Ethno-veterinary medicines and livestock production in mushagashe small scale commercial farming area, masvingo

Manasa Sibanda[1,*] Tendai Chiuta[2]

[1]Lecturer, [2]Livestock Officer, [1]Dept. of Sociology and social Anthropology, Faculty of Social Sciences Great Zimbabwe University, Masvingo, [2]Livestock Section, Makoholi Research Station, Masvingo, Zimbabwe

***Corresponding Author: Manasa Sibanda**
Email: msibanda@gzu.ac.zw, manasa.sibanda@yahoo.com

Abstract
This paper examined ethnoveterinary medicines and practices as cultural heritage in Mushagashe Small Scale Commercial Farming Area in Masvingo province. It applied both quantitative and qualitative approaches to gather data. A Semi-structured questionnaire, focus group discussions, key informant interviews and participant observation were used. SPSS version 16 and Excel software were used to analyse quantitative data while themes were developed for qualitative data. Results show that the knowledge of common diseases, diagnosis and medicines was dominated by males (80%). 50% of the age group above 60 years, was more knowledgeable, followed by the (35 - 60 years) age group (35%), while the least (15%) were between 25-35 years. Those in the 25-35 years category ridiculed and regarded traditional medicines as archaic. The age group 36 - 60 years (62.5%), were reluctant to share their knowledge, while herbalists were secretive as a way of socially patenting it. Only 10% respondents were aware of the toxicity levels while the majority (70%) considered traditional medicines as safe and effective. The study concluded that ethnoveterinary supersede modern veterinary practices in the area, but lacks pharmaceutical validation and documentation. It recommended the aligning of government policy on intellectual property rights and the validation to promote commercialisation.

Keywords: Ethnoveterinary medicines, Indigenous knowledge systems, Livelihoods, Traditional medicines, Cultural heritage.

Introduction
This paper examined ethnoveterinary medicines and practices as cultural heritage in Mushagashe Small Scale Commercial Farming Area in Masvingo province. Ethnoveterinary medicines and practices are a branch of Indigenous Knowledge Systems (IKS), which look at unique local knowledge on animal health and associated diagnostic skills, practices, beliefs, practitioners, and social structures (Maroyi, 2013). McCorkle (1995) posits that the use of traditional medicines have the ultimate goal of increasing human well-being via increased benefits from stock raising. Because of the varying traditions and ecological setups, ethnoveterinary knowledge differs from region to region (Matekaire and Bwakura, 2004) hence their documentation cannot be overemphasised.

The pursuance in the adoption of traditional medicines and practices denotes what can be regarded as resilience to the more modern veterinary practices which is a form of westernization. It can also be viewed as cultural heritage to local people that affects their livelihoods. Kabatabazi (2010) inferred that invasion of western cultures weakens the traditional system, in some instances totally replacing them, which he equated to a tragedy. This paper adopted the UNESCO (1972) definition of cultural heritage which encompasses monuments, collections of objects, traditions or living expressions inherited from ancestors and passed on to descendants, such as oral traditions, social practices, rituals, festive events and practices concerning nature and the universe.

Scholars such as Mudzengi, Dahwa, Skosana and Murungweni (2014) argued that ethnoveterinary medicines reduce animal health management costs, are locally available, environmentally friendly and locally acquired techniques applied hence regarded as sustainable to utilize by the farmer. Ethnoveterinary medicines provide information to the development of adaptive livestock healing practices (Froemming, 2006) which overlaps with human ethnomedicine, hence can contribute towards the development of new drugs, what Ogunlela (2007) coined as the bedrock of the pharmaceutical industry. Its diverse application, different plant species used, dosages, mode of application and type of disease or parasite cured vary from area to area. These attributes, proclaim it a robust livelihood option for livestock farmers. Earlier work by Phondani, Maikhuri and Kala (2010) affirmed that traditional stock raisers, farmers and herders developed and perfected their own ways of managing the health of their stock thereby keeping them productive. Evidently, the high cost, inaccessibility and other problems such as side effects associated with the conventional drugs have encouraged constant dependence on traditional medicines (Mafimisebi and Oguntade, 2011). WHO (2010) estimated that 80% of people in the developing world depend on traditional medicine based largely on the use of plants.

Notwithstanding the relevance of ethnoveterinary practices and medicines, it lacks scientific validation, particularly in Zimbabwe. As such, active ingredients of such materials used remain unconfirmed and or commercialised. In spite of the applauded economic sense in literature on the use of ethnoveterinary medicines the level of adoption is hampered by the use of the modern conventional drugs. This scenario renders them not considered as effective treatments (Chavhunduka, 1978) hence further experimentation and critical investigation for applicability in livestock production is required (Wanzala et al., 2012).

Regarding veterinary service provision, the Zimbabwe prefecture is unique. At national level, the veterinary health sector had a number of challenges that include scarcity of medications, erratic supply of drugs and prohibitive cost of most supplies. To add, there was poor communication infrastructure, manpower shortage and personnel immobility (Mwale, Bhebe, Chimonya and Helimani, 2005). Such conditions have not only constrained livestock farmers but propelled them to treat their animals on their own, using available resources (Mafimisebi and Oguntade, 2011). It is within the arguments above that this research was grounded.

Threats to full adoption of traditional medicines and practices exist. These include the negative effects of climate change and variability (Mudzengi et al., 2014) earmarked with the emergence of new and drug resistant pests and diseases. Other threats include loss of breeding stock where conventional drugs were not used (FAO, 1999) lack documentation as well as ridicule by the younger generations. Mafimisebi and Oguntade (2011) as well as Hefferman et al. (2000) considered that the prestige attached to modern practices makes it difficult for the younger generations to appreciate and utilize their inherited belief system. In spite of these constraints, Sibanda (2010) noted a widespread interest in documenting and validating traditional medicines and practices, which might contribute to safeguarding the invaluable knowledge for future generations.

Theoretical framework

The study was informed by the Department for International Development's (DfID) theoretical framework on sustainable livelihoods. The framework views people as entity operating in a vulnerability context. Within this context, they access poverty-reducing factors which gain meaning through a prevailing social environment which in turn influences livelihood strategies (Chambers and Conway 1992; Campbell et al., 2005). The sustainable livelihoods framework is based on five types of capitals, which are natural, human, financial, physical and social. The World Bank Report in 'Voices of the poor initiative', suggested that the poor focus on assets rather than income. In this case, livestock was viewed as natural, financial and social capital of the poor (DfID, 1999). Within this framework, livelihood strategies such as 'hanging in', are considered when livestock plays a buffering and insurance roles. The 'stepping up' situation was also interpreted in the event when they go beyond subsistence and contribute towards building other assets (DfID, 1999). The study considered the aspect of 'stepping out' which is a situation when livestock are less vital. This concept has been successfully used to investigate roles of livestock in livelihoods of poor families in the Yucatan, South-East Mexico (Dorward, Anderson, Clark, Keane and Moguel, 2001).

Problem statement

Zimbabwe, being a subtropical country, is host to a variety of livestock pests and diseases. The study area is no exception to such infestations. Mushagashe farmers possess a historical continuity of traditional practices, particularly in livestock production, improved through adaptation to the changing ecological systems in the region. Although a number of ethnoveterinary inventories concerning use of medicinal plants and animals in human health have been realized, the use of traditional medicines and practices in Mushagashe is poorly described. Scholars such as Mwale et al. (2005) researched on use of herbal plants in poultry health management in the study area, however, much of the local knowledge on livestock remain undocumented. This scarce description of such repository of knowledge that is being ridiculed by the younger generations, who emulate modern medicines and practices, is unambiguously in peculiarity to the problems of livestock rearing, where lack of regular access to conventional drugs has an effect on livestock productivity. If this trend perpetuates the likelihood that such beneficial traditional practices could be lost forever is inevitable. As such, the study was essential as it provided an in-depth investigation of the local practices, perceptions, knowledge and skills of Mushagashe farmers involved in traditional medicines, and the results produced could be anecdotal to a larger population in particular, Zimbabwe.

Aim and objectives of the study

The aim of this study was to investigate the adoption of ethnoveterinary practices in livestock production in the Mushagashe Small Scale Commercial Farming Area of Masvingo, Zimbabwe. The study identified ethnoveterinary practices (herein after referred to as traditional medicines), and materials applied by local farmers by gender. Further, it assessed the perceptions of local farmers on the contributions of traditional medicines towards effective livestock production explicating on both exogenous and endogenous threats to its full adoption. An analysis of local solutions to the challenges being faced was also conducted. The point of departure of our study however, was whether or not these practices and medicines were always safe and environmentally friendly, they contributed towards local livelihoods.

Materials and Methods

This section discusses the study site, methods used to collect data and data analysis.

The study site

This study was carried out in Mushagashe Small Scale Commercial Farming Area which is located 30 km North of Masvingo provincial town. Altitude is 1160m above sea level on latitude $19^0$50'S and longitude 30^0 46'E. Mushagashe is bound by Makoholi River on the North and Shakashe River on the South, which provide perennial drinking water for various uses including watering livestock. The area is demarcated into four sections namely Mushagashe East, West, North and South. Mushagashe falls within Natural Region IV of the Zimbabwean ecological classification system (Vincent and Thomas, 1961) which is predominantly characterized by sandy soils. Crop

production in the area is risky because of relatively low soil fertility, persistent pest and disease manifestation, highly variable and erratic rainfall patterns (450 to 650 mm annually). Temperatures in summer are hot (mean of 28°C) and drop significantly to as low as 2°C during winter. Livestock production is the main livelihood activity (Mutimukuru et al., 2000) in the area.

The dominant perennial vegetation cover includes Julbernadia globiflora, Brastegia speciformis, Terminalia serecea, Brastegia boehmii tree species. Dominant grass species are Hyparrhenia filupendular, Hyparrhenia dissoluta, Schizachyrium jeffrissi and Cynodon dactylon. These provide much of the livestock fodder throughout the year thereby increasing the potential for livestock production.

Data collection methods

Both qualitative and quantitative research approaches were adopted. The quantitative methodologies used in this study were in the form of a semi structured questionnaire. Interviews, direct observation, participant observation and focus group discussions constituted qualitative techniques applied. These assisted in collecting primary data on different veterinary medicines, practices and perceptions on the efficacy in treating and preventing livestock diseases and parasite infestation. Literature review complemented research findings from the primary data.

The semi structured questionnaire was used to collect information on demography, socio-economic, livestock reared, production systems, farmers' perception on the social, and economic roles of traditional medicines and practices. Participant observation verified not only local practices but established what local farmers do relative to what they say they actually do. As such, the study also used ethnographies.

Focus groups involved key informants such as farmers and elderly people with ethnoveterinary experience. Various key players operating in livestock health consisting 5 herbalists, government officers from AGRITEX, the Department of Research and Specialist Services, Department of Veterinary Services, Livestock Production and Development and 3 NGOs. The researchers used triangulation to cross-check information availed by various sources for authenticity and accuracy.

Selection of respondent farmers

From a population of 200 farmers, a semi structured questionnaire was administered to 60 (30%) purposively selected respondents who own livestock, comprising 33,3% women and 66.7% men. See fig 1. Where possible, other household members were allowed to attend interviews to supplement pre-requisite data. Respondents were 25 to above 60 years, representing a mixed group. A quarter of the respondents had Master Farmer Certificates, 15% held Young Farmers' Club Certificates, and 5% had certificates in Agriculture. Literacy made it easy for extension workers to communicate technical messages to livestock keepers.

75% households were male headed, and men while 15% were *de facto* female-headed households (those with a male, though temporarily absent), often consult their absent male partners for decisions. 10% respondents came from *de jure* female-headed households who make their own decisions.

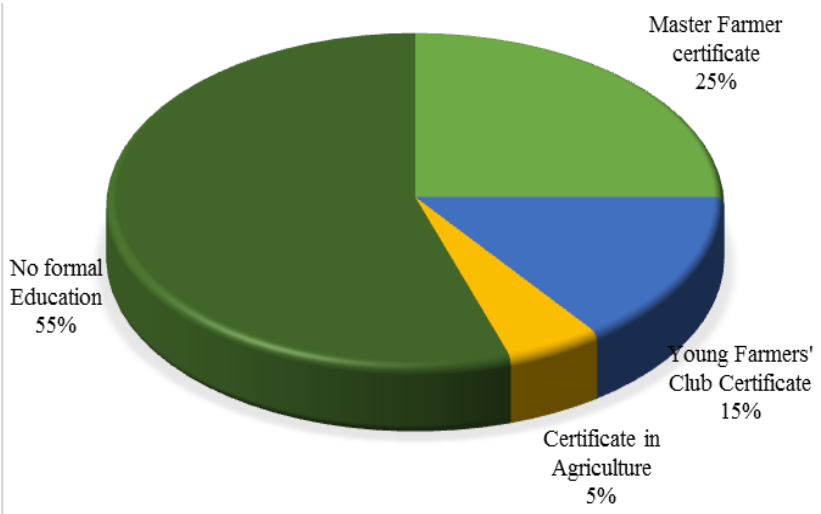

Fig. 1: Respondent local farmers

Data Analysis

Two computer software programmes (Software Programme for Social Sciences, version 16.0 and MS Excel), were used to analyse data. As such, descriptive statistics were used to illustrate the demographic parameters and socio-economic characteristics in the form of percentages.

Qualitative data was analysed using the Miles and Huberman's 1994 framework. The framework traces the

relationships among social phenomena based on the regularities and sequences that link these phenomena. Its three components, which are data reduction, data display and drawing as well as verifying conclusions, were applied throughout the research. Such data as livestock species kept, production systems, medicines and practices as well as perceptions on the efficacy, side effects, social and economic effects of adopting the medicines were considered. Themes were also developed from the data collected from discussions and participant observation.

Results and discussion

This section presents the results and discussion.

Extension service and adoption of ethnoveterinary

40% of the extension staff confirmed the use of traditional medicines in the study area. The study established that the extension staff from 3 NGOs was engaged in supporting the use of conventional veterinary drugs. Staff from the NGOs reiterated that they feared to lose their jobs if they support traditional medicine in case of casualties. It can be deduced that the risk associated with traditional medicine due to the lack of validation made extension staff from NGOs shun supporting it. Instead, they preferred securing their jobs. 72.5% respondents indicated that high costs and inaccessibility of conventional drugs, has left them no option except to turn to traditional medicines. However, those engaged in dairy production (25%) had access to subsidized conventional drugs from the 3 NGOs operating in the area. As reiterated by one local leader, the NGOs "… out-competed each other in facilitating one local project". Although they differ in approach, there was duplication of certain activities such as supplying of subsidised veterinary kits, breeding stock heifers and artificial insemination. Such access by local farmers suggested a reduction in the use of traditional medicines.

For other farmers who were not part of the supported dairy project, extension staff were virtually 'invisible' "hativaoni". As such, the unavailability of technical expertise (human capital) in the study site contributed to adoption of traditional medicines. See also similar inferences by Chigora, Masocha and Mutenheri (2007). Apart from being immobile, extension staff complained that they stay far from Mushagashe. This overburdened farmers' financial capital through additional transport costs to access extension services. A concern by respondents was the existence of 'bogus' veterinary extension staff, who unlawfully charged for services rendered, what they called "yemusana". These observations concur with findings by Williams and Williams (1991) on 'quack' veterinarians in Nigeria. Although most farmers (88%) appreciate modern medicines, they could not afford them due to prohibitive costs. This propelled resource-poor farmers to use traditional medicines as part of their natural capital and main investment asset to sustain their livelihood (Okojie, 1999).

Decision making in livestock management

The study revealed that decision making in livestock production for large livestock was gender skewed and dominated by males. Women were key decision-makers in small ruminants and poultry production. Similar results were observed in studies by Safilios-Rothschild (1983). It also agrees with Haralambos and Holborn's (2008) assertion that such specialized technical knowledge is tied to the division of labour in the society. In terms of labour, 75% of the respondents utilize labour from family members and 15% have permanent farm workers, while 10% rely on hired or casual labour. This provided a better understanding of most households' predisposition towards adoption of traditional medicine in the area. It also suggested the continuity in the acquisition of the knowledge and transfer of related skills within family units. This acted as a local repository of this vital knowledge. For the hired labour, they acquired the knowledge as they performed their duties. This in turn was passed on to other workers.

Gender, age and ethnoveterinary knowledge

A comparison of the knowledge of common disease diagnosis, traditional medicines and herding practices of large livestock between male and female respondents showed that males dominated with 80% and females (20%). This agrees with findings by Mussa (2004) and Antonio and Ahmed (2010) who posited that women by virtue of their limited proximity to large livestock were more knowledgeable about traditional animal care of small ruminants and poultry than men.

Respondents above 60 years were more knowledgeable (50%) about traditional medicines, followed by those between 35 and 60 years (35%), with the least (15%) being the age group 25-35 years. It was established that those between the age group 25-35 years, ridiculed and regarded traditional medicines as barbaric and archaic. This scenario presents challenges in the transfer of traditional knowledge and skill to the supposedly future repository age group. Similar findings were observed by Mafimisebi and Oguntade (2011) who concluded that there is a positive relationship between age and knowledge of traditional medicines, which is credited to older farmers as custodians. In other words, the unequal distribution of traditional knowledge among age and gender groups in the study area suggested the need for a deeper investigation into traditional medicines engagement at household level.

Sharing and 'social patenting' of knowledge

Most respondents (62.5%), between 36 to above 60 years were not secretive in sharing their knowledge, while the other 22.5% respondents were secretive. Initially, herbalists were reluctant to share their knowledge but became cooperative after realising that the study was focusing on livestock not humans, which they normally charge for services. Those who stayed with herbalists were well versed with plant species used due to involvement in the harvesting, preparation and application processes. Overall, the safeguarding of the local knowledge by

herbalists created a 'fortress of traditional medicine'. However, it was later realized that herbalists mentored a relative, especially a nephew "*muzukuru*", who undergoes an apprenticeship. In so doing, this practice ensured continuity of this medicinal legacy in the family, what we regarded as 'social patenting' of the cultural heritage.

Prevalent diseases

Respondents identified 11 common livestock diseases. All respondents cited heart water as the most prevalent disease in cattle while 90% pointed to eye problems as a common challenge. 75% ranked black quarter and lumpy skin as other prevalent diseases. All goat keepers cited Pulpy kidney/enterotoxaemia (Chindee) as a common disease in goats while coccidiosis by 97.5% poultry keepers followed by fowl pox and New Castle Disease. The high number of diseases in the study area proved a threat to livestock production and a potential risk to local livelihoods. Mushagashe East and South have highest incidences of tick-borne diseases while Pulpy kidney was prevalent in Mushagashe North because the area receives more rainfall and had pronounced vegetation than other areas. See inferences by Magona et al., (2008) who attributed the habitat characteristics to harbor pests and diseases as causative. Traditional remedies thus played a significant role in livestock production in the study area and local livelihoods.

Dominant medicinal plants used

A total of 26 most common broad-spectrum traditional plant species were identified by respondents. The ranked top six most effective plants were Aloe vera, Albizia gummisera, Euphobia tirucallii, Solanum nigrum, Conthaium huiilense and Adenium obesum. 97.5% respondents acknowledged that these were locally available rendering their use, cost effective.

Preparations, dosage and administration of remedies

Respondents said that different plant parts had different pharmaceutical properties hence were carefully selected to treat different diseases. The majority (90%) of respondents crushes roots, leaves fruits or barks and mixed them with drinking water while 2.5% female respondents mix with feed particularly for poultry. This is in agreement with Grades et al. (2008) who reported that methods and modes of application were dictated by the nature of the illness and the plant part used. A total of 30% respondents indicated that roots had the highest efficacy (stomach aches and reproductive diseases), while 55% regarded barks as effective in curing skin diseases (Lumpy Skin) in cattle. Concern was, however, raised that roots and barks if not properly extracted can negatively affect survival of plants due to the physiological impact on the affected trees rendering them less resilient to shocks such as water stress. See also observations by Nalule et al., (2010). The study did not establish the quantities involved and remains an area for further research.

Methods of preparation and administration of remedies utilized locally developed and appropriate technologies that local people were familiar with. Remedies prepared by herbalists (who mixed various plant species), were regarded as more potent by 63% respondents than those prepared by other individuals. This was in agreement with Kaufman et al., (1999) who claimed that mixing plants may enhance effectiveness through synergism. The study neither ascertained the antagonistic effects of such mixes by the herbalists, nor established consensus by respondents on the standard dosage levels. 80% could not give dosage rates for the prepared remedies they used.

Perception on efficacy and risks of medicinal plants

The study revealed that 90% respondents were not familiar of potential risks of using 'unstandardised' dosage of traditional remedies although they contemplated that they were beneficial and safe. Only 10% respondents were aware of the toxicity of some medicinal plants. Two elderly male respondents suggested that Adenium obesum liquid could be administered by putting in the eye, yet most respondents (78%) said this caused total blindness. However, all herbalists confirmed that improper use of herbs leads to toxicity. Similar perceptions are held by Ipsos-MORI (2008) that improper use of traditional remedies can be inimical to animal health and that excessive administration of some herbal medicine had adverse reactions in livestock, which mostly manifest as muscle tremors, shivering and diarrhea. Validation of the toxicity levels and side effects of traditional medicines were not established and requires further study.

Impact of climate variability on traditional medicines

All respondents conceded that changes in climatic conditions were noticeable with ripple effects on their livestock. 90% respondents ascribed increased incidences of diseases such as Lumpy Skin Disease and Black Quarter to climate variability. Upon further probing and clarification of what really climate change is, all respondents attributed its effects to the currently incessant droughts and erratic rains which exacerbated water and pasture shortages. A third of the respondents attributed climate change to outbreak of 'tiny whitish ticks' "Tumwe tushambwe tudikidiki twakacheneruka tunenge twakawanda". Respondents were hopeful that the adoption of traditional medicines can go a long way in extenuating and acclimatizing to new diseases and pests in the Mushagashe prefecture.

Vaccination and disease control

Most farmers (70%) did not follow routine vaccination programmes to prevent disease outbreaks, 25% follow routine while 5% occasionally vaccinate their stock. See Fig. 2 below. Almost all (97.5%) poultry keepers used traditional remedies

for both disease prevention and control. These results were consistent with observations by Mwale et al. (2005). The use of traditional medicines thus dominated in Mushagashe and the use of conventional drugs was complimentary.

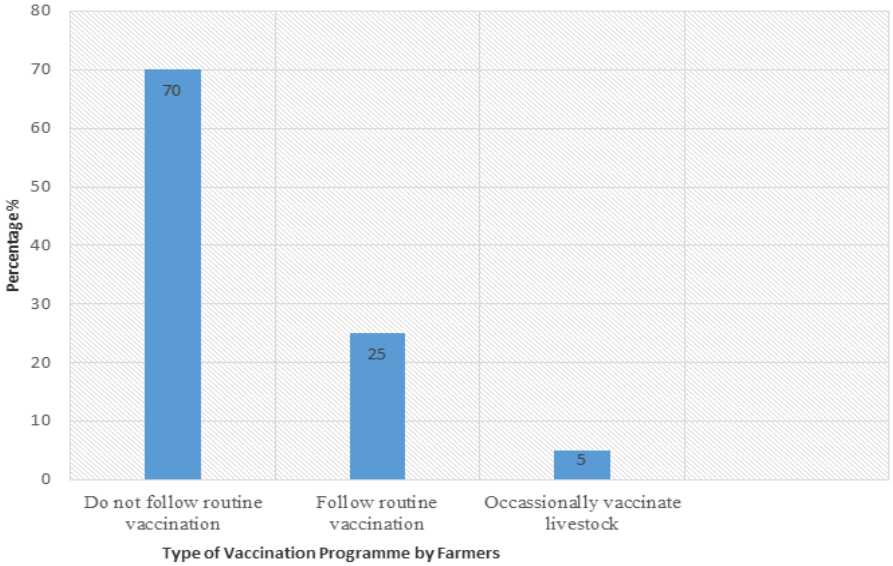

Fig. 2: Vaccination programmes by farmers in mushagashe

Common external parasites and antidotes

Ticks (Bont and Blue ticks), which were prevalent during summer in Mushagashe. 50% respondents credited Tephrosia vogelli (Chitupatupa) as an effective traditional remedy for ticks. 90% used Sphenoslylis marginata (Chidhibhana/Zhombwe) as an acaricide. It was revealed that limited access to dipping facilities and services increased the incidences of tick infestation. Again the unavailability and prohibitive costs of modern drug acaricides has led respondents to turn to traditional medicine. One respondent said that "Watching my animals die from diseases due to erratic veterinary dipping services made me realise the importance of traditional acaricides such as S marginata".

For poultry, 90% respondents experienced manifestation of fowl tampans and mites (Vutata). 87.5% used Lippia javanica (Zumbani) as a repellent. These findings were consistent with those reported by Okitoi et al. (2007) in Kenya where Mexican marigold was used as an insect repellent. Mange mites on goats were prevalent (56%). For remedies, 60% respondents used Eucalyptus spp while 80% applied Tagetes minuta as repellents. The wide range of external parasites were being contained by farmers through the use of traditional remedies rendering the medicines effective in keeping the invaluable natural asset supporting local livelihoods.

Common internal parasites and remedies

Tapeworms, wire worms and conical flukes were prevalent in local stock. 90% said wire worms were common in poultry and 50% pointed to liver flukes in cattle. Incidences of internal parasites were low in Mushagashe West due to regular deworming through support from 3 NGOs operating in the area. For remedies, 80% respondents used Albizia adianthifolia (Mucherenje) while 20% applied Aloe vera and Capsicum annum (chillies) to deworm livestock. Other dewormers used were soar traditional beer, as well as Elephantorrhiza goetzei and Elephantorrhiza elephantina (Ndorani) species. Helminthes were treated with soot (Chin'ai) and salt by 60% respondents. Accordingly, these readily available and perceived effective remedies safeguarded the natural livestock asset thereby positively enhanced local livelihoods.

Practices and remedies for various ailments and emergencies

The study revealed that fewer (30%) respondents stock modern antibiotics for emergencies while the majority (70%) relied on traditional remedies. For fractures, 90% respondents constructed structures to keep the separated bones intact using Euclea divonorum (Mubhubhunu) or reeds (Tsanga or Chisekete). Failure to rectify fractures led to natural capital loss as (18%) respondents ended up slaughtering their injured animals out of desperation. Bloat in animals especially cattle was treated with sour traditional beer (40%) while 20% and 5% used Aloe vera roots and pepper mixed with onion respectively. Findings by Mafimisebi and Oguntade (2011) showed that by providing fodder mixed with Murraya koenigii, black pepper and onion facilitated the treatment of bloat.

Most eye problems (pink eye, parafleria worms infections, cataracts (Shanga) and opthalmia), which were frequent during the rainy season were treated with Adenium obesum (Chisvosve) by 40% respondents while 50% used Strychnos spinosa (Man'ono) fruits and 25% used hot iron. For cataracts, 20% respondents used powdered snail shells and 15% applied millipede powder. Common remedy for wounds was Conthaium huiilense (Muvengahonye) with 70% respondents, 20% applied Xeroderris stuhlmannii (Murumanyama), and 10% claimed to use cow dung (Ndove) and human urine (Mutundo). Other remedies for

the treatment wounds were Jatropha curcas and Solanum incanum (Nhundugwa). Mastitis which was a common disease in the study area was treated using Xeroderris stuhlmannii (Murumanyama). Profuse diarrhea was treated with Lorathus spp (Murujuruju) by 80% respondents, while Solanum nigrum (Rusungusungu) and Euphobia tiricalli (Rusungwe) were used by 60% and 30% respondents respectively. In addition, a mixture of Aloe vera and Nicotiana tabacum (Fodya) leaf treated diarrhea. These findings were consistent with those by Mwale et al. (2005). Not only does the availability and use of an array of prophylactic plants in the study area suggest the presence of a rich biodiversity resource-base but the potential to improving local livelihood options.

Remedies for retained afterbirths and dystocia

85% respondents tied heavy stones to force down the placenta in cases of retained afterbirths. There was no general consensus on the actual sizes (weights) of such stones. Alternatively, 75% respondents used Dicerocaryum zanguebarium (Ruredzo) or Albizia anthelmintica (Nhanzva) to treat the same condition. 10% of the respondents used crushed Carica papaya (paw paw) leaves that were soaked in 2liters of water and drenched after which the cow was expected to expel the placenta in 24 hours.

In terms of dystocia, 80% respondents inserted hands lubricated with Dicerocaryum zanguebarium or Albizia anthelmintica into the uterus to extract the calf. 20% respondents alluded that they called veterinary staff or other experienced farmers to render their services. For prolapsed uteruses, 90% respondents used Dicerocaryum zanguebarium to lubricate their hands in order to restore the uterus while 10% used clean water and ordinary soap.

Post mortem and carcass disposal

In case of animal deaths, 40% respondents seek the opinion of veterinary officers to conduct a postmortem. Their modes of disposal of the carcasses after postmortem were deep burial or burning. However, 30% respondents conducted postmortem on their own and claimed to bury the carcasses afterwards. This concurs with Mengesha et al. (2011) who alluded that local people have the capacity to conduct postmortem and safe disposal of carcasses. The study also revealed that 20% respondents consumed meat from dead animals despite cause of death while 10% disposed the meat to willing neighbours. Notably, all farmers in Mushagashe were aware of the value of establishing the cause of death of their animals and seeking the services of extension workers was on a voluntary basis.

Conclusion

The larger population of Mushagashe derive their livelihoods from livestock as their natural capital hence their need to protect them even in the wake of economic challenges and climate variability. Traditional medicines and practices in Mushagashe have proven not only to be relatively cheap but readily available and familiar to livestock keepers. Generally, people who utilised traditional medicines were better off than those who exclusively relied on conventional drugs not only on their well-being but also on the income saved. Herbalists managed to generate financial capital from their practice as they charged other farmers to treat livestock hence diversified their survival portfolios. The reserved nature of herbalists to sharing their knowledge on traditional medicines was a way of fortifying local knowledge. There are gender disparities in traditional medicines due to the different roles they play in livestock production. The Mushagashe case showed no general consensus on the dosage, toxicity and efficacy of the remedies. In spite of the benefits that the local famers have acquired by adopting traditional medicines and practices, its documentation and adoption by the younger generations remain a potential threat. The DfID's sustainable livelihoods framework, was ideal to informing the study particularly on the contributions of the cultural heritage of traditional medicines to the livelihoods of local farmers. It is safe to conclude that traditional medicines can become the most revered and treasured social capital of a community although their conservation can be threatened to local extinction if no transmission of the knowledge is undertaken to the younger generations.

Recommendations

These recommendations are based on a comprehensive analysis of current ethnoveterinary practices and key constraints in four areas of Mushagashe in Masvingo, Zimbabwe. The major entry point is improving the perception of traditional medicines, particularly to the younger generation through developing farmers' awareness and their capacity to effectively make use of this invaluable social capital of knowledge for animal health care. More studies to validate community claims on efficacy, toxicity and dosage of traditional medicines are needed. The fact that ethnoveterinary has little documented information, through participation of relevant stakeholders such as research institutions and the private sector, the government should consider the securing of Intellectual Property Right of such knowledge and explore possible strategies for commercialization.

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