno-veterinary practices among agro-pastoralists in treating various livestock diseases and parasites infestations. This study used the Participatory Action Research (PAR) method. A total of 97 agro-pastoralists were randomly selected as respondents. Data were collected by interviewing randomly selected agro-pastoralists using structured questionnaire. Also focus group discussions with groups of agro-pastoralists were conducted. While secondary data were obtained through documentary review. Descriptive statistics were employed in analyzing frequencies and percentages; while for inferential statistics the logistic regression was used in order to assess factors influencing agro-pastoralists to adopt EVPs. Findings revealed that majority (72.2%) of the respondents use ethno-veterinary practices in treatments of various diseases and parasites. The most important ethno-veterinary plants reported were Tephrosia vogelii (95.7%), Azadirachta indica (90.0%), Commiphora swynnertonii (84.3%), Tamarindus indica (72.9%), Aloe vera (48.6%), Euphobia tirucalli (75.7%), Carica papaya (55.7%), Solanum incanum (58.6%), Acacia nilotica (82.9%), Adansonia digitata (87.1%), Capsicum frutescens (65.7%) and Arachis hypogea (62.9%). According to those agro-pastoralists who engaged in the use of EVPs, they said that these plants were used to treat ectoparasites, endoparasites, skin infections, coccidiosis, fowl typhoid, Newcastle disease, diarrhea, dysentery, worm infestation, infertility, acetonaemia, bloat, ring worm and foot rot. Furthermore study revealed costs of buying or acquiring ethno-veterinary medicines, shamefulness in using ethno-veterinary plants and effectiveness of ethno-veterinary medicines in treatment of various diseases were found to influence significantly ($P<0.05$) the adoption of EVPs. While lack of knowledge on existence of EVPs, availability of ethno-veterinary plants and how apply ethno-veterinary medicines did not significantly ($P>0.05$) influenced adoption of EVPs. It was concluded that there is potential use of EVPs in treating various livestock diseases in the study area.
Keywords: Adoption, Agro-pastoralists, Animal health, Ethno-veterinary medicine, Semi-arid, Tanzania

INTRODUCTION

Background information

Tanzania is endowed with abundant natural resources, which include land, forage and a big livestock resource base. Government documents state that, of the total 94.52 million hectares of land resource, 60 million hectares are rangelands utilized for grazing about 21 million cattle, 15 million goats and 5.7 million sheep [1]. Other livestock kept in the country include 1.6 million pigs, 56 million indigenous poultry and other species.

The traditional farmers are the major producers of cattle, sheep, goats and poultry in Tanzania, they find these animals as their readily source of income to meet their daily needs as well as security for continued food supply in periods of crop failures.

Animal health is a very important aspect to farmers engaging with livestock production but most of them do not have access to modern health facility, managing the health of these animals has been mostly through the indigenous knowledge inherited by the people. Findings by Martin *et al.;* [2] indicate that ethno-veterinary practices are used extensively and quite effectively for primary health care treatment and maintaining animals' productivity.

Cost, unavailability and other problems like side effects associated with the conventional western animal health care system have encouraged constant dependence on such traditional rural wisdom in this field. Ethno-veterinary practices are often cheap, safe, time tested and based on local resources and strengths. These can provide useful alternatives to conventional animal health care [3].

Reports on ethno veterinary studies in rural areas show that agro-pastoralists are aware of ethno-veterinary practices but do not use them because there are not properly validated by government or researchers (Dwivedi) [4]. The task of scientific evaluation and validation becomes tedious under voluminous presence of the practices available with the farmers in the field. Reports have shown that about 80% of the world population relies solely on medicinal plants for the

treatment of animal diseases [5]. Therefore there is a need of putting more emphasis on adoption of ethno veterinary practices especially among agro pastoralists.

In Tanzania ethno-veterinary practices have been in use for long time of which some of the herbs used prove its effectiveness. In Kigoma agro pastoralists lower worm burdens and improve performance of infected goats by drenching with Senna didymobotrya, Chassalia subockreata and Cassia abbreviate extracts [6]. Other supported study has indicated Antimicrobial activity of Adansonia digitata [7].There are very many plants used as ethno-veterinary drugs, among them include Aloe Vera (Aloe barteri), Dalbergia nitidula, Lannea schweinfurthii, Sena spectabilis, Moringa oleifera, Azadirachta indica and Tephrosia vogelii [8].

Despite the government effort on promotion of ethno-veterinary practices, through various types of institutions to identify and document the ethno-veterinary practices, the actual extent of adoption of those practices as well as the factors that enhance or impair the extent of utilization of ethno-veterinary practices among the agro pastoralists are yet to be explored. Hence this study was carried out in order to assess the extent of adoption of ethno-veterinary practices among agro pastoral communities and to determine factors that enhance or impair the extent of utilization of ethno-veterinary practice by various groups of agro-pastoralists in Mpwapwa district, Dodoma region.

METHODOLOGY

Description of the Study area

This study was conducted at Bumila village in Mpwapwa district located in Dodoma region, which is in semi raid region of central Tanzania. Bumila village has relatively cool climate, slope, flood plains and high soil fertility. The major crops grown are maize, beans and sunflower. The village is located in the semi-arid zone of central Tanzania which lies between longitude $34^o50'$ E to $35^o15'$E and latitude $5^o32'$S to $6^o15'$S. Lands in the village have low agricultural potential and people are semi-nomadic agro-pastoralists whose main economic activities are livestock keeping and crop production [9]. Livestock kept in the study area includes cattle, sheep, goats, chicken and donkeys. Crops grown are maize, beans, sorghum and other small enterprise like selling bamboo juice.

Research approach

This study used the Participatory Action Research (PAR) method. Participatory action research aimed at collecting necessary information in the study area by making full involvement of agro-pastoralists in order to know extent of the use and factors influencing adoption of ethno-veterinary practices (EVPs). The rationale of using PAR was to encourage agro-pastoralists to express their problems, needs and interest also promotes empowerment.

Study Population and Sampling procedure

The study involved 97 agro-pastoralists who were randomly selected. The study population included all farmers who use EVPs and those who were not using EVPs.

Data collection methods, tools and analysis

Data were collected by interviewing randomly selected agro-pastoralists using structured questionnaire. Also focus group discussions with groups of agro-pastoralists were conducted. While secondary data were obtained through documentary review.

Data collected were coded and summarized. Analysis of quantitative data was conducted with respect to the objectives of the study by using Statistical Package for Social Sciences (SPSS). Descriptive statistics were employed in analyzing frequencies and percentages; while for inferential statistics the logistic regression was used in order to assess factors influencing agro-pastoralists to adopt EVPs. The model for logistic regression was as follows:

$$Y = A + \beta_1X_1 + \beta_2X_2 \ldots\ldots \beta_nX_n + \varepsilon$$

A = Constant
β_1- β_n= Regression Coefficient Parameter
X= Predictor variables (i.e factors influencing adoption of EVPs)
ε = an error distributed by the standard logistic distribution

RESULTS AND DISCUSSION

Social Economic characteristics of respondents

The findings from present study indicates that majority of the respondents were male (83.5%) while the rest were females (Table 1). This was expected since males are mainly the head of households and owners of livestock apart from poultry in study area.

Most (58.8%) of respondents were aged above 40 years. This findings indicate that agro- pastoralists are relatively easily to adopt ethno-veterinary practices during advanced age because they have a tendency to shift their attention more to animal rearing and they are most frequent involved in the practices at old age. This finding is in agreement with those reported by Abdu *et al.;* [10].

Findings about the level of farmers' education in the study area indicated that majority (82.5%) of respondents have minimum education level of primary school which is a bit good for them to adopt ethno-veterinary practices or any newly introduced farming technologies.

Only 13 (13.4%) respondents were unmarried while 84 (86.9%) were married. This implies that most of the families in the study area have more labour to engage in various farming and livestock keeping activities.

Table 1: Distribution of respondents by socio economical characteristics (N=97)

Characteristics of respondents	Frequency	Percentage
Sex		
Male	81	83.5
Female	16	16.5
Age		
18-25	11	11.3
26-40	29	29.9
Above 40	57	58.8
Marital status		
Married	84	86.6
Single	13	13.4
Education level		
Non formal	17	17.5
Primary school	80	82.5

The extent of utilization of Ethno-veterinary practices

Table 2 shows that majority (72.2%) of the respondents use ethno-veterinary practices in treatments of various diseases and parasites. The most important ethno-veterinary plants which were reported by respondents adopted EVPs were Tephrosia vogelii (95.7%), Azadirachta indica (90.0%), Commiphora swynnertonii (84.3%), Tamarindus indica (72.9%), Aloe vera (48.6%), Euphobia tirucalli (75.7%), Carica papaya (55.7%), Solanum incanum (58.6%), Acacia nilotica (82.9%), Adansonia digitata (87.1%), Capsicum frutescens (65.7%) and Arachis hypogea (62.9%). Some of these plants were also observed in the fields in the study area. According to those agro-pastoralists who engaged in the use of EVPs, they said that these plants were used to treat the following: ectoparasites, endoparasites, skin infections, coccidiosis, fowl typhoid, Newcastle disease, diarrhea, dysentery, worm infestation, infertility, acetonaemia, bloat, ring worm and foot rot (Table 2). These diseases are most important in the village and normally are neglected. These findings to great extent are similar to that of Shicai *et al.;* [11], Also Opiro *et al.;* [12] who conducted their study in Uganda reported a number of plants which are used in controlling Ticks and treat Tick-Borne Diseases in Acholi Sub-region.

Through probing it was revealed that in the study area, sometimes ethno-veterinary plants are stored after drying, some are stored in a liquid form as a decoction. If all the necessary steps have been observed for harvesting and processing, and the herbal plants are stored in the right way, dry medicines will remain active for several years. Liquid forms have short life span therefore does not last for a long time, although tinctures in modern ethno veterinary practices can be stored for at least 6 months.

Table 2: Adoption, plants used and different livestock diseases treated through EVPs

Variables	Disease Treated/parasites controlled	Frequency	Percentage
Adoption of EVPs			
Do not use EVPs		27	27.8
Employ EVPs in treating livestock		70	72.2
Plants used in EVPs *			
Tephrosia vogelii	Ectoparasites (Ticks and fleas)	67	95.7
Azadirachta indica	Skin infections	63	90.0
Commiphora swynnertonii	Ectoparasites (Ticks ,fleas, lice, mites)	59	84.3
Tamarindus indica	Ectoparasites, infertility	51	72.9
Aloe vera	Coccidiosis, fowl typhoid, Newcastle	34	48.6
Euphobia tirucalli	Skin infections	53	75.7
Carica papaya	Endoparasites	39	55.7
Solanum incanum	Worms and coccidiosis in poultry	41	58.6
Acacia nilotica	Skin infection, foot rot	58	82.9
Adansonia digitata	Diarrhea and dysentery	61	87.1
Capsicum frutescens	Newcastle disease	46	65.7
Arachis hypogea	Acetonaemia, bloat, ring worm	44	62.9

NB: *Multiple responses from the respondents adopted EVPs in treating their livestock (N=70)

Factors affecting the adoption of EVPs

After conduct regression analysis, the results in Table 3 revealed that costs of buying or acquiring ethno-veterinary medicines, shamefulness in using ethno-veterinary plants and effectiveness of ethno-veterinary medicines in treatment of various diseases were found to influence significantly ($P<0.05$) the adoption of EVPs. While lack of knowledge on existence of EVPs, availability of ethno-veterinary plants and how to apply ethno-veterinary medicines did not significantly ($P>0.05$) influenced adoption of EVPs.

The successful adoption of ethno-veterinary practices depends on how farmers are trained and indigenous knowledge possessed by farmers. This phenomenon has also been noted by Bamikole and Ikhatua [13]. However Opiro *et al.;* observed that the young people have tendency of embracing modern practices in treating their livestock, however among the older generation the remembrance of the past is still alive though gradually eroding now that they do not practice it too often. Furthermore this concern has been expressed by a number of [14, 15, 16]. Additionally according Tabuti *et al.;*[17] who conducted study on ethno-veterinary medicines for cattle (Bos indicus) in Uganda claimed that this situation is worsened by rapid socio economic, technological and environmental changes.

Table 3: Regression analysis results on factors influencing use of EVPs

Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Cost	3.507	1.675	4.385	1	.036	33.342	1.252	887.960
Effective	4.802	1.595	9.064	1	.003	121.732	5.343	2773.256
Shame	-4.539	2.218	4.189	1	.041	.011	.000	.825
Knowledge	-2.887	1.809	2.546	1	.111	.056	.002	1.933
Availability	1.310	2.701	.235	1	.628	3.704	.019	737.269
Application	1.859	1.564	1.413	1	.235	6.417	.299	137.608
Constant	-1.134	1.712	.439	1	.508	.322		

Additional information about EVPs in study area

Table 4 shows the duration in which agro-pastoralists have been engaged with the use of EVPs in the study area. About 74.3 % of them said they have been using EVPs for more than 6 years and 25.7 % said it is about 3 – 5 years.

Table 4: Additional information on ethno-veterinary practices in study area

Comment	Frequency	Percentage
Duration of using EVPs		
1 - 3 years	9	12.9
3.1 - 5 years	12	17.1
5.1 – 10 years	17	24.3
Above 10 years	32	45.7
Total	**70**	**100.0**
Methods of acquiring knowledge of EVPs *		
Researchers and extension agents	52	74.3
Fellow agro-pastoralists	45	64.3
Elders	49	70.0
Accessibility of ethno-veterinary plants *		
Locally	49	70.0
Bought	34	48.5
Given by fellow farmers	10	14.3
Frequency of using EVPs		
Very frequently	37	52.9
Frequently	12	17.1
Less frequently	21	30.0
Total	**70**	**100.0**
Needs of more training on use of EVPs		
Yes	76	78.4
No	21	21.6
Total	**97**	**100**

NB: * Multiple responses from the respondents adopted EVPs in treating their livestock

Also the results show that most of respondents use ethno-veterinary plants very frequently (77.1%), while some use them occasionally (14.3%); however few (8.6%) respondents do use EVPs less frequently. On the use of other practices /conversional medicine, respondents said they use them when EVPs have failed to give positive results.

Seventy percent of farmers using EVPs said that most of the plants used are indigenous and locally accessed at the village (Table 4). The findings reveled that agro pastoralists acquired the knowledge of EVPs through researchers and extension agents (74.3%), fellow agro pastoralists (64.3%) and from elders (70.0%). Since most of farmers have attained ethno-veterinary practices through various researches and advice from extension officers, therefore there is a possibility of upgrading the use of ethno-veterinary practices in this area because the research centers and livestock extension officers through local government authority are among the major institutional factors that can influence the extent and adoption of ethno-veterinary practices and utilization as reported by Islam *et al.;* [18].

CONCLUSION AND RECOMMENDATIONS

This study has shown there is potential use of EVPs in treating various livestock diseases in the study area. But lack of knowledge and negative perception has been identified as the major factors limiting the adoption of EVPs to some agro-pastoralists.

The study findings revealed that there are a lot of potential plants of ethno-veterinary value that are highly recognized in the study area.

Due to less documented information about ethno-veterinary practices it is recommended that further researches to be done, documenting the findings and disseminate information on use of ethno-veterinary to various stake holders of the livestock sector and specifically livestock farmers.

Also livestock farmers should be encouraged to establish more herbal plants thus make ethno-veterinary practices sustainable. Education for sensitization on the use ethno veterinary practices should be provided to livestock farmers through training in order to increase the rate of adoption.

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